



# Neptune Handheld System Users' Manual









## Neptune Handheld System Users' Manual

***Accu-Flo***  
**1-800-921-2228**  
**[www.accuflo.com](http://www.accuflo.com)**



## Proprietary Rights Notice

This manual is an unpublished work and contains the trade secrets and confidential information of Neptune Technology Group Inc., which are not to be divulged to third parties and may not be reproduced or transmitted in whole or part, in any form or by any means, electronic or mechanical for any purpose, without the express written permission of Neptune Technology Group Inc. All rights to designs or inventions disclosed herein, including the right to manufacture, are reserved to Neptune Technology Group Inc.

The information contained in this document is subject to change without notice. Neptune reserves the right to change the product specifications at any time without incurring any obligations.

## Trademarks Used in This Manual

R900 is a registered trademark of Neptune Technology Group Inc. N\_SIGHT R900 is a trademark of Neptune Technology Group Inc. R900 Belt Clip Transceiver is a trademark of Neptune Technology Group Inc. MRX920 is a trademark of Neptune Technology Group Inc. ARB is a registered trademark of Neptune Technology Group Inc.

Trimble Nomad is a registered trademark of Trimble Navigation Limited. Trimble Ranger 3 is a trademark of Trimble Navigation Limited.

CE Net Windows, Windows 6.1, and Windows Mobile Device Center are registered trademarks of Microsoft Corporation.

Other brands or product names are the trademarks or registered trademarks of their respective holders.

## FCC Conformity

### Trimble Nomad Handheld Computer

#### U.S.A.

This device complies with Part 15 of the FCC Rules. It is tested to comply with FCC standards for home or office use. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the



user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.



**Warning: Changes or modifications to this device not expressly approved by Neptune Technology Group Inc. could void the user's authority to operate the equipment.**

### Trimble Ranger Handheld Computer

#### U.S.A.

This device complies with Part 15 of the FCC Rules. It is tested to comply with FCC standards for home or office use. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

### R900 Belt Clip Transceiver

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not



occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

### Neptune HR2650i

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.



**Warning: Changes or modifications to this device not expressly approved by Neptune Technology Group Inc., could void the user's authority to operate the equipment.**

### RF Exposure (Intentional Radiators Only)

This device has been tested and complies with FCC SAR (Specific Absorption Rate) RF exposure compliance requirements for body-worn operation.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment is in direct contact with the body of the user under normal operating conditions. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.



## Industry Canada

### Trimble Nomad

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the radio interference regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de Classe B prescrites dans le règlement sur le brouillage radioélectrique édicté par le Ministère des Communications du Canada.

### Trimble Ranger

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the radio interference regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de Classe B prescrites dans le règlement sur le brouillage radioélectrique édicté par le Ministère des Communications du Canada.

### R900 Belt Clip Transceiver

This Class B digital apparatus meets all requirements of the Canadian Interference Causing Equipment Regulations. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Cet appareillage numérique de la classe B répond à toutes les exigences de l'interférence canadienne causant des règlements d'équipement. L'opération est sujette aux deux conditions suivantes: (1) ce dispositif peut ne pas causer l'interférence nocive, et (2) ce dispositif doit accepter n'importe quelle interférence reçue, y compris l'interférence qui peut causer l'opération peu désirée.

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

Conformément à la réglementation d'Industrie Canada, cet émetteur radio ne peut fonctionner à l'aide d'une antenne d'un type et maximum (ou moins) Gain approuvé pour l'émetteur par Industrie Canada. Pour réduire le risque d'interférence avec d'autres utilisateurs, le type d'antenne et son gain doivent être choisis afin que la puissance isotrope rayonnée équivalente n'est pas plus que ce qui est nécessaire pour une communication réussie.



## Neptune HR2650i

This Class A digital apparatus meets all requirements of the Canadian Interference Causing Equipment Regulations. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Cet appareillage numérique de la classe A répond à toutes les exigences de l'interférence canadienne causant des règlements d'équipement. L'opération est sujette aux deux conditions suivantes: (1) ce dispositif peut ne pas causer l'interférence nocive, et (2) ce dispositif doit accepter n'importe quelle interférence reçue, y compris l'interférence qui peut causer l'opération peu désirée.

## CE Conformity

The Neptune Handheld System meets the 89/336/EEC directive intent for Electromagnetic Compatibility Compliance when used with appropriate accessories. These are Class B products. In a domestic environment, these products may cause radio interference, in which case, the user may be required to take adequate measures. The compliance was demonstrated to the following specifications as listed in the official Journal of the European Communities:

|                              |                                       |
|------------------------------|---------------------------------------|
| EN 50081-2, Emissions        | EN 50082-2, Immunity                  |
| EN 55022: Radiated, Class B  | EN 61000-4-2: Electrostatic discharge |
| EN 55022: Conducted, Class B | EN 61000-4-3: RF radiated             |
|                              | EN 61000-4-4: Fast transients         |
|                              | EN 61000-4-6: RF conducted            |

Neptune Handheld System  
Users' Manual  
Literature No. UM Handheld System  
11.14  
Part No. 11769-016

Neptune Technology Group Inc.  
1600 Alabama Highway 229  
Tallassee, AL 36078  
Tel: (334) 283-6555  
Fax: (334) 283-7293



# Contents

---

## 1 Introduction

|  |     |
|--|-----|
| Conventions Used in this Manual .....          | 1-1 |
| Screen Shots Used in this Manual .....         | 1-2 |
| Differences in Screen Appearances .....        | 1-2 |
| Available Functions .....                      | 1-3 |
| Product Support within the United States ..... | 1-3 |
| Finding the Software Version Number .....      | 1-4 |
| When Not Logged In .....                       | 1-4 |
| When Logged On to N_SIGHT R900 .....           | 1-5 |
| Contacting Customer Support .....              | 1-5 |
| Finding Information within the Manual .....    | 1-7 |
| Where to Start .....                           | 1-7 |
| Meter Readers .....                            | 1-8 |
| Operators .....                                | 1-9 |

## 2 Overview of the Neptune Handheld System

|  |     |
|--|-----|
| Typical Meter Reading Process .....            | 2-1 |
| Daily Use of the Neptune Handheld System ..... | 2-2 |
| Meter Readers .....                            | 2-3 |
| Operators .....                                | 2-3 |
| Basic Features of the Nomad .....              | 2-4 |
| Operating Environment .....                    | 2-7 |
| Rain and Water Resistance .....                | 2-7 |
| Electromagnetic Resistance .....               | 2-7 |
| Shock Resistance .....                         | 2-8 |



|  |      |
|--|------|
| Use of the Nomad . . . . .             | 2-8  |
| Basic Features of the Ranger. . . . .  | 2-9  |
| Operating Environment . . . . .        | 2-12 |
| Rain and Water Resistance . . . . .    | 2-12 |
| Electromagnetic Resistance . . . . .   | 2-13 |
| Shock Resistance . . . . .             | 2-13 |
| Use of the Ranger . . . . .            | 2-13 |
| The Display on the Handhelds . . . . . | 2-13 |
| The Handheld Screens . . . . .         | 2-14 |
| Menu Screens . . . . .                 | 2-14 |
| Main Screens. . . . .                  | 2-16 |
| Extended Screens . . . . .             | 2-18 |
| Icon Bar . . . . .                     | 2-20 |

## 3 Using the Nomad Handheld

|  |     |
|--|-----|
| Unpacking the Nomad . . . . .  | 3-1 |
| Setting Up the Nomad . . . . .   | 3-3 |
| One Nomad and a Communication Cradle . . . . .                             | 3-3 |
| The Router. . . . .  | 3-4 |
| Connecting to the Host Computer and Power Supply. . . . .                  | 3-4 |
| Connecting the Router, Nomad Handheld Cradle, and Power Supplies . . . . . | 3-5 |
| Configuring the Nomad Handheld. . . . .                                    | 3-7 |
| On the Host Computer. . . . .  | 3-7 |
| On the Nomad Handheld . . . . .  | 3-7 |
| The Display and Keyboard . . . . .   | 3-9 |
| Learning the Keyboard. . . . .   | 3-9 |



---

|  |      |
|--|------|
| Buttons and Keys . . . . .                       | 3-10 |
| Buttons . . . . .                                | 3-11 |
| Direction Buttons . . . . .                      | 3-12 |
| Number Buttons . . . . .                         | 3-12 |
| Nomad Screen Keyboard . . . . .                  | 3-13 |
| Changing the Size of the Keys . . . . .          | 3-13 |
| Large Keys . . . . .                             | 3-14 |
| Small Keys . . . . .                             | 3-14 |
| Lowercase Keys . . . . .                         | 3-14 |
| Uppercase Keys . . . . .                         | 3-14 |
| Numeric and Symbols Keys . . . . .               | 3-15 |
| Information Keys . . . . .                       | 3-15 |
| Direction Keys . . . . .                         | 3-18 |
| Combination Keys . . . . .                       | 3-19 |
| Nomad Functions . . . . .                        | 3-19 |
| Adjusting System Settings . . . . .              | 3-23 |
| Calibrating the Stylus . . . . .                 | 3-23 |
| Changing the Handheld Properties . . . . .       | 3-26 |
| Working with the Properties Screen . . . . .     | 3-27 |
| Configuring RF/Serial Properties . . . . .       | 3-28 |
| Turning the Nomad On and Off . . . . .           | 3-30 |
| Turning the Nomad On . . . . .                   | 3-30 |
| Turning the Nomad Off . . . . .                  | 3-31 |
| Logging In and Out of N_SIGHT R900 . . . . .     | 3-31 |
| Logging Into N_SIGHT R900 on the Nomad . . . . . | 3-31 |
| Logging Out of N_SIGHT R900 . . . . .            | 3-36 |



## 4 Using the Ranger Handheld

|   |      |
|---|------|
| Unpacking the Ranger .....  | 4-1  |
| Setting Up the Ranger .....   | 4-3  |
| One Ranger and a Communication Cradle .....                             | 4-3  |
| The Router .....  | 4-4  |
| Connecting to the Host Computer and Power Supply .....                  | 4-4  |
| Connecting the Router, Ranger Handheld Cradle, and Power Supplies ..... | 4-5  |
| Configuring the Ranger Handheld .....                                   | 4-7  |
| On the Host Computer .....  | 4-7  |
| On the Ranger Handheld .....  | 4-7  |
| The Display and Keyboard .....  | 4-9  |
| Learning the Keyboard .....   | 4-9  |
| Buttons and Keys .....  | 4-10 |
| Buttons .....   | 4-11 |
| Direction Buttons .....   | 4-11 |
| Number Buttons .....  | 4-11 |
| Ranger Screen Keyboard .....  | 4-12 |
| Changing the Size of the Keys .....                                     | 4-12 |
| Ranger Keyboard Keys .....  | 4-13 |
| Lowercase Keys .....  | 4-14 |
| Uppercase Keys .....  | 4-14 |
| Numeric and Symbols Keys .....  | 4-14 |
| Information Keys .....  | 4-15 |
| Direction Keys .....  | 4-17 |
| Ranger Functions .....  | 4-18 |
| Adjusting System Settings .....   | 4-20 |
| Calibrating the Stylus .....  | 4-21 |



|   |      |
|---|------|
| Changing the Handheld Properties . . . . .        | 4-24 |
| Working with the Properties Screen . . . . .      | 4-24 |
| Configuring RF/Serial Properties . . . . .        | 4-26 |
| Turning the Ranger On and Off . . . . .           | 4-28 |
| Turning the Ranger On . . . . .                   | 4-28 |
| Turning the Ranger Off . . . . .                  | 4-28 |
| Logging In and Out of N_SIGHT R900 . . . . .      | 4-29 |
| Logging Into N_SIGHT R900 on the Ranger . . . . . | 4-29 |
| Logging Out of N_SIGHT R900 . . . . .             | 4-34 |

## 5 Setting Up the R900 Belt Clip Transceiver

|   |      |
|---|------|
| R900 Belt Clip Transceiver . . . . .  | 5-1  |
| R900 Belt Clip Transceiver Overview. . . . .  | 5-1  |
| Nomad Handheld and R900 Belt Clip Transceiver . . . . .                                     | 5-2  |
| Unpacking and Inspecting Equipment. . . . .   | 5-2  |
| R900 Belt Clip Transceiver Components . . . . .   | 5-3  |
| Using the R900 Belt Clip Transceiver . . . . .  | 5-4  |
| Understanding the R900 Belt Clip Transceiver Modes . . . . .                                | 5-4  |
| Accessing the R900 Belt Clip Transceiver Status Screen . . . . .                            | 5-7  |
| Understanding the R900 Belt Clip Transceiver LED Operating Modes . . . . .                  | 5-8  |
| Understanding the External Battery Charger Status . . . . .                                 | 5-10 |
| Pairing the Trimble Nomad to the R900 Belt Clip Transceiver through the Bluetooth . . . . . | 5-10 |
| Pairing the Trimble Nomad . . . . .   | 5-10 |
| Using the R900 Belt Clip Transceiver to Read a Route . . . . .                              | 5-11 |
| R900 Belt Clip Transceiver Status Screen in N_SIGHT R900. . . . .                           | 5-11 |
| RF Performance Modes . . . . .  | 5-12 |
| Selecting the R900 Belt Clip Transceiver Reading Mode . . . . .                             | 5-13 |



|   |      |
|---|------|
| Using the R900 Belt Clip Transceiver RF Test Mode . . . . . | 5-13 |
| From the Login Screen . . . . .                             | 5-13 |
| From the Route Screen . . . . .                             | 5-14 |
| R900 Belt Clip Transceiver SD Card Functionality . . . . .  | 5-14 |
| Updating R900 Belt Clip Transceiver Firmware . . . . .      | 5-15 |
| How the Firmware Update Works . . . . .                     | 5-16 |

## **6**   **Gathering Route Data**

|   |      |
|---|------|
| The Reading Entry Screen . . . . .                                | 6-2  |
| Using Search. . . . .   | 6-3  |
| Manually Collecting Meter Readings . . . . .                      | 6-5  |
| Entering a Reading . . . . .                                      | 6-5  |
| Entering a Skip Code . . . . .                                    | 6-7  |
| Clearing a Skip Code . . . . .                                    | 6-9  |
| Tagging an Account . . . . .                                      | 6-11 |
| Adding Customer Notes . . . . .                                   | 6-13 |
| Adding a Trouble Code . . . . .                                   | 6-15 |
| Entering Comment Codes . . . . .                                  | 6-17 |
| Clearing a Customer Note, Trouble Code, or Comment Code . . . . . | 6-19 |
| Leaving a Reading Blank . . . . .                                 | 6-20 |
| Collecting RR Readings . . . . .                                  | 6-21 |
| Collecting an RF Reading . . . . .                                | 6-22 |
| Working with Accounts . . . . .                                   | 6-23 |
| Changing the Route Direction, Forward or Reverse . . . . .        | 6-23 |
| Finding Information . . . . .                                     | 6-24 |



|   |      |
|---|------|
| Validating Readings . . . . .                             | 6-27 |
| Hi/Low Fails . . . . .                                    | 6-27 |
| Removing a Reading . . . . .                              | 6-29 |
| Adding a New Meter to a Route . . . . .                   | 6-31 |
| Correcting or Changing Meter Information . . . . .        | 6-33 |
| Finding and Displaying Reading-Entry Screens . . . . .    | 6-35 |
| Moving Through Reading-Entry Screens . . . . .            | 6-36 |
| Reviewing Additional Information for an Account . . . . . | 6-36 |
| Location or Hazard Codes . . . . .                        | 6-36 |
| Statistics for Loaded Routes . . . . .                    | 6-38 |
| Moving Around Routes . . . . .                            | 6-39 |
| Resequencing Routes . . . . .                             | 6-41 |
| Resequence an Order . . . . .                             | 6-41 |
| Resequence While Collecting Readings . . . . .            | 6-43 |
| Confirming the Resequencing . . . . .                     | 6-43 |

## 7 Data Logging

|  |      |
|--|------|
| Accessing Data Logging . . . . .                   | 7-2  |
| Initializing IR-Activated Data Logging . . . . .   | 7-5  |
| Initiating RF-Activated Data Logging . . . . .     | 7-7  |
| Viewing Handheld Graphing . . . . .                | 7-10 |
| Sample Data Logging Graphs . . . . .               | 7-11 |
| Using Graphing Buttons and Options . . . . .       | 7-12 |
| Accessing off-cycle Reading . . . . .              | 7-13 |
| Initializing the Data Logger . . . . .             | 7-15 |
| Assigned Data Log and Off-Cycle Readings . . . . . | 7-20 |
| Assigning MIUs from the Host Software . . . . .    | 7-20 |



## 8 Communicating with the Host Computer

|                                  |     |
|----------------------------------|-----|
| Exchanging Information . . . . . | 8-1 |
| Exiting the Software . . . . .   | 8-1 |
| Sending and Receiving . . . . .  | 8-4 |

## 9 Using the Field Programmer

|  |      |
|--|------|
| Connecting the Mouse . . . . .                       | 9-1  |
| Connecting the Mouse to the Handheld . . . . .       | 9-2  |
| Starting Field Programmer . . . . .                  | 9-4  |
| Changing Your Password . . . . .                     | 9-6  |
| Programming the ProRead . . . . .                    | 9-6  |
| Configuring the ProRead . . . . .                    | 9-7  |
| Querying the ProRead . . . . .                       | 9-11 |
| Reading the ProRead Register . . . . .               | 9-12 |
| Viewing Software and Firmware Information . . . . .  | 9-14 |
| Programming the R900G Endpoint . . . . .             | 9-15 |
| Configuring Gas . . . . .                            | 9-15 |
| Collecting the Initial Reading . . . . .             | 9-16 |
| Querying the R900G Endpoint . . . . .                | 9-18 |
| Using Command Gas . . . . .                          | 9-20 |
| Reading the R900G Endpoint Register . . . . .        | 9-21 |
| Viewing Software and Firmware Information . . . . .  | 9-22 |
| Networking Two Registers . . . . .                   | 9-23 |
| Programming Registers . . . . .                      | 9-23 |
| Programming the Network Primary Register . . . . .   | 9-23 |
| Programming the Network Secondary Register . . . . . | 9-24 |



---

|   |      |
|---|------|
| Network Wiring . . . . .                          | 9-24 |
| Wiring the Registers . . . . .                    | 9-25 |
| Managing Formats . . . . .                        | 9-25 |
| Managing Formats for ProRead Registers . . . . .  | 9-25 |
| Selecting ProRead Preferences . . . . .           | 9-26 |
| Selecting a ProRead Format . . . . .              | 9-28 |
| Editing a ProRead Format . . . . .                | 9-29 |
| Using the New ProRead Format . . . . .            | 9-31 |
| Deleting a Format for ProRead Registers . . . . . | 9-31 |
| Creating a New ProRead Format . . . . .           | 9-32 |
| Using the Custom Format Screens . . . . .         | 9-34 |
| Saving the Custom ProRead Format . . . . .        | 9-36 |
| Creating Formats for R900G Endpoints . . . . .    | 9-36 |
| Configuring Gas . . . . .                         | 9-37 |
| Selecting a Gas Format . . . . .                  | 9-38 |
| Adding or Editing a Gas Format . . . . .          | 9-40 |
| Using the Gas Format . . . . .                    | 9-44 |
| Deleting a Format for R900G Endpoints . . . . .   | 9-45 |

## 10 Maintaining and Repairing the Neptune Handheld System

|   |      |
|---|------|
| Recommended Maintenance . . . . .             | 10-1 |
| Maintaining the Nomad . . . . .               | 10-1 |
| Nomad Battery Life . . . . .                  | 10-1 |
| Tips for Extending the Battery Life . . . . . | 10-1 |
| Charging the Nomad Battery . . . . .          | 10-2 |
| Checking the Nomad Battery Status . . . . .   | 10-3 |
| Replacing the Nomad Battery . . . . .         | 10-3 |



|  |       |
|--|-------|
| Calibrating the Nomad Battery . . . . .                    | 10-4  |
| Nomad Notification LEDs . . . . .                          | 10-6  |
| Maintaining the Ranger . . . . .                           | 10-7  |
| Ranger Battery Life . . . . .                              | 10-7  |
| Tips for Extending the Ranger Battery Life . . . . .       | 10-7  |
| Charging the Ranger Battery . . . . .                      | 10-8  |
| Checking the Ranger Battery Status. . . . .                | 10-9  |
| Replacing the Ranger Battery . . . . .                     | 10-9  |
| Ranger Battery Power . . . . .                             | 10-11 |
| Ranger Notification LEDs . . . . .                         | 10-11 |
| Maintaining the R900 Belt Clip Transceiver . . . . .       | 10-12 |
| Recommended Maintenance . . . . .                          | 10-12 |
| Battery Life . . . . .                                     | 10-12 |
| Tips for Extending the Battery Life. . . . .               | 10-12 |
| Charging the Battery . . . . .                             | 10-12 |
| Using the USB Port . . . . .                               | 10-13 |
| Charging Considerations . . . . .                          | 10-13 |
| Using the Charger . . . . .                                | 10-14 |
| Replacing the R900 Belt Clip Transceiver Battery . . . . . | 10-15 |
| Removing the Battery . . . . .                             | 10-15 |
| Replacing the Battery. . . . .                             | 10-16 |
| LED Status Indication . . . . .                            | 10-17 |
| Checking the Battery Status . . . . .                      | 10-18 |
| Recommended Spare Parts . . . . .                          | 10-18 |
| Ordering Parts . . . . .                                   | 10-18 |
| Ranger Spare Parts . . . . .                               | 10-18 |
| Nomad Spare Parts . . . . .                                | 10-18 |
| R900 Belt Clip Transceiver Spare Parts . . . . .           | 10-19 |
| Returning Your Neptune Handheld System . . . . .           | 10-20 |



## 11 Troubleshooting

|  |      |
|--|------|
| Troubleshooting the Handheld .....                       | 10-1 |
| Basic Tasks for the Handheld .....                       | 10-2 |
| Reading Entry Tasks .....                                | 10-3 |
| Communication Tasks .....                                | 10-4 |
| Starting the N_SIGHT R900 Program .....                  | 10-4 |
| Loading Data Initially .....                             | 10-4 |
| Missing Route Files .....                                | 10-5 |
| Resetting the Handheld .....                             | 10-5 |
| Rebooting the Handheld .....                             | 10-7 |
| Rebooting When Logged into a Route in N_SIGHT R900 ..... | 10-7 |
| Rebooting When Logged Off N_SIGHT R900 .....             | 10-9 |

## A Changing Volume Settings

|   |     |
|---|-----|
| Adjusting Customized Sounds .....       | A-1 |
| Changing the Volume Settings .....      | A-1 |
| Changing Sounds and Notifications ..... | A-3 |
| Enabling Sounds .....                   | A-6 |
| Enabling Notifications .....            | A-6 |

## B Tokens List for Custom Format Screen

|                               |     |
|-------------------------------|-----|
| Field Programmer Tokens ..... | B-1 |
|-------------------------------|-----|

## C Pressure Configuration Factor Indexes

|                         |     |
|-------------------------|-----|
| Available Formats ..... | C-1 |
|-------------------------|-----|



**Glossary**

**Index**



# Figures

---

| Figure | Title   | Page |
|--------|---|------|
| 1.1    | Sample Screens on the Neptune Handheld System .....     | 1-3  |
| 1.2    | Login Screens on the Neptune Handheld System .....      | 1-4  |
| 1.3    | Screen Information .....                                | 1-5  |
| 1.4    | Customer Support .....                                  | 1-6  |
| 2.1    | Typical Meter Reading Process .....                     | 2-2  |
| 2.2    | Nomad Handheld Features .....                           | 2-4  |
| 2.3    | Back of Nomad Handheld .....                            | 2-6  |
| 2.4    | Ranger Handheld Features .....                          | 2-9  |
| 2.5    | Back of Ranger Handheld .....                           | 2-11 |
| 2.6    | Handled Display Screens .....                           | 2-14 |
| 2.7    | Example of a Menu Screen .....                          | 2-15 |
| 2.8    | Example of a Main Screen .....                          | 2-16 |
| 2.9    | Meter Position within Route .....                       | 2-17 |
| 2.10   | Example of More Information .....                       | 2-18 |
| 2.11   | Example of an Extended Screen .....                     | 2-19 |
| 3.1    | Nomad and Cradle Charger .....                          | 3-3  |
| 3.2    | Connecting RJ-45 Ethernet Cable to Router, Port 1 ..... | 3-5  |
| 3.3    | Nomad Communications Cradle Connections .....           | 3-6  |
| 3.4    | Network Cable Connection .....                          | 3-6  |
| 3.5    | N_SIGHT R900 Main Menu .....                            | 3-7  |
| 3.6    | N_SIGHT R900 Admin Menu .....                           | 3-8  |
| 3.7    | Learning the Keyboard .....                             | 3-10 |
| 3.8    | Nomad Large Keyboard .....                              | 3-14 |
| 3.9    | Nomad Small Keyboard .....                              | 3-14 |
| 3.10   | Nomad Lowercase Keyboard .....                          | 3-14 |
| 3.11   | Nomad Uppercase Keyboard .....                          | 3-15 |
| 3.12   | Nomad Numeric and Symbols Keyboard .....                | 3-15 |
| 3.13   | N_SIGHT R900 Main Menu .....                            | 3-24 |
| 3.14   | N_SIGHT R900 Stylus Calibration Screen .....            | 3-25 |
| 3.15   | Stylus at Another Location on Screen .....              | 3-26 |
| 3.16   | Handheld Properties Screen .....                        | 3-27 |



| Figure | Title   | Page |
|--------|---|------|
| 3.17   | N_SIGHT R900 F1 Menu . . . . .                              | 3-29 |
| 3.18   | N_SIGHT R900 System Menu . . . . .                          | 3-29 |
| 3.19   | RF/Serial Properties Screen . . . . .                       | 3-30 |
| 3.20   | N_SIGHT R900 Message Area . . . . .                         | 3-32 |
| 3.21   | N_SIGHT R900 Clock Error Screen . . . . .                   | 3-33 |
| 3.22   | N_SIGHT R900 Set Date / Time Screen . . . . .               | 3-33 |
| 3.23   | N_SIGHT R900 Handheld Login Screen . . . . .                | 3-34 |
| 3.24   | N_SIGHT R900 Select Route Screen . . . . .                  | 3-35 |
| 3.25   | N_SIGHT R900 Initializing Message . . . . .                 | 3-35 |
| 3.26   | N_SIGHT R900 Reading Entry Screen . . . . .                 | 3-36 |
| 4.1    | Ranger and Communications Cradle . . . . .                  | 4-3  |
| 4.2    | Connecting RJ-45 Ethernet Cable to Router, Port 1 . . . . . | 4-5  |
| 4.3    | Ranger Communications Connections . . . . .                 | 4-6  |
| 4.4    | Network Cable Connection . . . . .                          | 4-6  |
| 4.5    | N_SIGHT R900 Main Menu . . . . .                            | 4-7  |
| 4.6    | N_SIGHT R900 Admin Menu . . . . .                           | 4-8  |
| 4.7    | Learning the Keyboard . . . . .                             | 4-10 |
| 4.8    | Ranger Screen with Keyboard . . . . .                       | 4-13 |
| 4.9    | Ranger Keyboard . . . . .                                   | 4-13 |
| 4.10   | Ranger Lowercase Keyboard . . . . .                         | 4-14 |
| 4.11   | Ranger Uppercase Keyboard . . . . .                         | 4-14 |
| 4.12   | Ranger Numeric and Symbols Keyboard . . . . .               | 4-14 |
| 4.13   | N_SIGHT R900 Main Menu . . . . .                            | 4-21 |
| 4.14   | N_SIGHT R900 Stylus Calibration Screen . . . . .            | 4-22 |
| 4.15   | Stylus at Another Location on Screen . . . . .              | 4-23 |
| 4.16   | Handheld Properties Screen . . . . .                        | 4-24 |
| 4.17   | N_SIGHT R900 F1 Menu . . . . .                              | 4-26 |
| 4.18   | N_SIGHT R900 System Menu . . . . .                          | 4-27 |
| 4.19   | RF/Serial Properties Screen . . . . .                       | 4-27 |
| 4.20   | N_SIGHT R900 Message Area . . . . .                         | 4-30 |
| 4.21   | N_SIGHT R900 Routes Summary Screen . . . . .                | 4-30 |
| 4.22   | N_SIGHT R900 Clock Error Screen . . . . .                   | 4-31 |



| Figure | Title   | Page |
|--------|---|------|
| 4.23   | N_SIGHT R900 Set Date / Time Screen .....                         | 4-31 |
| 4.24   | N_SIGHT R900 Handheld Login Screen .....                          | 4-32 |
| 4.25   | N_SIGHT R900 Select Route Screen .....                            | 4-33 |
| 4.26   | N_SIGHT R900 Initializing Message .....                           | 4-33 |
| 5.1    | Meter Reading Cycle .....   | 5-2  |
| 5.2    | R900 Belt Clip Transceiver Components .....                       | 5-3  |
| 5.3    | R900 Belt Clip Transceiver Status Screen .....                    | 5-11 |
| 5.4    | R900 Belt Clip Transceiver RF Mode Screen .....                   | 5-13 |
| 5.5    | R900 Belt Clip Transceiver RF Mode Screen from Route .....        | 5-14 |
| 5.6    | Tab within N_SIGHT R900 Utilities .....                           | 5-15 |
| 5.7    | R900 Belt Clip Transceiver Firmware Tab with Update Options ..... | 5-16 |
| 6.1    | N_SIGHT R900 Reading-Entry Screen .....                           | 6-2  |
| 6.2    | Search Screen .....   | 6-3  |
| 6.3    | GoTo Screen .....   | 6-4  |
| 6.4    | N_SIGHT R900 Reading-Entry Field .....                            | 6-6  |
| 6.5    | N_SIGHT R900 Skip Order Screen .....                              | 6-7  |
| 6.6    | N_SIGHT R900 Skip Order Reason Codes .....                        | 6-8  |
| 6.7    | N_SIGHT R900 Skipped Read .....                                   | 6-8  |
| 6.8    | Reading to be Unskipped .....                                     | 6-9  |
| 6.9    | N_SIGHT R900 Undo Skipped Order Screen .....                      | 6-10 |
| 6.10   | Reading Field after Unskipped .....                               | 6-10 |
| 6.11   | Tag Account Icon .....  | 6-11 |
| 6.12   | Tagged Account .....  | 6-12 |
| 6.13   | N_SIGHT R900 Customer Notes Screen .....                          | 6-13 |
| 6.14   | N_SIGHT R900 Marked Customer Notes .....                          | 6-14 |
| 6.15   | N_SIGHT R900 Trouble Codes Screen .....                           | 6-15 |
| 6.16   | N_SIGHT R900 Marked Trouble Codes .....                           | 6-16 |
| 6.17   | N_SIGHT R900 Coded Notes Screen .....                             | 6-17 |
| 6.18   | Drop-down Selection List of Coded Notes .....                     | 6-18 |
| 6.19   | N_SIGHT R900 Marked Comment Codes .....                           | 6-18 |
| 6.20   | Screen Showing Code Attached .....                                | 6-19 |
| 6.21   | Screen Where Code Was Entered .....                               | 6-19 |



| Figure | Title  | Page |
|--------|--|------|
| 6.22   | Leaving a Meter Reading Blank . . . . .                  | 6-20 |
| 6.23   | N_SIGHT R900 Manual Reading Screen . . . . .             | 6-21 |
| 6.24   | N_SIGHT R900 RF Reading Screen . . . . .                 | 6-22 |
| 6.25   | Left to Right Route Direction Icon . . . . .             | 6-23 |
| 6.26   | Right to Left Route Direction Icon . . . . .             | 6-24 |
| 6.27   | N_SIGHT R900 Find Order Screen . . . . .                 | 6-25 |
| 6.28   | Search Display Fields . . . . .                          | 6-25 |
| 6.29   | Search Screen Enter Multiple Values . . . . .            | 6-26 |
| 6.30   | Search Screen Multiple Values to Match . . . . .         | 6-26 |
| 6.31   | Reading Outside High/Low Range . . . . .                 | 6-28 |
| 6.32   | N_SIGHT R900 Hi/Lo/No/Inact Screen . . . . .             | 6-28 |
| 6.33   | Reading to be Cleared . . . . .                          | 6-29 |
| 6.34   | N_SIGHT R900 Reset Order Screen . . . . .                | 6-30 |
| 6.35   | Reset Reading . . . . .                                  | 6-31 |
| 6.36   | N_SIGHT R900 Meter Process Menu . . . . .                | 6-32 |
| 6.37   | N_SIGHT R900 New Meter Screen . . . . .                  | 6-32 |
| 6.38   | Meter Information to Change . . . . .                    | 6-33 |
| 6.39   | N_SIGHT R900 Meter Process Menu . . . . .                | 6-34 |
| 6.40   | N_SIGHT R900 Change Meter Info Screen . . . . .          | 6-34 |
| 6.41   | Additional Meter Information to View . . . . .           | 6-37 |
| 6.42   | Location and Hazard Codes Screen . . . . .               | 6-37 |
| 6.43   | For Statistics for Loaded Routes . . . . .               | 6-38 |
| 6.44   | Statistics for Loaded Routes Screen . . . . .            | 6-39 |
| 6.45   | N_SIGHT R900 GoTo Screen . . . . .                       | 6-40 |
| 6.46   | Account to Resequence . . . . .                          | 6-41 |
| 6.47   | Resequence Screen . . . . .                              | 6-42 |
| 6.48   | Inline Resequencing Screen . . . . .                     | 6-43 |
| 6.49   | Confirm Resequencing Screen . . . . .                    | 6-44 |
| 7.1    | Data Logging with the Nomad or Ranger Handheld . . . . . | 7-2  |
| 7.2    | N_SIGHTR900 Login Screen . . . . .                       | 7-2  |
| 7.3    | N_SIGHT R900 Main Menu Screen . . . . .                  | 7-3  |
| 7.4    | N_SIGHT R900 Utilities Menu . . . . .                    | 7-3  |



| Figure | Title   | Page |
|--------|---|------|
| 7.5    | User Authentication Screen . . . . .                      | 7-4  |
| 7.6    | Verify Time Screen . . . . .                              | 7-4  |
| 7.7    | Initialize Device Screen . . . . .                        | 7-5  |
| 7.8    | Data Log IR Method Selection . . . . .                    | 7-6  |
| 7.9    | Unit of Measure Screen . . . . .                          | 7-6  |
| 7.10   | Initialize Device Screen . . . . .                        | 7-7  |
| 7.11   | Data Log RF Method Screen . . . . .                       | 7-8  |
| 7.12   | Unit of Measure Screen . . . . .                          | 7-8  |
| 7.13   | RF-Activate Meter Screen . . . . .                        | 7-9  |
| 7.14   | Listening for Data Screen . . . . .                       | 7-9  |
| 7.15   | Receiving Data . . . . .                                  | 7-10 |
| 7.16   | Graph Button . . . . .                                    | 7-10 |
| 7.17   | Examples of Data Logging Graphs . . . . .                 | 7-11 |
| 7.18   | N_SIGHT R900 Main Screen . . . . .                        | 7-13 |
| 7.19   | N_SIGHT R900 Main Menu Screen . . . . .                   | 7-14 |
| 7.20   | N_SIGHT R900 Off Cycle Option . . . . .                   | 7-14 |
| 7.21   | User Authentication Screen . . . . .                      | 7-15 |
| 7.22   | Verify Time Screen . . . . .                              | 7-16 |
| 7.23   | Initialize Device Screen . . . . .                        | 7-16 |
| 7.24   | Off Cycle Capture Screen . . . . .                        | 7-17 |
| 7.25   | Unit of Measure Screen . . . . .                          | 7-17 |
| 7.26   | RF-Activate Meter Screen . . . . .                        | 7-18 |
| 7.27   | Listening for MIU . . . . .                               | 7-19 |
| 7.28   | Data Captured . . . . .                                   | 7-19 |
| 7.29   | N_SIGHT R900 Main Menu Screen . . . . .                   | 7-20 |
| 7.30   | Assigned DL/OC Option . . . . .                           | 7-21 |
| 7.31   | List of MIU IDs from N_SIGHT R900 Host Software . . . . . | 7-21 |
| 8.1    | Confirm Resequencing Screen . . . . .                     | 8-2  |
| 8.2    | N_SIGHT R900 Handheld Logout Screen . . . . .             | 8-3  |
| 8.3    | Hold Routes Screen . . . . .                              | 8-3  |
| 8.4    | N_SIGHT R900 Login Screen . . . . .                       | 8-4  |
| 8.5    | Synchronize Button . . . . .                              | 8-5  |



| Figure | Title   | Page |
|--------|---|------|
| 9.1    | Field Programmer Mouse for the Nomad .....      | 9-2  |
| 9.2    | Connecting Mouse to Nomad .....                 | 9-3  |
| 9.3    | Field Programmer Menu .....                     | 9-4  |
| 9.4    | Field Programmer Password Screen .....          | 9-5  |
| 9.5    | Change Password Screen .....                    | 9-6  |
| 9.6    | ProRead Configuration Screen .....              | 9-7  |
| 9.7    | Format Name Selection List .....                | 9-7  |
| 9.8    | Otr Selection List .....                        | 9-8  |
| 9.9    | Program Result -- Pass Screen .....             | 9-9  |
| 9.10   | ProRead Program Details Screen .....            | 9-10 |
| 9.11   | ProRead Query Screen .....                      | 9-11 |
| 9.12   | ProRead Query Results .....                     | 9-12 |
| 9.13   | ProRead Read Screen .....                       | 9-13 |
| 9.14   | ProRead Reading Result Screen .....             | 9-13 |
| 9.15   | ProRead Software and Firmware Information ..... | 9-14 |
| 9.16   | Gas Meter Configuration Screen .....            | 9-15 |
| 9.17   | Gas Program Screen .....                        | 9-16 |
| 9.18   | Format Name Selection List .....                | 9-16 |
| 9.19   | Program Result – Sending Data .....             | 9-17 |
| 9.20   | Program Result – Pass Screen .....              | 9-17 |
| 9.21   | Gas Query Screen .....                          | 9-18 |
| 9.22   | Gas Query Results .....                         | 9-19 |
| 9.23   | Command Gas Screen .....                        | 9-20 |
| 9.24   | Gas Read Screen .....                           | 9-21 |
| 9.25   | Gas Reading Result Screen .....                 | 9-22 |
| 9.26   | Gas Software and Firmware Information .....     | 9-23 |
| 9.27   | Field Programmer Menu .....                     | 9-26 |
| 9.28   | ProRead Preferences Screen .....                | 9-27 |
| 9.29   | Select Formats Screen .....                     | 9-28 |
| 9.30   | ProRead New Format Screen .....                 | 9-29 |
| 9.31   | Default ProRead New Format Screen .....         | 9-32 |
| 9.32   | New Button Available .....                      | 9-33 |
| 9.33   | Custom Format 1 Screen .....                    | 9-34 |
| 9.34   | Custom Format 2 Screen .....                    | 9-35 |



| Figure | Title   | Page  |
|--------|---|-------|
| 9.35   | Configure Gas Password Screen . . . . .                         | 9-37  |
| 9.36   | Gas New Format Screen . . . . .                                 | 9-38  |
| 9.37   | Gas New Format Selection List . . . . .                         | 9-40  |
| 9.38   | Gas Values Shown on New Format Screen . . . . .                 | 9-41  |
| 9.39   | Gas New Format Screen – Blank . . . . .                         | 9-43  |
| 10.1   | Battery Status Indicator on Nomad . . . . .                     | 10-3  |
| 10.2   | Changing the Nomad Battery . . . . .                            | 10-3  |
| 10.3   | Battery Status Indicator on Ranger . . . . .                    | 10-9  |
| 10.4   | Changing the Ranger Battery . . . . .                           | 10-10 |
| 10.5   | External Battery Charger . . . . .                              | 10-14 |
| 10.6   | R900 Belt Clip Transceiver Side View . . . . .                  | 10-15 |
| 10.7   | Latch Direction to Open . . . . .                               | 10-15 |
| 10.8   | Battery Inside Compartment . . . . .                            | 10-16 |
| 10.9   | R900 Belt Clip Transceiver Battery Inside Compartment . . . . . | 10-17 |
| 11.1   | N_SIGHT R900 Login Screen . . . . .                             | 11-5  |
| 11.2   | N_SIGHT R900 Main Menu . . . . .                                | 11-6  |
| 11.3   | N_SIGHT R900 Admin Menu . . . . .                               | 11-6  |
| 11.4   | Reset Warning Message . . . . .                                 | 11-7  |
| 11.5   | N_SIGHT R900 Menu . . . . .                                     | 11-8  |
| 11.6   | N_SIGHT R900 Handheld Menu . . . . .                            | 11-8  |
| 11.7   | Reboot Handheld Screen . . . . .                                | 11-9  |
| A.1    | Handheld Volume Control . . . . .                               | A-2   |
| A.2    | Handheld Scrollbar and Radio Buttons . . . . .                  | A-2   |
| A.1    | N_SIGHT R900 Main Menu . . . . .                                | A-3   |
| A.2    | N_SIGHT R900 Admin Menu . . . . .                               | A-3   |
| A.3    | Administrator Password Screen . . . . .                         | A-4   |
| A.4    | CE.Net Windows Screen . . . . .                                 | A-4   |
| A.5    | Windows Start Menu . . . . .                                    | A-5   |
| A.6    | Windows Settings Menu . . . . .                                 | A-5   |
| A.7    | Sounds & Notifications Screen . . . . .                         | A-6   |
| A.8    | Notifications Tab . . . . .                                     | A-7   |
| A.9    | Event Notification Options . . . . .                            | A-8   |
| A.10   | Sound Selection Options . . . . .                               | A-8   |
| A.11   | Sample Reminder Notification . . . . .                          | A-9   |



*Notes:*



# Tables

---

| Table | Title  | Page  |
|-------|--|-------|
| 2.1   | N_SIGHT R900 Display Icons .....                     | 2-20  |
| 3.1   | Nomad Functionality .....                            | 3-19  |
| 4.1   | Ranger Functionality .....                           | 4-18  |
| 5.1   | R900 Belt Clip Transceiver Power .....               | 5-4   |
| 5.2   | R900 Belt Clip Transceiver Modes .....               | 5-5   |
| 5.3   | R900 Belt Clip Transceiver Software Functions .....  | 5-7   |
| 5.4   | R900 Belt Clip Transceiver LED Operating Modes ..... | 5-8   |
| 5.5   | External Battery Charger LED .....                   | 5-10  |
| 7.1   | Data Logging Graph Legend .....                      | 7-11  |
| 9.1   | Meter Input Drive Rotation .....                     | 9-42  |
| 10.1  | Calibration Error Messages .....                     | 10-5  |
| 10.2  | Nomad Calibration Error Messages .....               | 10-6  |
| 10.3  | Ranger Battery LEDs .....                            | 10-9  |
| 10.4  | Ranger Notifications LED .....                       | 10-11 |
| 10.5  | Charging Considerations .....                        | 10-13 |
| 10.6  | LED Status Indicators .....                          | 10-17 |
| 10.7  | Ranger Part Numbers .....                            | 10-18 |
| 10.8  | Nomad Part Numbers .....                             | 10-19 |
| 10.9  | R900 Belt Clip Transceiver Part Numbers .....        | 10-19 |
| B.1   | Custom Format Tokens .....                           | B-1   |
| C.1   | Pressure Configuration Factor Index Table .....      | C-1   |



***Notes:***



# 1 Introduction

---

The *Neptune Handheld System Users' Manual* describes how to use the following components of the Neptune handheld system to collect route data. It also explains how to exchange route and account data with the host computer for the N\_SIGHT™ R900® host software. Descriptions for the following devices and procedures for using them are included in this manual.

- Trimble® Nomad® (Nomad)
- Trimble® Ranger™ 3 (Ranger)
- R900® Belt Clip Transceiver (BCT)
- Neptune Field Programmer

This manual also describes how to maintain these devices, also referred to as the Neptune handheld system.

---

## Conventions Used in this Manual

This manual uses the following icons and typographic conventions to identify special information.



The Warning icon identifies actions that can injure the user or permanently damage the product.



The Caution icon identifies important information that is critical to successfully operating N\_SIGHT R900.





The Note icon identifies information that clarifies a point within the text.



The Setup icon identifies a part of the application program that needs only periodic adjustment.



The Meter Reader icon identifies tasks that are usually performed by a meter reader.



The Operator icon identifies tasks that are usually performed by a N\_SIGHT R900 operator.

Save As

Menu titles and menu selections shown in the display of the handheld are in **bold** type.

enter

Keys that appear on the face of the handheld are in SMALL CAPS.

---

## Screen Shots Used in this Manual

In order to be consistent with the representation of all the screens in this manual, the screens used in this guide are captured on the Nomad. However, they appear very similarly on the other handheld device.



Except for the chapter dedicated to setting up and using the Ranger, this manual uses the Nomad screens. However, the Ranger screens are very similar.

## Differences in Screen Appearances

The most predominant differences in the appearances of the screens on both handheld devices are the following.

- The Ranger screens appear in a landscape or horizontal format.
- The Nomad screens appear in a portrait or vertical format.



The following illustrations demonstrate the differences in the screen appearances.

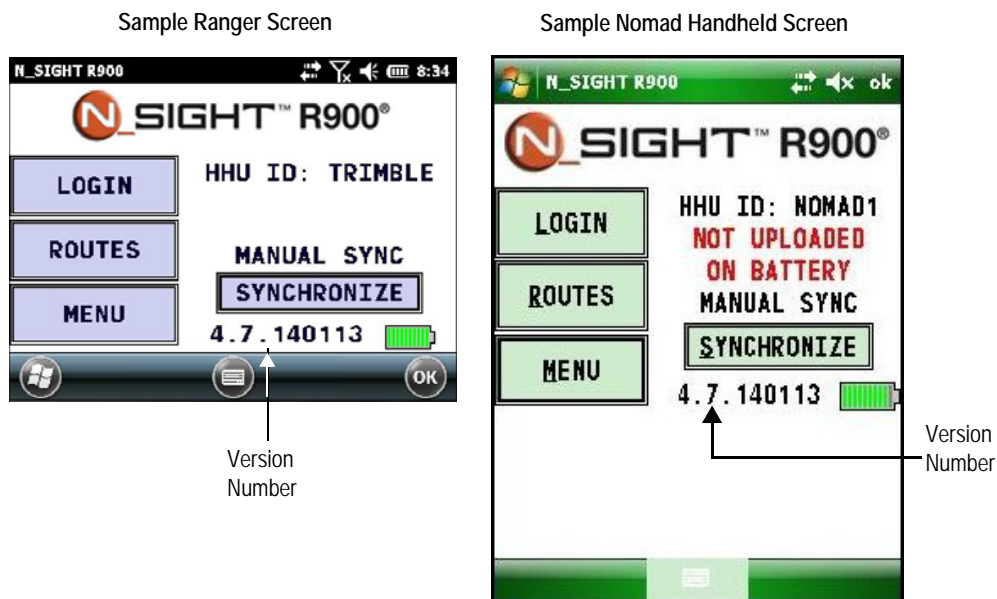


Figure 1.1 Sample Screens on the Neptune Handheld System

Although the style of the screens appear differently, the information on both the Ranger and the Nomad screens is identical.

---

## Available Functions

Not all buttons and function on the Ranger are available at this time. Some are reserved for future use.

---

## Product Support within the United States

Neptune offers you different ways to obtain high-quality, responsive technical support. However, before contacting Neptune, it is important that you know the version number of the software that your handheld uses. This information is useful to the support technician who helps you.



## Finding the Software Version Number

The procedures for finding the software version number differ depending on whether or not you have logged on to N\_SIGHT R900.

### When Not Logged In

If you have not yet logged on to N\_SIGHT R900, complete the following.

- 1 Turn **ON** the handheld.

The handheld initializes N\_SIGHT R900, and this process can take a few minutes.

- 2 Go to the Login screen.

The Login screen displays the version number at the bottom of the screen as shown in Figure 1.3.

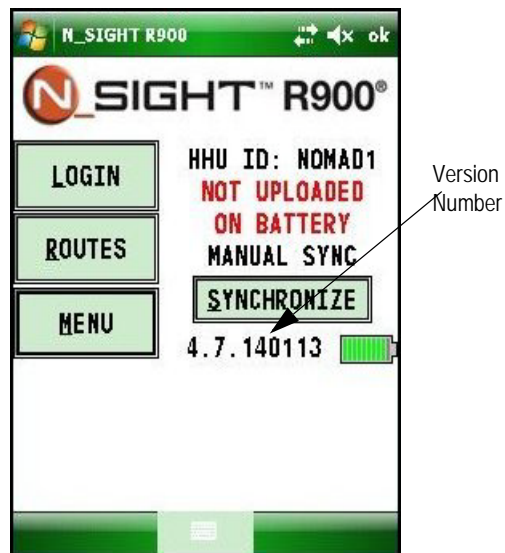


Figure 1.2 Login Screens on the Neptune Handheld System



## When Logged On to N\_SIGHT R900

When you have logged on to N\_SIGHT R900, you can find the version number by completing the following tasks from any screen.

- From any N\_SIGHT R900 screen, press **Ctrl + I**.

The Screen Information appears as shown in Figure 1.3.

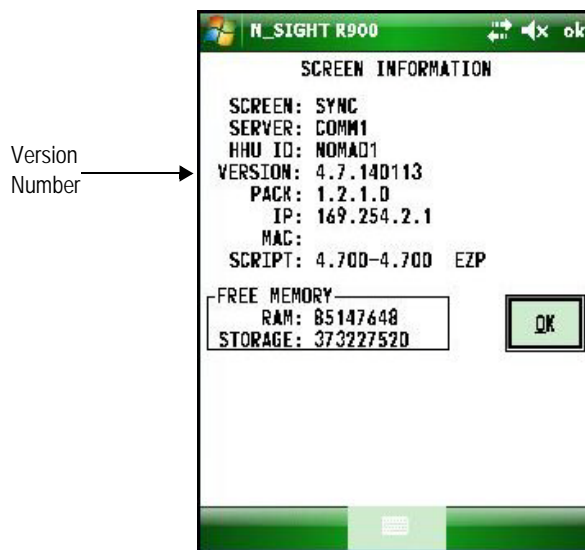


Figure 1.3 Screen Information

- View the version number which appears directly below the handheld ID on this screen.

This screen contains all the vital information you need to know about the handheld.

---

## Contacting Customer Support

Within North America, Neptune Customer Support is available Monday through Friday, 8:00 AM to 6:00 PM Eastern Standard Time by telephone, email, or fax.



To contact Customer Support by phone, call (800) 647-4832. You will be directed to the appropriate team of specialists. These specialists are dedicated to assisting you until the issue is resolved to your satisfaction.

When placing a call, be prepared to give the following information:

- The exact wording of any message that appears on the screen of the computer or the handheld device
- A description of what happened and what you were doing when the problem occurred
- A description of how you tried to solve the problem
- Your utility's name

You will be directed according to the options shown in Figure 1.4.



Figure 1.4 Customer Support

To contact Customer Support by fax, send a description of your problem to (334) 283-7497. Please include on the fax cover sheet the best time of day for a Customer Support Specialist to contact you.




To contact Customer Support by e-mail, send your information to [hhsupp@neptunetg.com](mailto:hhsupp@neptunetg.com).



---

## Finding Information within the Manual

This manual is written for two basic types of users: meter readers and operators. To help both types of users find the information they need, this manual uses the following symbols to identify different types of tasks:

- Tasks usually performed by meter readers are indicated by the **Meter Reader**  icon.
- Tasks usually performed by N\_SIGHT R900 operators are indicated by the **Operator**  icon.
- Tasks that are performed occasionally are indicated by the **Setup**  icon.

In addition to looking for these symbols, use the following sections to find information quickly:

- If you have a specific task or item in mind, look in the *Index*.
- Look through the *Contents* to find tasks and topics for which the titles are not familiar to you.
- If you are unsure of a term, look it up in the *Glossary*.

---

## Where to Start

The best way for you to use this manual depends upon your responsibilities in your company's meter reading process and how familiar you are with using a handheld computer.

- **Meter readers** typically gather meter readings and other information about meters on a route. They most likely use the Neptune handheld system to gather meter readings and route data and to get route assignments.
- **Operators** typically manage the daily tasks of a meter reading process. They most likely use one of the Neptune handheld devices to upload route data from it to their computer and to download billing and customer information from their computer to the handheld device.





## Meter Readers

If this is the first time that you have used the handheld, read one of the following chapters to get a general understanding of how the display and keys work.

You will probably find the following chapters of the manual most useful.

- Chapter 2, "Overview of the Neptune Handheld System," describes the basic features and functions of the handhelds; introduces you to the Nomad handheld computer; how the handheld is incorporated into the Neptune handheld system host software; and how it is used by both meter readers and operators.
- Chapter 3, "Using the Nomad Handheld," provides help to set up and get started with your Nomad handheld so that you can begin collecting information from the field and exchanging information with the host computer.
- Chapter 4, "Using the Ranger Handheld," provides help to set up and get started with your Ranger handheld so that you can begin collecting information from the field and exchanging information with the host computer.
- Chapter 5, "Setting Up the R900 Belt Clip Transceiver," provides basic instructions for unpacking and inspecting the R900 BCT. It also gives instructions for setting it up and becoming familiar with the display, pairing it with the handheld, and usage.
- Chapter 6, "Gathering Route Data," provides instructions for using the handheld device to collect meter readings and route data.
- Chapter 7, "Communicating with the Host Computer," provides procedures for exchanging information with the host computer and exiting the software.
- Chapter 8, "Using the Field Programmer," provides fundamental instructions for operating the Field Programmer including how to connect the mouse, program the device, and operate the Field Programmer.



- Chapter 10, "Troubleshooting," helps you solve any issues or problems that can occur when using the Neptune handheld system.
- Appendix A, "Changing Volume Settings," provides instructions for adjusting customized sounds and the volume control setting.
- Appendix B, "Tokens List for Custom Format Screen," provides a list of the tokens that are constants and special characters used with the Field Programmer as part of a ProRead™ format.
- Appendix C, "Pressure Configuration Factor Indexes," provides a list used for selecting gas formats available from American Meter, Sensus, and Actaris when using the Field Programmer.
- "Glossary" provides a list of terms used in this manual that can be useful when reading and learning how to use the handheld device and software.



## Operators

If this is the first time that you have used the Ranger, read Chapter 2, "Overview of the Neptune Handheld System," to get a general understanding of how the display and keys work. You will probably find the following chapters of the manual most useful.

- Chapter 3, "Using the Nomad Handheld," provides help to set up and get started with your Nomad handheld so that you can begin collecting information from the field and exchanging information with the host computer.
- Chapter 4, "Using the Ranger Handheld," provides help to set up and get started with your Ranger handheld so that you can begin collecting information from the field and exchanging information with the host computer.
- Chapter 5, "Setting Up the R900 Belt Clip Transceiver," provides basic instructions for unpacking and inspecting the R900 BCT. It also gives instructions for setting it up and becoming familiar with the display, pairing it with the handheld, and usage.



- Chapter 7, "Communicating with the Host Computer," provides procedures for exchanging information with the host computer and exiting the software.
- Chapter 9, "Maintaining and Repairing the Neptune Handheld System," provides instructions for maintaining and repairing the Ranger, the Nomad, and the R900 BCT and includes recommended spare parts. It also gives instructions for packing and shipping a device to Neptune should you ever need to return any unit for repair.
- Chapter 10, "Troubleshooting," helps you to solve any issues or problems that can occur when using the Neptune handheld system.
- Appendix A, "Changing Volume Settings," provides instructions for adjusting customized sounds and the volume control setting.
- "Glossary" provides a list of terms used in this manual that can be useful when reading and learning how to use the handheld device and software.



## 2 Overview of the Neptune Handheld System

---

This chapter is designed to introduce you to the Neptune handheld system handheld computer. It will explain how the handheld is incorporated into the N\_SIGHT R900 host software, and how it will be used by both meter readers and operators. It will also help you become familiar with the basic features and functions the handheld computer offers.

---

### Typical Meter Reading Process

By using the handheld computer in conjunction with N\_SIGHT R900 software, the meter reading process has an effective tool in collecting and distributing information that is critical to managing daily tasks.

Meter readers use the handheld to gather route information. Operators use N\_SIGHT R900 to collect route information from the handheld and to collect billing information from the billing computer. Once this information is stored on an operator's computer, called the host computer, operators use N\_SIGHT R900 to make route assignments and to send updated information to the handheld and to the billing computer.



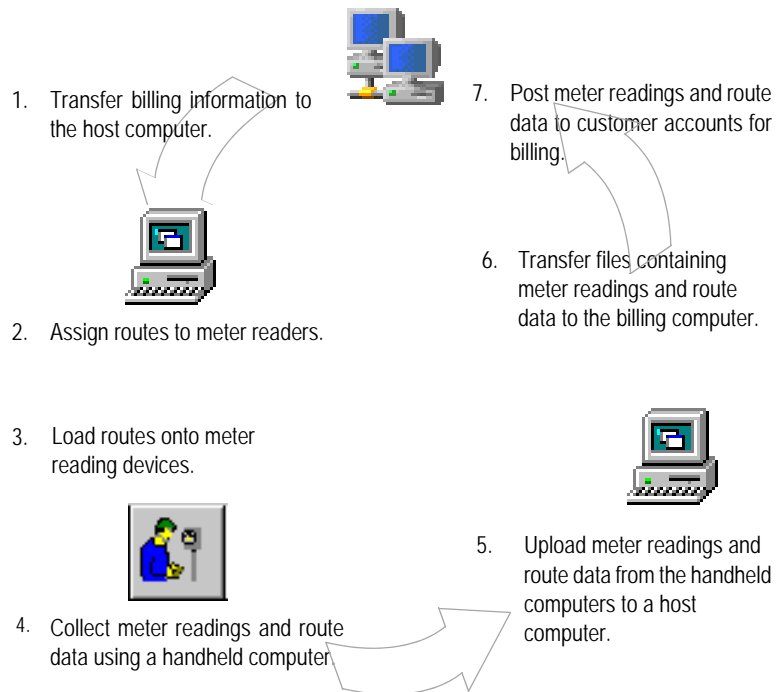


Figure 2.1 Typical Meter Reading Process

---

## Daily Use of the Neptune Handheld System

Because the Neptune handheld system helps users collect and pass on different types of information needed by a meter reading process, how you use it depends upon your responsibilities in your meter reading process. The following topics describe how meter readers and operators typically use the handheld to complete their work.





## Meter Readers

During a typical day, meter readers use the handheld to get route assignments and to gather route data. Meter readers pick up a handheld in the morning and review route assignments that were downloaded the previous afternoon by an operator. Then, they use it to gather meter readings and other data from the assigned routes. After they complete their routes, meter readers return the handheld to the office where an operator uploads the readings and route data onto the computer and then downloads route assignments and other data to it.



## Operators

Typically, operators connect the handheld so that it can communicate with their computer. Once the handheld is connected, operators set up the software so that it can exchange information with their computer, called the host computer.

During a typical day, operators make route assignments and collect billing information from the billing computer. Toward the end of the day, after meter readers complete their routes and return the handhelds to the office, operators exchange information with them. During a typical information exchange, route data is unloaded from the handheld at the same time that the next day's assignments and updated billing information are loaded to it.

The operator makes sure that the handheld is fully charged and ready for use by a meter reader.



## Basic Features of the Nomad

In addition to an environmental seal that protects the unit from dust, dirt, and water, the Nomad includes the following features.



Figure 2.2 Nomad Handheld Features

- **Display**—shows up to 33 lines of text and allows touchscreen entry. In addition, you have the option of backlighting the display so that information is visible in low light.
- **Keyboard**—uses 51 multifunctional keys that include letter, number, character, task, and menu keys. The tactile design of the



keys and the tone that sounds when a key is pressed help to reduce errors. In addition, if you have the Keyboard Backlight option, the keys can be illuminated making them easy to read in low light.

- **Ethernet Communication Port**—an RJ-45 Ethernet connector on the cradle allows you to connect the Nomad using an Ethernet cable to a variety of devices. This capability provides for route assignments and route data to be sent to the Nomad, and meter readings and route information to be retrieved from it.
- **Battery Status Light**—lets you know when the battery is fully charged. If the light is red, the battery needs recharging and if the light is green, the battery is charged and the handheld is operational.



Do not attempt to remove the back panel of the Nomad. Attempting to repair the unit on your own voids the warranty by breaking the warranty label which covers a screw on the back of the unit. If the Nomad does not function, contact a Neptune support technician for assistance. For help in contacting Neptune, refer to the topic “Contacting Customer Support,” on page 1-5.





Figure 2.3 Back of Nomad Handheld

- **Handstrap**—makes it easy to carry the Nomad.
- **Battery Compartment**—holds a lithium-ion battery pack that is rated for up to 500 charge cycles or 2 years - whichever occurs first.
- **Stylus**—makes it easy to use the touchscreen display, and can be calibrated for the user's own personal touch.



The Nomad also offers the following:

- **Suspend Mode**—puts the Nomad into a low-power state.
- **Manual Off Feature**—allows operators to turn the Nomad off immediately.
- **Automatic Return Feature**—shows the information that was last in the display after the handheld is turned off manually or automatically.
- **Customized Sounds**—can be used as warning signals or as a prompt.

## Operating Environment



The Trimble Nomad has gone through multiple tests and meets MIL-STD-810F military standards. Long exposure to temperatures below -20°C (-4°F) can damage the display. Prolonged exposure to temperatures above 50°C (122°F) will damage the battery and above 60°C (140°F) can permanently damage the unit.

The recommended temperature range for operating the Nomad is from -30°C to 60°C (-22°F to 140°F). Short exposure to temperatures lower or higher than these can cause the display to turn very dark or very light until the unit returns to the recommended operating temperature range.

## Rain and Water Resistance



Water resistance can be impaired if the door of the battery compartment or top cover is improperly closed or if the gaskets have deteriorated.

The handheld withstands exposure to rain without allowing water to seep inside the unit. It is designed to endure occasional immersions, and the unit floats making it easy to retrieve if dropped in water.

## Electromagnetic Resistance

The Nomad performs well in most common environments where electromagnetic fields are present. Examples of these environments include areas near power-transmission lines, electric motors, transformers, compressors, and low-power radio transmitters.



Performance can be degraded when using a communication cable, a peripheral, such as a printer, or a battery charger under these conditions.

## Shock Resistance

When the unit is operated within the specified temperature range, it can withstand occasional drops from up to 1.22 meters (4 feet) onto a hard surface.

---

## Use of the Nomad

To set up and begin using your Nomad handheld, go to “Using the Nomad Handheld,” on page 3-1.



## Basic Features of the Ranger

In addition to an environmental seal that protects the unit from dust, dirt, and water, the Ranger includes the following features.

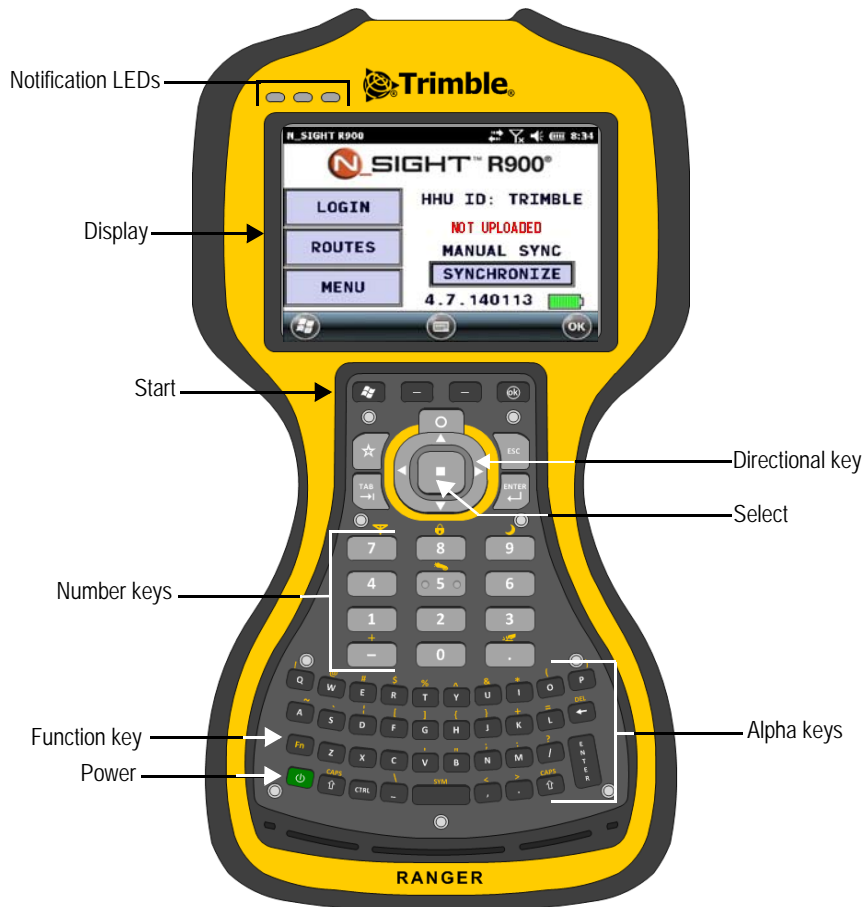


Figure 2.4 Ranger Handheld Features

- **Display**—shows up to 33 lines of text and allows touchscreen entry. In addition, you have the option of backlighting the display so that information is visible in low light.
- **Keyboard**—uses multifunctional keys that include letter, number, character, task, and menu keys. The tactile design of the keys and the tone that sounds when a key is pressed help to reduce errors. In



addition, if you have the Keyboard Backlight option, the keys can be illuminated making them easy to read in low light.

- **Ethernet Communication Port**—an RJ-45 Ethernet connector on the cradle allows you to connect the Ranger using an Ethernet cable to a variety of devices. This capability provides for route assignments and route data to be sent to the Ranger, and meter readings and route information to be retrieved from it.
- **Battery Status Light**—lets you know when the battery is fully charged. If the light is red, the battery needs recharging and if the light is green, the battery is charged and the handheld is operational.



Do not attempt to remove the back panel of the Ranger. Attempting to repair the unit on your own voids the warranty by breaking the warranty label which covers a screw on the back of the unit. If the Nomad does not function, contact a Neptune support technician for assistance. For help in contacting Neptune, refer to the topic “Contacting Customer Support,” on page 1-5.



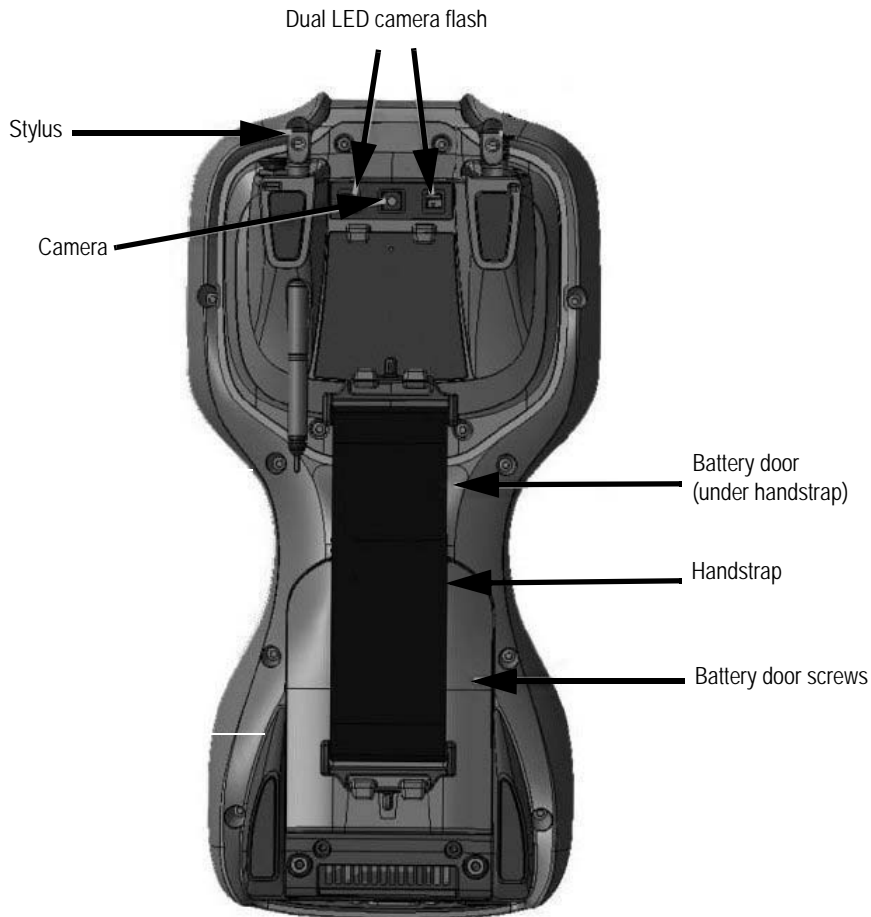


Figure 2.5 Back of Ranger Handheld

- **Handstrap**—makes it easy to carry the Ranger.
- **Battery Compartment**—holds a lithium-ion battery pack that is rated for up to 500 charge cycles or 2 years - whichever occurs first.
- **Stylus**—makes it easy to use the touchscreen display, and can be calibrated for the user's own personal touch.



The Ranger also offers the following:

- **Suspend Mode**—puts the Ranger into a low-power state.
- **Manual Off Feature**—allows operators to turn the Nomad off immediately.
- **Automatic Return Feature**—shows the information that was last in the display after the handheld is turned off manually or automatically.
- **Customized Sounds**—can be used as warning signals or as a prompt.

## Operating Environment



The Trimble Ranger has gone through multiple tests and meets MIL-STD-810F military standards. Long exposure to temperatures below -20°C (-4°F) can damage the display. Prolonged exposure to temperatures above 50°C (122°F) will damage the battery and above 60°C (140°F) can permanently damage the unit.

The recommended temperature range for operating the Ranger is from -30C to 60C (-22F to 140F). Short exposure to temperatures lower or higher than these can cause the display to turn very dark or very light until the unit returns to the recommended operating temperature range.

## Rain and Water Resistance



Water resistance can be impaired if the door of the battery compartment or top cover is improperly closed or if the gaskets have deteriorated.

The handheld withstands exposure to rain without allowing water to seep inside the unit. It is designed to endure occasional immersions, and the unit floats making it easy to retrieve if dropped in water.



## Electromagnetic Resistance

The Ranger performs well in most common environments where electromagnetic fields are present. Examples of these environments include areas near power-transmission lines, electric motors, transformers, compressors, and low-power radio transmitters.

Performance can be degraded when using a communication cable, a peripheral, such as a printer, or a battery charger under these conditions.

## Shock Resistance

When the unit is operated within the specified temperature range, it can withstand occasional drops from up to 1.22 meters (4 feet) onto a hard surface.

---

## Use of the Ranger

To set up and begin using your Ranger handheld, go to “Using the Ranger Handheld,” on page 4-1.

---

## The Display on the Handhelds



Except for the chapter dedicated to setting up and using the Ranger, this manual uses the Nomad keys and screens. However, the Ranger keys and screens are very similar.

This section describes the display on the Neptune handheld system.

- The types of information that are shown in the display of the handheld.
- An overview of how to use the screens to access different types of information.



# The Handheld Screens

Information in the display of the handheld appears in three formats: menu screens, main screens, and extended screens.



*Menu screens* allow you to choose from the icon options and navigate through various N\_SIGHT functions.

*Main screens* allow you to select or enter data, such as a manual reading or the meter number.

*Extended screens* do not show the main screen toolbar and you must close them to get back to the main screen.

Figure 2.6 Handheld Display Screens

## Menu Screens

Menu screens typically display a list of options for you to select one. See Figure 2.7 on Page 2-15.



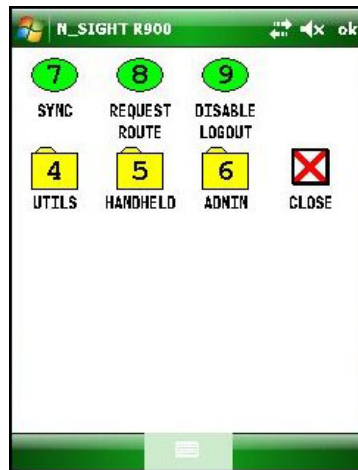




Figure 2.7 Example of a Menu Screen

To select an option from a menu screen, do one of the following.

From the keypad,

- Press the key whose number corresponds to the item that you want to select.

**Example:** If the menu displays **Admin** as an option , you can press the SIX  key on the keypad.

Your selection appears in the display.

From the screen keyboard,

- Touch the number that corresponds to the item that you want to select.

**Example:** If the menu displays **Sync** as an option , you can press SEVEN  key on the screen keyboard.

Your selection appears in the display.



A key that can be used to select an item from a list is called a hot key.



## Main Screens

Main screens allow you to select or enter data, such as a manual reading or the meter number. See Figure 2.8,

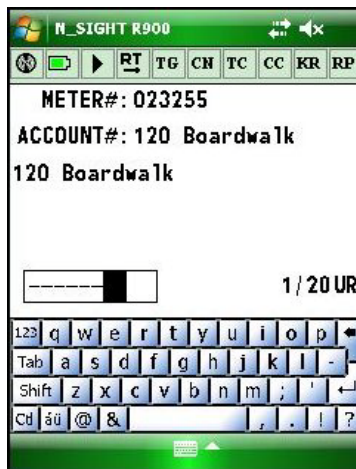


Figure 2.8 Example of a Main Screen

Usually, the main screens prompt you to enter information. Whenever a main screen is displayed, the handheld automatically disables inappropriate keys. For example, when prompted to enter a meter reading, it allows you to enter numbers only. However, if you are prompted to enter a new trouble code, it enables the letter and number keys because codes can use letters and numbers.

On each of the reading entry screens the meter reader can tell the position of the meter within the route. See Figure 2.9 on Page 2-17.



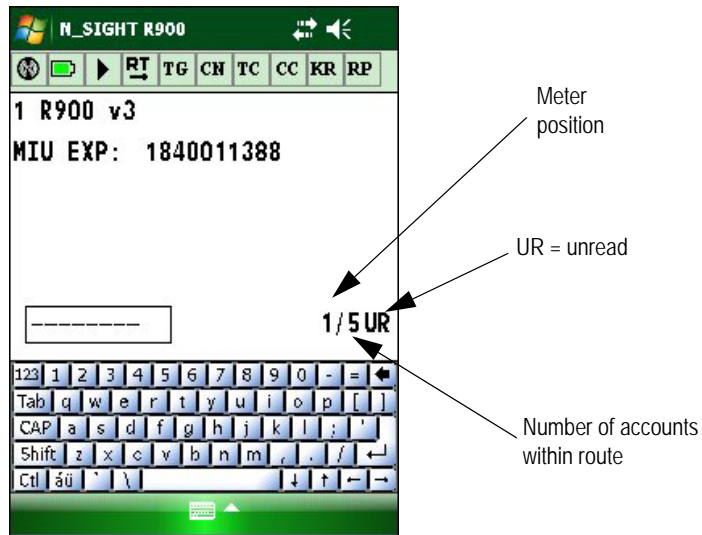


Figure 2.9 Meter Position within Route

In this illustration, the number 1/5 shows that the position of this meter is 1 out of 5 accounts contained on the route.

The reader can use ◀ and ▶ to navigate to other accounts on the route.

## Icons

The icon bar at the top of the screen allows you to perform other tasks with the selected account. For information on the task that each of these icons performs, see “Icon Bar,” on page 2-20.

## Arrow Keys

Use the UP or DOWN keys to view additional screens related to this account.





**Example:** Pressing the UP  or DOWN  keys allows you to see more information as illustrated in Figure 2.10.





Figure 2.10 Example of More Information

Continue pressing the UP  or DOWN  keys to view more information or return to the main screen.

## Extended Screens

Extended screens do not show the main screen icon bar and you must close them to get back to the main screen. They contain other information, as illustrated in Figure 2.11 on Page 2-19.



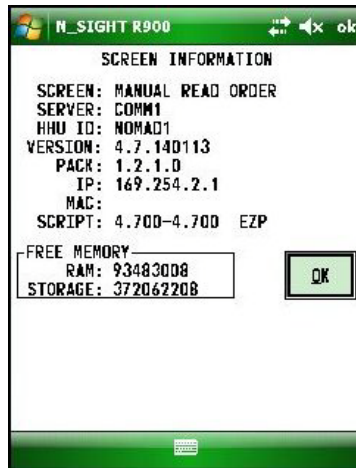


Figure 2.11 Example of an Extended Screen

To access these screens, refer to the following sections.

For the Nomad, see:

- “Information Keys,” on page 3-15
- “Direction Keys,” on page 3-18
- “Combination Keys,” on page 3-19

For the Ranger, see:

- “Information Keys,” on page 4-15
- “Direction Keys,” on page 4-17

The procedures in this manual will instruct you to follow one or the other method. Use the method most comfortable for you.














## Icon Bar

The icon bar allows you to work with the main screens. It appears at the top of the screen similar to the one shown in Table 2.1.


### Table 2.1 N\_SIGHT R900 Display Icons

Display Icons


|   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|




Main menu




Battery indicator




Next unread account




Route direction: points




Tag account



Customer notes




Trouble codes




Comment Code


Cycles between these icons depending on the reading:




→ Keyed Read (Manual)




→ R900 (can also display as R3 for ERT/Itron)



→ Probe



→ Read parameters (manual accounts)



→ Enables Edit mode when you use the up and down arrows to view additional information from main screens..



If an icon appears as gray, it means that this icon is not available.



## 3 Using the Nomad Handheld

---



If you want to set up and configure the Ranger handheld, see “Using the Ranger Handheld,” on page 4-1.

This chapter provides basic instructions for unpacking and inspecting the Nomad. It also gives instructions for setting up the Nomad and becoming familiar with the keyboard and display. This chapter also provides help to get started with your Nomad, so that you can begin collecting information from the field and exchange information with the host computer.

In addition, this chapter gives procedures for changing the system settings, which affects how the handheld displays and accesses data. Although these settings are preset by Neptune to meet the needs of most meter reading processes, you can change some of the settings so that they better suit your needs.

---

### Unpacking the Nomad

Besides using normal care, you need no special instructions to unpack the handheld or the equipment that you purchased with it.

Check that you have received all the items you need and inspect the items for shipping damage. If you detect any damage, return the damaged equipment to Neptune. Instructions for shipping the handheld to Neptune are given in “Returning Your Neptune Handheld System,” on page 9-20 of this manual.



Inside the box with the Nomad is an Orientation Guide that exhibits the contents:

- Handstrap
- Battery
- Trimble Nomad getting started disk
- AC adapter
- USB cable
- Stylus
- Screen protectors
- 4GB SD card (also included in the box)

The Guide shows you how to do the following:

- Install the battery
- Attach the handstrap
- Insert the SD card







## The Router



It is important that the router you use has the capability to work as a switch.

If you are using a router to link cradles to exchange information with more than one Nomad at a time, check that you have the following items:

- One or more Nomad handheld computers.
- One communication cradle for each Nomad.
- One AC adapter/battery charger cable for each cradle.
- One RJ-45 Ethernet cable for each communication cradle.
- One RJ-45 Ethernet cable to connect the router to the PC.
- One router/switch with one AC power supply cable.



In order for the Communications function to work properly, a standard RJ45 Ethernet cable must be used.

## Connecting to the Host Computer and Power Supply



This configuration is for handhelds not connected to a system network. If you are connected to a system network, see the network specialist or your system administrator for assistance.

The procedures in this chapter describe how to connect the Nomad to the host computer so that it can exchange information with the host. The procedures also describe how to connect a power supply to the communications cradle so that you can recharge the battery. Complete the following procedures to connect the equipment you have.



You need no special tools to connect the devices that were shipped with your handheld.

## Connecting the Router, Nomad Handheld Cradle, and Power Supplies

Follow this procedure to connect the router, communication cradles, and power supplies.



You need a network switch or it is important that the router you use has the capability to work as a switch.

- 1 If you have not already done so, make sure that you have all of the equipment you need. If necessary, refer to the preceding section “Unpacking the Nomad,” on page 3-1.
- 2 With the host computer OFF, connect the power supply to the router.
- 3 Leaving the far left port empty, connect one end of the RJ-45 Ethernet cable into one of the four slots in the router. See Figure 3.2.

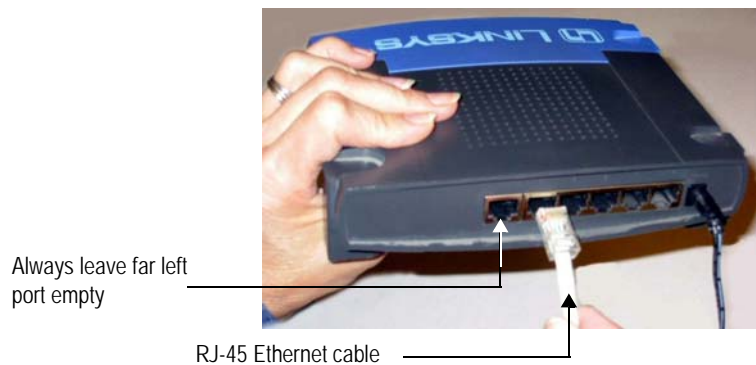


Figure 3.2 Connecting RJ-45 Ethernet Cable to Router, Port 1

- 4 Connect the other end of the Ethernet cable to the host computer.
- 5 Push the single-hole connector of the 110V AC adapter/battery charger onto the single-prong connector on the back of the communication cradle.



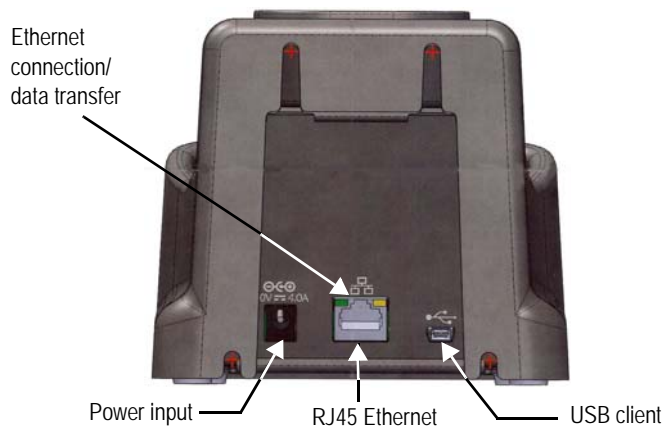


Figure 3.3 Nomad Communications Cradle Connections

- 6 Connect the other end of the AC adapter/battery charger into a power source. See Figure 3.3.
- 7 With an additional Ethernet cable, insert one of its connectors into the back of the cradle and the other into the back of the router. See Figure 3.3.
- 8 Connect the network cable to the single router.

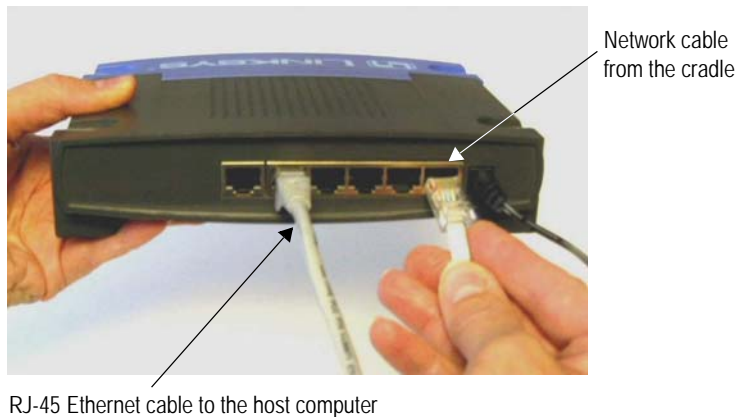


Figure 3.4 Network Cable Connection



## Configuring the Nomad Handheld


### On the Host Computer

- 1 On the host computer, click **Start**.
- 2 Type **CMD** and press **Enter**.  
A DOS window appears.
- 3 Type **ipconfig** and press **Enter**.
- 4 Write the IP address here: \_\_\_\_\_
- 5 Type **exit** and press Enter to close the DOS window.

### On the Nomad Handheld



Before proceeding with this section, you must complete the information for the handhelds in two tables within the N\_SIGHT R900 host software: Handhelds and Reader ID. Refer to the *N\_SIGHT R900 Online HTML Help* for the steps to complete this information in these tables.

- 1 On the N\_SIGHT R900 Login screen, press **M** or touch .

The N\_SIGHT R900 Main Menu screen appears.

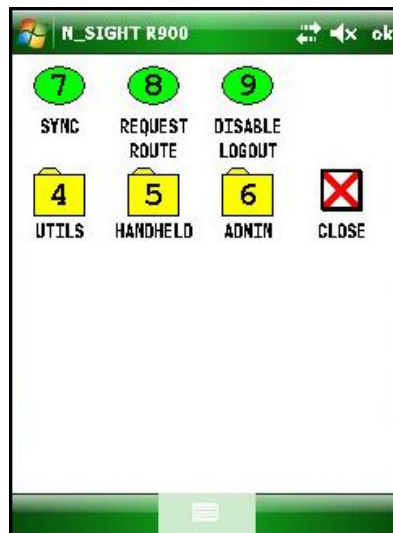


Figure 3.5 N\_SIGHT R900 Main Menu



- 2 Select , **Admin**.

The Admin Menu appears as illustrated in Figure 3.6.

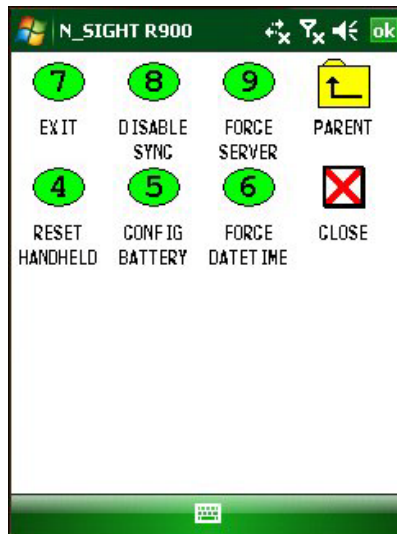


Figure 3.6 N\_SIGHT R900 Admin Menu

- 3 Select , **Reset Handheld**.



Do not press Reset Handheld if the handheld is not in the communications cradle.

- 4 Click **Yes**.
- 5 Leave the password field blank, or if required, type **BUBBA**.
- 6 Click **OK**.

The Communications Configuration screen appears.



- 7 Tab to the **HHU ID** field, and type the **ID** of the handheld.



The HHU ID for the Nomad can be found four ways:

- On the outside of the box in which the Nomad is packaged.
- In the battery compartment on the right side.
- Navigate to Windows Icon, Settings, System Tab at bottom of the screen, and then scroll to System Information and Info Tab at bottom of screen.
- Navigate to Windows Icon, Settings, System Tab at bottom of the screen and click **About** then **Device ID** at the bottom of the screen.

- 8 Type the IP address of the PC which you want the Nomad to synchronize within the **Server Name** field.
- 9 Be sure the **Port** is **25101**.
- 10 Click **OK**.

The handheld resets, and the N\_SIGHT R900 Login screen appears.

---

## The Display and Keyboard



If the message **DB Uninitialized** flashes on the screen, press **Synchronize** once more to complete Database Synchronization.

This section describes the display and keyboard on the Nomad.

- The types of information that are shown in the display of the handheld.
- An overview of how to use the keys to access different types of information.

### Learning the Keyboard

The Nomad handheld uses 51 keys to give you access to all the stored information and to allow you to enter new data. Most keys perform more than one function.





Figure 3.7 Learning the Keyboard

## Buttons and Keys


In addition to an environmental seal that protects the unit from dust, dirt, and water, the Nomad includes the following features.

- **Function Button**—allows you to perform special tasks quickly, such as navigate through a screen when you use the yellow arrow keys.
- **Direction Buttons**—allow you to navigate and move up or down a list of items and to move forward or backward in a data entry space or through the meters of a route.
- **Number Buttons**—allow you to access accounts while reading meters.




- **Letter/Character Keys**—allow you to enter a letter or character in a screen or to select an item from a list of items shown.
- **Application Soft Buttons**—allow you to enter, change, or view information about a meter or a route.
- **Combination Keys**—allow you to execute a task quickly by pressing certain keys at once or in a particular order.


## Buttons


To help you perform handheld tasks, the keyboard is color coded. For example, by using the yellow  function button in conjunction with keys that are marked in yellow, you can navigate around a screen. Buttons with white numbers or symbols are single-entry keys. To enter the number, simply press the button with the corresponding number or letter.


### Function Button

Because the Nomad automatically disables inappropriate buttons, the type of task that you can perform from the keyboard depends upon the type of menu that is displayed.

On the numeric keypad, the yellow  function button (clicky key sounds) accesses the tasks in yellow, including the navigation arrows. Several settings can be changed under Keyboard Options.

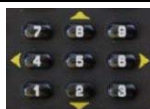
**Auto release:** Press and release  to access a yellow task for one use. It then goes back to the original key tasks.

**Manual release:** This is the default. Press  to toggle it on and off. Yellow tasks remain active until the function key is pressed again.



**Disabled:**  must be held down while pressing any other key to access the yellow task.

**Play Sticky Key Sounds:** To disable clicky key sounds, remove the check in the box.









## Direction Buttons




In conjunction with the yellow  function button, the yellow direction arrows are enabled by the number buttons closest to them. You can use these buttons on the handheld to move up or down through a list of items displayed in a menu screen, and to move forward or backward within a data entry space or through the meters of a route. Using  and pressing the arrow/number button up or down displays additional screens for the account.

The type of task that you can perform using an arrow/number button depends upon the type of screen displayed.

- **Data Entry Screen**—moves forward or backward within a data entry space by pressing  + BACKWARD  **4** or  + FORWARD **6**  buttons.



Moving over existing letters or numbers will not erase them.

- **Reading Entry Screen**—displays the reading entry screen of the next or previous meter by pressing the right  to go forward in the route, or  +  **4** to go backward.

## **4** Number Buttons

The number buttons on the handheld are used most often for entering readings. Because entering readings is the primary function of users, the number buttons are smaller than the other buttons and are placed in the center of the keypad. Number buttons enable you to complete one of two tasks:


- Enter a number in the display, such as for a reading.
- Select an item by pressing the number key that corresponds to a numbered item in a list of items.



The type of task that you can perform using a number key depends upon the type of screen that is displayed.

- **Menu Screen**—select a numbered item from the list by pressing the key whose number corresponds to the item that you want to select. (When used this way, the number key is called a hot key.)
- **Data Entry Screen**—enter a number in the data entry screen by pressing the key with the number that you want to appear in the field.


## Nomad Screen Keyboard

When you tap the keyboard  icon located at the bottom of the screen, an onscreen keypad appears with 60 keys to use. There are three views of this keyboard.



### Changing the Size of the Keys

There are two ways you can change the size of the keys that display on the screen keyboard.

#### Using the Windows Icon.

- 1 Click the  at the top left of the screen.
- 2 Click **Settings**, and then click **Input**.
- 3 Select **Large Keys**. (The default is Small Keys.)
- 4 Click **OK**.

#### Using the Keyboard Icon.

- 1 Click  at the bottom center of the screen.
- 2 Click  to the right of the Icon.
- 3 Click **Options**.
- 4 Select **Large** or **Small Keys**. See Figure 3.8 and Figure 3.9 on Page 3-14.
- 5 Click **OK**.



### Large Keys

The following figure illustrates the large keyboard.



Figure 3.8 Nomad Large Keyboard

### Small Keys

The following figure illustrates the small keyboard.



Figure 3.9 Nomad Small Keyboard

### Lowercase Keys

The following figure illustrates the lowercase QWERTY keyboard.



Figure 3.10 Nomad Lowercase Keyboard

### Uppercase Keys

The following figure illustrates the uppercase QWERTY keyboard.



To use the uppercase keys, tap **CAP** or **Shift**.



Figure 3.11 Nomad Uppercase Keyboard

## Numeric and Symbols Keys

The following figure illustrates the keyboard with numeric and symbols keys.

To use the numeric and symbols keys, tap **123**.



Figure 3.12 Nomad Numeric and Symbols Keyboard

## Information Keys



Information keys only work when logged into the handheld (Production Mode).

The information keys on the handheld screen are the letter/character keys that allow you to perform specific tasks while in N\_SIGHT R900. You can enter, change, or view the following information about a meter or a route by pressing the appropriate key whenever you are logged into a route and a reading entry screen is shown in the display.







These letter hotkeys on the keypad are defined in the N\_SIGHT R900 host software. The Handheld Hotkeys - DAP table in Table Maintenance, found in Utilities, allows you to alter these keys for the Nomad, Ranger, and DAP handhelds.



For the Nomad and Ranger handhelds (not DAP handhelds), the left application key can be used instead of the letter hotkeys. This key is also defined in the N\_SIGHT R900 host software. The Handheld Hotkeys - Nomad table in Table Maintenance, found in Utilities, allows you to alter the key functions. Each page contains a different list of hotkeys.



Toggles between the Automatic Meter Reading (AMR) mode: R900  Keyed  Advantage  R300. ( is the right application key.) Pressing the left application key repeatedly on the Nomad and Ranger handhelds toggles between these functions.



Accesses the Codes menu, allowing you to enter trouble codes or customer notes depending upon the type of import file you are using.



Allows you to turn the Edit mode ON. In edit mode, you can type information on screens that allow text entry.



Allows you to access the Search screen where you can select criteria to look for information you need:

- Coded note
- Route
- Meter number
- Name
- Meter type
- Account status
- Sequence number
- Skip code
- Instruction code
- Account number
- Constant
- Tag





Allows you to access the GoTo screen. On this screen, you can access the following information for a meter or a route:

- Position of the meter within the route
- Sequence number of the meter
- Previous route
- Next route
- Beginning of the route
- End of the route
- First incomplete read
- Last incomplete read



Allows you to view summary information about the route. When pressed with the CTL key, this key allows you to view screen information for the handheld, such as the version number, Internet Protocol (IP) Address, Random Access Memory (RAM), and storage.



Allows you to enter a reading manually.



Allows you enter List mode where the account addresses are presented in list form, a convenient way to browse through the accounts.



Allows you to access the Meter Menu where you can skip a reading, change meter information, and enter information for a found meter.



Allows you to view the Properties information for the handheld:

- Read direction
- Route dir
- Battery key clicks
- Date
- Time



Allows you to skip the reading for this account.





Allows you to tag the account so that you can come back to it later.



Allows you to log out of N\_SIGHT R900 after completing the required information.



Allows you to search for the accounts already tagged.

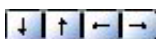


Allows you to perform an RF test.

You can use these keys when a Reading Entry screen is displayed. For example, if the you need to find more information about this meter, do the following:

Press UP  or DOWN  keys while reading the account.





This takes you to additional information. Once you display the information you need, pressing these keys again returns you to meter's Reading Entry screen.





### Direction Keys

The direction keys on the handheld are used to move up or down through a list of items displayed in a menu screen and to move forward or backward within fields where you can enter data or through the meters of a route. Pressing the direction key up or down displays additional screens for the account, such as an account-specific hazard.

The type of task that you can perform using a number key depends upon the type of screen displayed.

- **Menu Screen**—highlights a numbered item in the list of items displayed by pressing the UP  or DOWN  keys to move through the list of items. You can also use the BACKWARD  or FORWARD  keys to jump to the first or last item in the menu. As you reach an item, it becomes highlighted.




- **Data Entry Screen**—moves forward or backward within a data entry space by pressing the FORWARD  or BACKWARD  keys to move forward or backward within the space.

## Combination Keys

By pressing specific keys at once, or in a particular order, you can execute a task quickly. Certain quick key tasks can be performed no matter what type of screen is shown. The following examples summarize tasks that you can perform using quick keys.



Use the color coding to remember which keys to use with quick keys that have two functions: to activate the function printed in yellow, press the **YELLOW**  function button first and then press the key with a function printed in yellow.






Backlighting can drain the battery rapidly. To conserve the battery, use this feature only in low light.

If you do not press a key within 45 seconds of activating this feature, the Nomad automatically deactivates the backlight to conserve battery power.












## Nomad Functions

The following table provides an explanation of the functions available on the Nomad.















**Table 3.1 Nomad Functionality**

| Function        | Explanation  |
|-----------------|--|
| Power ON        | Press  once.  |
| Power OFF       | Press and hold  for five seconds, then release. Choose <b>Shut down</b> . |
| Turn screen OFF | Press  once.  |


























| Function              | Explanation   |
|-----------------------|---|
| Turn backlight ON/OFF | Press and hold  for two seconds  |
| Reboot                | Hold down  for five seconds, then release. Choose <b>Reset</b> .   |
| Soft reboot           | Press  ,  , then  to perform a soft reboot of the Nomad handheld. |
| Enter                 | Press  to enter a reading or select an item from a menu screen   |
| Today                 | Press  to escape from any screen.  |
| Tab                   | Press  to advance to the next field on the screen.   |
| Decimal point.        | Press  to enter a decimal point. This is typically required only by "floating point" meters.   |
| Previous menu/back    | Press  to move up one level in the menu.   |
| Enter a space         | Press  to enter a space when entering a special message or other data.   |



| Function                     | Explanation   |
|------------------------------|---|
| Erase/<br>backspace          | Press  to erase a letter, number, or character that you have entered. As you backspace over each letter, number, or character, each is erased.   |
| Minimize<br>backlight        | Press  , PROGRAMS, SYSTEM TAB, <br><b>Backlight</b> to minimize the amount of time the backlight stays on and dim it to only as bright as required to view the display.   |
| Show meter<br>information    | Press  +  to show meter information on the screen.  |
| Next and previous<br>account | Press  + FORWARD  or<br>BACKWARD    |
| Next unread                  | Press the left  . The left application key can be used instead of the letter hotkeys. This key is also defined in the N_SIGHT R900 host software. The Handheld Hotkeys - Nomad table n Table Maintenance, found in Utilities. In this table, allows you to alter the key functions. Each page contains a different list of hotkeys. |
| Previous unread              | Press  ,  , then  .   |
| Resequenece                  | Press  +  .   |



| Function  | Explanation  |
|---|--|
| Reset order/<br>delete read                                   | Press  ,  , then  .   |
| Field Programmer  | Do one of the following: <ul style="list-style-type: none"> <li>Logged into route:<br/>Tap , , , then .</li> <li>Not logged in route:<br/>Tap , , then .</li> </ul>      |
| Data Logger   | Do one of the following: <ul style="list-style-type: none"> <li>Logged into route:<br/>Tap , , , then .</li> <li>Not logged in route:<br/>Tap , , then .</li> </ul>      |
| Bluetooth Pairing<br>(with the R900 Belt<br>Clip Transceiver) | <ol style="list-style-type: none"> <li>1 Power on the R900 BCT by pressing  for two seconds.</li> <li>2 Tap , ,  on the Nomad.</li> <li>3 Click .</li> <li>4 Select the Belt Clip in the drop-down selection list.</li> <li>5 Click .</li> </ol> |



---

## Adjusting System Settings

System settings affect how the handheld displays and accesses data. Although these settings are factory-set to meet the needs of most meter reading processes, you can change some of the settings so that they better suit your needs. These settings are typically set once and never changed; however, you can adjust these settings any time.

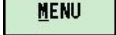
## Calibrating the Stylus

The Nomad handheld has a touchscreen display that uses a stylus for ease of use. Because each person's touch differs, it is important to calibrate the stylus to the touchscreen for the user's own personal touch.



All functions are available without the stylus by using the keyboard.

To calibrate the stylus, complete the following procedure.

- 1 On the N\_SIGHT R900 Login screen, tap **M** or touch .



The N\_SIGHT R900 Main Menu screen appears.

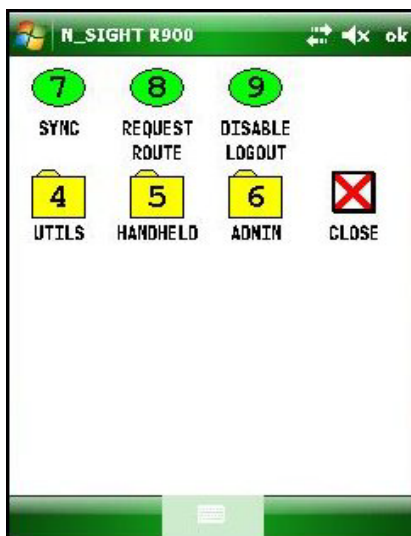




Figure 3.13 N\_SIGHT R900 Main Menu

- 2 Press **5** or touch item  **Handheld**.
- 3 Press **9** or touch  **Stylus**.



The Stylus Calibration screen appears like Figure 3.14.

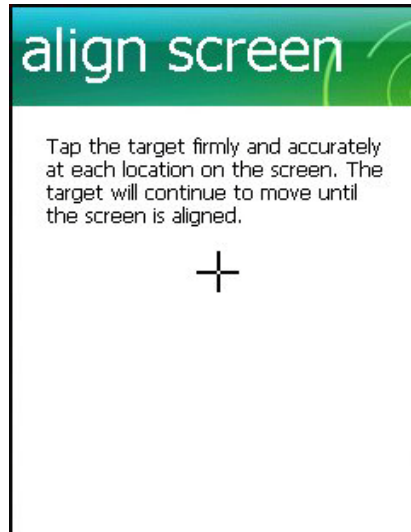


Figure 3.14 N\_SIGHT R900 Stylus Calibration Screen

Calibration is simply done by touching the center of the target with the stylus for a couple of seconds and releasing. When the target moves to another place, repeat the operation.

- 4 Press the stylus on the center of the target until it moves, and then release.

Once released the target moves to the next corner of the screen.



Remember just to touch the screen; there is no need to press hard or to punch it.



The target moves to another location on the screen similar to that illustrated in Figure 3.15.

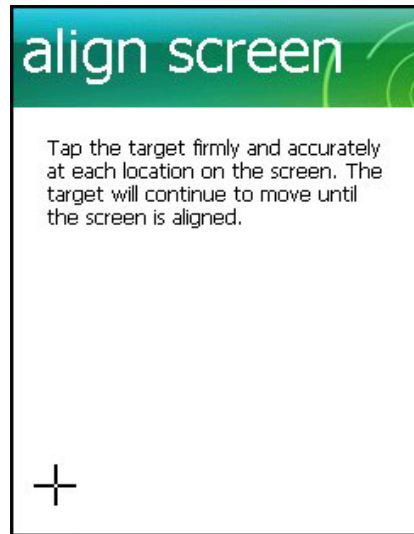



Figure 3.15 Stylus at Another Location on Screen

- 5 Repeat pressing the stylus on the center of the target until it moves, and then release.
- 6 When finished, press .

The handheld returns to N\_SIGHT R900 Main Login screen.

## Changing the Handheld Properties


The section allows you to adjust or change the following properties for the handheld:

- Key clicks
- Reading entry direction
- Route direction



## Working with the Properties Screen

To access the Properties screen, complete these steps:

- 1 On any reading entry screen, press  on the expandable keypad.

The Properties screen appears as illustrated in Figure 3.16.

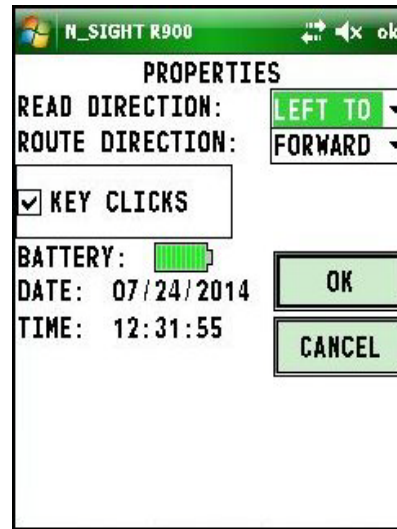


Figure 3.16 Handheld Properties Screen

## Changing the Reading Entry Direction

As you enter a reading in the handheld, each number can be displayed from right to left or from left to right.

- 2 In the **Read Dir** field, touch the down arrow and do one of the following:
  - Select **LEFT TO RIGHT** if you want the number to begin from the left.
  - Select **RIGHT TO LEFT** if you want the number to begin from the right.

These setting toggle between Left to Right or Right to Left according to the current setting.



This procedure affects only accounts for which directions have not been set by the host computer. If the reading entry direction of an account has been set by the host computer, the host setting replaces your setting.



## Changing the Route Read Direction

The handheld typically displays meters of a route from the first meter to the last meter. However, you can change the order that meters are displayed so that they are shown from the last meter to the first meter.

- 3 In the **Route Dir** field, touch the down arrow and do one of the following:
  - Select **FORWARD** if you want the readings to advance to the next unread account in the route.
  - Select **BACKWARD** if you want to change the directions of the readings to go backward to the previous unread account in the route.

These settings toggle between Forward or Backward according to the current setting.

## Turning Key Clicks On and Off

The Key Clicks feature allows you to control how the handheld responds when you press a key. When this feature is ON, the handheld beeps whenever you press a key. Turning the Key Clicks feature on can help you reduce errors by making sure that you press each key fully. If you do not press a key fully, the handheld does not acknowledge your entry. You can turn the Key Clicks feature on or off at any time.

- 4 Do one of the following:
  - Select the check box to enable **Key Clicks**.
  - Leave the check box empty to disable the **Key Clicks**.

These settings toggle between on (checked) or off (unchecked) according to the current setting.

- 5 Touch **OK** to save your settings.

You return to the reading entry screen or your previous screen.

## Configuring RF/Serial Properties

Depending on the type of accounts on your route, you may have to configure the RF antenna, the type of probe, or serial properties you are using. Follow this procedure to configure or change the RF antenna, the type of probe, or serial properties.



- 1 Press .

The **System Menu** appears as illustrated in Figure 3.17.

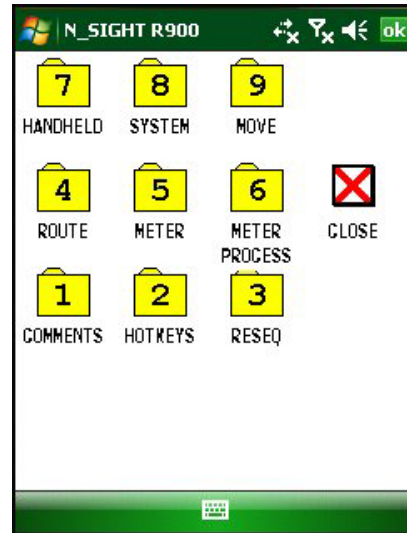


Figure 3.17 N\_SIGHT R900 F1 Menu

- 2 Touch .

The **System Menu** appears as illustrated in Figure 3.18.

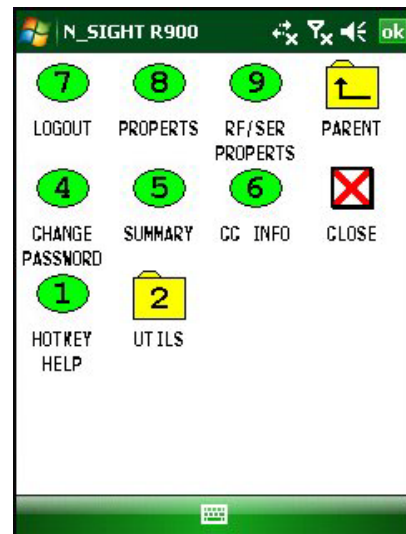


Figure 3.18 N\_SIGHT R900 System Menu



- 3 Touch .

The **RF/Serial Properties** screen appears as illustrated in Figure 3.19.

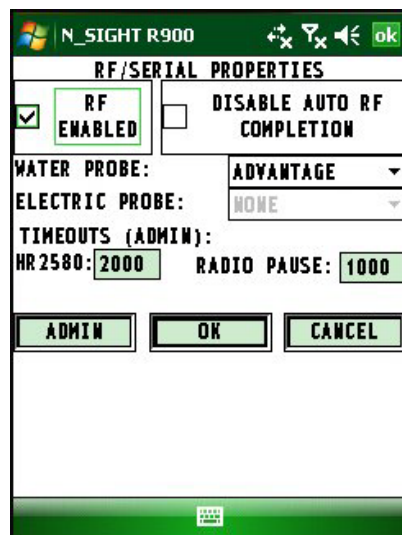


Figure 3.19 RF/Serial Properties Screen


## Turning the Nomad On and Off

This section explains how to turn the handheld on and off, and then how to sign on to access the screens needed to complete meter reading tasks.

Whenever the handheld is in a communication cradle, it is on. This is because, when connected properly, the cradle supplies power. However, once the handheld is taken out of the cradle, the unit runs on its battery. When powered by the battery, you can manually turn on the handheld and you can turn it off automatically or manually.

Use the following procedures to turn the handheld on or to turn it off manually.

### Turning the Nomad On

Turn on the Nomad handheld by pressing and releasing the  button. The Nomad shows a menu, data entry, or message screen depending upon the last activity performed with the unit.



One of the most convenient features is *suspend/resume*. There is no waiting for the unit to boot up every time it is turned on. (This does not occur the first time the unit is powered ON.)



A message indicating low battery can appear on the battery LED located on right side of the unit. For a new Nomad, be sure to connect the plug to the power cord and attach to the power supply. The unit will be charged in about 4.5 hours. Neptune recommends that you fully charge the unit prior to your first use.

## Turning the Nomad Off

Manually turn off the handheld by pressing and holding down the



button for five seconds, then release. Choose Shut Down. The display goes blank indicating that the handheld is off.

If you allow the handheld to remain inactive for the factory-set delay of 45 seconds or for the delay time specified by the host computer, it turns off automatically. After this period of inactivity, the screen of the handheld goes blank and the unit turns off to conserve the battery. Just tap the screen to use the Nomad again.

---

## Logging In and Out of N\_SIGHT R900

This section explains how to log into N\_SIGHT R900 on the handheld to access the screens needed to complete meter reading tasks.


### Logging Into N\_SIGHT R900 on the Nomad

After you have loaded a route, or after you have exchanged meter readings and route data with the host computer, you need to log into N\_SIGHT R900 on the handheld. Signing on gives you access to the screens you need to collect and exchange route and meter data.

Complete the following steps to log into N\_SIGHT R900 on the Nomad.


Not Uploaded



- 1 If you have not already done so, press  to turn on the Nomad.



If you see the message “Not Uploaded,” this means the handheld has been loaded but has not yet been uploaded. This is normal if a new route was just loaded to the handheld.

Touch  or **Synchronize** to start Communications. For more information, refer to “Data Logging,” on page 7-1.

You can see a message like the one illustrated in Figure 3.20.



Figure 3.20 N\_SIGHT R900 Message Area

- 2 Click .



There may be times that the Clock Error screen appears when you are attempting to log in. When this screen appears, continue with the following steps.



A Clock Error screen appears, prompting you to log on and manually set the clock, as illustrated in Figure 3.21.

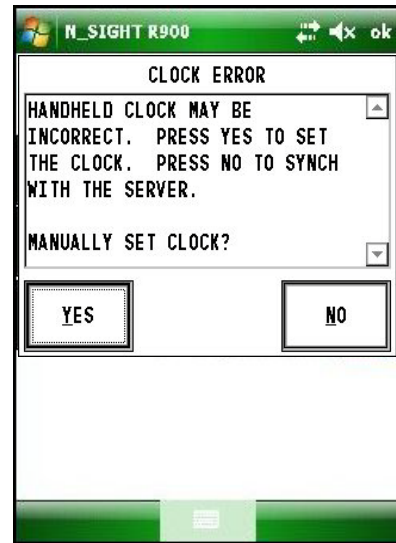


Figure 3.21 N\_SIGHT R900 Clock Error Screen

### 3 Click **Yes**.



If you answer **NO** to the clock error message, the Login screen appears again.

After you click Yes, the Set Date/Time screen appears as illustrated in Figure 3.22.

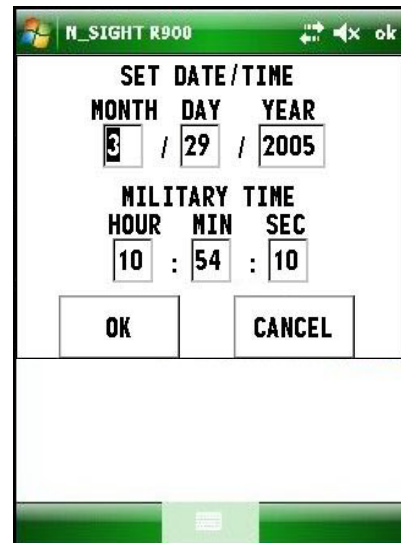


Figure 3.22 N\_SIGHT R900 Set Date / Time Screen



- 4 If applicable, make any changes to the date and time.

The correct date and time to use is the date and time that the handheld last synchronized.

- 5 When the date and time are accurate, click **OK**.

The Handheld Login screen appears as illustrated in Figure 3.24.

The screenshot shows a handheld device screen with a green header bar. The header bar contains the text 'N\_SIGHT R900' and several small icons. Below the header bar, the title 'HANDHELD LOGIN' is displayed. The main area of the screen contains five labeled input fields: 'HHU ID:' with the value 'FW07014', 'READER ID:' with the value 'SCOTT', 'PASSWORD:' which is empty, 'VEHICLE NUMBER:' which is empty, and 'MILEAGE:' which is empty. At the bottom of the screen, there are two buttons: 'LOGIN' and 'CANCEL'. The background of the screen is white, and the overall interface is simple and functional.

Figure 3.23 N\_SIGHT R900 Handheld Login Screen

The Reader ID field displays the information contained in the N\_SIGHT R900 software.

- 6 Complete the following information as applicable:
  - **Password** (Determined by N\_SIGHT R900 setup)
  - **Vehicle #** (Optional)
  - **Mileage** (Optional)



- 7 Click **LOGIN**.

The Select Route screen appears as illustrated in Figure 3.24.

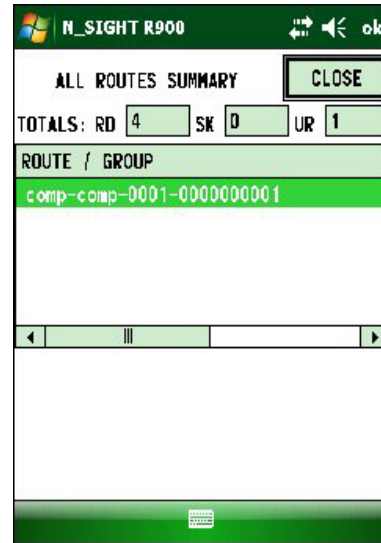


Figure 3.24 N\_SIGHT R900 Select Route Screen

- 8 Highlight the route you want, and click **OK**.

A message appears similar to the one illustrated in Figure 3.25.

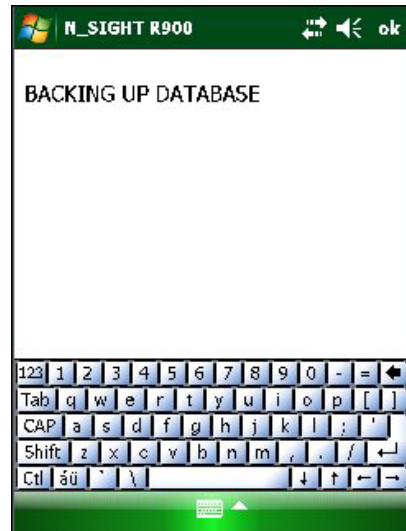


Figure 3.25 N\_SIGHT R900 Initializing Message



When the software has finished initializing, a Reading Entry screen indicating that the sign-on process is complete and that the unit is ready for use in collecting readings. See Figure 3.26.

For assistance in using the Nomad to collect meter readings, refer to Figure 6 on Page 6-1.

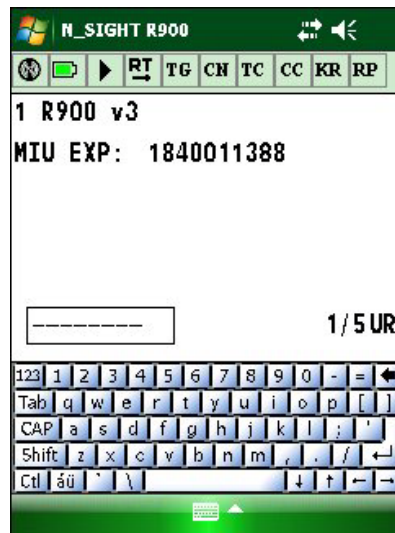


Figure 3.26 N\_SIGHT R900 Reading Entry Screen

## Logging Out of N\_SIGHT R900

The only time that you need to log out of N\_SIGHT R900 on the handheld is just before you begin exchanging information with the host computer. Logging out gives you access to the communication features of the handheld. Before logging out of N\_SIGHT R900, instructions for logging out on the handheld are included in the procedures that describe how to exchange information with the host computer. For more information, see “Exiting the Software,” on page 8-1.

If you allow the handheld to remain inactive for the factory-set delay of 45 seconds or for the delay time specified by the host computer, it turns off automatically. After this period of inactivity, the screen of the handheld goes blank and the unit turns off to conserve the battery.



## 4 Using the Ranger Handheld

---



If you want to set up and configure the Nomad handheld, see “Using the Nomad Handheld,” on page 3-1.

This chapter provides basic instructions for unpacking and inspecting the Ranger. It also gives instructions for setting up the Ranger and becoming familiar with the keyboard and display. This chapter also provides help to get started with your Ranger, so that you can begin collecting information from the field and exchange information with the host computer.

In addition, this chapter gives procedures for changing the system settings, which affects how the handheld displays and accesses data. Although these settings are preset by Neptune to meet the needs of most meter reading processes, you can change some of the settings so that they better suit your needs.

---

### Unpacking the Ranger

Besides using normal care, you need no special instructions to unpack the handheld or the equipment that you purchased with it.

Check that you have received all the items you need and inspect the items for shipping damage. If you detect any damage, return the damaged equipment to Neptune. Instructions for shipping the handheld to Neptune are given in “Returning Your Neptune Handheld System,” on page 9-20 of this manual.



Inside the box with the Ranger is an Orientation Guide that exhibits the contents:

- Handstrap
- Battery
- Trimble Ranger getting started disk
- AC adapter
- USB cable
- Stylus
- Screen protectors
- 4GB SD card (also included in the box)

The Guide shows you how to do the following:

- Install the battery
- Attach the handstrap
- Insert the SD card



---

## Setting Up the Ranger

The following section describes how to set up your Ranger so that you can begin using it.

### One Ranger and a Communication Cradle

If you are using a communication cradle to power and exchange information with one handheld at a time, check that you have received the following items.



Figure 4.1 Ranger and Communications Cradle

- One Ranger handheld computer.
- The charger that is included with the Ranger can be used to power the communications cradle. If you want a separate charger, you can order it as an accessory.



## The Router



It is important that the router you use has the capability to work as a switch.

If you are using a router to link cradles to exchange information with more than one Ranger at a time, check that you have the following items:

- One or more Ranger handheld computers.
- One communication cradle for each Ranger.
- One AC adapter/battery charger cable for each cradle.
- One RJ45 Ethernet cable for each communication cradle.
- One RJ45 Ethernet cable to connect the router to the PC.
- One router/switch with one AC power supply cable.



In order for the Communications function to work properly, a standard RJ45 Ethernet cable must be used.

## Connecting to the Host Computer and Power Supply



This configuration is for handhelds not connected to a system network. If you are connected to a system network, see the network specialist or your system administrator for assistance.

The procedures in this chapter describe how to connect the Ranger to the host computer so that it can exchange information with the host. The procedures also describe how to connect a power supply to the communications cradle so that you can recharge the battery. Complete the following procedures to connect the equipment you have.



You need no special tools to connect the devices that were shipped with your handheld.

## Connecting the Router, Ranger Handheld Cradle, and Power Supplies

Follow this procedure to connect the router, communication cradles, and power supplies.



You need a network switch or it is important that the router you use has the capability to work as a switch.

- 1 If you have not already done so, make sure that you have all of the equipment you need. If necessary, refer to the preceding section “Unpacking the Ranger,” on page 4-1.
- 2 With the host computer OFF, connect the power supply to the router.
- 3 Leaving the far left port empty, connect one end of the RJ-45 Ethernet cable into one of the four slots in the router. See Figure 4.2.

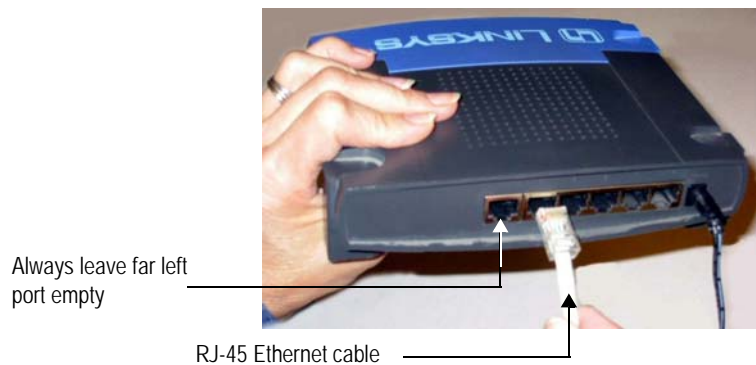


Figure 4.2 Connecting RJ-45 Ethernet Cable to Router, Port 1

- 4 Connect the other end of the Ethernet cable to the host computer.
- 5 Push the single-hole connector of the 110V AC adapter/battery charger onto the single-prong connector on the back of the communication cradle.



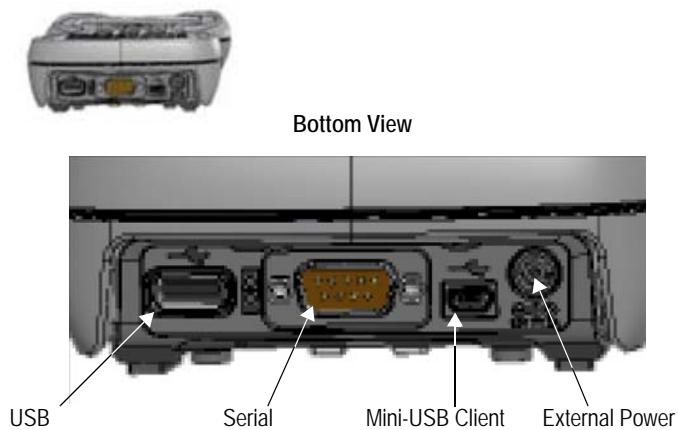


Figure 4.3 Ranger Communications Connections

- 6 Connect the other end of the AC adapter/battery charger into a power source. See Figure 4.3.
- 7 With an additional Ethernet cable, insert one of its connectors into the back of the cradle and the other into the back of the router. See Figure 4.4.
- 8 Connect the network cable to the single router.

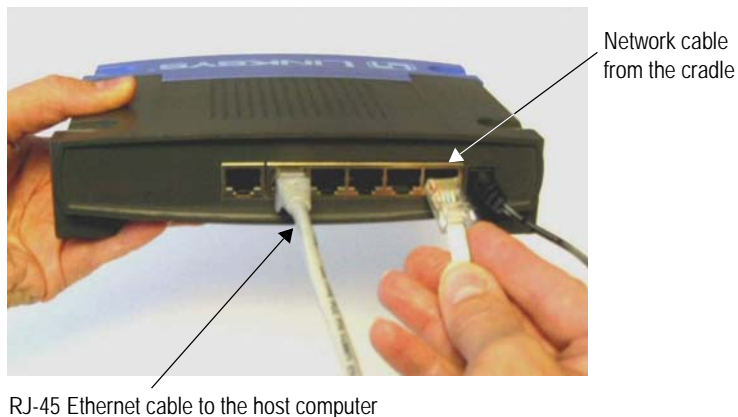


Figure 4.4 Network Cable Connection



## Configuring the Ranger Handheld

### On the Host Computer

- 1 On the host computer, click **Start**.
- 2 Type **CMD** and press **Enter**.  
A DOS window appears.
- 3 Type **ipconfig** and press **Enter**.
- 4 Write the IP address here: \_\_\_\_\_
- 5 Type **exit** and press **Enter** to close the DOS window.

### On the Ranger Handheld



Before proceeding with this section, you must complete the information for the handhelds in two tables within the N\_SIGHT R900 host software: Handhelds and Reader ID. Refer to the *N\_SIGHT R900 Online HTML Help* for the steps to complete this information in these tables.

- 1 On the N\_SIGHT R900 Login screen, press **M** or touch



The N\_SIGHT R900 Main Menu screen appears.

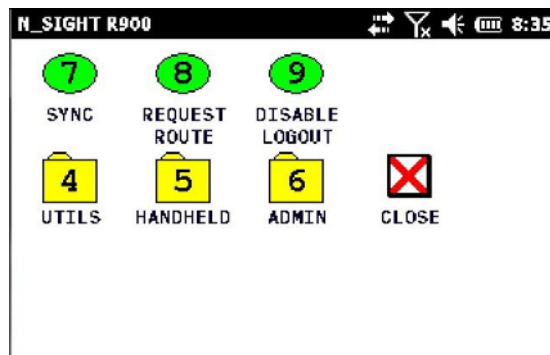


Figure 4.5 N\_SIGHT R900 Main Menu

- 2 Select , **Admin**.



The Admin Menu appears as illustrated in Figure 4.6.

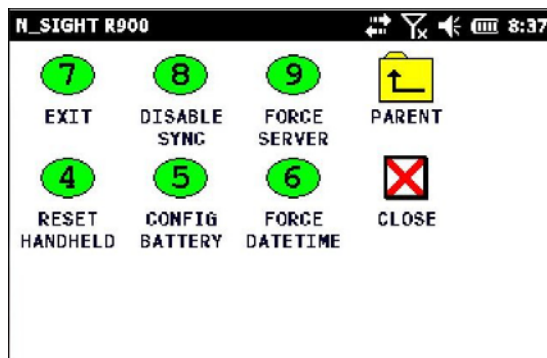


Figure 4.6 N\_SIGHT R900 Admin Menu

- 3 Select **4**, **Reset Handheld**.



Do not press Reset Handheld if the handheld is not in the communications cradle.

- 4 Click **Yes**.
- 5 Leave the password field blank, or if required, type **BUBBA**.
- 6 Click **OK**.

The Communications Configuration screen appears.

- 7 Tab to the **HHU ID** field, and type the **ID** of the handheld.

The HHU ID for the Ranger can be found four ways:

- On the outside of the box in which the Ranger is packaged.
- In the battery compartment on the right side.
- Navigate to Windows Icon, Settings, System Tab at bottom of the screen, and then scroll to System Information and Info Tab at bottom of screen.
- Navigate to Windows Icon, Settings, System Tab, and click **About** then **Device ID**.





- 8 Type the IP address of the PC which you want the Ranger to synchronize within the **Server Name** field.
- 9 Be sure the **Port** is **25101**.
- 10 Click **OK**.

The handheld resets, and the N\_SIGHT R900 Login screen appears.

---

## The Display and Keyboard



If the message **DB Uninitialized** flashes on the screen, press **Synchronize** once more to complete Database Synchronization.

This section describes the display and keyboard on the Ranger.

- The types of information that are shown in the display of the handheld.
- An overview of how to use the keys to access different types of information.

### Learning the Keyboard

The Ranger handheld uses 51 keys to give you access to all the stored information and to allow you to enter new data. Most keys perform more than one function.



Not all buttons and functions on the Ranger are available at this time. Some are reserved for future use.



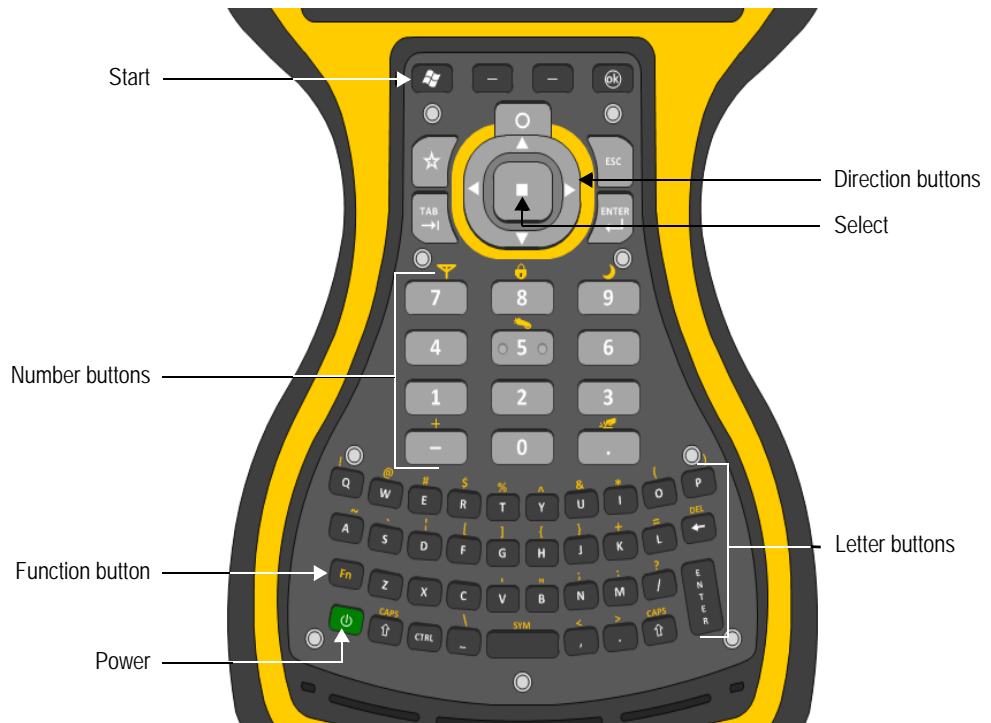


Figure 4.7 Learning the Keyboard


## Buttons and Keys

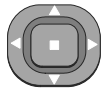
In addition to an environmental seal that protects the unit from dust, dirt, and water, the Ranger includes the following features.

- **Function Button**—allows you to enter special characters in a screen.
- **Direction Buttons**—allow you to navigate and move up or down a list of items and to move forward or backward in a data entry space or through the meters of a route.
- **Number Buttons**—allow you to access accounts while reading meters.
- **Letter Buttons**—allow you to enter a letter or character in a screen.



## Buttons



To help you perform handheld tasks, the keyboard is color coded. For example, by using the  button in conjunction with buttons that have symbols marked in yellow, you can enter special characters in a screen. Buttons with white numbers or symbols are single-entry keys. To enter the number, simply press the button with the corresponding number or letter.



### Direction Buttons

You can use the direction buttons on the handheld to move up or down through a list of items displayed in a menu screen, and to move forward or backward within a data entry space or through the meters of a route.

The type of task that you can perform using a direction button depends upon the type of screen displayed.

- **Data Entry Screen**—moves forward or backward within a data entry space by pressing the   buttons.



Moving over existing letters or numbers will not erase them.

- **Reading Entry Screen**—displays the reading entry screen of the next or previous meter by pressing the   buttons.



### Number Buttons

The number buttons on the handheld are used most often for entering readings. Because entering readings is the primary function of users, the number buttons are smaller than the other buttons and are placed in the center of the keypad. Number buttons enable you to complete one of two tasks:

- Enter a number in the display, such as for a reading.




- Select an item by pressing the number key that corresponds to a numbered item in a list of items.

The type of task that you can perform using a number key depends upon the type of screen that is displayed.

- **Menu Screen**—select a numbered item from the list by pressing the key whose number corresponds to the item that you want to select. (When used this way, the number key is called a hot key.)
- **Data Entry Screen**—enter a number in the data entry screen by pressing the key with the number that you want to appear in the field.


## Ranger Screen Keyboard

When you tap the keyboard  icon located at the bottom of the screen, an onscreen keyboard appears with 60 keys to use. There are three views of this keyboard.

### Changing the Size of the Keys

There are two ways you can change the size of the keys that display on the screen keyboard.

#### Using the Windows Icon.

- 1 Click the  at the top left of the screen.
- 2 Click **Settings**, and then click **Input**.
- 3 Select **Large Keys**. (The default is Small Keys.)
- 4 Click **OK**.



## Using the Keyboard Icon.



Click  at the bottom center of the screen. The screen displays a keyboard as illustrated in Figure 4.8.



Figure 4.8 Ranger Screen with Keyboard

The  button works as a toggle to display or hide the keyboard.

## Ranger Keyboard Keys

The following figure illustrates the keyboard.



Figure 4.9 Ranger Keyboard



## Lowercase Keys

The following figure illustrates the lowercase QWERTY keyboard.



Figure 4.10 Ranger Lowercase Keyboard

## Uppercase Keys

The following figure illustrates the uppercase QWERTY keyboard.

To use the uppercase keys, tap **CAP** or **Shift**.



Figure 4.11 Ranger Uppercase Keyboard

## Numeric and Symbols Keys

The following figure illustrates the keyboard with numeric and symbols keys.

To use the numeric and symbols keys, tap **123**.



Figure 4.12 Ranger Numeric and Symbols Keyboard



## Information Keys



Information keys only work when logged into the handheld (Production Mode).

The information keys on the handheld screen are the letter/character keys that allow you to perform specific tasks while in N\_SIGHT R900. You can enter, change, or view the following information about a meter or a route by pressing the appropriate key whenever you are logged into a route and a reading entry screen is shown in the display.



Toggles between the Automatic Meter Reading (AMR) mode: R900 → Keyed → Advantage → R300.



Accesses the Codes menu, allowing you to enter trouble codes or customer notes depending upon the type of import file you are using.



Allows you to turn the Edit mode ON. In edit mode, you can type information on screens that allow text entry.



Allows you to access the Search screen where you can select criteria to look for information you need:

- Coded note
- Route
- Meter number
- Name
- Meter type
- Account status
- Sequence number
- Skip code
- Instruction code
- Account number
- Constant
- Tag





Allows you to access the GoTo screen. On this screen, you can access the following information for a meter or a route:

- Position of the meter within the route
- Sequence number of the meter
- Previous route
- Next route
- Beginning of the route
- End of the route
- First incomplete read
- Last incomplete read



Allows you to view summary information about the route. When pressed with the CTL key, this key allows you to view screen information for the handheld, such as the version number, Internet Protocol (IP) address, Random Access Memory (RAM), and storage.



Allows you to enter a reading manually.



Allows you enter List mode where the account addresses are presented in list form, a convenient way to browse through the accounts.



Allows you to access the Meter Menu where you can skip a reading, change meter information, and enter information for a found meter.



Allows you to view the Properties information for the handheld:

- Read direction
- Route directory
- Battery
- Key clicks
- Date
- Time



Allows you to skip the reading for this account.





Allows you to tag the account so that you can come back to it later.



Allows you to log out of N\_SIGHT R900 after completing the required information.



Allows you to search for the accounts already tagged.



Allows you to perform an RF test.

You can use these keys when a reading entry screen is displayed. For example, if the you need to find more information about this meter, do the following:

Press UP or DOWN keys while reading the account.

This takes you to additional information. Once you display the information you need, pressing these keys again returns you to meter's reading entry screen.





### Direction Keys

The direction keys on the handheld are used to move up or down through a list of items displayed in a menu screen and to move forward or backward within a data entry space or through the meters of a route. Pressing the direction key up or down displays additional screens for the account, such as an account-specific hazard.

The type of task that you can perform using a number key depends upon the type of screen displayed.

- **Menu Screen**—highlights a numbered item in the list of items displayed by pressing the UP or DOWN keys to move through the list of items. You can also use the BACKWARD or FORWARD keys to jump to the first or last item in the menu. As you reach an item, it becomes highlighted.












- **Data Entry Screen**—moves forward or backward within a data entry space by pressing the FORWARD  or BACKWARD  keys to move forward or backward within the space.




















## Ranger Functions

The following table provides an explanation of the functions available on the Ranger.














**Table 4.1 Ranger Functionality**

| Function              | Explanation  |
|-----------------------|--|
| Power ON              | Press  once.  |
| Power OFF             | Press and hold  for five seconds, then release. Choose <b>Shut down</b> .   |
| Turn screen OFF       | Press  once.  |
| Turn backlight ON/OFF | Press and hold  for two seconds.  |
| Reboot                | Hold down  for five seconds, then release. Choose <b>Reset</b> .  |
| Soft reboot           | Press  ,  , then  to perform a soft reboot of the Ranger handheld. |
| Decimal point.        | Press  to enter a decimal point. This is typically required only by “floating point” meters.  |



| Function                          | Explanation  |
|-----------------------------------|--|
| Enter a space                     | Press  to enter a space when entering a special message or other data.  |
| Erase/<br>backspace               | Press  to erase a letter, number, or character that you have entered. As you backspace over each letter, number, or character, each is erased.  |
| Minimize<br>backlight             | Press  , PROGRAMS, SYSTEM TAB, <br><b>Backlight</b> to minimize the amount of time the backlight stays on and dim it to only as bright as required to view the display.  |
| Show meter<br>information         | Press  +  to show meter information on the screen.   |
| Next unread                       | Press right  .   |
| Resequence                        | Click  , then  .   |
| Reset order<br>(delete a reading) | Click  ,  , then  .  |
| Field Programmer                  | Do one of the following: <ul style="list-style-type: none"> <li>Logged into route:<br/>Click  ,  ,  , then .</li> <li>From main screen:<br/>Click  ,  , then .</li> </ul> |



| Function                                 | Explanation   |
|--|---|
| Data Logger                              | <p>Do one of the following:</p> <ul style="list-style-type: none"><li>Logged into route:<br/>Click  ,  ,  , then  .</li><li>From main screen:<br/>Click  ,  , then  .</li></ul> |
| Bluetooth Pairing<br>(with the R900 BCT) | <ol style="list-style-type: none"><li>1 Power on the R900 BCT by pressing  for two seconds.</li><li>2 Click  ,  , then  on the Ranger 3.</li><li>3 Click  .</li><li>4 Select the R900 BCT in the drop-down selection list.</li><li>5 Click  .</li></ol>           |

## Adjusting System Settings

System settings affect how the handheld displays and accesses data. Although these settings are factory-set to meet the needs of most meter reading processes, you can change some of the settings so that they better suit your needs. These settings are typically set once and never changed; however, you can adjust these settings any time.



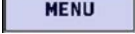
## Calibrating the Stylus

The Ranger handheld has a touchscreen display that uses a stylus for ease of use. Because each person's touch differs, it is important to calibrate the stylus to the touchscreen for the user's own personal touch.



All functions are available without the stylus by using the keyboard.

To calibrate the stylus, complete the following procedure.

- 1 On the N\_SIGHT R900 Login screen, tap **M** or touch .

The N\_SIGHT R900 Main Menu screen appears.

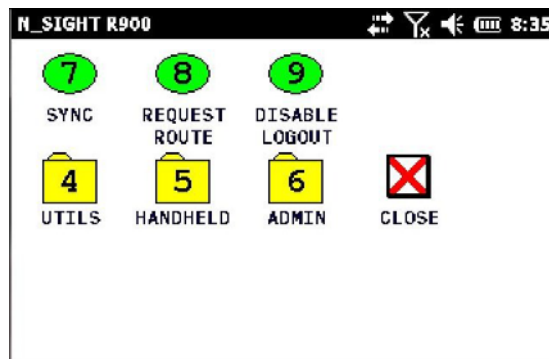




Figure 4.13 N\_SIGHT R900 Main Menu

- 2 Press **6** or touch item  **Handheld**.
- 3 Press **9** or touch  **Stylus**.



The Stylus Calibration screen appears like Figure 4.14.

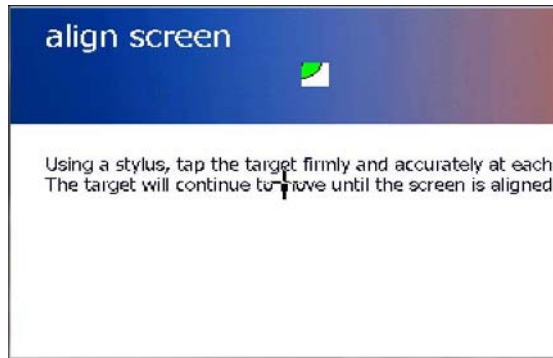


Figure 4.14 N\_SIGHT R900 Stylus Calibration Screen

Calibration is simply done by touching the center of the target with the stylus for a couple of seconds and releasing. When the target moves to another place, repeat the operation.

- 4 Press the stylus on the center of the target until it moves, and then release.

Once released the target moves to the next corner of the screen.



Remember just to touch the screen; there is no need to press hard or to punch it.



The target moves to another location on the screen similar to that illustrated in Figure 4.15.

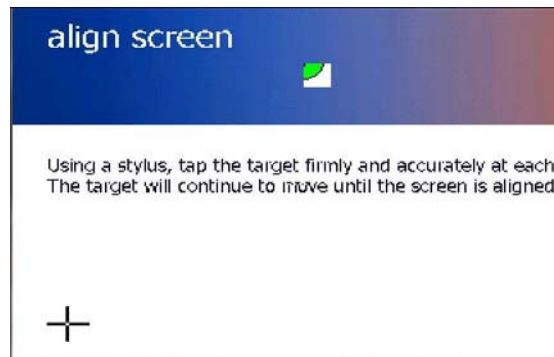



Figure 4.15 Stylus at Another Location on Screen

- 5 Repeat pressing the stylus on the center of the target until it moves, and then release.

- 6 When finished, press .

The handheld returns to N\_SIGHT R900 Main Login screen.



## Changing the Handheld Properties

This section allows you to adjust or change the following properties for the handheld:

- Key clicks
- Reading entry direction
- Route direction

### Working with the Properties Screen

To access the Properties screen, complete these steps:

- 1 On any reading entry screen, press **P** on the expandable keypad.

The Properties screen appears as illustrated in Figure 4.16.

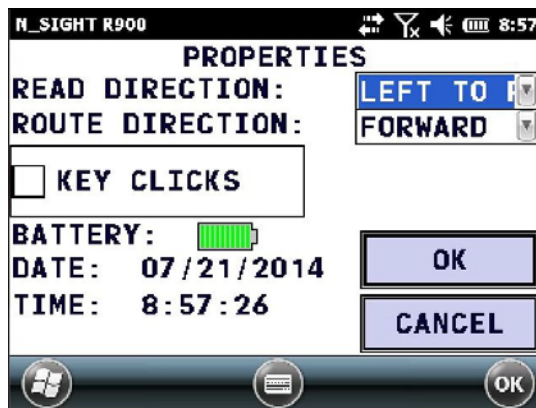


Figure 4.16 Handheld Properties Screen



## Changing the Reading Entry Direction

As you enter a reading in the handheld, each number can be displayed from right to left or from left to right.

- 2 In the **Read Dir** field, touch the down arrow and do one of the following:
  - Select **LEFT TO RIGHT** if you want the number to begin from the left.
  - Select **RIGHT TO LEFT** if you want the number to begin from the right.

These settings toggle between Left to Right or Right to Left according to the current setting.



This procedure affects only accounts for which directions have not been set by the host computer. If the reading entry direction of an account has been set by the host computer, the host setting replaces your setting.

## Changing the Route Read Direction

The handheld typically displays meters of a route from the first meter to the last meter. However, you can change the order that meters are displayed so that they are shown from the last meter to the first meter.

- 3 In the **Route Dir** field, touch the down arrow and do one of the following:
  - Select **FORWARD** if you want the readings to advance to the next unread account in the route.
  - Select **BACKWARD** if you want to change the directions of the readings to go backward to the previous unread account in the route.

These settings toggle between Forward or Backward according to the current setting.

## Turning Key Clicks On and Off

The Key Clicks feature allows you to control how the handheld responds when you press a key. When this feature is ON, the handheld beeps whenever you press a key. Turning the Key Clicks feature on can



help you reduce errors by making sure that you press each key fully. If you do not press a key fully, the handheld does not acknowledge your entry. You can turn the Key Clicks feature on or off at any time.

4 Do one of the following:

- Select the check box to enable **Key Clicks**.
- Leave the check box empty to disable the **Key Clicks**.

These settings toggle between on (checked) or off (unchecked) according to the current setting.

5 Touch **OK** to save your settings.

You return to the reading entry screen or your previous screen.

## Configuring RF/Serial Properties

Depending on the type of accounts on your route, you may have to configure the RF antenna, the type of probe, or serial properties you are using. Follow this procedure to configure or change the RF antenna, the type of probe, or serial properties.

1 Press .

The System Menu appears as illustrated in Figure 4.17.

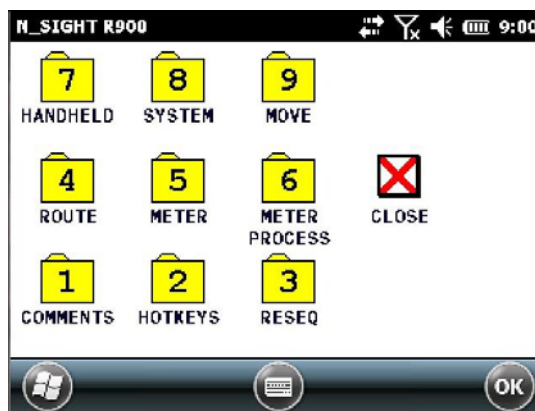


Figure 4.17 N\_SIGHT R900 F1 Menu

2 Touch .



The System Menu appears as illustrated in Figure 4.18.

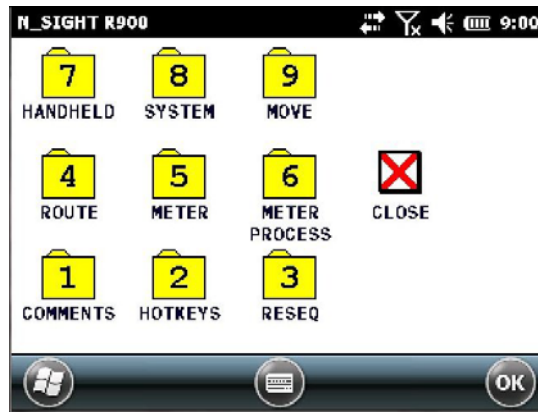


Figure 4.18 N\_SIGHT R900 System Menu

- 3 Touch **9**.

The **RF/Serial Properties** screen appears as illustrated in Figure 4.19.

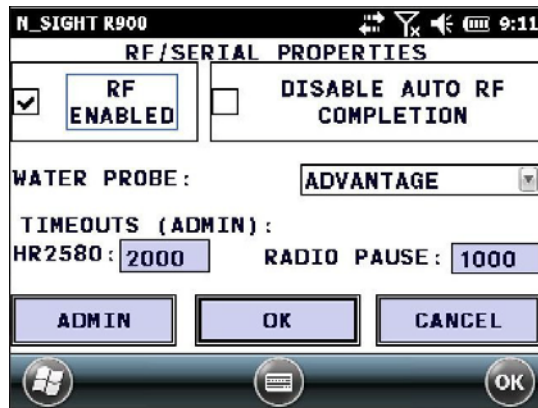


Figure 4.19 RF/Serial Properties Screen



---


## Turning the Ranger On and Off

This section explains how to turn the handheld on and off, and then how to sign on to access the screens needed to complete meter reading tasks.

Whenever the handheld is in a communication cradle, it is on. This is because, when connected properly, the cradle supplies power. However, once the handheld is taken out of the cradle, the unit runs on its battery. When powered by the battery, you can manually turn on the handheld and you can turn it off automatically or manually.

Use the following procedures to turn the handheld on or to turn it off manually.

### Turning the Ranger On


Turn on the Ranger handheld by pressing and releasing the  button. The Ranger shows a menu, data entry, or message screen depending upon the last activity performed with the unit.

One of the most convenient features is *suspend/resume*. There is no waiting for the unit to boot up every time it is turned on. (This does not occur the first time the unit is powered ON.)



A message indicating low battery can appear on the battery LED located on right side of the unit. For a new Ranger, be sure to connect the plug to the power cord and attach to the power supply. The unit will be charged in about 4.5 hours. Neptune recommends that you fully charge the unit prior to your first use.

### Turning the Ranger Off

Manually turn off the handheld by pressing and holding down the  button for five seconds, then release. Choose Shut Down. The display goes blank indicating that the handheld is off.



If you allow the handheld to remain inactive for the factory-set delay of 45 seconds or for the delay time specified by the host computer, it turns off automatically. After this period of inactivity, the screen of the handheld goes blank and the unit turns off to conserve the battery. Just tap the screen to use the Ranger again.

---


## Logging In and Out of N\_SIGHT R900

This section explains how to log into N\_SIGHT R900 on the handheld to access the screens needed to complete meter reading tasks.

### Logging Into N\_SIGHT R900 on the Ranger


After you have loaded a route, or after you have exchanged meter readings and route data with the host computer, you need to log into N\_SIGHT R900 on the handheld. Signing on gives you access to the screens you need to collect and exchange route and meter data.

Complete the following steps to log into N\_SIGHT R900 on the Ranger.

- 1 If you have not already done so, press  to turn on the Ranger.



If you see the message “Not Uploaded,” this means the handheld has been loaded but has not yet been uploaded. This is normal if a new route was just loaded to the handheld.

Touch  or **Synchronize** to start Communications. For more information, refer to “Data Logging,” on page 7-1.



You can see a message like the one illustrated in Figure 4.20.

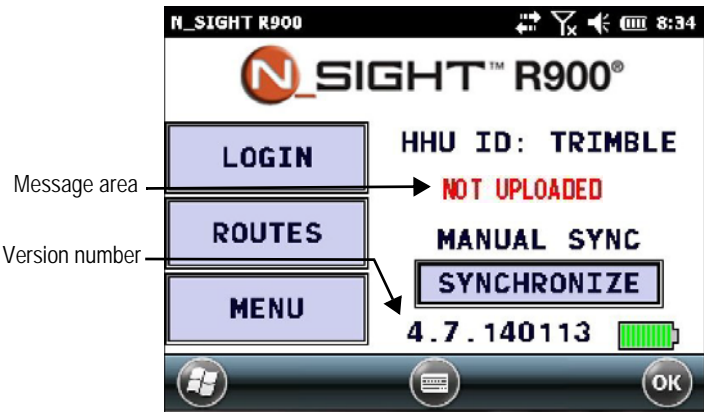


Figure 4.20 N\_SIGHT R900 Message Area

- 2 Click .



There may be times that the Clock Error screen appears when you are attempting to log in. When this screen appears, continue with the following steps.

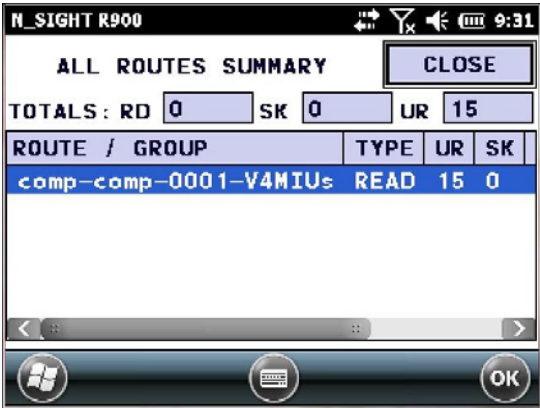


Figure 4.21 N\_SIGHT R900 Routes Summary Screen



A Clock Error screen appears, prompting you to log on and manually set the clock, as illustrated in Figure 4.22.

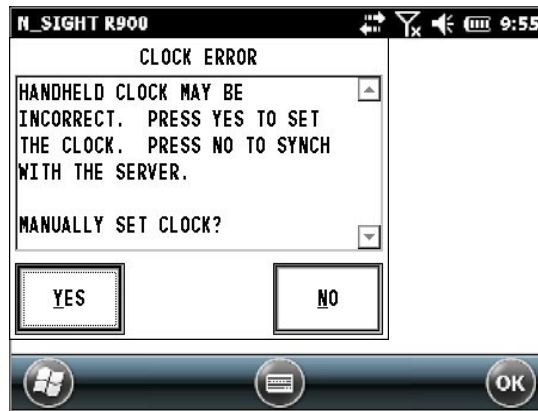


Figure 4.22 N\_SIGHT R900 Clock Error Screen

- 3 Click **Yes**.



If you answer **NO** to the clock error message, the Login screen appears again.

After you click Yes, the Set Date/Time screen appears as illustrated in Figure 4.23.

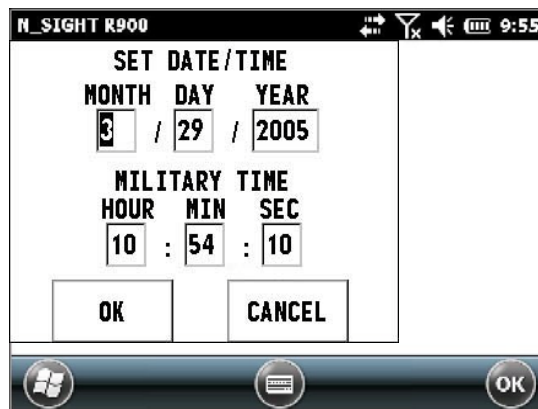


Figure 4.23 N\_SIGHT R900 Set Date / Time Screen



- 4 If applicable, make any changes to the date and time.

The correct date and time to use is the date and time that the handheld last synchronized.

- 5 When the date and time are accurate, click **OK**.

The Handheld Login screen appears as illustrated in Figure 4.24.

The image shows a handheld device screen titled "HANDHELD LOGIN" for the "N\_SIGHT R900" system. The screen displays several input fields: "HHU ID:" with the value "TRIMBLE", "READER ID:" with the value "VG", "PASSWORD:" (empty), "VEHICLE NUMBER:" (empty), and "MILEAGE:" (empty). At the bottom, there are two buttons labeled "LOGIN" and "CANCEL". The device's status bar at the top shows the time as 9:26 and various icons.

Figure 4.24 N\_SIGHT R900 Handheld Login Screen

The Reader ID field displays the information contained in the N\_SIGHT R900 system.

- 6 Complete the following information as applicable:
  - **Password** (Determined by N\_SIGHT R900 setup)
  - **Vehicle #** (Optional)
  - **Mileage** (Optional)

- 7 Click .



The Select Route screen appears as illustrated in Figure 4.25.



Figure 4.25 N\_SIGHT R900 Select Route Screen

- 8 Highlight the route you want, and click **OK**.

A message appears similar to the one illustrated in Figure 4.26.

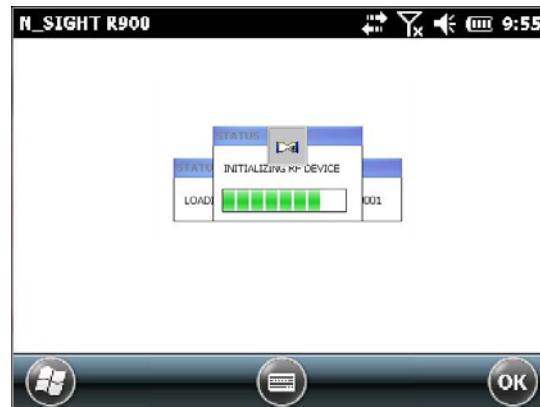


Figure 4.26 N\_SIGHT R900 Initializing Message



## Logging Out of N\_SIGHT R900

The only time that you need to log out of N\_SIGHT R900 on the handheld is just before you begin exchanging information with the host computer. Logging out gives you access to the communication features of the handheld. Before logging out of N\_SIGHT R900, instructions for logging out on the handheld are included in the procedures that describe how to exchange information with the host computer. For more information, see “Exiting the Software,” on page 8-1.

If you allow the handheld to remain inactive for the factory-set delay of 45 seconds or for the delay time specified by the host computer, it turns off automatically. After this period of inactivity, the screen of the handheld goes blank and the unit turns off to conserve the battery.



## 5 Setting Up the R900 Belt Clip Transceiver

---

---

### R900 Belt Clip Transceiver

This section introduces you to the R900® Belt Clip Transceiver (R900 BCT). It will explain how the R900 BCT is incorporated into the N\_SIGHT R900 host software, and how it will be used by both meter readers and operators. It will also help you become familiar with the basic features and functions the handheld computer offers.

This chapter provides basic instructions for unpacking and inspecting the R900 BCT. It also gives instructions for setting up the R900 BCT, becoming familiar with the display, pairing it with the handheld, and usage.

### R900 Belt Clip Transceiver Overview

The R900 BCT is a software-defined receiver capable of simultaneously receiving R900, Advantage, and Pocket ProReader RF transmissions. The R900 BCT collects readings and then transfers these readings to the handheld through the Bluetooth connection. The R900 BCT also has the capability to receive and store R900 readings that can be imported into the billing system without the use of a handheld. Because the R900 BCT is software-defined, you can apply firmware updates in order to keep your R900 BCT current with new products introduced to the market.



---

## Nomad Handheld and R900 Belt Clip Transceiver

The Trimble Nomad (Nomad) handheld utilizes Bluetooth connectivity to Neptune's R900 BCT to receive the meter readings.

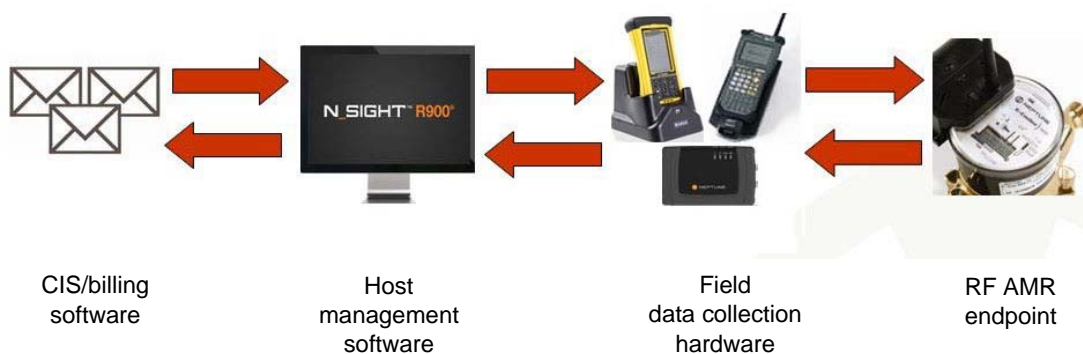


Figure 5.1 Meter Reading Cycle

---

## Unpacking and Inspecting Equipment

Besides using normal care, you need no special instructions to unpack the handheld or the equipment that you purchased with it.

Check that you have received all the items you need for the type of system configuration that you are using and inspect the items for shipping damage. If you detect any damage, return the damaged equipment to Neptune. Instructions for shipping the handheld to Neptune are given in "Returning Your Neptune Handheld System," on page 9-20 of this manual.



Save the packing box that was used to ship the handheld. Should you ever need to ship the handheld, you need to repack the unit in its original shipping box. The handling involved in land and air transport often subjects the handheld to impact beyond that which occurs during normal use. The packing box is designed to absorb shocks and protect the handheld device during shipping.



## R900 Belt Clip Transceiver Components

Figure 5.2 shows the basic components of the R900 BCT.

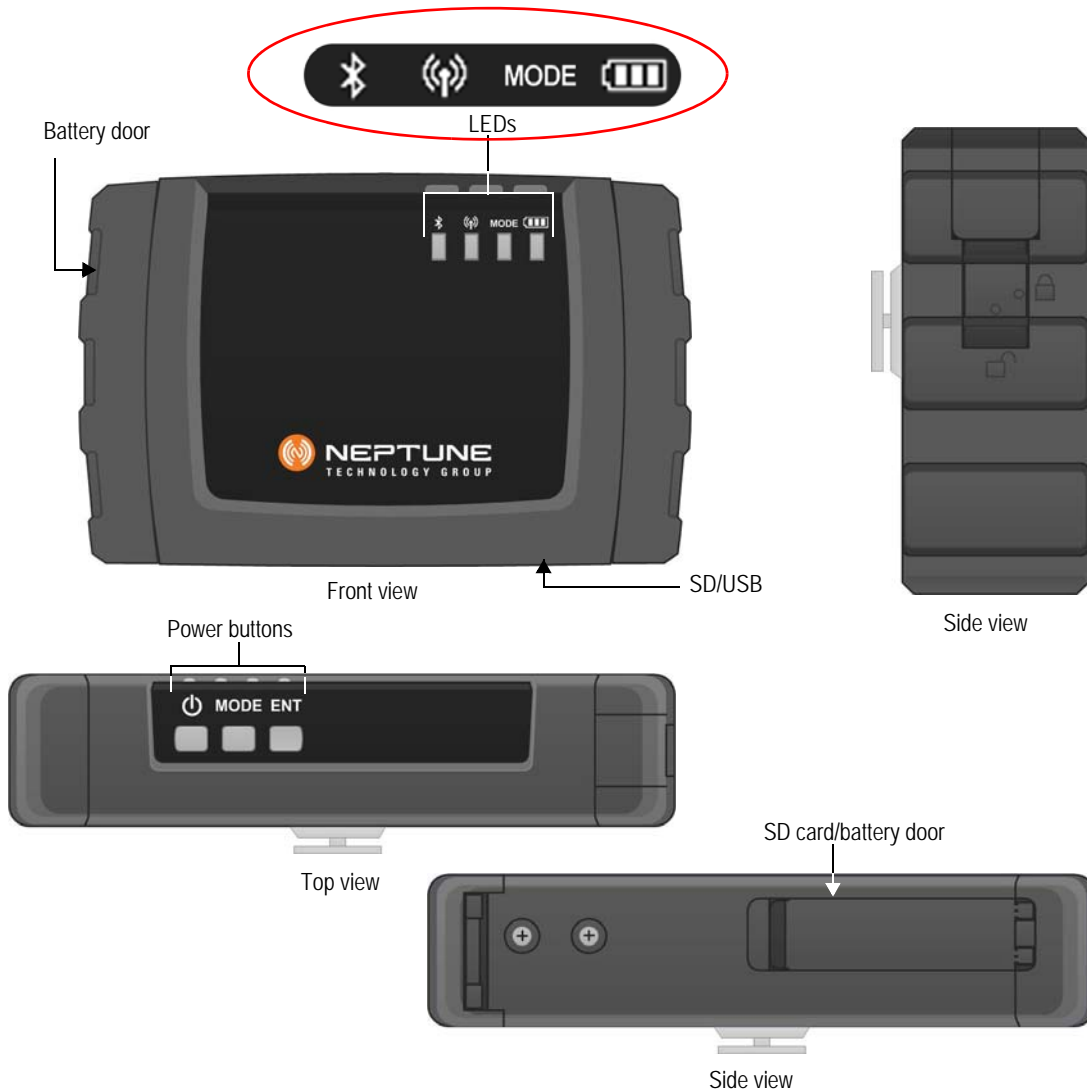


Figure 5.2 R900 Belt Clip Transceiver Components



---



# Using the R900 Belt Clip Transceiver

The following section explains how to use the R900 BCT.

## Understanding the R900 Belt Clip Transceiver Modes






The following tables describe the R900 BCT modes of operation. You change modes on the R900 BCT with a combination of the Mode and Enter buttons. To cycle through available modes, you press the Mode button. The Mode indicator will flash with the color for the mode to enter. To enter the Mode, you press the Enter button within two seconds of pressing the Mode button. If entered, the Mode indicator displays the newly-entered mode. If you do not press Enter within two seconds, the R900 BCT stays in the previous mode. This combination of Mode and the Enter button is done to prevent accidental mode changes during operation,

**Table 5.1 R900 Belt Clip Transceiver Power**

| Function          | Explanation   |
|-------------------|---|
| Power ON          | <p>Press  for two seconds. The backlight turns orange when the power is applied.</p> <p>The unit takes approximately one minute to fully boot. The Mode and RF lights are white during most of boot-up. The unit is fully booted when the Mode and Enter light turn off and the Mode LED displays the previous mode of operation</p> |
| Power OFF         | <p>Press  for two seconds. The mode and RF lights blink until off.</p>   |
| Setting Date/Time | <p>The R900 BCT synchronizes the time with the Nomad when the two are paired. The time on the R900 BCT defaults to the time from the last Nomad synchronization.</p>  |









**Table 5.2 R900 Belt Clip Transceiver Modes**

| Function      | LED Color | Explanation   |
|---------------|-----------|---|
| Reading Modes |           |   |
| Normal        | (Green)   | <p><i>Normal Mode</i> is used to connect through Bluetooth to a host device. Selection between Route (filtered) and RF Test (unfiltered) is made in the host device software.</p> <p>To enter this mode from other modes.</p> <p><b>MODE</b></p> <p>1 Press  until the Mode LED flashes green.</p> <p><b>ENT</b></p> <p>2 Press , and the Mode LED turns green.</p> |
| Unattended    | (Yellow)  | <p><i>Unfiltered Operations Mode</i> can operate using the battery or when connected to vehicle power.</p> <p>To enter this mode with battery power:</p> <p><b>MODE</b></p> <p>1 Press  until Mode LED is yellow.</p> <p><b>ENT</b></p> <p>2 Press .</p>  |
|               |           | <p>To enter from when connected to vehicle power:</p> <p><b>MODE</b></p> <p>1 Press  until the Mode LED is yellow.</p>   |

*continued on next page*



**Table 5.2 R900 Belt Clip Transceiver Modes**











| Function  | LED Color | Explanation   |
|---|-----------|---|
|   | Magenta   | <p><b>ENT</b></p> <p>2 Press  and release.</p> <p><b>ENT</b></p> <p>3 Press  again and hold for five seconds, then release.</p> <p>The <b>Mode LED</b> is <b>Magenta</b>.</p> <p>4 Connect the USB.</p> |
|    |           | The USB charger must be capable of supplying 1A of current.   |
| USB mass storage  | (White)   | The SD card appears as an external drive to the PC.   |
|   |           | <p>To enter this mode:</p> <p>1 Connect the <b>USB</b> to the R900 BCT and to the PC.</p>   |
|  |           | The USB must be connected before the unit can enter the USB mass storage mode.  |
|   |           | <p><b>MODE</b></p> <p>2 Press  until Mode LED flashes white.</p> <p><b>ENT</b></p> <p>3 Press .</p> <p>The SD card now shows as an external drive attached to the PC.</p>                           |



## Accessing the R900 Belt Clip Transceiver Status Screen

The R900 BCT must first be set to Normal Mode to access the R900 BCT Status screen. The following table explains how to access the status screen on the handheld.

**Table 5.3 R900 Belt Clip Transceiver Software Functions**


| Accessing R900 Belt Clip Transceiver Status Screen |   |
|--|---|
| While in route                                     | Neptune Key, System, UTILS, AMR Status =<br> ,  ,  ,  |
|  | 1 Select <b>Advanced Options</b> .<br>2 Select the <b>check box</b> .<br>3 Select <b>Belt Clip Status</b> .   |
| From the Synchronize screen                        | TAB twice, UTILS, Belt Clip Status =<br>Click  ,  ,  .   |
|  | 1 Select  .<br>2 Select  <b>Utils</b> .<br>3 Select  <b>Belt Clip Status</b> .  |



## Understanding the R900 Belt Clip Transceiver LED Operating Modes

To help you better interpret the different colors for the flashing Mode LED, refer to the following table.

**Table 5.4 R900 Belt Clip Transceiver LED Operating Modes**

| State   | LED Colors          |
|---|---------------------|
| Unit powered OFF  | No color; LEDs off. |
| Power  |                     |
| On-Battery 100% – 31%   | Green               |
| On-Battery 30% – 16%  | Yellow              |
| On-Battery 15% – 6%   | Red                 |
| On-Battery 5% – Critical  | Flashes red         |
| Battery – Charging  | Flashes yellow      |


  


| Mode              |         |
|-------------------|---------|
| Normal mode       | Green   |
| Unattended mode   | Yellow  |
| Installed mode    | Magenta |
| Mass storage mode | White   |

*continued on next page*



**Table 5.4 R900 Belt Clip Transceiver LED Operating Modes**

| State  | LED Colors                   |
|--|------------------------------|
| <b>RF Mode</b>  |                              |
| No reading being received  | Off                          |
| Receive R900/ERT packet  | Flashes green when receiving |
| Receive Advantage packet   | Flashes cyan when receiving  |
| No reading received in two + minutes   | Solid red                    |

|  |  |
|--|--|
| <b>Bluetooth</b>  |  |
| Not Connected  | Off  |
| Pairing  | Flashes blue                                 |
| Connected  | Blue   |
| <b>Error Codes</b>   |  |
| Temperature error  | Bluetooth and Power LED flash red five times |
| Hardware error   | Bluetooth and Power LED are solid red        |
| Battery error  | Power LED flashes red and yellow             |
| Cannot power on - battery too low  | Power LED flashes red three times            |
| SD card error  | Mode LED is solid red                        |



## Understanding the External Battery Charger Status

Refer to the following table for a description of the external battery LED.

**Table 5.5 External Battery Charger LED**

| LED                       | Indicates                                  |
|---------------------------|--|
| Red, yellow, green or OFF | Startup initialization when applying power |
| OFF                       | No battery inserted                        |
| Yellow                    | Battery charging                           |
| Solid green               | Battery charged successfully               |
| Red                       | Error condition                            |

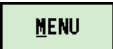
## Pairing the Trimble Nomad to the R900 Belt Clip Transceiver through the Bluetooth

Complete these steps only if you are pairing the Nomad to the R900 BCT for the first time.

### Pairing the Trimble Nomad

To pair the Nomad to the R900 BCT, complete the following steps.

- 1 Power **ON** the R900 BCT and set to Normal Node, if not already set. See “Understanding the R900 Belt Clip Transceiver LED Operating Modes,” on page 5-8.

- 2 On the Nomad, click .

- 3 Click  – **UTILS.**

- 4 Click  – **Belt Clip Status.**

The AMR Connection screen appears. The R900 BCT is visible in the **Broadcasting Device** drop-down selection list.

- 5 Choose the device from the drop-down selection list and click **Bluetooth.**



The R900 BCT Status screen now displays the device details.


- If you have previously paired a device, go to the **R900 BCT Status** screen and not the AMR Connection screen.
- If you want to **Change Devices**, you can click this option on the bottom of the R900 BCT Status screen.

You then see the AMR Connection screen and can choose the device from the drop-down selection list.

## Using the R900 Belt Clip Transceiver to Read a Route

To begin reading a route using the R900 BCT, you first need to load a route to the Nomad. See “Loading and Unloading Data for Handhelds” in the *N\_SIGHT™ R900® Online Help*.



Click  to load a route when you are working in the N\_SIGHT R900 host software. Press F1 to see the instructions for loading a route to a handheld.

Once the route is loaded and the pairing is complete, you can log in and the unit can receive readings from the R900 BCT.

## R900 Belt Clip Transceiver Status Screen in N\_SIGHT R900

While the Nomad and the R900 BCT are paired, you can access a screen showing the status of the R900 BCT. You can see a message like the one illustrated in Figure 5.3.

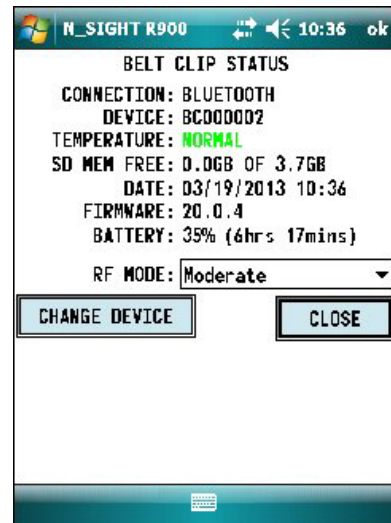


Figure 5.3 R900 Belt Clip Transceiver Status Screen



The following information appears on this screen.

|             |  |
|-------------|--|
| Connection  | Displays the type of connection used to pair the R900 BCT, such as Bluetooth.  |
| Device      | Displays the name of the R900 BCT.   |
| Temperature | Displays the temperature of the R900 BCT, such as normal.  |
| SD MEM Free | Displays the amount of available memory for the SD card.   |
| Date        | Displays the date and time as follows: <ul style="list-style-type: none"><li>• Date: MM/DD/YYYY</li><li>• Time: HH:MM</li></ul>  |
| Firmware    | Displays the version of the firmware on the R900 BCT.  |
| Battery     | Displays the available battery percentages.  |
| RF Mode     | Allows you to change the reading mode for the R900 BCT by clicking the drop-down selection list. <ul style="list-style-type: none"><li>• <i>Efficiency</i> – reduced RF performance and best battery life</li><li>• <i>Moderate</i> – default RF performance</li><li>• <i>Performance</i> – best RF performance and decreased battery life</li></ul> |

### RF Performance Modes

This Mode can be changed from the R900 BCT Status screen. The unit has three options for the RF performance during a reading:

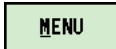


- |   |                    |   |
|---|--------------------|---|
| 1 | <b>Efficiency</b>  | Reduces RF performance* and best battery life   |
| 2 | <b>Moderate</b>    | Default RF performance*                         |
| 2 | <b>Performance</b> | Best RF performance* and decreased battery life |

\*RF performance refers specifically to the throughput of the receiver which can impact the speed with which readings are processed in high density areas. Range is not impacted by these modes.



## Selecting the R900 Belt Clip Transceiver Reading Mode

To choose the reading mode, complete the following steps.

- 1 On the Nomad, click .
- 2 Click  – **Utilities**.
- 3 Click  – **R900 BCT Status**.

The R900 BCT Status screen appears.

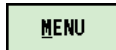


- 4 Tap the drop-down selection list for **RF Mode** and you can choose the reading mode. See the modes listed above.

## Using the R900 Belt Clip Transceiver RF Test Mode

RF Test Mode allows the R900 BCT to go into a continuous receive mode and listens for any and all R900 transmissions.

### From the Login Screen

To access RF Test Mode from the Login screen, complete the following steps.

- 1 On the Nomad, click .
- 2 Click  – **Utilities**.
- 3 Click  – **RF Test**.

The RF Test Mode screen appears as illustrated in Figure 5.4.

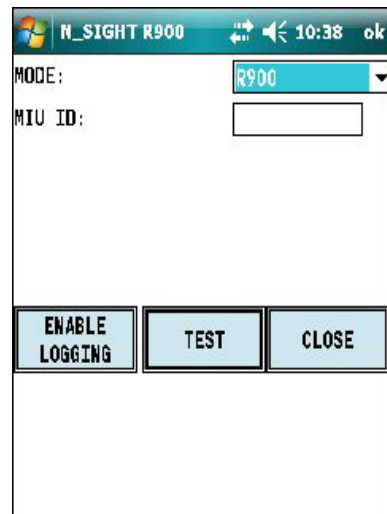






Figure 5.4 R900 Belt Clip Transceiver RF Mode Screen



## From the Route Screen

To access RF Test Mode from the Route screen, complete the following steps.

- 1 In the route, click .
- 2 Click  – **System**.
- 3 Click  – **Utilities**.
- 4 Click  – **RF Test**.

The RF Test Mode screen appears as illustrated in Figure 5.4.

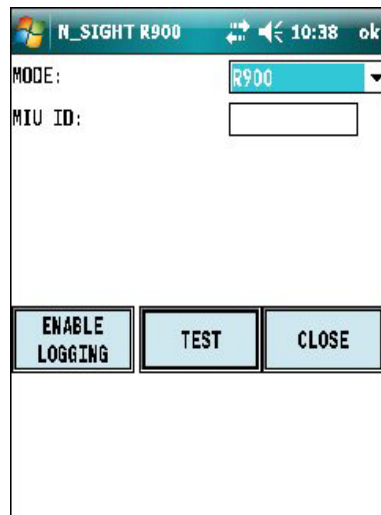


Figure 5.5 R900 Belt Clip Transceiver  
RF Mode Screen from Route

## R900 Belt Clip Transceiver SD Card Functionality

Any data that is read by the R900 BCT and sent to the handheld is stored on its internal SD card.

The SD card also handles the firmware updates explained in “Using the R900 Belt Clip Transceiver,” on page 5-4.



---

## Updating R900 Belt Clip Transceiver Firmware



You cannot update multiple R900 BCTs at once; they must be updated individually.

When there is an update to the R900 BCT firmware, it is available from Neptune through the web updates in the N\_SIGHT R900 software, or it can be obtained from Neptune Customer Support through email or direct upload to an FTP site.

With either choice for receiving the firmware update, the firmware is updated in the N\_SIGHT R900 database and then sent to the R900 BCT through the USB transfer cable or saved to the SD card and installed on the R900 BCT.



To update the R900 BCT firmware update with the USB cable, the R900 BCT must first be connected to the PC and be in Mass Storage Mode. To update through the SD card, the Firmware Update File can be transferred to the SD card by using an SD Card Reader.

To update the R900 BCT firmware, complete the following steps.

- 1 Connect the R900 BCT to the PC and place in **Mass Storage Mode**.
- 2 In the N\_SIGHT R900 host software, select **Utilities**.
- 3 Select the **Beltclip Firmware** tab.

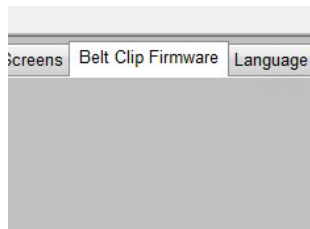


Figure 5.6 Tab within N\_SIGHT R900 Utilities



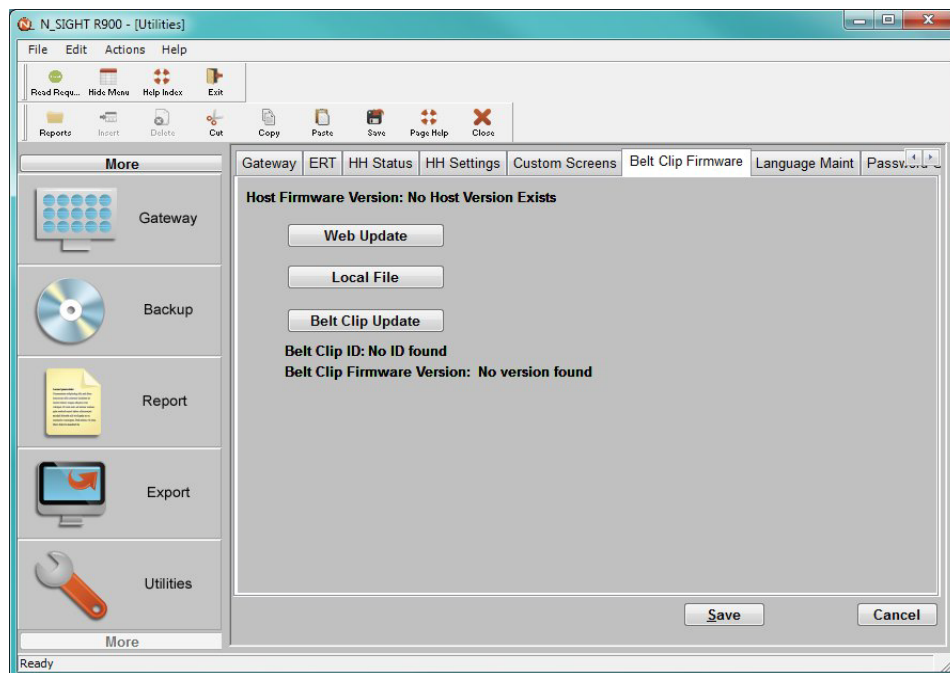


Figure 5.7 R900 Belt Clip Transceiver Firmware Tab with Update Options



The Web Update and Local File buttons perform the same task of updating the database with the updated firmware version depending on where the updated firmware file is located.

### How the Firmware Update Works

The following explains how the firmware update works.

**Web Update**—looks to the Neptune servers for an updated version of R900 BCT firmware and downloads it to the database.

**Local File**—allows you to import updated firmware from a thumb drive, network drive, or FTP site into the database.

**Belt Clip Update**—locates the updated firmware file after the updated firmware has been downloaded and sends it to the R900 BCT through the USB transfer cable.



## 6 Gathering Route Data

---

This chapter provides instructions for using the handheld to collect meter readings and route data. The procedures in this chapter assume that route assignments have already been loaded onto the handheld.

When using this chapter, keep in mind that a sample reading entry screen is shown throughout the manual. The reading entry screen of your handheld may not resemble the one shown here. This inconsistency is caused when the N\_SIGHT R900 administrator customizes the screen so that it better suits the needs of your company.



# The Reading Entry Screen

The following illustration shows the N\_SIGHT R900 Reading Entry screen.

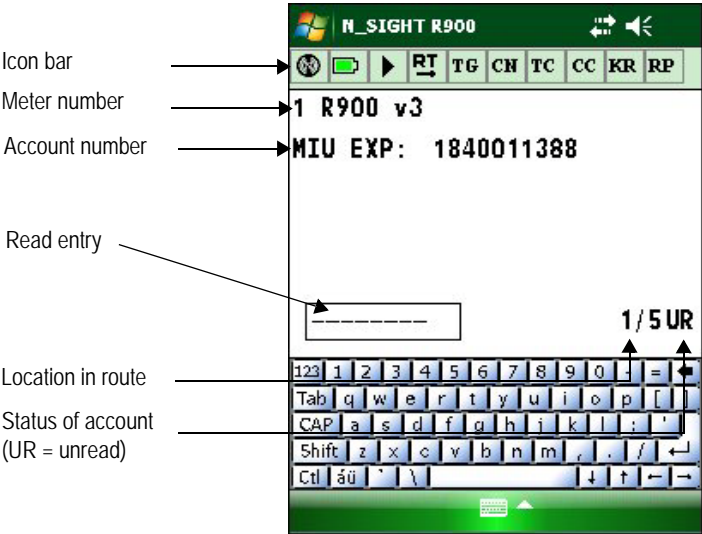


Figure 6.1 N\_SIGHT R900 Reading-Entry Screen



## Using Search

While you are on a Reading Entry screen, if you want to search to find a specific account, you must first press **F** or press **Start**, then **4 Route**, then **8 Find Order** to display the Search screen.

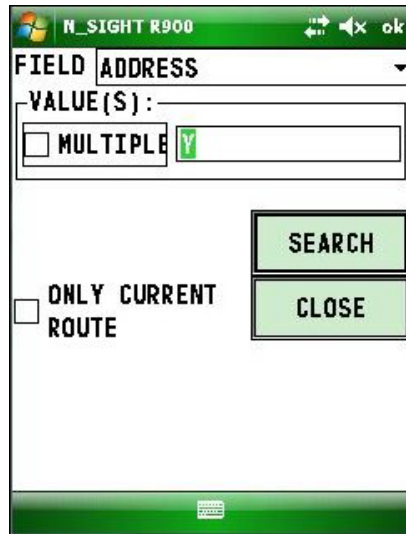


Figure 6.2 Search Screen

You can then select which field to search through, then enter the search criteria to locate a specific account or group of accounts.



Press **G** or click **Start**, then **9** **Move**, then **7** **GoTo** to quickly maneuver through a route, such as going to the beginning of a route or to the end of a route to display the **GoTo** screen. The handheld goes to that point.

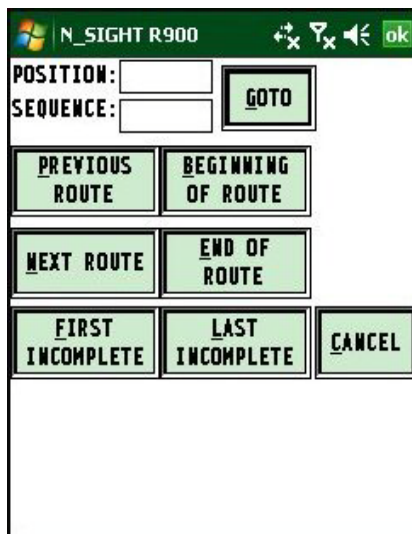


Figure 6.3 GoTo Screen

On this screen you can go to the following points on a route:

- Position of the meter within the route
- Sequence number of the meter
- Previous route
- Next route
- Beginning of the route
- End of the route
- First incomplete read
- Last incomplete read



---

## Manually Collecting Meter Readings



When using the CE5320 to collect meter readings, typically you need to enter only the reading for each meter. However, sometimes you may need to also enter a trouble code or comment concerning conditions at the account. Additionally, you may “skip” an account by inserting a “skip code” and indicating why you skipped the account. The procedures in this section give you the information you need to manually collect or skip readings:

- “Entering a Reading,” which follows
- “Entering a Skip Code” on page 7
- “Tagging an Account” on page 11
- “Leaving a Reading Blank” on page 20

### Entering a Reading

Follow this procedure to enter a meter reading in the handheld.



If this is the first time that you have accessed a route, the reading entry screen of the first meter in the route appears in the display. If the read direction is set for , “Left to Right,” then after the reading for the first meter is taken, the screen advances to the second meter in the route. By clicking this icon, you can change the read direction to , “Right to Left.” The read direction toggles between these two read directions.

- 1 If you have not already done so, first log into N\_SIGHT R900 on the handheld so that a reading entry screen appears in the display. See Figure 6.1 on Page 6-2.

For help with this task, refer to “Logging Into N\_SIGHT R900 on the Nomad,” on page 3-31 or “Logging Into N\_SIGHT R900 on the Ranger,” on page 4-29.



- 2 Using the number keys, enter the reading in the space provided.

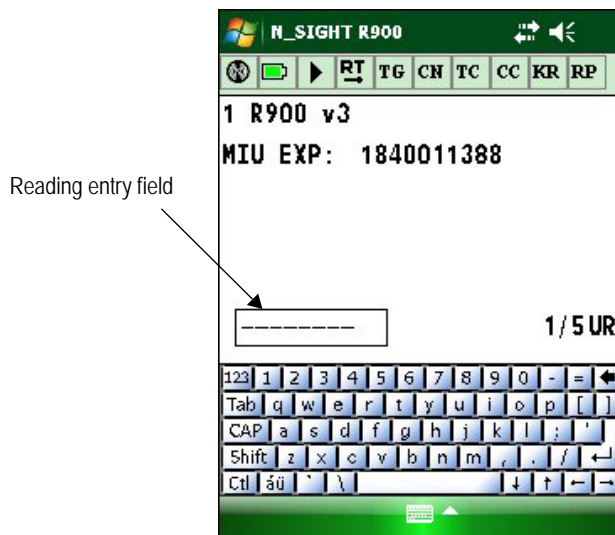




Figure 6.4 N\_SIGHT R900 Reading-Entry Field



The number of hyphens in the reading entry field indicate the number of reading digits required.

- 3 Touch **ok** or press .

The N\_SIGHT R900 software displays the next meter in the route, according to the route direction  or . Touching this icon temporarily changes the direction for the route. However, to change it for future uses, refer to the procedure for “Changing the Route Direction, Forward or Reverse,” on page 6-23.

- 4 Continue entering readings for each meter until you have completed all routes assigned to you.

As you complete each route, a message appears in the display to let you know that you have completed the route and are moving to a new one. Follow the instructions shown in the display to access the reading entry screen of the next route.



---

## Entering a Skip Code

In some cases, you may be unable to collect a reading. If you are unable to collect a reading, you can enter a skip code, giving the reason that the reading could not be obtained.



In the v4 file format, screens can appear differently depending on the file format you are using. For example, you could have either Coded Notes or Comment Codes.

Follow this procedure to enter a skip code instead of a reading.

- 1 From the reading entry screen of the meter for which you want to enter a skip code, press **S** on the CE5320 keypad or the Nomad screen keypad.

A screen appears prompting you to enter a skip code in place of the reading. See Figure 6.5.

Figure 6.5 N\_SIGHT R900 Skip Order Screen



- 2 Click the drop-down selection list as illustrated in Figure 6.6 to choose the appropriate reason code.

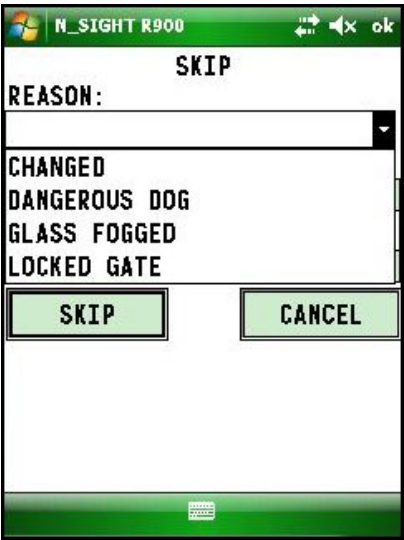


Figure 6.6 N\_SIGHT R900 Skip Order Reason Codes

The actual codes that are available to you are determined by the host operator.

- 3 In **Comment**, type any notes for this account.
- 4 Click **Skip**.

The account is marked as skipped, as illustrated in Figure 6.7. The N\_SIGHT R900 software displays the next meter in the route.



Figure 6.7 N\_SIGHT R900 Skipped Read

- 5 Continue entering readings within this route.



## Clearing a Skip Code

In some cases, you may need to clear a skip code. For example, if you can now revisit the account you skipped and enter the reading, follow this procedure to unskip a skip code from the handheld.

- 1 Display the reading entry screen of the meter whose reading you skipped. See Figure 6.8.

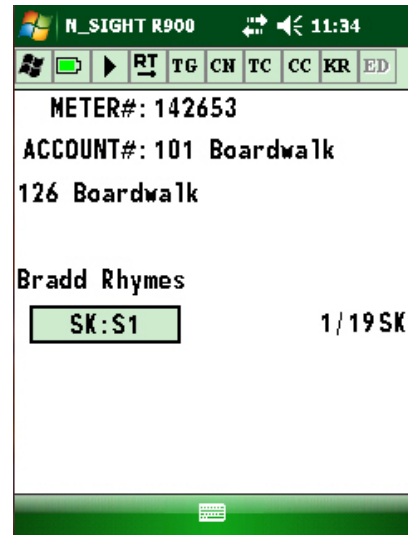


Figure 6.8 Reading to be Unskipped

- 2 Touch **Unskip**.



The Undo Skipped Order screen appears as illustrated in Figure 6.9.

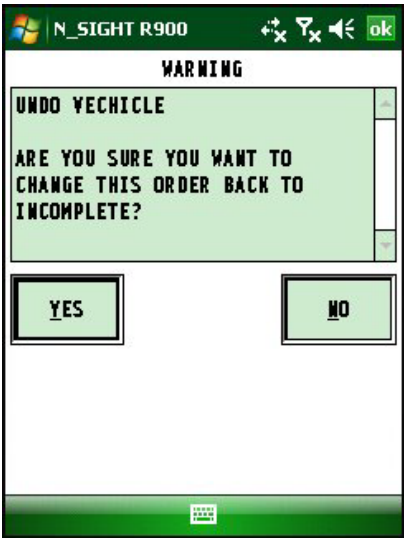


Figure 6.9 N\_SIGHT R900 Undo Skipped Order Screen

- 3 Press **Y** or touch **Yes** to unskip the reading.

The reading is then reset to UR (unread) as illustrated in Figure 6.10.

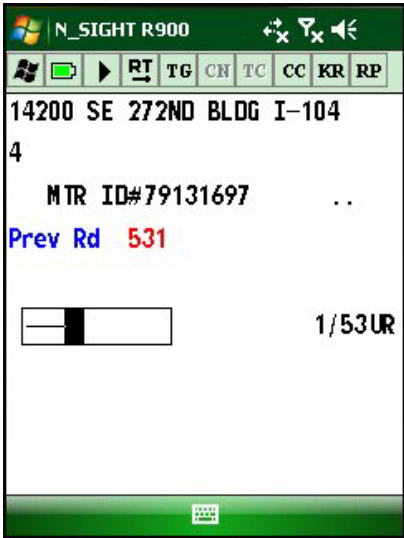


Figure 6.10 Reading Field after Unskipped

You can now continue with a new reading, or leave the reading blank and display the reading entry screen of the next meter on the route.



## Tagging an Account

While you are reading meters, there may be a need to tag an account and come back to it later. Follow this procedure to tag or untag accounts within the route for which you want to complete the readings later on.

- 1 On the Reading Entry screen, do one of the following:

- Click **TG**.

or


- Press **T**.

Tag account icon



Figure 6.11 Tag Account Icon



The icon changes to , as illustrated in Figure 6.12. This works as a toggle between tagged and untagged accounts.



Tag icon 



Figure 6.12 Tagged Account

- 2 Continue entering readings within this route.
- 3 To search the tagged accounts so that you can complete the readings for them, press .






## Adding Customer Notes



After you load the v2/v4 file format, this changes to Customer Notes and the appearance also change.

In some cases, you might want to add some free-form notes to inform your office about a change to an customer account. When the N\_SIGHT R900 administrator uploads data from your handheld, your message is sent to the N\_SIGHT R900 host software and may also be sent to your company's billing computer. You can also use this feature to create reminders for yourself. For example, you might use this feature to specify the exact location of a meter. Follow this procedure to enter a special message.

- 1 From the reading entry screen of the meter for which you want to enter free-form notes, do one of the following:

- Touch , and select .
- Touch .

A screen appears prompting you to enter a free-form note. See Figure 6.13.

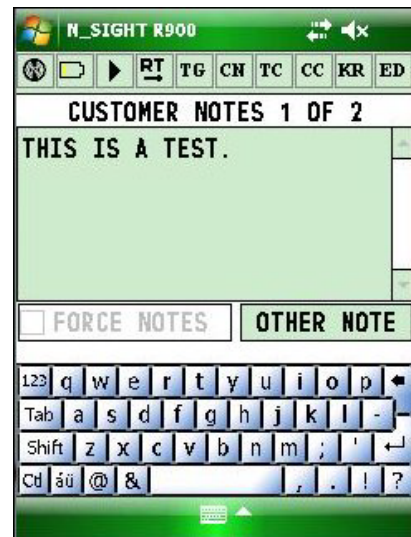





Figure 6.13 N\_SIGHT R900 Customer Notes Screen

- 2 Touch .
- 3 Begin typing your note.



- 4 Click **Other Note**, to view or type another note.
- 5 Begin typing the second note, if applicable.
- 6 When you've completed your notes, press  to save your notes and return to the reading screen.

The icon changes to , as illustrated in Figure 6.18 to show that there is a comment code attached to this account. This works as a toggle.

Marked Customer Notes






Figure 6.14 N\_SIGHT R900 Marked Customer Notes



## Adding a Trouble Code

In some cases, you might have a need to add one or trouble codes to describe a meter situation and inform your office about it. Follow this procedure to enter a trouble code.

- 1 From the reading entry screen of the meter for which you want to enter one or two trouble codes, do one of the following:
  - Touch , and select .
  - Touch .

A screen appears prompting you to select one or two trouble codes. See Figure 6.13.

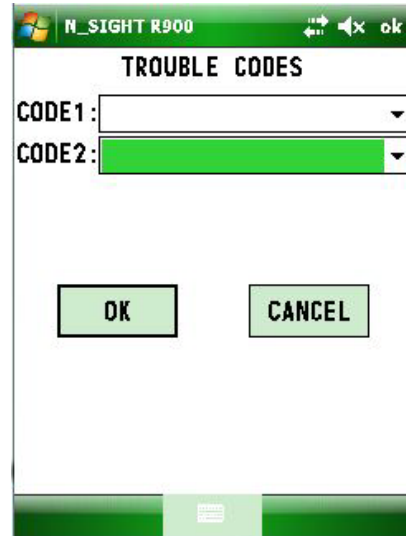



Figure 6.15 N\_SIGHT R900 Trouble Codes Screen

- 2 From the drop-down list, select a code that best describes the trouble for this meter.
- 3 Select a second code from the drop-down list, if applicable.



- 4 When you've completed your trouble codes, touch **OK** or **ok** to save your codes for this meter and return to the reading screen.

The icon changes to , as illustrated in Figure 6.18 to show that there is a comment code attached to this account. This works as a toggle.

Marked Trouble Codes



Figure 1 N\_SIGHT R900 Marked Trouble Codes






## Entering Comment Codes



In the v4 file format, screens can appear differently depending on the file format you are using. For example, you could have either Coded Notes or Comment Codes.

In some cases, you may need to enter a comment code (a coded note) for trouble or another reason for a meter. For example, if the glass is broken or the seal is broken, the meter is leaking or frozen, or has a bad dial. If you notice ants or bees while collecting a reading, you can enter a comment code. Follow this procedure to enter a comment code.

- 1 From the reading entry screen of the meter for which you want to enter one or two comment codes, do one of the following:
  - Touch , and select .
  - Touch .

The Comment Codes screen appears prompting you to enter coded notes. See Figure 6.16.

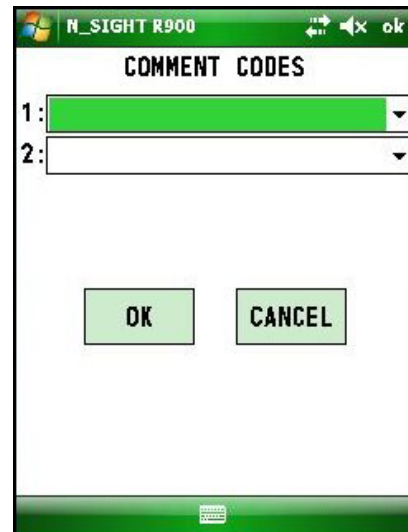



Figure 6.16 N\_SIGHT R900 Coded Notes Screen



- 2 Touch the DOWN  arrow to view the list of codes, as illustrated in Figure 6.17.
- 3 Select the appropriate code for the trouble found.
- 4 Select an additional code, if applicable.

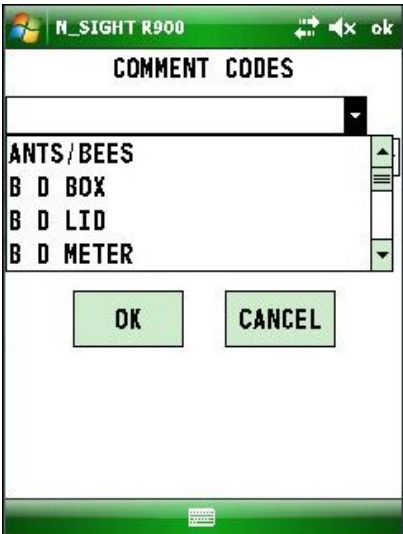




Figure 6.17 Drop-down Selection List of Coded Notes

- 5 When you've completed your comment codes, touch  or  to save your codes for this meter and return to the reading screen.


The icon changes to , as illustrated in Figure 6.18 to show that there is a comment code attached to this account. This works as a toggle.




Figure 6.18 N\_SIGHT R900 Marked Comment Codes



## Clearing a Customer Note, Trouble Code, or Comment Code

In some cases, you may need to clear a code that you've entered for a comment code, customer note, or a trouble code. Follow this procedure to clear the code you entered on the handheld.

- 1 Identify the account that has the code or note you want to clear.

The  icon, as illustrated in Figure 6.19, shows that there is a code or note attached to this account.

Marked comment code

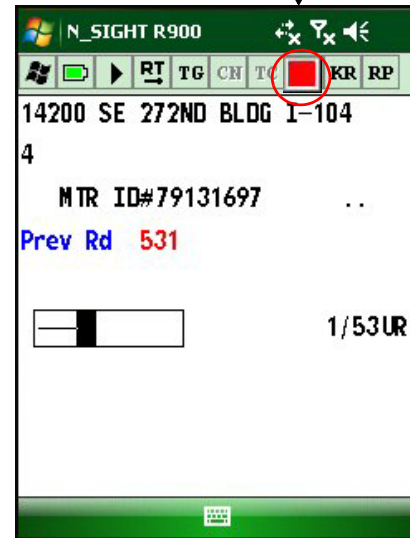


Figure 6.19 Screen Showing Code Attached

- 2 Go to the screen where you entered the code or note. See Figure 6.20.

- 3 Press .

The code or note is then cleared from this account.

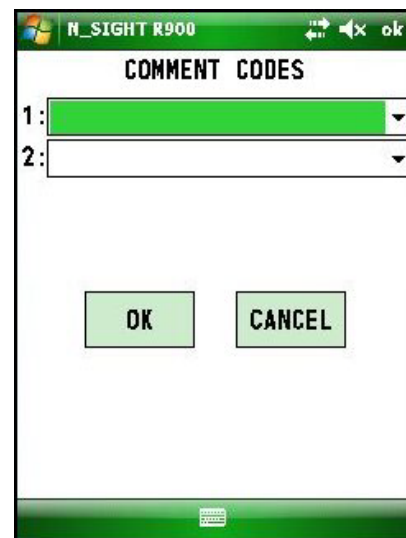


Figure 6.20 Screen Where Code Was Entered



# Leaving a Reading Blank

In some cases, you need to leave a reading blank. For example, if a meter’s reading is to be estimated by your company’s billing computer. Follow this procedure to skip over a meter without entering a reading or a skip code.

- 1 Access the reading entry screen of the meter you want to skip.

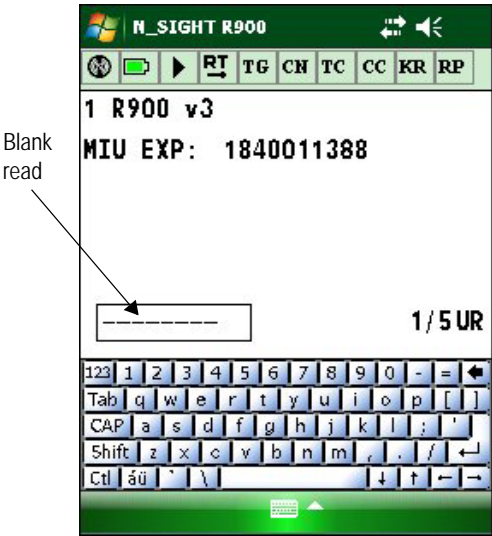




Figure 6.21 Leaving a Meter Reading Blank

- 2 Using the direction keys, press the FORWARD  or BACKWARD  key to display the next meter in the route without entering a reading.



Your ability to use this feature can be restricted by your company. In such cases, the handheld will inform you that you must enter either a reading or a skip code.

The next meter in the route appears in the display.



## Collecting RR Readings

When you receive your Neptune handheld, it is factory-set to collect readings manually using the keyboard. When you begin readings manually, the handheld screen appears similar to the one illustrated in Figure 6.22.

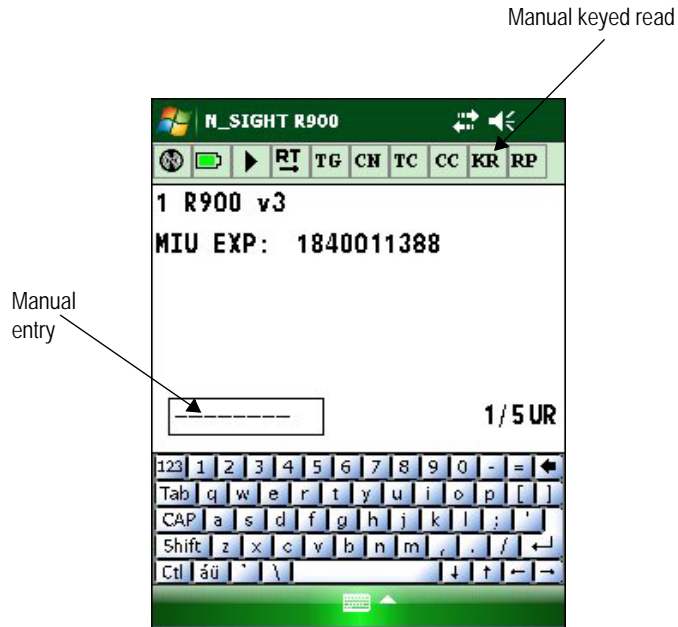


Figure 6.22 N\_SIGHT R900 Manual Reading Screen



While on a keyed account or an R900 account, the handheld reads R900s within range, holds these reads in a buffer, and distributes them to the correct accounts in the route once an R900 account appears on the display.



## Collecting an RF Reading

When you approach an RF account while collecting meter readings on a route, the screen similar to the one illustrated in Figure 6.23 appears.

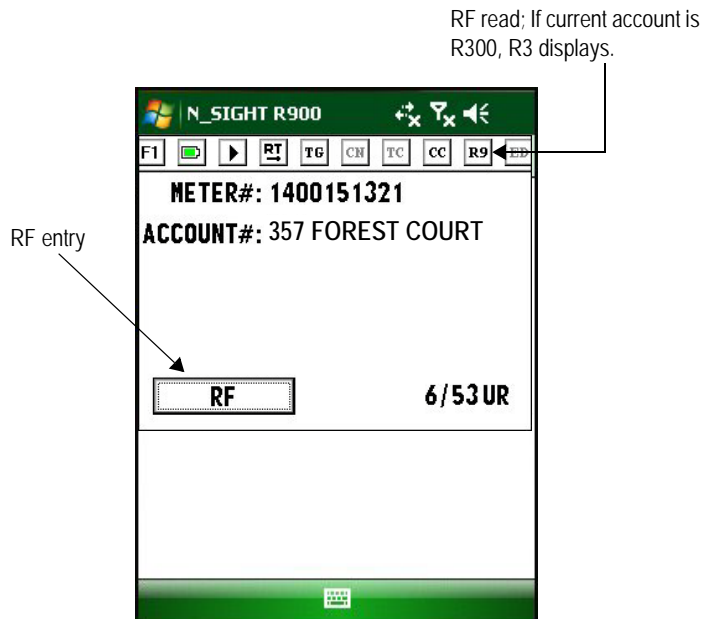


Figure 6.23 N\_SIGHT R900 RF Reading Screen



While on a Keyed account or an R900 account, the handheld collects R900 meter readings in the background.

If the account you are reading is an R900 account, the reading icon **R9** at the top right of the screen displays as R9. If the account is an R300 account, the reading icon displays as R3. See Figure 6.23.

At an RF account, the unit is ready to receive a reading transmitted from an RF transmitter, like an R900. If the account is set up properly and the RF transmitter is transmitting properly, you should receive a reading for the account once you are in range of the transmitter.



## Working with Accounts

While you are reading meters and when you are working with accounts, there are certain tasks that you need to perform to help you with your data collection.

### Changing the Route Direction, Forward or Reverse

This icon is used for changing the Route Direction from a Forward direction (advancing from account 1 to account 2) to reverse direction (advancing from account 2 to account 1) as readings are being recording in the handheld.

On the Reading Entry screen, click



Right route direction icon

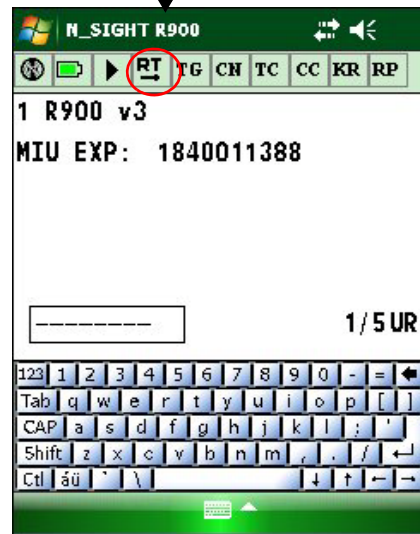


Figure 6.24 Left to Right Route Direction Icon




The icon changes to , as illustrated in Figure 6.25. This works as a toggle between the two read directions, forward and reverse.



Figure 6.25 Right to Left Route Direction Icon

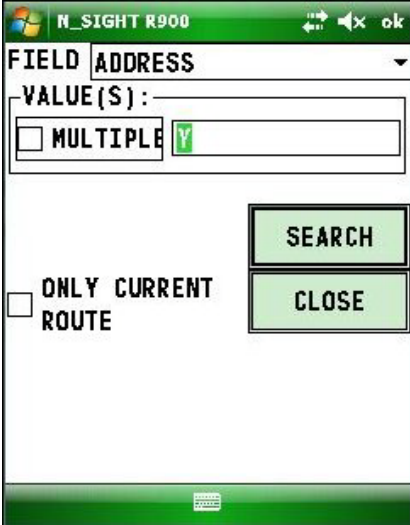
Finding Information

When you are reading meters and need to find an account, an address, a meter number, or some other information, you can easily do so by using the N\_SIGHT R900 Find function. If you already know specific information about a meter, such as its meter number, you can quickly display that meter by using the search function. When you use the search feature, the handheld searches for the specific information that you enter. When the software finds a meter whose data matches the information you entered, that meter appears in the display. Follow this procedure to find the information you need.

- 1 On the Reading Entry screen, press .



The **Find Order** screen appears as illustrated in Figure 6.26.

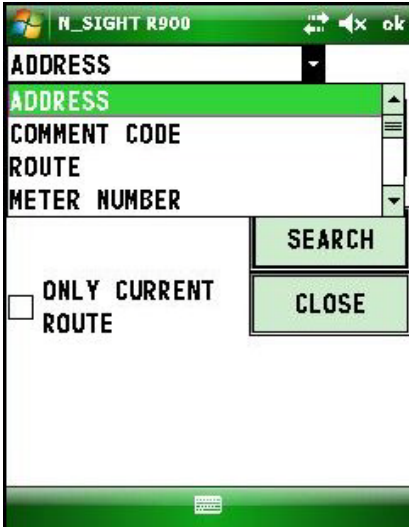


The screenshot shows the 'Find Order' screen on an N\_SIGHT R900 handheld. At the top, the title bar reads 'N\_SIGHT R900' with navigation icons. Below the title bar, there is a dropdown menu labeled 'FIELD' with 'ADDRESS' selected. Underneath is a 'VALUE(\$):' label followed by a text input field containing the letter 'Y'. To the left of this input field is a checkbox labeled 'MULTIPLE'. At the bottom left, there is a checkbox labeled 'ONLY CURRENT ROUTE'. On the right side, there are two green buttons: 'SEARCH' and 'CLOSE'.

Figure 6.26 N\_SIGHT R900 Find Order Screen

- 2 Touch .

The list of fields displays for you to select the type of information you want to find. See Figure 6.27.



The screenshot shows the 'Search Display Fields' screen on an N\_SIGHT R900 handheld. The title bar reads 'N\_SIGHT R900'. Below the title bar, a list of fields is displayed: 'ADDRESS', 'COMMENT CODE', 'ROUTE', and 'METER NUMBER'. The 'ADDRESS' field is highlighted in green. To the right of the list is a vertical scrollbar. At the bottom left, there is a checkbox labeled 'ONLY CURRENT ROUTE'. On the right side, there are two green buttons: 'SEARCH' and 'CLOSE'.

Figure 6.27 Search Display Fields



- 3 Select **Multiple** to enter more than one value for the search. See Figure 6.28.

N\_SIGHT R900

FIELD: DISPLAY FIELDS

VALUE(S):

☒ MULTIPLE

ENTER MULTIPLE VALUES

☐ ONLY CURRENT ROUTE

SEARCH

CLOSE

SEARCH FIELDS

Figure 6.28 Search Screen Enter Multiple Values

N\_SIGHT R900

ENTER VALUES TO MATCH ON

1: UR

2: 10

3:

4:

5:

CLEAR CANCEL SEARCH

SEARCH FIELDS

Figure 6.29 Search Screen Multiple Values to Match

- 4 Touch the field for the information you want to find.
- Your selection appears in the field.



- 5 Type a value for the information you want to find in the **Value** field, if applicable.



You can find information within only the current route, or within any of the routes you selected, when you logged into N\_SIGHT R900. The field named Display Fields are typically where your address information is located. Use Display Fields as your address search field.

- 6 If you selected more than one route when you logged into N\_SIGHT R900, do one of the following:
  - Touch **Only Current Route** if you only want to search within the current route to find the information.
  - Leave the **Only Current Route** checkbox empty if you want to search within all the routes you selected when you logged into N\_SIGHT R900.
- 7 Touch one of the following to begin your search.
  - **Search>** if you want to search forward in the route.
  - **<Search** if you want to search backward in the route.

If only one exact match to your entered search criteria is found, it is displayed. If multiple accounts match your entered criteria, they will appear in a list form. You should browse the list and select the desired account.

---

## Validating Readings

If the audit feature has been set on the host computer, the handheld validates each reading you enter against the high/low range selected for the audit feature.

### Hi/Low Fails

If the reading falls within the high/low range, the handheld accepts the reading and advances to the next meter in the route. If the reading is outside the high/low range, the handheld does not accept the reading and the Hi /Lo/No/Inact Check screen appears. Use this procedure to complete a reading that falls outside the high/low range.



- 1 On the reading entry screen, enter the reading that falls outside the high/low range. See Figure 6.30.

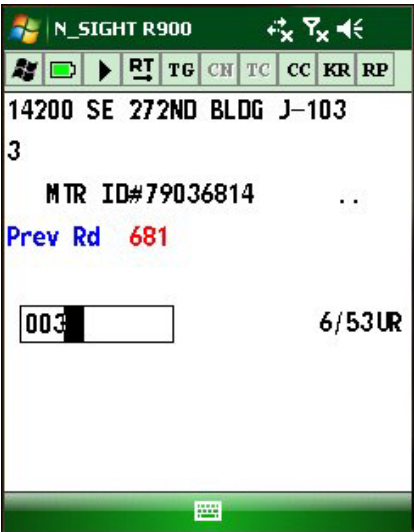


Figure 6.30 Reading Outside High/Low Range

The handheld sounds and the Hi/Lo/No/Inact Check screen appears as illustrated in Figure 6.31.

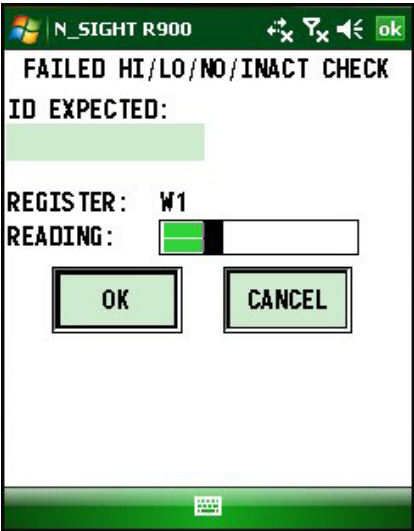


Figure 6.31 N\_SIGHT R900 Hi/Lo/No/Inact Screen

N\_SIGHT R900 wants you to be sure that you entered the number correctly.



- 2 If you are sure this is the correct reading, then enter the numbers again on the Hi/Lo/No/Inact Check screen.



You must enter the same digits in the reading to pass the high/low audit during the second attempt. If a different reading is entered during the second attempt, the system will fail the audit. This failure mode will continue until you enter the same reading digits twice.

- 3 Touch **ok**.

The reading is accepted as the next account appears.

## Removing a Reading

In some cases, you may need to clear or delete a reading. For example, if you make a mistake entering a reading and need to enter it again, follow this procedure to clear an existing reading from the handheld.

- 1 Display the reading entry screen of the meter whose reading you want to clear. See Figure 6.32.



Figure 6.32 Reading to be Cleared








You can only clear or reset readings for the same day. If you completed readings for a previous day, you cannot reset the readings.



Performing this action will also delete all comments and codes you have entered.

- 2 Press . Then touch , and touch .

The Reset Order screen appears as illustrated in Figure 6.33.

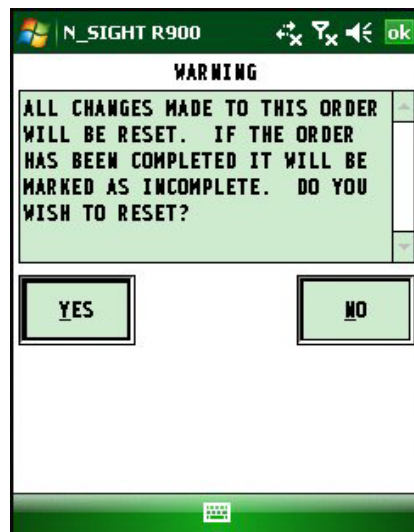


Figure 6.33 N\_SIGHT R900 Reset Order Screen



- 3 Press **Y** or touch **Yes** to reset the reading.

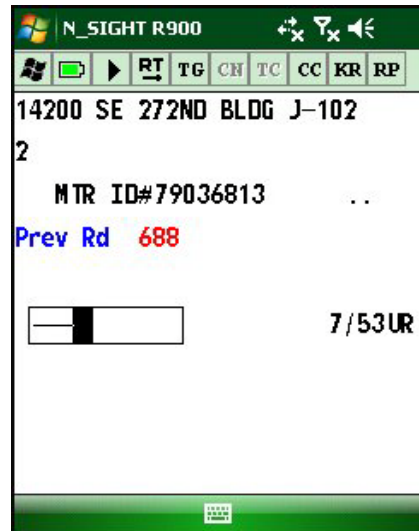


Figure 6.34 Reset Reading

The reading is then reset to UR (unread).

You can now enter a new reading or skip code, or leave the reading blank and display the reading entry screen of the next meter on the route.




If you reset a created found meter account, the found meter account is cleared in its entirety.

## Adding a New Meter to a Route

If you find a meter on your route that has not yet been loaded on the handheld, you can add the new meter and information about it to the current route. Follow this procedure to add a new meter to an existing route.



- 1 Press .
- The **Meter Process Menu** appears as illustrated in Figure 6.35.

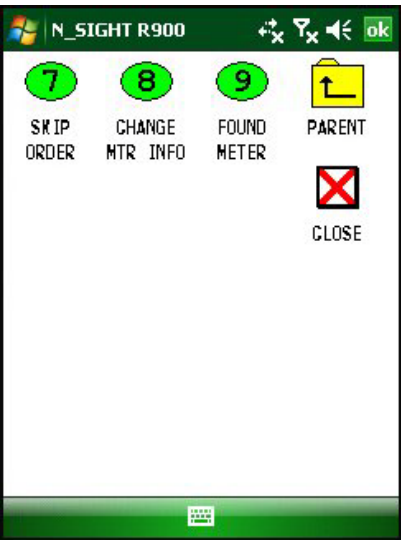



Figure 6.35 N\_SIGHT R900 Meter Process Menu

- 2 Touch .
- The New Meter screen appears as illustrated in Figure 6.36.

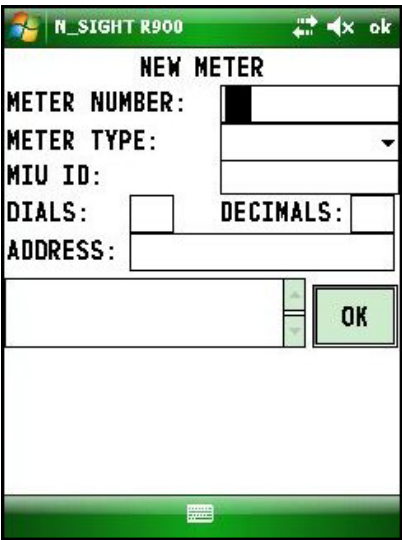




Figure 6.36 N\_SIGHT R900 New Meter Screen

- 3 Using the letter and number keys, type the meter number for the new meter in the **ID EXP** field.



- 4 In the **MTR TYPE** field, touch the DOWN  arrow and select the type of meter just found.
- 5 Touch the **DIALS** field, and enter the number of dials that the new meter uses.
- 6 Touch the **DECIMALS** field, and enter the number of decimals that the meter uses.
- 7 Touch the **ADDRESS** field, and type the address for the account.
- 8 Touch the notes field and type any notes, if applicable.
- 9 Touch  to add the found meter.

The found meter is now added to the route.

## Correcting or Changing Meter Information

Depending upon the options selected by the host operator, you can correct or change some information that was loaded from the host computer. Follow this procedure to access the **Change Meter Info** screen so that you can change information about a meter.

Follow this procedure to correct meter information.

- 1 Make sure that the meter whose data you want to change is shown in the display.

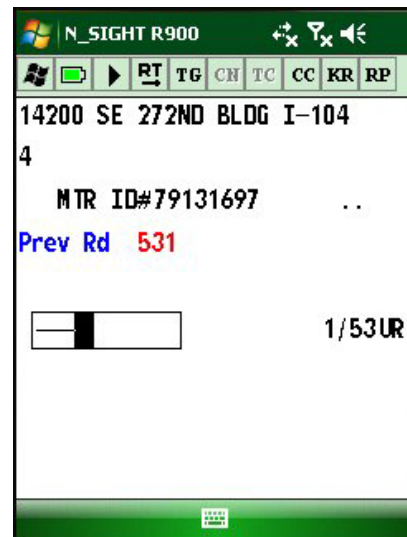



Figure 6.37 Meter Information to Change



- 2 Press .
- The **Meter Process Menu** appears as illustrated in Figure 6.38.

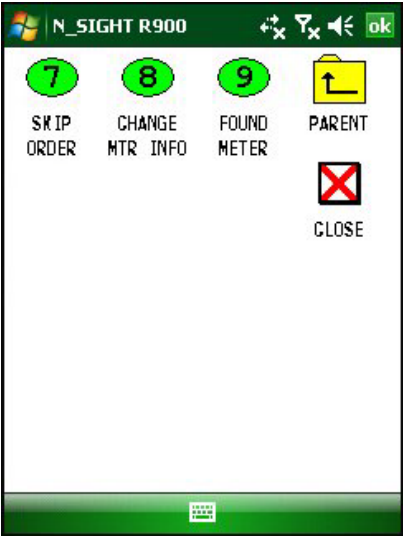



Figure 6.38 N\_SIGHT R900 Meter Process Menu

- 3 Touch .
- The **Change Meter Info** screen appears as illustrated in Figure 6.39.

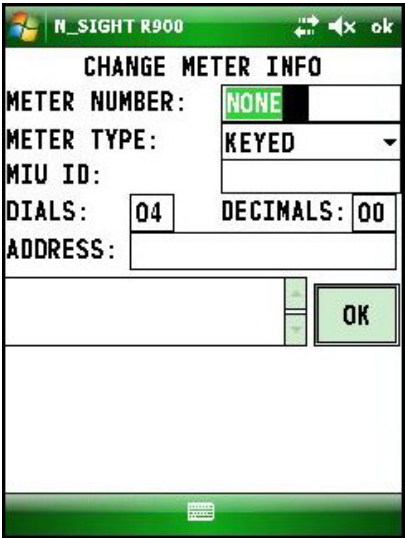




Figure 6.39 N\_SIGHT R900 Change Meter Info Screen



- 4 Correct any of the following information.
  - Using the letter and number keys, correct the information in **METER NUMBER**, if applicable.
  - In **METER TYPE**, touch the  arrow, and select the type of meter just found, if applicable.
  - Using the letter and number keys, correct the information in **MIU ID**, if applicable.
  - Touch **DIALS**, and enter the number of dials that the new meter uses, if applicable.
  - Touch **DECIMALS**, and enter the number of decimals that the meter uses, if applicable.
  - Touch the notes field and type any notes, if applicable.
  - Using the letter and number keys, correct the information in **ADDRESS**, if applicable.

- 5 Touch  to accept the changes you made to the meter.

The changes made to the meter are reflected in the current route with which you are working.



You will need to print these changes in a standard report. Usually, when the information is transferred from N\_SIGHT R900 to the billing system, this information is not updated by the billing system.

---

## Finding and Displaying Reading-Entry Screens




The procedures in this section explain how to move within a single route, change routes, search for specific meters, and use the bookmark feature. The following tasks are explained in this section.

- “Moving Through Reading-Entry Screens,” on page 6-36
- “Moving Around Routes,” on page 6-39





## Moving Through Reading-Entry Screens

The handheld moves from one reading entry screen to the next in one of two ways:

- When reading meters, the N\_SIGHT R900 software automatically advances to next meter in the route after you enter a reading or a skip code for the current meter on the route. See “Entering a Reading,” on page 6-5.
- You can move FORWARD  or BACKWARD  when you are on the reading entry screen to display the next meter or previous meter in the route without entering a reading. The key that you press depends upon the route direction icon  that you establish. Refer to “Entering a Reading,” on page 6-5.

## Reviewing Additional Information for an Account

Each reading entry screen has two additional screens you can view by simply pressing the  or  arrow keys. These screens contain location and hazard codes, and the statistics for the loaded routes.



Continually pressing the up or down arrow keys while on an account cycles between the three available screens, the Main Reading screen, the Hazard screen, and the Route Statistics screen.

## Location or Hazard Codes

To view location or hazard codes, follow this procedure.



You can also modify Location Codes, Hazard Codes, and Read Instructions on this screen by clicking the ED button on the screen or pressing the edit (E) hotkey.



- 1 Make sure that the meter for which you want to view additional information is shown in the display.

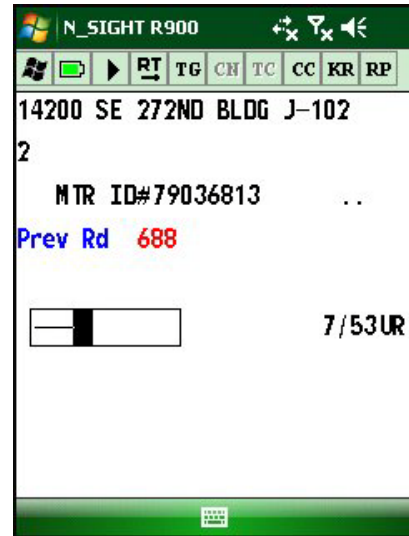



Figure 6.40 Additional Meter Information to View

- 2 Press  twice.

The Location and Hazard Codes screen appears as illustrated in Figure 6.41.

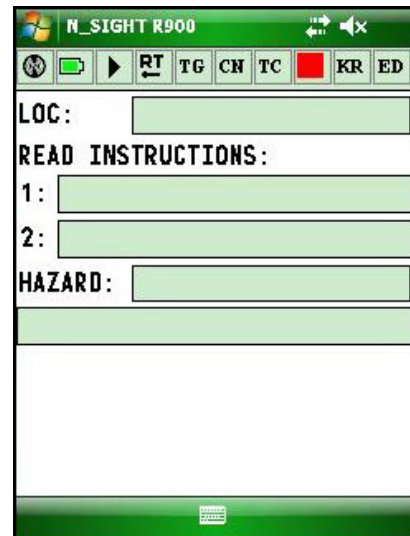



Figure 6.41 Location and Hazard Codes Screen

You can view two location codes and two hazard codes for each account.



3 When finished viewing these codes, do one of the following.

- Press **Esc** to return to the Reading Entry screen.
- Press  to view the Statistics for Loaded Routes screen.

## Statistics for Loaded Routes

To view statistics for loaded routes, follow this procedure.

- 1 Make sure that the meter for which you want to view statistics for loaded routes is shown in the display.

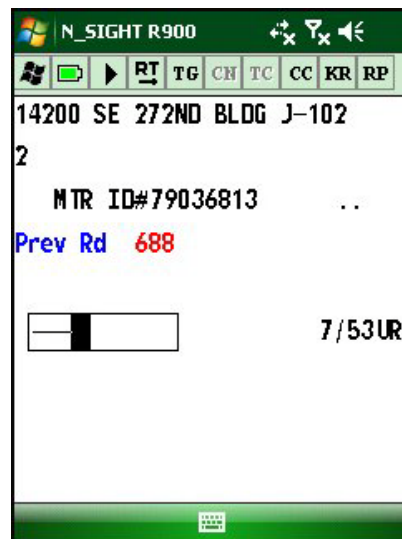


Figure 6.42 For Statistics for Loaded Routes



- 2 Press .

The Statistics for Loaded Routes screen appears as illustrated in Figure 6.43.

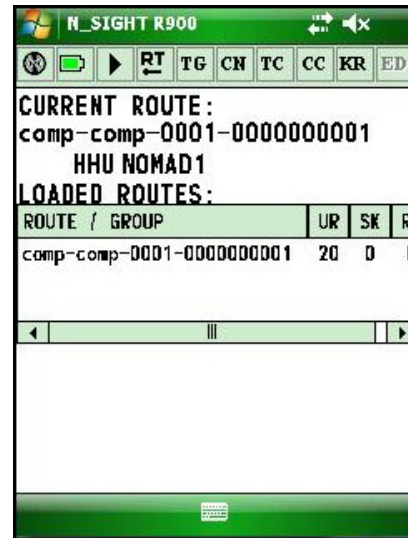



Figure 6.43 Statistics for Loaded Routes Screen

You can view the number of unread accounts, skipped accounts, and read accounts for each of the loaded routes.

- 3 When finished viewing these statistics, do one of the following.
- Press **Esc** to return to the Reading Entry screen.
  - Press  again to view the Location and Hazard Codes screen.

## Moving Around Routes

While reading meters, you can move around within the current route, or another route if you selected it at the time you logged in. The GoTo feature allows you to go to the following:

- Previous or next route, if selected at login
- Beginning or end of the current route
- First or last incomplete account in the route

Use the following procedure to move around within a route as well as to move from one route to another.



- 1 Press .

The **GoTo** screen appears as illustrated in Figure 6.44.

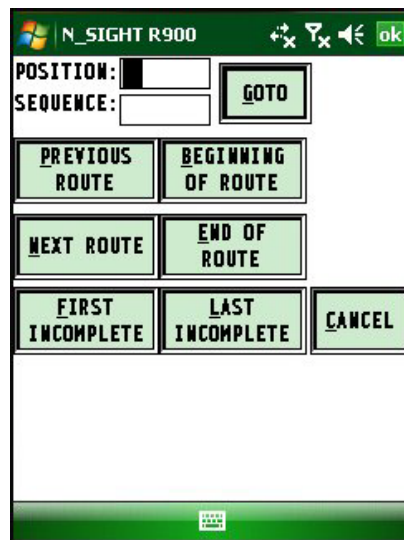








Figure 6.44 N\_SIGHT R900 GoTo Screen

- 2 On this screen, do one of the following to move to where you want to go.
  - Press  or touch **Prev Route** to go to the previous route.
  - Press  or touch **Next Route** to go to the next route.
  - Press  or touch **Beg of Route** to go to the beginning of the current route.
  - Press  or touch **End of Route** to go to the end of the current route.
  - Press  or **First Incompl** to go to the first incomplete within the route.
  - Press  or **Last Incompl** to go to the last incomplete within the route.
- 3 Depending upon your selection, N\_SIGHT R900 moves to the account you chose.



## Resequencing Routes



Before selecting to resequence a route, you should confirm with your Utility Office Manager that your billing system can accept the route in a resequenced order.

Resequencing allows you to sort meters by the sequence numbers or by the timestamp of when readings were collected. Whenever you exit the N\_SIGHT R900 software, you are given the option to resequence. However, you can resequence while you are reading meters on your route. Complete the following procedures to resequence your route.

### Resequence an Order

Follow this procedure to resequence an order.

- 1 Display the reading entry screen that you want to resequence. See Figure 6.45.



Figure 6.45 Account to Resequence



- 2 Press .
- 3 Then touch , and touch .

The Resequence screen appears as illustrated in Figure 6.46.

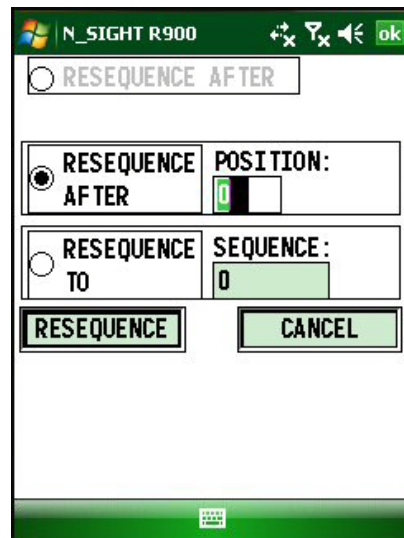





Figure 6.46 Resequence Screen

- 4 Make your selections for the following.
    - **Resequence After** – if you want the account to resequence after the current account.
    - **Reseq After** – if you want to specify a certain position in the route.
    - **Resequence To** – if you want to resequence all accounts to a certain position in the route.
  - 5 Press **Resequence** after you make your selection.
- The resequencing is completed for you.



## Resequence While Collecting Readings

Follow this procedure to turn on or off resequencing while collecting readings.

- 1 Press .
- 2 Then touch , and touch .

The Resequencing screen appears as illustrated in Figure 6.47.

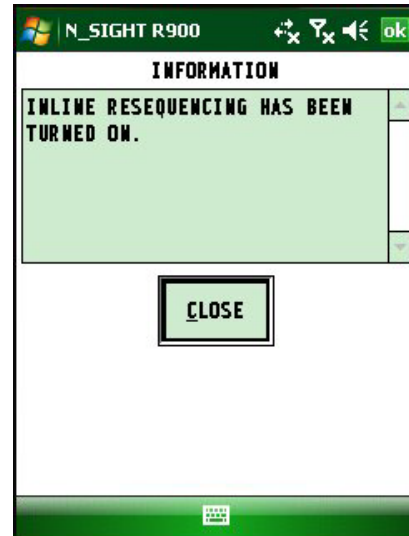


Figure 6.47 Inline Resequencing Screen

This function works as a toggle either on or off. Use this screen to turn it on or off, when applicable.

## Confirming the Resequencing

When you exit the N\_SIGHT R900 software, you must first confirm the resequencing for the routes you have just read. Three options are available to you.

- Timestamp resequencing
- Accept resequencing
- Reject resequencing



Follow this procedure to confirm resequencing.



- 1 When you press  to exit the N\_SIGHT R900 software, the Confirm Resequencing screen appears as illustrated in Figure 6.48.



Figure 6.48 Confirm Resequencing Screen

- 2 Touch the  to select one of the following options.
  - Timestamp Reseq
  - Accept Reseq
  - Reject Reseq



## 7 Data Logging

---



Neptune's enhanced R900® MIU is capable of storing interval data for data logging and retrieving this data through radio frequency (RF) activation. The enhanced R900 MIU is activated using the Trimble Nomad or Trimble Ranger and the R900® Belt Clip Transceiver (R900 BCT) and is explained in more detail in the following section.

The enhanced R900 MIU stores consumption in hourly intervals for a rolling total of 96 days. This is equal to 2,304 hourly intervals of consumption. Data logging can be performed through either RF activation of E-Coder®)R900i™ data log MIUs or infrared (IR) activation of enhanced R900 MIUs. Both methods of activation allow the utility workers to visit the location and extract the data without physically interacting with the meter itself. This limits exposure by the worker to animals or dangerous situations. The extraction process, once started, only takes about 30 seconds. The activation is done through the handheld connected to the R900 BCT via Bluetooth. The activation signal is sent by the R900 BCT to the enhanced R900 MIU which in turn sends the data intervals to the R900 BCT and are saved in the handheld.

With data logging, you can capture the hourly interval data stored over the past 96 days. On the handheld, this option is located on the Utility screen. There are two ways to perform data logging.

- **IR** – activated by a flashlight with the current E-Coder®)R900i data log MIUs.
- **RF** – activated by a R900 BCT v1.7 and enhanced R900 MIUs.

The following items are required for RF-activated data logging.

- N\_SIGHT R900 v4.7 handheld (Nomad or Ranger)
- R900 BCT v1.7 (most current firmware)
- enhanced R900 MIU (beginning with an MIU ID of 154 or 155)





Figure 7.1 Data Logging with the Nomad or Ranger Handheld

---

## Accessing Data Logging

Complete the following steps for data logging.

- 1 From the N\_SIGHT R900 Login screen, touch

**MENU**

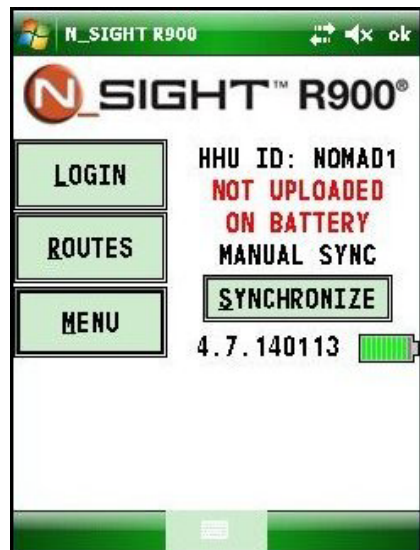


Figure 7.2 N\_SIGHTR900 Login Screen



The Main menu screen appears. See Figure 7.3.

- 2 Touch **4** UTILS.

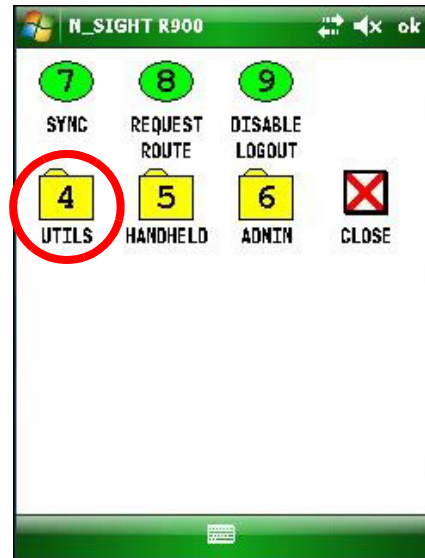


Figure 7.3 N\_SIGHT R900 Main Menu Screen

The N\_SIGHT R900 Utilities menu appears. See Figure 7.4.

- 3 Select **9**, DATA LOGGER.

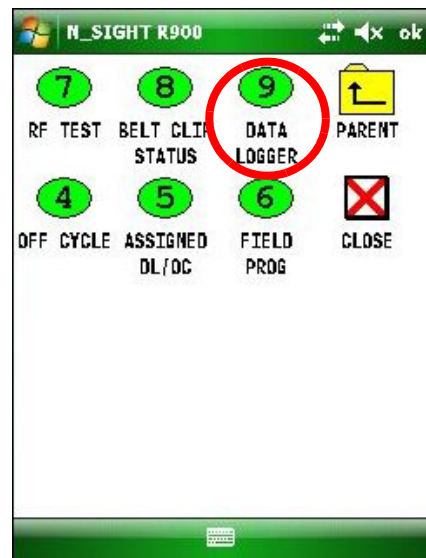


Figure 7.4 N\_SIGHT R900 Utilities Menu



The User Authentication screen appears. See Figure 7.5.

- 4 Type your reader ID and password (if applicable).
- 5 Click **LOGIN**.

The Verify Time screen appears. See Figure 7.6.

The screenshot shows the 'USER AUTHENTICATION' screen on a handheld device. The title bar at the top is green and contains the text 'N\_SIGHT R900' along with navigation icons and an 'ok' button. The main area has a white background with the title 'USER AUTHENTICATION' in bold. Below the title are two input fields: 'READER ID:' followed by a text box, and 'PASSWORD:' followed by a text box. At the bottom of the main area are two green buttons with black borders, labeled 'LOGIN' and 'CANCEL'. A small status bar at the very bottom is green and contains a small icon.

Figure 7.5 User Authentication Screen

- 6 Verify the time is correct, and click **YES**. See Figure 7.6.

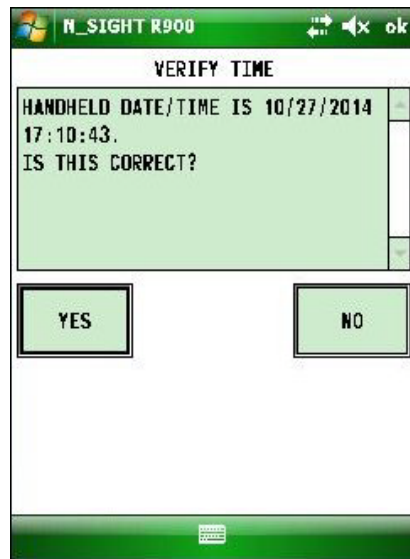
The screenshot shows the 'VERIFY TIME' screen on a handheld device. The title bar at the top is green and contains the text 'N\_SIGHT R900' along with navigation icons and an 'ok' button. The main area has a white background with the title 'VERIFY TIME' in bold. Below the title is a green rectangular area containing the text 'HANDHELD DATE/TIME IS 10/27/2014 17:10:43. IS THIS CORRECT?'. To the right of this area is a vertical scrollbar. At the bottom of the main area are two green buttons with black borders, labeled 'YES' and 'NO'. A small status bar at the very bottom is green and contains a small icon.

Figure 7.6 Verify Time Screen



## Initializing IR-Activated Data Logging

Complete the following steps to initialize the data logger.



The handheld must be synchronized prior to data logging in order to set the clock.

- 1 The Initialize Device screen appears if you are not connected or you are not in range of your R900 BCT. Click **INITIALIZE**. See Figure 7.7.

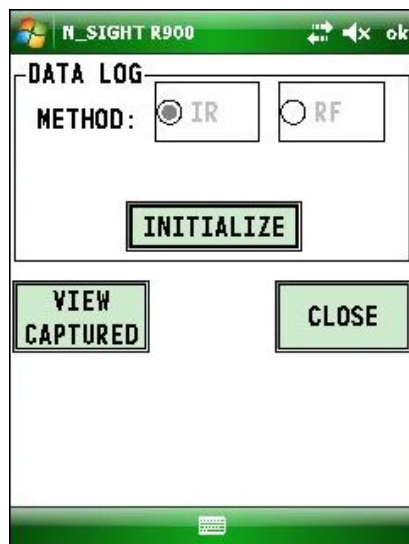


Figure 7.7 Initialize Device Screen



If the handheld is connected to a R900 BCT v1.0, the RF option will be disabled after pressing Initialize. Only the R900 BCT v1.7 supports RF Activation.



- 2 Select **IR**. See Figure 7.8.
- 3 Click **Capture**.

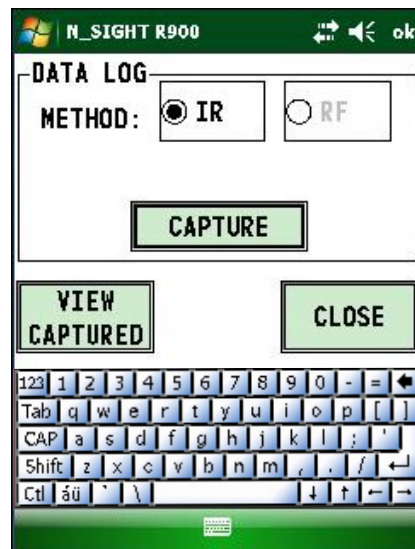


Figure 7.8 Data Log IR Method Selection

- 4 Select **Unit Of Measure** from the drop-down list. See Figure 7.9.
- 5 Select **Meter Size** (or leave blank to select later).
- 6 Click **OK**.

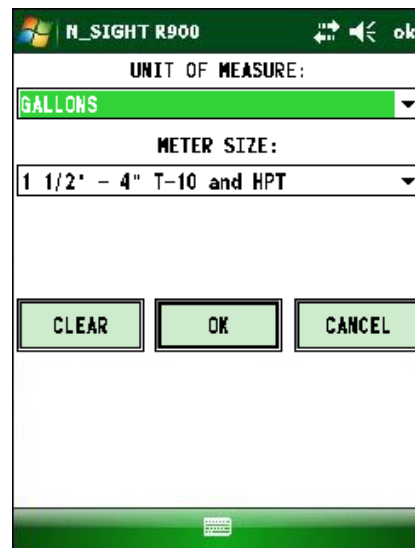


Figure 7.9 Unit of Measure Screen





Your selection for unit of measure and meter size updates the meter combination for the N\_SIGHT R900 Data Logger report after the handheld synchronizes with the host computer.

- 7 Click **Start**, then activate the data logger with flashlight.

If you are not connected to the R900 BCT or you are not in range of it, the Initialize Device screen appears. See Figure 7.7 on page 7-5. Click **INITIALIZE** to continue.

## Initiating RF-Activated Data Logging

Complete the following steps to initiate the RF-activated data logger.

- 1 On the Initialize Device screen, click **INITIALIZE**. See Figure 7.10.

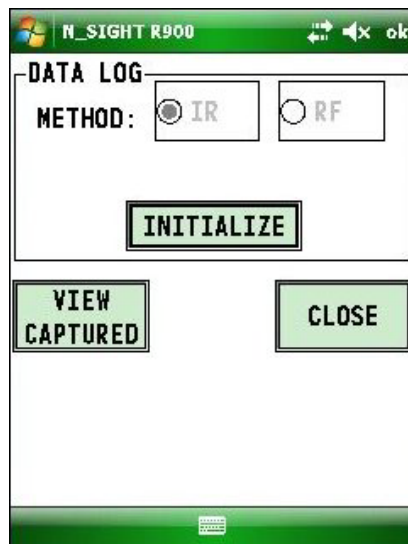


Figure 7.10 Initialize Device Screen



- 2 Select **RF** and type the MIU ID. See Figure 7.11.



You can type the MIU ID with the number pad keys or expand the on-screen keyboard.

- 3 Click **CAPTURE**.

Figure 7.11 Data Log RF Method Screen

- 4 Select **Unit Of Measure** from the drop-down list. See Figure 7.12.
- 5 Select **Meter Size** (or leave blank to select later).
- 6 Click **OK**.

Figure 7.12 Unit of Measure Screen



Your selection for unit of measure and meter size updates the meter combination for the N\_SIGHTR900 Data Logger report after the handheld synchronizes with the host computer.



- 7 Click **START** to initiate RF-activated data logging. See Figure 7.13.

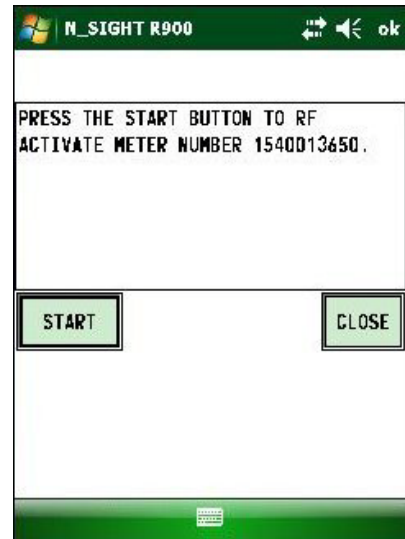


Figure 7.13 RF-Activate Meter Screen

- 8 The R900 BCT activates the data logging MIU and listens for it to start transmitting. See Figure 7.14.

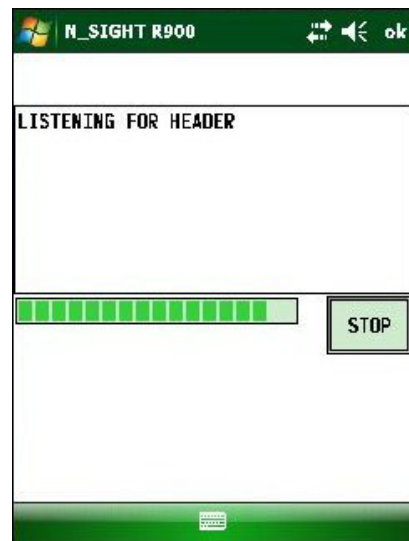


Figure 7.14 Listening for Data Screen



- 9 The data received is displayed on the screen. The data logging process takes a few minutes. See Figure 7.15.

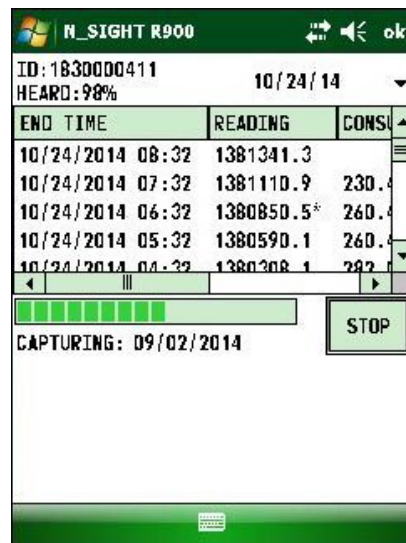


Figure 7.15 Receiving Data

## Viewing Handheld Graphing

- 1 After the data logging process is completed, you can choose the meter size. See Figure 7.12 on page 7-8.
- 2 Click **GRAPH**. See Figure 7.16 to display the data in a graph. Examples of graphs are shown in Figure 7.17 on page 7-11.
- 3 The handheld processes and saves the data.
- 4 After closing the data logging screen, the unit performs a backup.

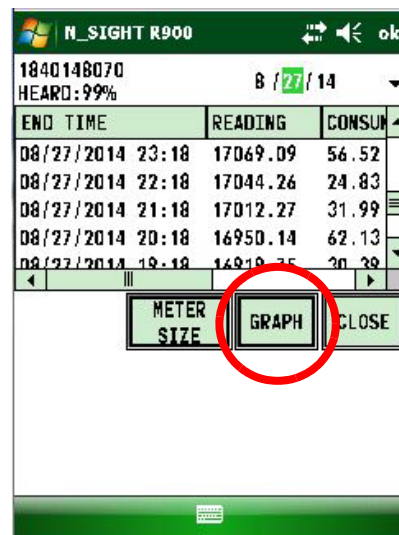


Figure 7.16 Graph Button



## Sample Data Logging Graphs

The following are two examples of graphs that can be produced with data logging.

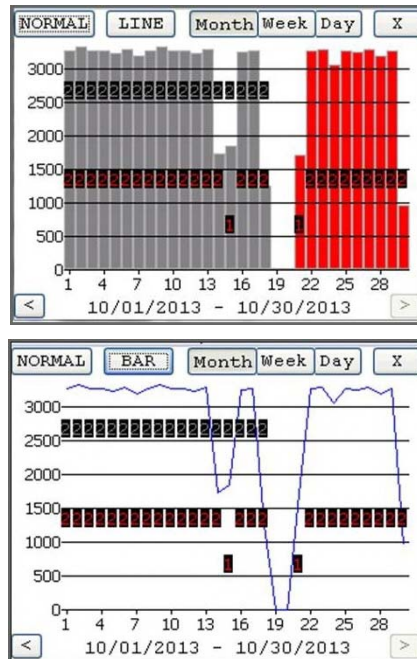


Figure 7.17 Examples of Data Logging Graphs

**Table 7.1 Data Logging Graph Legend**

| Color Code | Description       |
|------------|-------------------|
| 1 red      | Intermittent Leak |
| 2 red      | Continuous Leak   |
| 1 gray     | Minor Backflow    |
| 2 gray     | Major Backflow    |
| Blue bars  | No Flags          |



**Table 7.1 Data Logging Graph Legend**

|  |          |
|--|----------|
| Red bars   | Leak     |
| Gray bars *  | Backflow |
| * If the Backflow flag and the Leak flag appear at the same time, Backflow (Gray bars) has precedence over Leak. |          |

Using Graphing Buttons and Options

Use the following buttons and options to display the data logging data in different graph formats.



Click to access graphing from the MIU Interval Reading screen. See Figure 7.16 on page 7-10.



- To drill down:
- Click any area of the graph to drill down.
  - Click the Month | Week | Day buttons.



Click to zoom into the graph to the highest visible value in the current graph.



Click to zoom out, back to the default normal view.



Click to view as a line graph.



Click to view as a bar graph.



Click these arrows to navigate to the previous and next consumption intervals.



Click to close the graph.



---

## Accessing off-cycle Reading

With off-cycle reading, N\_SIGHT R900 captures daily interval data stored over the past 96 days. off-cycle reading can be used for obtaining a previous day's final read for billing; for example, a customer moved last week.

Off cycle reading activation only is performed using RF activation with R900 BCT v1.7 and enhanced R900 MIUs. See Figure 7.1 on page 7-2.

Complete the following steps for off-cycle reading.

- 1 From the N\_SIGHT R900 Login screen, touch

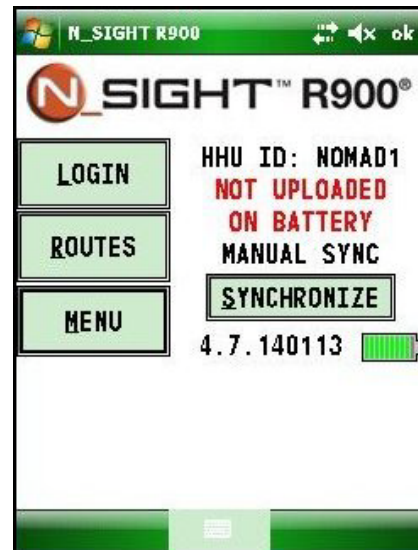


Figure 7.18 N\_SIGHT R900 Main Screen



The Main menu screen appears. See Figure 7.19.

- 2 Touch **4** UTILS.

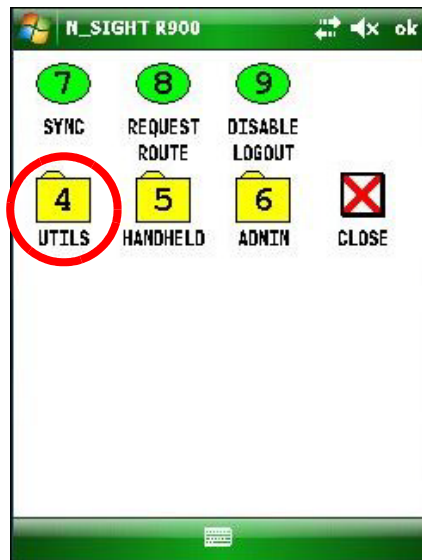


Figure 7.19 N\_SIGHT R900 Main Menu Screen

The N\_SIGHT R900 Utilities menu appears. See Figure 7.20.

- 3 Select **4**, Off Cycle.

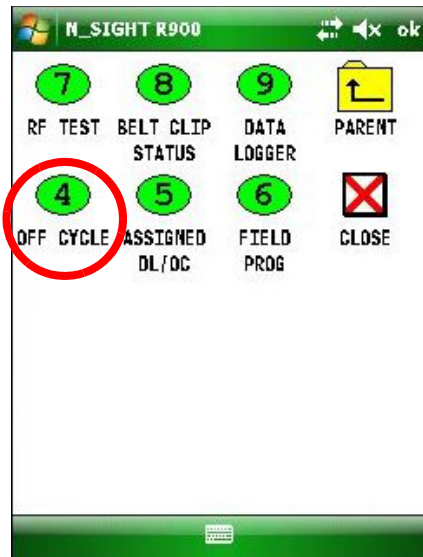


Figure 7.20 N\_SIGHT R900 Off Cycle Option



The User Authentication screen appears. See Figure 7.21.

- 4 Type your reader ID and password (if applicable).
- 5 Click **LOGIN**.

The Verify Time screen appears. See Figure 7.6 on page 7-4.



Figure 7.21 User Authentication Screen

## Initializing the Data Logger

Complete the following steps to initialize the data logger.



The handheld must be synchronized prior to data logging in order to set the clock.



- 1 Verify the time is correct, and click **YES**. See Figure 7.22.



Figure 7.22 Verify Time Screen

- 2 The Initialize Device screen appears if you are not connected or you are not in range of your R900 BCT. Click **INITIALIZE**. See Figure 7.23.

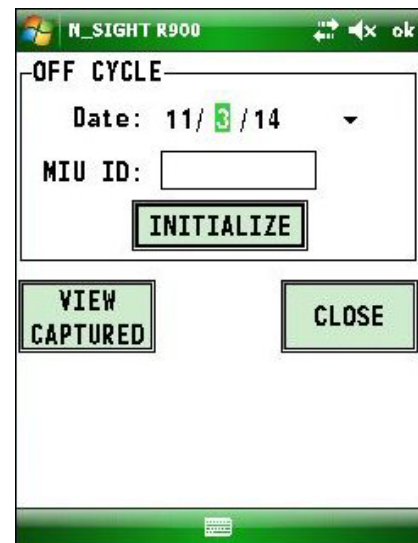


Figure 7.23 Initialize Device Screen



- 3 Select a **Date** (or leave the default), which is auto-selected after reading.
- 4 Enter an **MIU ID** for an off cycle reading. See Figure 7.24.



You can type the MIU ID with the number pad keys or expand the on-screen keyboard.

- 5 Click **Capture**.

Figure 7.24 Off Cycle Capture Screen

- 6 Select **Unit Of Measure** from the drop-down list. See Figure 7.25.
- 7 Select **Meter Size** (or leave blank to select later).
- 8 Click **OK**.

Figure 7.25 Unit of Measure Screen





Your selection for unit of measure and meter size updates the meter combination for the N\_SIGHT Data Logger report after the handheld synchronizes with the host computer.

- 9 Click **START** to initiate RF-activated data logging. See Figure 7.26.

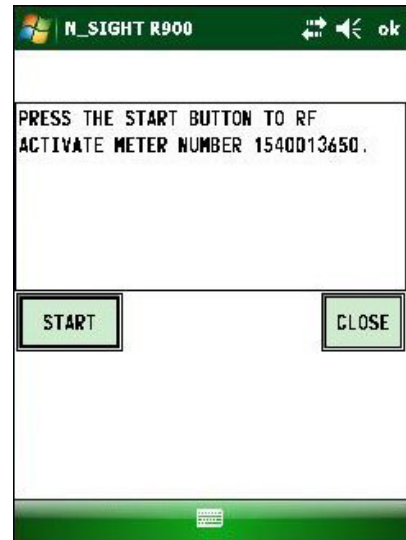


Figure 7.26 RF-Activate Meter Screen



The R900 BCT sends transmission to the MIU, and the R900 BCT listens for transmission from the MIU. See Figure 7.27.

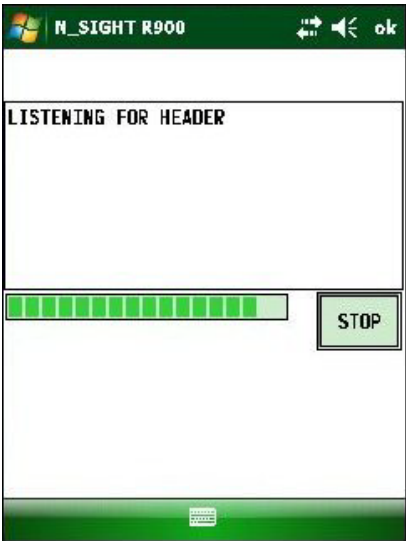


Figure 7.27 Listening for MIU

A message appears if there is no response. Otherwise, the captured data appears.

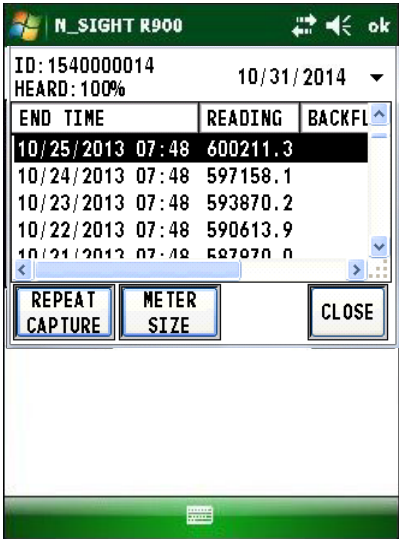


Figure 7.28 Data Captured



The date you selected on the Initialize Device screen is highlighted after off-cycle data is captured. See Figure 7.23 on page 7-16.



## Assigned Data Log and Off-Cycle Readings

The host software computer operator can initiate and assign data logging and off-cycle read appointments for MIUs within the R900 System, defining the capture type and handheld ID. This is only available if the utility decides to take this approach. After all the appointments have been assigned, they are loaded when the handheld synchronizes with the host software. The meter reader can then see which units need to be data logged.

### Assigning MIUs from the Host Software

A meter reader can assign MIU IDs from the host software to be data logged or off-cycle read by the handheld.

To assign MIU IDs from the host software, complete the following steps.

- 1 From the Main menu,  
Touch **4** UTILS. See  
Figure 7.29.

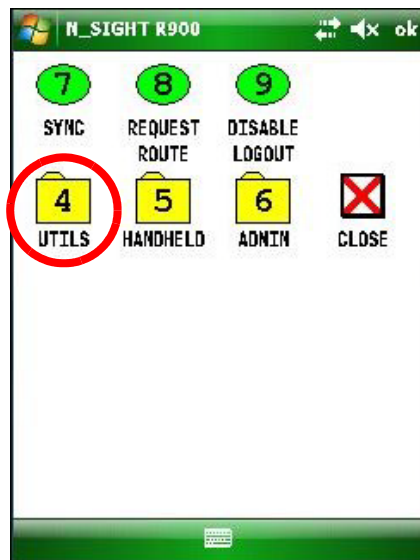


Figure 7.29 N\_SIGHT R900 Main Menu Screen



The N\_SIGHT R900 Utilities menu appears. See Figure 7.30.

- 2 Select **5**, **ASSIGNED DL/OC**.

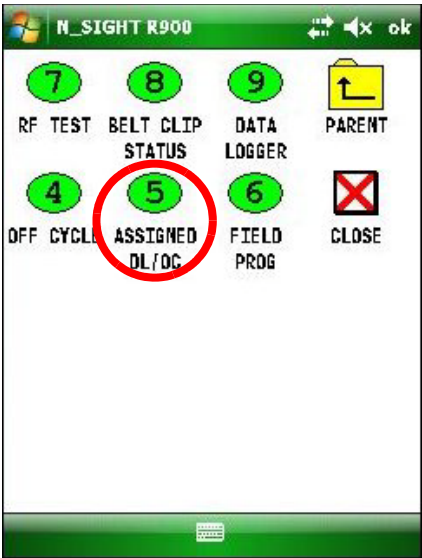


Figure 7.30 Assigned DL/OC Option

The Assigned DL/OC screen appears with a list of MIU IDs assigned from the “Appointments” screen in the host software.

| MIU ID     | TYPE          | CAPTURED | ADDRESS    | CUSTOMER NAME |
|------------|---------------|----------|------------|---------------|
| 1550011122 | DATA LOG – RF | NO       |            |               |
| 1550011122 | OFF CYCLE     | NO       |            |               |
| 1830398222 | DATA LOG – IR | NO       | 2 Desk St. | DL #2         |
| 1831525638 | DATA LOG – IR | NO       |            |               |

Figure 7.31 List of MIU IDs from N\_SIGHT R900 Host Software

In viewing this screen, keep in mind the following.

- The TYPE for each MIU ID indicates how the handheld should capture the data.
  - Captured indicates whether or not the MIU ID row has yet been captured by the handheld.
  - Address and Customer Name display if the MIU ID was linked to a premise in the host software.
- 3 Refer to one of the following to capture the data.
- “Accessing Data Logging,” on page 7-2.
  - “Accessing off-cycle Reading,” on page 7-13.



***Notes:***



## 8 Communicating with the Host Computer

---

Once the software for the Neptune handheld system is set up and the hardware is connected as described in either “Setting Up the CE5320,” on page 3-3 or “Setting Up the Nomad,” on page 3-3, use the procedures of this chapter to exchange information with the host computer. During a typical information exchange, assignments and other route data, such as code tables, are sent to the handheld, and meter readings and route information are sent to the host.

---

### Exchanging Information

There are several methods you can use to exchange information with the host computer. The method for exchanging information is called *synchronize*.

**Synchronize**—initiates a two-way communication between the handheld and the host computer in which the handheld sends information to the host computer and also receives information from the host computer.

### Exiting the Software

When you have completed all the reads in your routes, you exit the software and upload the route information to the N\_SIGHT R900 host software. To exit the software, complete the following procedure.



- 1 Exit N\_SIGHT R900 by pressing .

The Confirm Resequencing screen appears as illustrated in Figure 8.1.

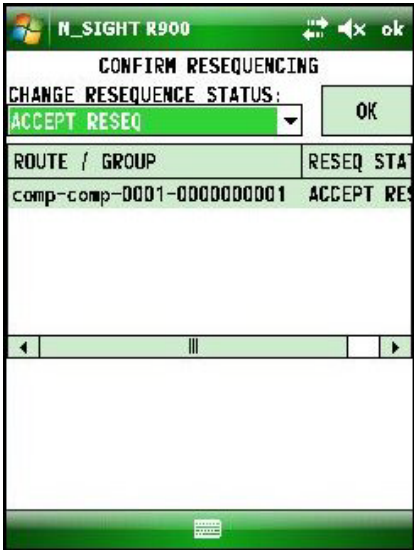



Figure 8.1 Confirm Resequencing Screen

- 2 Touch the  in the Change Reseq Status to select one of the following options, if applicable:
  - Timestamp Reseq
  - Accept Reseq
  - Reject Reseq

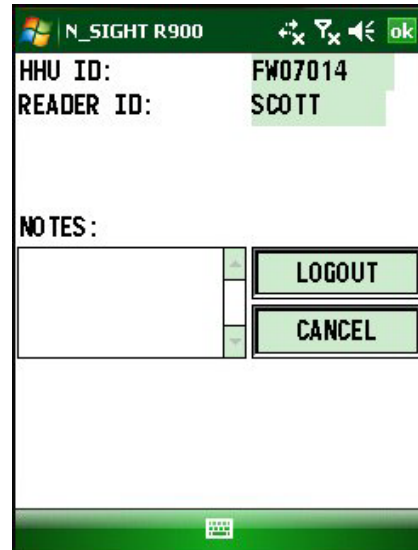


If you have more than one route, select the next route and repeat step 2.



- 3 Touch **ok** to confirm your resequencing choice.

The Handheld Logout screen appears as illustrated in Figure 8.2.

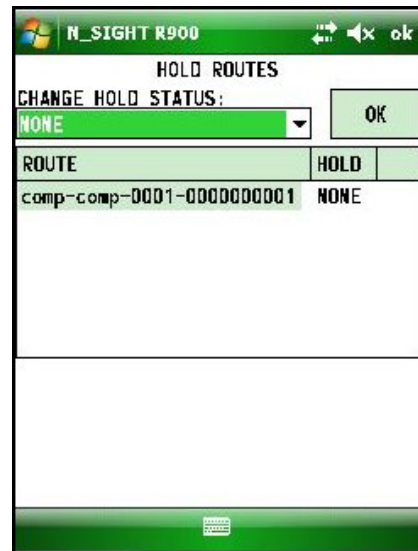


The screenshot shows the 'N\_SIGHT R900' handheld interface. At the top, there's a status bar with a Windows logo, the title 'N\_SIGHT R900', and navigation icons (back, forward, search, and an 'ok' button). Below this, the screen displays 'HHU ID: FW07014' and 'READER ID: SCOTT'. A 'NOTES:' section is present with a text input area and two buttons: 'LOGOUT' and 'CANCEL'. The bottom of the screen features a green bar with a small 'N\_SIGHT R900' logo.

Figure 8.2 N\_SIGHT R900 Handheld Logout Screen

- 4 Type any notes, if applicable.
- 5 Touch **Logout**.

The Hold Routes screen appears as illustrated in Figure 8.3.



The screenshot shows the 'N\_SIGHT R900' handheld interface. The title bar is the same as in Figure 8.2. Below the status bar, the screen displays 'HOLD ROUTES'. There is a 'CHANGE HOLD STATUS:' section with a dropdown menu currently set to 'NONE' and an 'OK' button. Below this is a table with two columns: 'ROUTE' and 'HOLD'. The first row of the table shows 'comp-comp-0001-0000000001' under 'ROUTE' and 'NONE' under 'HOLD'. The bottom of the screen features a green bar with a small 'N\_SIGHT R900' logo.

| ROUTE                     | HOLD |
|---------------------------|------|
| comp-comp-0001-0000000001 | NONE |

Figure 8.3 Hold Routes Screen



- 6 Touch the  in **Change Hold Status** to select one of the following options, if applicable.

|                |  |
|----------------|--|
| None           | Hold none of the accounts in the handheld.                         |
| Unread/Skipped | Hold all unread accounts and all skipped accounts in the handheld. |
| Unread         | Hold only the unread accounts in the handheld.                     |

All of these Hold functions determine which accounts are left in the handheld after the route is uploaded.

- 7 Select the route to hold, if applicable.

- 8 Touch .

The N\_SIGHT R900 Login screen appears as illustrated in Figure 8.4.




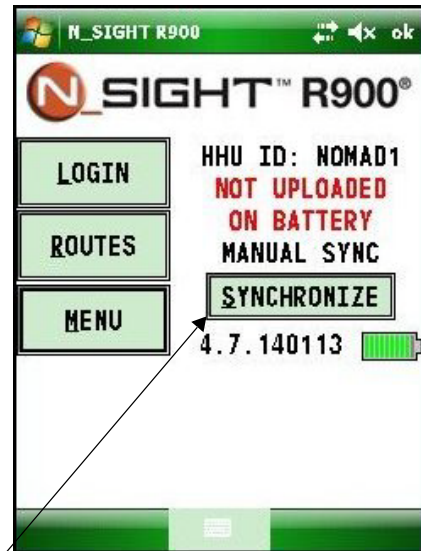
Figure 8.4 N\_SIGHT R900 Login Screen

## Sending and Receiving

When ready to communicate or synchronize with the host computer, use this procedure to send and receive information. Follow this procedure for each handheld that you are using.



- 1 Do one of the following.
  - Place the CE5320B handheld in the cradle by sliding it bottom first into the cradle.
  - Place the Nomad handheld into the charging/communications cradle or connect the Nomad to the PC with the USB cable.
- 2 On the N\_SIGHT R900 Login screen, press  or touch **Synchronize**.



Touch **Synchronize** to start communications. An X appears until Network Connection is established

Figure 8.5 Synchronize Button

If your handheld system is set to AutoSync, the handheld will indicate with the audible message "Connected" when it is starting the communications process.

When the handheld is removed from the Cradle, it will indicate with the audible message "Disconnected" (regardless of sync mode).

The hour glass appears on the screen to show that the communications process is underway.



***Notes:***



## 9 Using the Field Programmer

---

This chapter provides fundamental instructions for operating the Field Programmer including how to connect the mouse to the CE5320 and the Nomad handheld devices, programming the device, and more. This chapter contains basic features of the Field Programmer and it also gives instructions for setting it up, so that it can be used to collect information from the field.

---

### Connecting the Mouse

The Field Programmer mouse, when connected to the CE5320 or the Nomad handhelds, allows you to query or program a ProRead register by using one of the following methods.

- Touchread
- Use of the alligator clip to connect red, green, and black wires.

It also allows you to program an R900G endpoint through an infrared programming LED.



## Connecting the Mouse to the Handheld

The following illustration displays some of the features of the mouse.



Figure 9.1 Field Programmer Mouse for the Nomad

To connect the mouse to the handheld Field Programmer, complete the following steps.

- 1 Locate the USB connector at the end of the mouse cable. See Figure 9.1.
- 2 Locate the USB port on the bottom of the Nomad. See Figure 9.2 on page 9-3.
- 3 Push the USB connector into the USB port.





Figure 9.2 Connecting Mouse to Nomad





For the location of the USB port on the Ranger, see Figure 4.3 on page 4-6.



# Starting Field Programmer

To start the Field Programmer, complete the following steps.

- 1 From the N\_SIGHT R900 Login screen, touch **Menu**.
- 2 Touch .
- 3 Select , Field Programmer.  
  
The Field Programmer Menu appears.

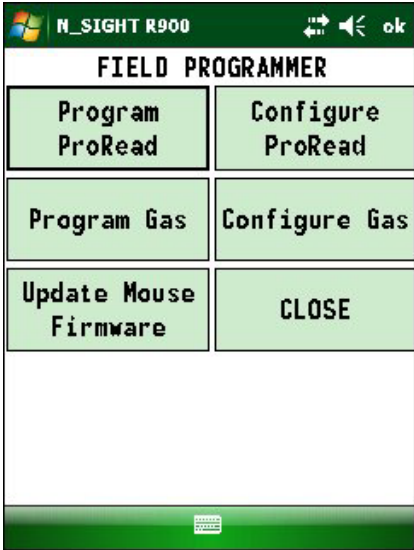


Figure 9.3 Field Programmer Menu



4 Touch the option you want to use.

- Program ProRead
- Configure ProRead
- Program Gas
- Configure Gas

After you select the option you want, the Field Programmer Password screen appears.

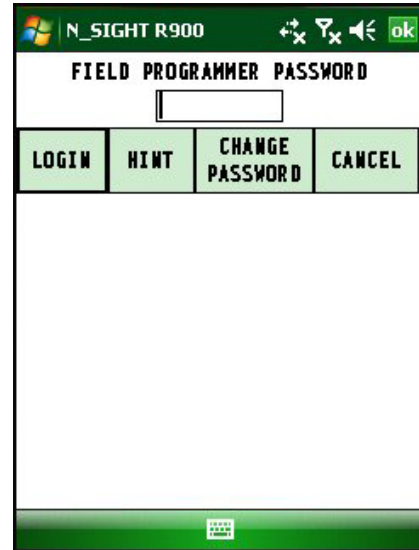


Figure 9.4 Field Programmer Password Screen

5 Type your password.



If you cannot remember your password, you can touch or click **HINT** to display a clue.

On this screen, you can also change your password as described in “Changing Your Password,” on page 9-6 or you can cancel logging in to the system.

6 Click **ok**.



## Changing Your Password

Complete the following steps to change your password.

- 1 On the Field Programmer Password screen, touch



The Change Password screen appears. See Figure 9.5.

A screenshot of the "FIELD PROGRAMMER PASSWORD" screen. At the top is a status bar with a Windows logo, "N\_SIGHT R900", and icons for back, forward, and OK. Below the title is a text input field. A row of four buttons follows: "LOGIN", "HINT", "CHANGE PASSWORD", and "CANCEL". The "CHANGE PASSWORD" button is highlighted. Below this are four rows of labels and input fields: "OLD PASSWORD:", "NEW PASSWORD:", "CONFIRM:", and "HINT:". To the right of the "NEW PASSWORD:" and "CONFIRM:" fields is a "CLEAR" button. To the right of the "HINT:" field is a "CHANGE" button. At the bottom is a green bar with a small "FIELD PROGRAMMER" logo.

Figure 9.5 Change Password Screen

- 2 In **Old Password**, type the old password.
- 3 In **New Password**, type your new password.
- 4 In **Confirm**, type your new password again.



What you enter in **New Password** and **Confirm** must match in order for you to change the password. If they do not, you will receive an error message.

- 5 Touch . The "CHANGE" button is a green rectangle with the word "CHANGE" in white text.

Your password is now changed.

---

## Programming the ProRead

The first time you use the Field Programmer software after the



installation, you need to configure both the ProRead and the gas functionality.

## Configuring the ProRead

To program the ProRead, use the Neptune Field Programmer and complete the following steps.

- 1 Select **Program ProRead** from the **Field Programmer** Menu. See “Starting Field Programmer,” on page 9-4.

The ProRead Programming screen appears. See Figure 9.6.

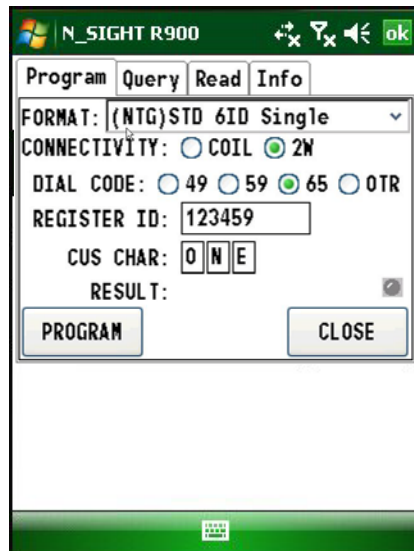


Figure 9.6 ProRead Configuration Screen

- 2 Touch  for **Format Name**.

A selection list similar to Figure 9.7 appears.

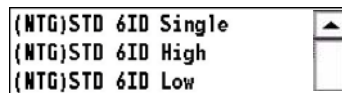


Figure 9.7 Format Name Selection List

- 3 Touch or click the format you want, and double click or press **Enter**.



- 4 For **Connectivity**, touch one of the following.
  - **Coil** – if you are using the touchpad
  - **2W** – (2-wire) if you are using the alligator clip
- 5 For **Dial Code**, touch one of the following to adjust the number of meter reading digits returned from the register to a reading device:
  - **49**
  - **59**
  - **65**
  - **otr** – to choose another value from a selection list. See Figure 9.8. (To return to the screen from this list, select **None**.)

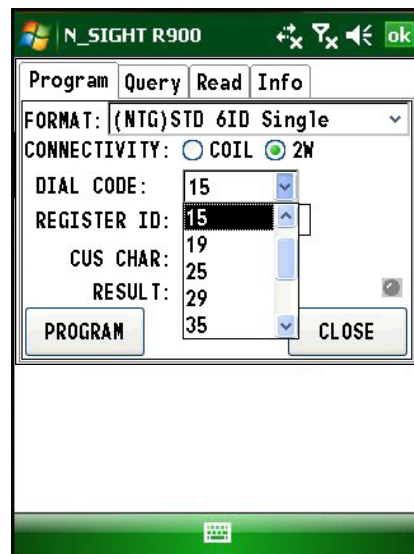


Figure 9.8 Otr Selection List



The water utility often requires modification so that a reading matches its standard billing units, such as 1000s of gallons.


- 6 In **Register ID**, type the ID or serial number of the register.
- 7 For **Cus Char**, enter the additional information you want to have for that meter, such as size or location.
  - **M N L** (upper case, alphanumeric)
  - **1 2 S** (numeric digits.)



## 8 Connect in one of the following ways.

- For coil, align the mouse coil with the receptacle, then proceed to step 9.
- For alligator clips, attach the clips to the corresponding wire color, then proceed to step 9.

## 9 Start Programming in one of the following ways.

- Touch or click .

(This button can only be used for programming; it cannot be used for Read or Query.)

- Press the program button on the mouse.
- Press **Enter**.

An audible tone signals the **Program Result**.

- PASS
- FAIL

See Figure 9.9.

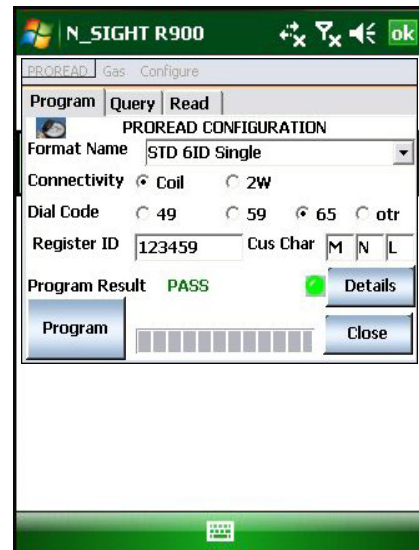


Figure 9.9 Program Result -- Pass Screen

10 If you want to view detailed information, touch or click **Details**.



Details display the data in raw format. See Figure 9.10.

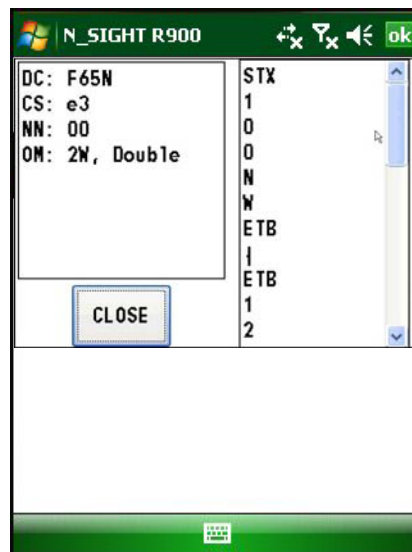
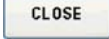




Figure 9.10 ProRead Program Details Screen

- 11 Touch or click  to return to the ProRead Configuration screen.
- 12 You can program a similar register that can automatically generate a new ID number by pressing  again.
- 13 You can program a different type of register by repeating steps 1 through 10.
- 14 When finished programming, choose one of the following.
  - Touch or click **Read** to take a reading.
  - Touch or click **Query** to query the register.
  - Touch or click  to return to the main screen.



---

## Querying the ProRead

Use the query function to determine the current programming configuration of a ProRead register. You can determine the format type, Dial Code setting, Network Numbers, ID number, and other important settings from the query results. This information is especially critical when using the Field Programmer to read registers because the programmer must first be configured with the proper settings before it can read successfully.

To query a register, place the appropriate adapter on the register or receptacle, and complete the following steps.

- 1 Select **Program ProRead** from the **Field Programmer** menu.

- 2 Select the **Query** tab.

The ProRead Query screen appears. See Figure 9.11.

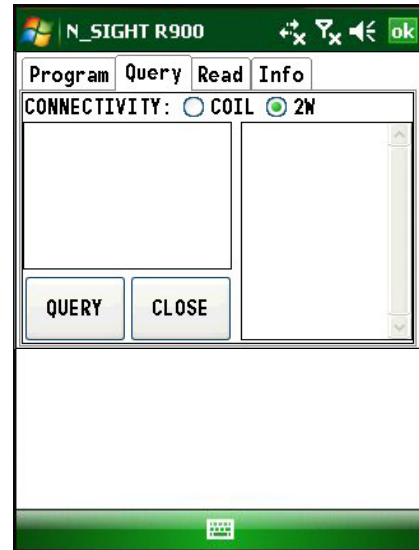


Figure 9.11 ProRead Query Screen

- 3 Touch or click  to perform a query.



The query results appear similar to that of Figure 9.12.

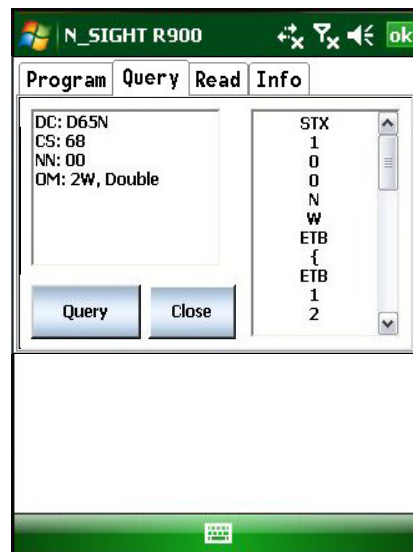



Figure 9.12 ProRead Query Results

The query results should confirm that the ProRead register is programmed correctly.

- 4 Repeat steps 1 through 3 to query another register or choose one of the following.
  - Touch or click **Read** to take a reading.
  - Touch or click **Program** to program the register.
  - Touch or click  to return to the main screen.

## Reading the ProRead Register

The Field Programmer is designed to be used as a programming and troubleshooting tool rather than a reading device. However, the Field Programmer is capable of collecting readings.

To read a ProRead register, complete the following steps:



- 1 Select **ProRead** from the Field Programmer menu.
- 2 Select the **Read** tab.

The ProRead Read screen appears. See Figure 9.13

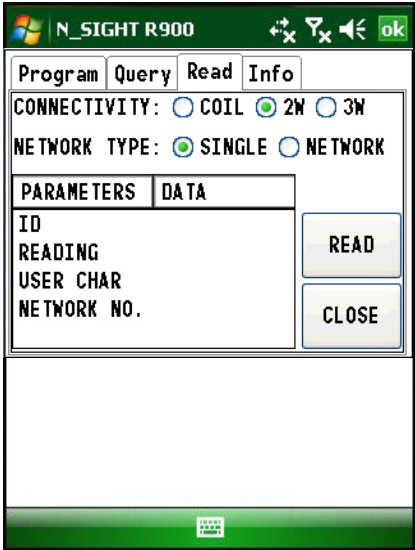


Figure 9.13 ProRead Read Screen

- 3 Select Network Type.
- 4 Select the **Connectivity**.
  - Align the mouse with the register. Touch or click **Coil** to collect a reading.
  - Select **2W** to use without receptacle.
  - Select **3W** for programmed registers.

- 5 Touch or click **READ** to collect the reading. See Figure 9.14.

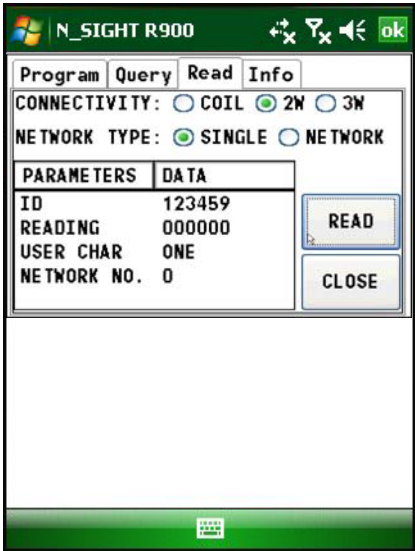



Figure 9.14 ProRead Reading Result Screen





If an error message appears during a read attempt, it is most likely due to improper format information.

- 6 Repeat steps 1 through 5 to read another register, or choose one of the following.
  - Touch or click **Program** to program the register.
  - Touch or click **Query** to query the register.
  - Touch or click  to return to the main screen.

## Viewing Software and Firmware Information

It is important to know which version of the Field Programmer software you are using when you contact Neptune Customer Support. To identify the version of Field Programmer software or the firmware version of the Field Programmer mouse you are using, complete the following steps.

- 1 Select **Program Pro-Read** from the **Field Programmer** menu.
- 2 Select the **Info** tab.

The software and firmware information appears. See Figure 9.15.

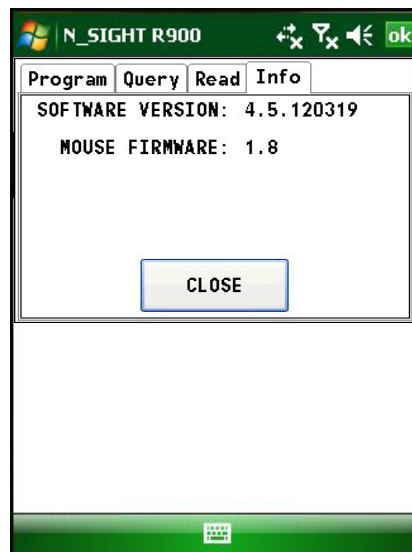


Figure 9.15 ProRead Software and Firmware Information

- 3 Touch or click  to return to the Field Programmer Menu.



## Programming the R900G Endpoint

You need to configure the gas functionality in the Field Programmer software after the installation.

### Configuring Gas

To program the R900G endpoint, use Neptune's N\_SIGHT R900 and complete the following steps.

- 1 Select **Configure Gas** from the **Field Programmer** Menu. See "Starting Field Programmer," on page 9-4.
- 2 When prompted, enter your password. See Figure 9.4 on page 9-5.  
  
The Gas Preferences screen appears as illustrated in Figure 9.16.

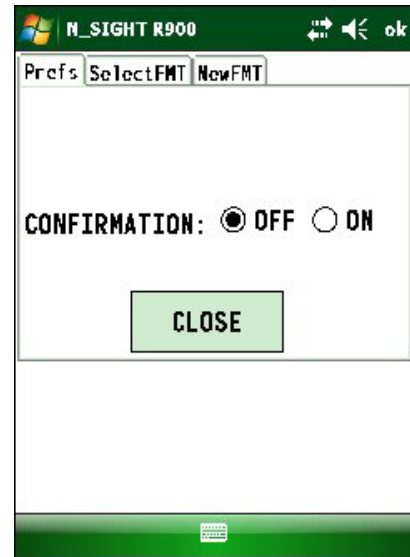



Figure 9.16 Gas Meter Configuration Screen

- 3 Select one of the following for receiving a confirmation.
  - **OFF** – to turn off some confirmation dialogs for actions.
  - **ON** – to allow all confirmation dialogs for actions.
- 4 Touch  to return to the Field Programmer Menu.



# Collecting the Initial Reading

To use the Field Programmer for R900G endpoints, complete the following steps.

- 1 Select **Program Gas** from the **Field Programmer** Menu.

The Program Gas screen appears as illustrated in Figure 9.17.

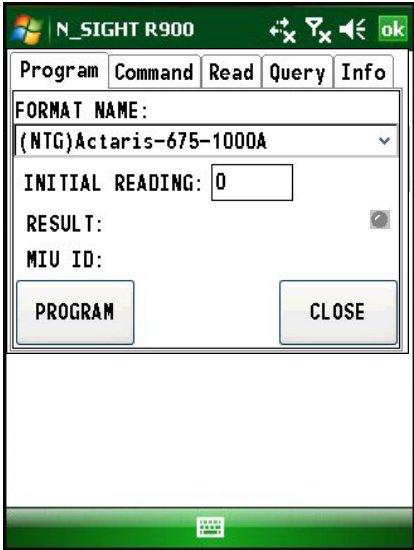



Figure 9.17 Gas Program Screen

- 2 Touch  for **Format Name**.

A selection list similar to Figure 9.18 appears.

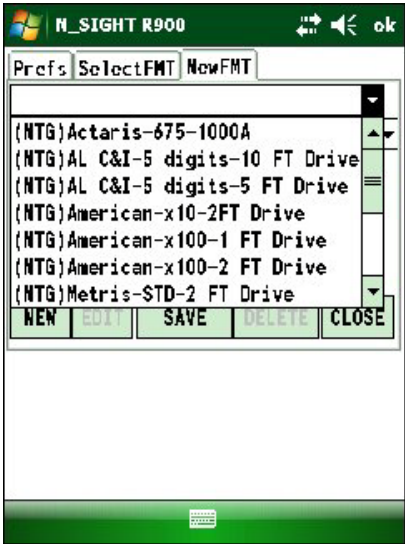



Figure 9.18 Format Name Selection List



- 3 Touch or click the format you want and press **Enter**.
- 4 For **Initial Reading**, type a value.
- 5 Align the IR LED to Gas Programming post, and do one of the following to program gas:
  - Press the program button on the mouse.
  - Press **Enter**.
  - Touch or click  .  
(This button can only be used for programming; it cannot be used for Read or Query.)

The Program Result area of the screen displays that it is Confirming Data, and a progress bar at the bottom of the screen shows you the progress. See Figure 9.19.

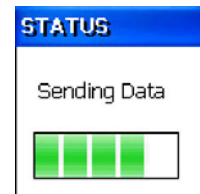


Figure 9.19 Program Result – Sending Data

An audible tone signals the **Program Result**.

- PASS
- FAIL

The MIU ID displays the ID or serial number of the MIU. See Figure 9.20.

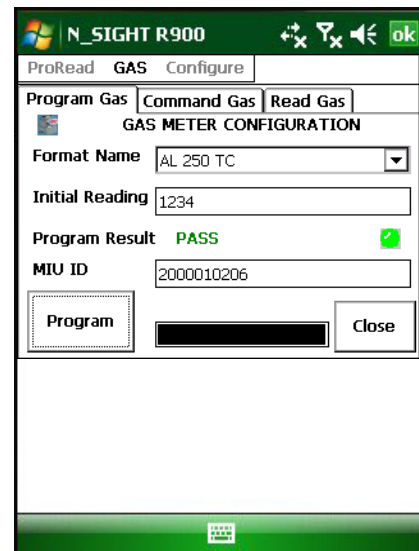
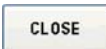


Figure 9.20 Program Result – Pass Screen



- 6 You can program another gas register by repeating steps 1 through 5, or touch  to return to the main screen.

## Querying the R900G Endpoint

Use the query function to check the current configuration of the R900G. Perform a query after you program the endpoint, or anytime you want to verify that the correct parameters are programmed in the unit.

To query an R900G endpoint, place the mouse on the R900G endpoint and complete the following steps.

- 1 Select **Program Gas** from the **Field Programmer** Menu.
- 2 Select the **Query** tab.  
The Gas Query screen appears. See Figure 9.21.



Figure 9.21 Gas Query Screen





- 3 Touch  .
- The query results appear similar to that of Figure 9.22.



Figure 9.22 Gas Query Results

- The query results should confirm that the R900G endpoint is programmed correctly.
- 4 Repeat steps 1 through 3 to query another endpoint or choose one of the following:
- Touch or click **Read** to take a reading.
  - Touch or click **Program** to program the register.
  - Touch or click **Command** to do the following:
    - Place the R900G endpoint in **Sleep** mode.
    - **Refresh** the data for the R900G endpoint.
    - **Wake up** the R900G endpoint from sleep mode.
- 5 Touch or click  to close the Gas Query tab return to the main screen.



---

## Using Command Gas

The Command Gas tab allows you to perform the following functions at any time you are using the Field Programmer for gas functionality.

- **Refresh** the data for the R900G endpoint.
- Place the R900G endpoint in **Sleep** mode.
- **Wake up** the R900G endpoint from sleep mode.
- **Close** the Program Gas screen and return to the start screen.



In order to perform these commands, align the mouse with the unit.

To use Command Gas, complete the following instructions.

- 1 Start the Neptune Field Programmer software; refer to “Starting Field Programmer,” on page 9-4.
- 2 Select **Program Gas** from the **Field Programmer** Menu.
- 3 Select **Command**.

The Command Gas screen appears as illustrated in Figure 9.23.

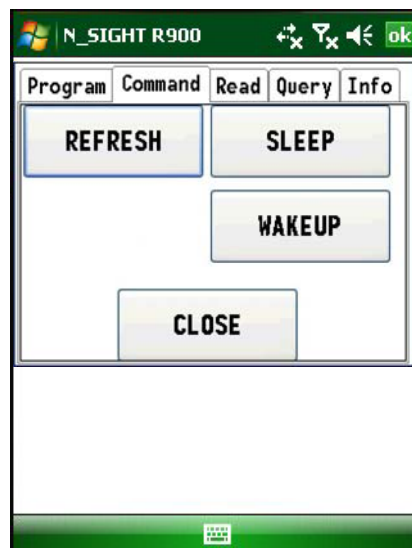


Figure 9.23 Command Gas Screen



## 4 Do one of the following:

- Touch or click **Refresh** to force the R900G to transmit the most current reading.
- Touch or click **Sleep** to place the R900G endpoint in sleep mode to be used for shipping.
- Touch or click **Wakeup** to activate the R900G endpoint from sleep mode.
- Click **Close** to exit the Program Gas screen and return to the start screen.



Any time you are using the Field Programmer gas program, you can use the functions on the Command Gas screen.

## Reading the R900G Endpoint Register

The Field Programmer is designed to be used as a programming and troubleshooting tool rather than a reading device. However, the Field Programmer is capable of collecting readings.

To read a gas register, complete the following steps.

- 1 Select **GAS** from the Neptune Programmer System start screen.
- 2 Select the **Read Gas** tab.

The Gas Read screen appears. See Figure 9.24.

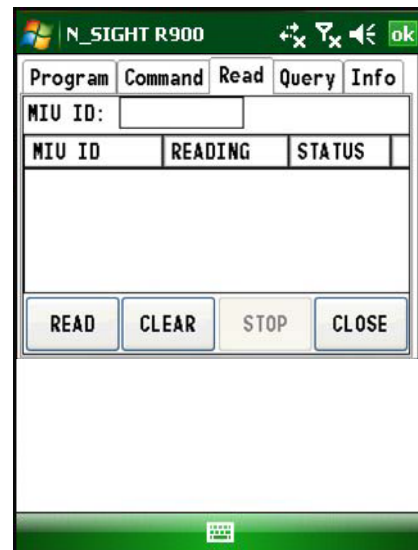


Figure 9.24 Gas Read Screen



- 3 Enter the **MIU ID** to read a specific unit.

Leaving the MIU ID blank allows you to receive all readings in a range.

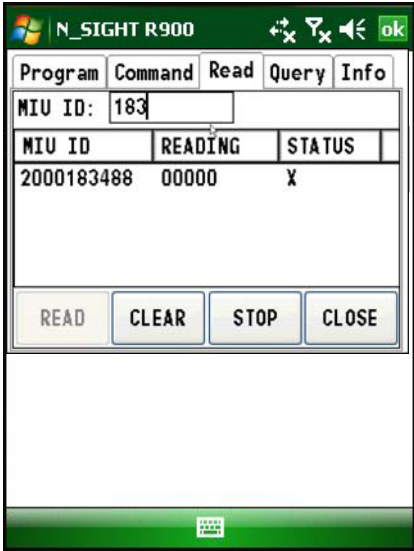



Figure 9.25 Gas Reading Result Screen

- 4 Touch or click  on the Field Programmer to collect a reading.



If an error message appears during a read attempt, it is most likely due to improper format information.

- 5 Press **Clear** to clear the reading and repeat steps 1 through 4 to read another MIU.

Viewing Software and Firmware Information

It is important to know which version of the Field Programmer software you are using when you contact Neptune Customer Support. To identify the version of Field Programmer software or the firmware version of the Field Programmer mouse you are using, complete the following steps.



- 1 Select **Program Gas** from the **Field Programmer** menu.
- 2 Select the **Info** tab.  
  
The software and firmware information appears. See Figure 9.26.

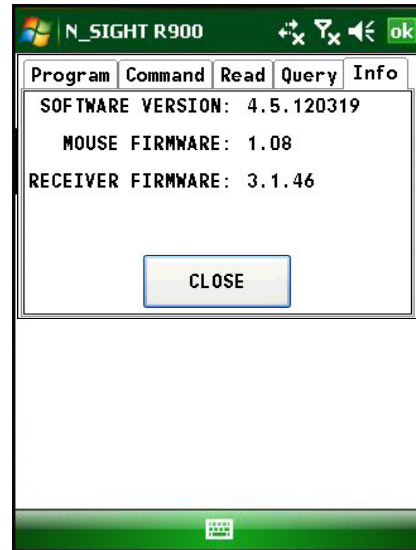


Figure 9.26 Gas Software and Firmware Information

- 3 Touch or click  to return to the Field Programmer menu.

## Networking Two Registers

The term *Networking* is used to refer to the process of connecting multiple registers to a single receptacle.



You cannot program ProRead registers while connected together in a network. You must program each register separately prior to making the network connections.

## Programming Registers

To network two registers, you must first program a *primary* register and a *secondary* register.

### Programming the Network Primary Register

To program the network primary register, complete the following steps.

- 1 Select the appropriate High Side programming format, such as,



STD 8ID HIGH

- 2 Enter the following information.
  - Dial Code
  - User Characters
  - ID Number
- 3 When you have properly entered all information, press **PROG** to program the primary register.

### Programming the Network Secondary Register

To program the network secondary register, complete the following steps.

- 1 Select the appropriate Low Side programming format such as:

STD 8ID LOW
- 2 Enter the following information.
  - Dial Code
  - User Characters
  - ID Number
- 3 When you have properly entered all information, press **PROG** to program the secondary register.
- 4 Repeat for any additional secondary registers.

## Network Wiring

After you properly program the registers for networking, they can then be connected to the receptacle. Be sure to use weatherproof crimp connectors for all wiring splices in order to prevent corrosion and other moisture-related problems. Also, observe proper polarity when wiring the registers, so that you interconnect all red terminals and interconnect all black terminals.



## Wiring the Registers

Refer to the following Neptune guides for complete instructions on wiring the registers.

- *E-Coder Quick Install Guide*, Part Number 12563-001
- *Encoder Quick Install Guide*, Part Number 12572-001

---

## Managing Formats

The Neptune Field Programmer allows you to manage formats for programming ProRead registers and R900G endpoints.

### Managing Formats for ProRead Registers

When you program a ProRead register, you can work with the format you need. You can do the following:

- Set your preferences for the programming process.
- Select formats from the list of available formats supplied by Neptune.
- Edit or create a new format that is added to the list of available formats.



## Selecting ProRead Preferences

To select preferences for programming a ProRead register, complete the following steps.

- 1 On the **Field Programmer** Menu, touch or click **Configure ProRead**. See Figure 9.27.

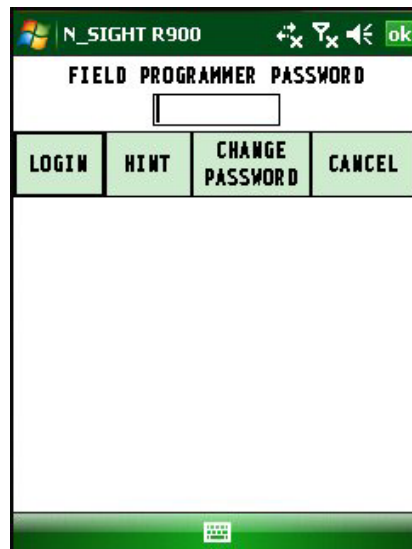


Figure 9.27 Field Programmer Menu

- 2 When the Field Programmer Password screen appears, type your password and do one of the following.
  - Touch **LOGIN**.
  - Click **ok**.
  - Press **Enter**.



If you cannot remember your password, you can touch or click **Hint** to display a clue.

On this screen, you can also change your password as described in “Changing Your Password,” on page 9-6 or you can cancel logging in to the system.



After entering your password, the **Preferences** screen appears as illustrated in Figure 9.28.

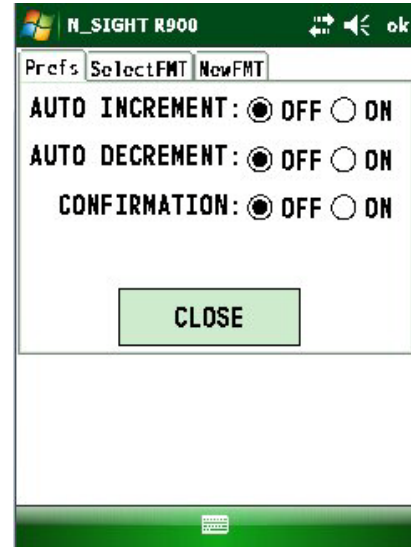


Figure 9.28 ProRead Preferences Screen

On this screen, select one for each of the following.

|                       |   |
|-----------------------|---|
| <b>Auto Increment</b> | Allows the system to automatically increment the ID numbering by one digit. |
| <b>Auto Decrement</b> | Allows the system to automatically decrement the ID numbering by one digit. |
| <b>Confirmation</b>   | Allows additional dialog to confirm the action to be performed.             |

3 Do one of the following.

- Touch or click **SelectFMT** to select a format that is already available for the Field Programmer.
- Touch or click **NewFMT** to create a new format and add it to the list of available formats.
- Touch or click **Close** to close the ProRead configuration and return to the previous screen.



## Selecting a ProRead Format

Selecting formats allows you to see a list of only the formats used by your utility. This eliminates unused formats which makes it easier to select formats and reduce errors.

To select the formats for programming a ProRead register, complete the following steps.

- 1 Touch or click **SelectFMT** to view the available formats used for programming ProRead registers. See Figure 9.29.

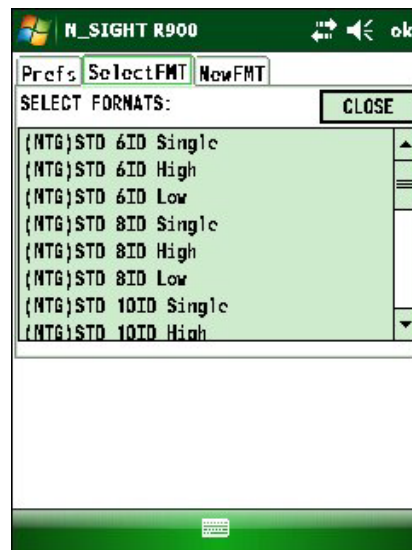


Figure 9.29 Select Formats Screen



Most user-created formats are simple modifications to the Neptune standard formats.



## Editing a ProRead Format

To make changes to an existing format, complete the following steps.

- 1 On the **Field Programmer** Menu, touch or click **Configure Pro-Read**.
- 2 Select **NewFMT**.

The New Format screen appears as illustrated in Figure 9.30.

Figure 9.30 ProRead New Format Screen

The following information appears.

- **Available Formats** display at the top of the screen (both standard and custom).
- **User Selected** shows the formats already selected.

- 3 On this screen, do any the following:

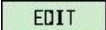

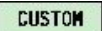

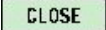
|        |   |
|--------|---|
| Add    | Allows you to select from the <b>Available Formats</b> , and touch or click Add to place it in the <b>User Selected</b> list. |
| Remove | Allows you to select a format from the <b>User Selected</b> list and touch or click Remove to remove it.                      |





Although you can remove a format from the User Selected list, it remains in the Available Formats list.

|        |  |
|--------|--|
| Close  | Allows you to close the ProRead Configuration and return to the previous screen. |
| NewFMT | Allows you to edit or create a ProRead Format.                                   |

- 4 Touch .
- 5 Touch or click  to select the format to edit from the list of available formats in **Format Name**.
- 6 Make any necessary changes on this screen, if applicable.
  - Touch  to make changes to Stop Bits, Clock Divisor, or Tokens. See “Creating a New ProRead Format,” on page 9-32. (These changes are rarely needed.)
  - From the Custom screen, touch  twice to return to the NewFMT screen.
- 7 Touch  to save the changes for the new format created.  
 A confirmation dialog appears asking you if you want to save the changes to the present format.
- 8 Touch or click **Yes** to save the format or **No** to cancel.
- 9 If you selected a standard format and made changes to it, you must save it as a new format. Touch **Save As**.  
 A dialog appears asking you to enter a different name for the format.
- 10 Touch **Close**, and then type the name of the new format in **Format Name**.



## Using the New ProRead Format

To use the newly created format to program ProRead registers, complete the following steps.



- 1 Select the **SelectFMT** tab.
- 2 Complete the steps outlined in “Selecting a ProRead Format,” on page 9-28.
- 3 Refer to “Programming the ProRead,” on page 9-6 to program, query, or read the ProRead register using the newly created format.

## Deleting a Format for ProRead Registers

To delete a user-defined format used for programming ProRead registers, complete the following steps.

- 1 Log in to the Field Programmer by completing steps 1 through 3 in “Selecting ProRead Preferences,” beginning on page B-26.
- 2 Select **NewFMT**.

The New Format screen appears as illustrated in Figure 9.30 on page 9-29.

- 3 Touch  since the NewFMT screen now defaults to **New**, then shift the numbers to compensate.
- 4 Touch or click  to delete the format from the list of available formats.

A confirmation dialog similar to the following appears asking if you are sure you want to delete this file format.

- 5 Touch or click **Yes** to save the format or **No** to cancel.

The format is no longer available for selection on the Field Programmer.



You cannot delete a standard format from the list of available formats.



## Creating a New ProRead Format



There are very few cases where a new format is required. Creating a new format requires detailed knowledge of the ProRead register and Neptune data collectors. You should first see if you can edit an existing format before creating a new format from scratch.

To create a new format and have it appear in the Available Formats list, complete the following steps.



- 1 On the **Field Programmer** Menu, touch or click **Configure Pro-Read**.
- 2 Select **NewFMT**.

The New Format screen appears as illustrated in Figure 9.31.

Figure 9.31 Default ProRead New Format Screen

- 3 Touch **EDIT** since the NewFMT screen now defaults to it.



- 4 Touch  to select the format to edit from the list of available in **Format Name**.
- 5 Touch . See Figure 9.32.

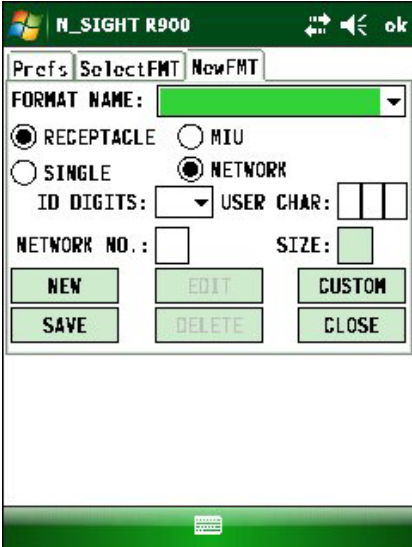



Figure 9.32 New Button Available




Touch  to view a format from the list of available formats. The screen then displays all the values associated with that format. You can select to copy this format by clicking or touching **Edit**. To save the copied format as a new format, touch or click **Save As** and give the format a new name.

- 6 Type a name that identifies the type of format you are creating in **Format Name**. See “Editing a ProRead Format,” on page 9-29. Select one of the following:
  - Receptacle
  - MIU
- 7 Select one of the following:
  - Single
  - Network





If **Network** is selected, you can enter the **Network No.** and **Size**. If the network number is less than 99, the network size defaults to 0 and cannot be edited. You can only configure the network size when the network number is 99.

- 8 Touch  to select from the list of available values of 1 to 10 for **ID Digits**.
- 9 Type three alphanumeric characters for **User Char.**
- 10 Type the number for the **Network No.**
- 11 Enter the size, if applicable.
- 12 On the **NewFMT** screen, select **CUSTOM**.

The **Cus\_FMT1** screen appears as illustrated in Figure 9.33.

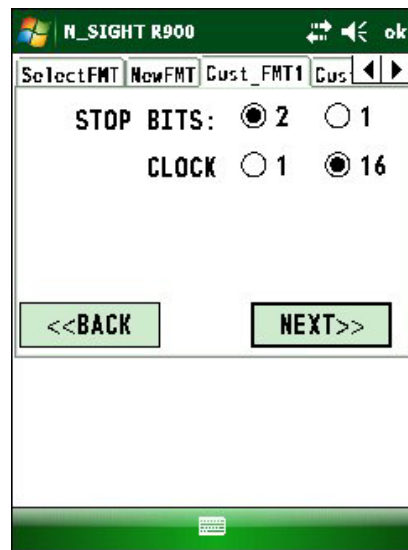


Figure 9.33 Custom Format 1 Screen

## Using the Custom Format Screens

Complete the following steps to use the custom format screens.



- 1 Select **2** or **1** for **Stop Bits**.
- 2 Select **1** or **16** for **Clock Divisor**.
- 3 Touch **NEXT>>** or the **Cus\_FMT2** tab.

The Cus\_FMT2 screen appears as illustrated in Figure 9.34.

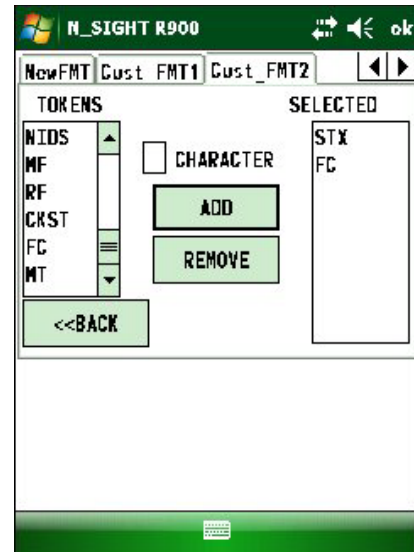


Figure 9.34 Custom Format 2 Screen

- 4 Type an alphanumeric character in **Character**, if applicable.
- 5 From the selection list of **Tokens**, touch the token you want to add to the custom format.



For a list of tokens and their explanations, refer to Appendix B, "Tokens List for Custom Format Screen" on page B-1.

- 6 Touch **ADD**.

The token you selected now appears in the **User Selected** list.

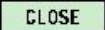
- 7 Repeat steps 5 and 6 to add more characters and tokens.
- 8 If there is a character or token in the User Selected list that you no longer need, touch **REMOVE**.

The item is removed from the User Selected list.

- 9 Touch **<<BACK** twice to return to the NewFMT screen.



## Saving the Custom ProRead Format

- 1 Touch or click  to save the changes to the new format created.

A confirmation dialog appears asking you to confirm the changes to the present format.

- 2 Click **Yes** to save the format, or **No** to cancel.

## Creating Formats for R900G Endpoints

When you program an R900G endpoint, you have the flexibility to work with the format you need by doing the following:

- Set your preferences for the type of endpoint you will be programming.
- Select a format from the list of available formats supplied by Neptune.
- Create a new format that is added to the list of available formats.

To select preferences for programming an R900G endpoint, complete the following steps.



## Configuring Gas

To select preferences for programming a gas endpoint, complete the following steps.

- 1 On the **Field Programmer** Menu, touch or click **Configure Gas**. See Figure 9.3 on page 9-4.

The Field Programmer Password screen appears as shown in Figure 9.35.

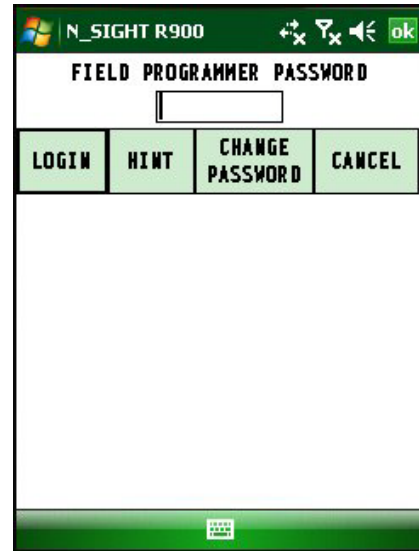


Figure 9.35 Configure Gas Password Screen

- 2 On the **Field Programmer Password** screen, type your password and do one of the following:
  - Touch **LOGIN**.
  - Click **ok**.
  - Press **Enter**.



If you cannot remember your password, you can touch or click **Hint** to display a clue.

On this screen, you can also change your password as described in “Changing Your Password,” on page 9-6 or you can cancel logging in to the system

After entering your password, the **Preferences** screen appears as illustrated in Figure 9.28.

- 3 Select your preferences as described in “Configuring Gas,” on page 9-15.



4 Do one of the following:

- Touch **Close** to close the gas configuration screen and return to the previous screen.
- Touch **SelectFMT** to select a format that is already available for the Field Programmer.
- Touch **NewFMT** to create a new format and add it to the list of available formats.

## Selecting a Gas Format

This feature allows an administrator to select formats that will be available to field personnel for programming, as described in “Programming the R900G Endpoint,” on page 9-15.

To select a format for programming an R900G endpoint, complete the following steps.

1 Select **Configure Gas** from the **Field Programmer** Menu. See “Starting Field Programmer,” on page 7-4.

2 When prompted, type your password and press **Enter**. See Figure 9.35.

The Gas Preferences screen appears as illustrated in Figure 7.15.


3 Touch **NewFMT**.

The New Format screen appears as illustrated in Figure 9.36.

Figure 9.36 Gas New Format Screen

4 Touch **EDIT**.



- 5 Touch  to select a format from the list of available formats in **Format Name**.



The formats preceded by (NTG) are standard ProRead formats from Neptune. The formats without (NTG) are custom formats defined by the user.

The following information appears:

- **Available Formats** display at the top of the screen.
- **User Selected** shows the formats already selected.

- 6 On this screen, do any the following by selecting the corresponding button or tab.

|        |  |
|--------|--|
| Add    | Allows you to select from the <b>Available Formats</b> , and touch or click <b>Add</b> to place it in the <b>User Selected</b> list.               |
| Remove | Allows you to select a format from the <b>User Selected</b> list and touch or click <b>Remove</b> to remove it from the <b>User Selected</b> list. |



Although you can remove a format from the User Selected list, it remains in the Available Formats list.

|        |   |
|--------|---|
| Close  | Allows you to close the Gas Configuration screen and return to the previous screen. |
| NewFMT | Allows you to add a new format for Gas Configuration.                               |



## Adding or Editing a Gas Format



To add a new format and have it appear in the Available Formats list, you can either edit an existing format or add a new format.

### Editing an Existing Gas Format

To edit an existing gas format, complete the following steps.

- 1 Touch **NewFMT**.

The New Format screen appears as illustrated in Figure 9.36 on page 9-38.

- 2 Touch .
- 3 Touch  in **Format Name** to select a format from the available gas formats.

A selection list similar to Figure 9.37 appears.



Figure 9.37 Gas New Format Selection List


- 4 Select the format you want from the available gas formats.




After you select a format, all the values associated with it appear as shown in Figure 9.38.

You can then make any necessary changes.

Figure 9.38 Gas Values Shown on New Format Screen

- 5 Touch or click  in **MULTIPLIER** to select the correct value from 0.01 to 1000 to be use for the format.
- 6 Type a value for **INPUT** to enter the input rate. This is controlled by the index.
- 7 Type the 9-digit number for the Pressure Configuration Factor index in **PCF**.

Refer to the listing of PCF indexes, refer to “Pressure Configuration Factor Indexes,” in Appendix C. These are examples only. This list does not include every index a utility has in its system. If there are any questions about the correct pressure configuration factor, contact the meter manufacturer.

- 8 Touch  in **DispDigits** to select one of the following:
  - 4 = Initial Reading will be in range of 0000 - 9999
  - 5 = Initial Reading will be in range of 00000 - 99999
  - 6 = Initial Reading will be in range of 000000 - 999999
- 9 Type the actual meter reading in **Initial Reading**.



- 10 Select **AB** for clockwise rotation or **BA** for counter-clockwise rotation. Use the table on “Meter Input Drive Rotation,” on page 9-42.

**Table 9.1 Meter Input Drive Rotation**

| <b>Meter</b>                         |           | <b>Rotation</b> |
|--------------------------------------|-----------|-----------------|
| American 250-630                     | 12759-000 | BA              |
| Sensus R275 - #415                   | 12821-XXX | AB              |
| Actaris Metris, 250, 400A            | 12861-000 | AB              |
| American AL800 - AL5000              | 12882-000 | BA              |
| Sensus #750 - #10000                 | 12882-200 | AB              |
| Actaris 675A - 1000A                 | 12882-100 | BA              |
| Dresser AMR adapter kit for American |           | BA              |
| Instrument Drive - CW                |           | AB              |
| Instrument Drive CCW                 |           | BA              |

### Saving the Format

To save the format and add it to the list of available formats, complete the following steps.

- 1 Complete the steps for “Editing an Existing Gas Format,” on page 9-40.
- 2 Touch **SAVE AS**.  
  
A dialog appears asking you to enter a different name for the format.
- 3 Touch or click **Yes** to save the changes to the new format or **No** to cancel.



- 4 Type the name of the new format in **Format Name**.

If you selected a standard format, and made changes to it, you must type a new name for the format.

A dialog appears asking you to enter a different name for the format.

- 5 Touch or click **ok**, and type the name of the new format in **Format Name**.
- 6 Touch or click **CLOSE**.

The new format is saved to the list of available gas formats.

### Adding a New Gas Format

To add a new gas format, complete the following steps.

- 1 Select **Configure Gas** from the **Field Programmer** Menu. See Figure 9.3 on page 9-4.
- 2 When prompted, enter your password. See “Starting Field Programmer,” on page 9-4.
- 3 Touch **NewFMT**.

The New Format screen appears as illustrated in Figure 9.36 on page 9-38.

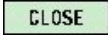
- 4 Touch **EDIT** since the NewFMT screen now defaults to **New** to select an existing format name. See Figure 9.37 on page 9-40.

- 5 Touch **NEW**.

The New Format screen appears with the fields and selections empty.

Figure 9.39 Gas New Format Screen – Blank



- 6 Type the name of the new format in **Format Name**.
- 7 Complete information for the following items, where applicable.
  - Multiplier
  - Input
  - PCF. See “Pressure Configuration Factor Indexes,” on page C-1. Contact the meter manufacturer if you have any questions.
  - DispDigits
  - Initial Reading
  - Rotation (see Table 7.2 on page 9-42.)
- 8 Touch .

A dialog appears asking you to enter a different name for the format.
- 9 Touch or click **Yes** to save the changes to the new format or **No** to cancel.
- 10 Type the name of the new format in **Format Name**.

## Using the Gas Format

To use the newly created gas format to program gas registers, complete the following steps.

- 1 Select **Configure Gas** from the **Field Programmer** Menu. See Figure 9.3 on page 9-4.
- 2 When prompted, enter your password. See “Starting Field Programmer,” on page 9-4.
- 3 Select the **SelectFMT** tab.
- 4 Complete the steps outlined in “Selecting a Gas Format,” on page 9-38.
- 5 Refer to “Programming the R900G Endpoint,” on page 9-15 to program or read the R900G endpoint using the newly created format.



## Deleting a Format for R900G Endpoints

To delete a gas format used for programming R900G endpoints, complete the following steps.


- 1 Select **Configure Gas** from the **Field Programmer** Menu. See Figure 9.3 on page 9-4.

- 2 When prompted, enter your password. See “Starting Field Programmer,” on page 9-4.

- 3 Select **NewFMT**.

The New Format screen appears as illustrated in Figure 9.37 on page 9-40.

- 4 Touch  since the NewFMT screen now defaults to **New**, then shift the numbers to compensate.

- 5 Touch  to delete the format from the list of available formats.

A confirmation dialog appears asking you to confirm the deletion.

- 6 Touch or click **Yes** to save the format or **No** to cancel.

The format is no longer available for selection on the Field Programmer.



You cannot delete a standard format from the list of available formats. You can only delete user-defined formats.



***Notes:***



## 10 Maintaining and Repairing the Neptune Handheld System

---

This chapter provides instructions for maintaining and repairing the Ranger, the Nomad, and the R900 Belt Clip Transceiver (R900 BCT), and includes recommended spare parts. This chapter also gives instructions for packing and shipping the Neptune handheld system to Neptune should you ever need to return any unit for repair.

---

### Recommended Maintenance

The Nomad and the Ranger require little maintenance. Only occasional cleaning of these handhelds or replacement of their batteries and handstrap are required. When carrying or shipping either handheld, follow the precautions given in this chapter.

---

### Maintaining the Nomad

#### Nomad Battery Life

The lithium ion battery life is dependent upon the usage and operating environment.

#### Tips for Extending the Battery Life

- **Keypad backlight:** The default is OFF. Using this backlight could reduce your battery life by up to 25%. **Display backlight:** Tap **Start** | **Settings** | **System** | **Backlight** to minimize the amount of time the backlight stays on, and dim it to only as bright as required to view the display.
- **WiFi, Bluetooth, camera, or barcode scanner:** If your unit comes with any of these options installed, use **ONLY** when necessary. Turn off when not needed. Minimize the flash intensity and the use of the flashlight.



- **Cold temperatures:** Keep the unit as warm as possible. If feasible, keep it inside your coat or a vehicle when not in use.
- **GPS:** Ensure that the GPS-aware applications that communicate with the GPS are closed when not in use.
- **Expansion ports:** Select low-power consumption CF and SD cards and use them only when necessary.
- **Auto features:** Tap **Start** | **Settings** | **System** | **Power** | **Advanced**. To conserve battery power, specify your unit to turn off in a short time if not in use.

Other factors that may have some impact on battery life include heavy usage of the Bluetooth radio and heavy processing by the CPU, but these factors are typically less significant.

## Charging the Nomad Battery

You can charge the battery in the unit or apart from the unit with an external battery charger (sold separately as an accessory). Connect the power adapter for your country to the power cord and attach to the power supply. Plug into an electrical outlet and plug the barrel end of the power supply into the unit. The unit will be charged in about 4.5 hours.

A full charge is indicated by the battery LED (right side of the unit) turning green. The recommended temperature range for charging is between +32°F and +113°F (0°C and +45°C). If the battery temperature is outside of this range, the battery will not charge.



Be sure to only use the power supply included with your unit. Use of other adapters may void the product warranty.



## Checking the Nomad Battery Status

To check the status of the battery, place the Nomad in a communication cradle. Then, check the battery indicator in the upper right portion of the unit, shown in Figure 10.1.



Figure 10.1 Battery Status Indicator on Nomad

## Replacing the Nomad Battery

The unit was designed to be able to replace the battery quickly without resetting it. The unit saves enough power (in Replace Battery mode) that if you swap the battery within approximately one minute, it will not trigger a reset.



If the saved power runs out before the new battery is installed, the unit will reset. This will not impact saved data, programs, or configuration; however, unsaved data will be lost and the time settings will need to be reset.

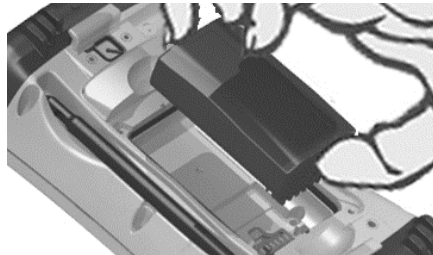


Figure 10.2 Changing the Nomad Battery



To replace a battery, perform the following steps.

- 1 Close open applications and save data in case the battery exchange takes too long.
- 2 Remove the handstrap from the unit.
- 3 Enter the **Replace Battery** mode.

This ensures that alarms will not wake up the unit while changing the battery.

- 4 Press and hold the Power key until you see the five-second prompt, then release. The menu appears and allows you to tap **Replace Battery**.
- 5 Use the supplied stylus or a small #1 Philips-head screwdriver to loosen the four screws in the battery door.
- 6 Remove the battery from the unit.
- 7 Quickly insert the replacement battery into the unit.
- 8 Place the battery door over the battery, with the flat side of the battery door at the top of the unit. Use the stylus or screwdriver to finger-tighten the four screws.
- 9 Replace the handstrap.
- 10 Power on the unit to resume operation.

## Calibrating the Nomad Battery



Neptune recommends calibrating the battery if the battery is deeply discharged, if it is replaced with a new battery, or once every three months.

The battery has an internal gauge that provides an estimate of the amount of energy in the battery as it charges and discharges. If your battery is showing inaccuracy in the power gauge or large jumps in capacity (such as the power is reading 50% and goes dead shortly thereafter), it may need calibration.



Tap **Start | Settings | System | Power | Calibration** to see if the message reads “Calibration recommended” or “Calibration not necessary.” If calibration is recommended or the battery is reporting inaccurately, perform the following steps.

1. Use the plug to connect the power supply, or place the handheld in the cradle.



The unit must remain connected to the power during the calibration or you may need to restart the process.

2. Ensure the temperature is between +32°F and +113°F (0°C and +45°C) while charging.
3. Tap **Start Calibration**.

During the calibration process, the Power key is disabled temporarily and the backlight is turned up to 100%.



It takes up to 24 hours to complete the calibration. When finished, a notification message states that the calibration is complete. Neptune recommends not using your unit during the calibration process.

4. To stop the calibration process, tap **Start | Settings | System | Power | Calibration | Stop Calibration**.

Refer to Table 9.1 for possible error messages that can occur during calibration.

**Table 9.1 Calibration Error Messages**

| Error Message                        | Part Solution  |
|--------------------------------------|--|
| Battery is not charging, aborting    | Battery temperature may be out of range. Wait until battery temperature settles and try again. |
| Discharge became invalid, restarting | Calibration will restart itself.   |



**Table 9.1 Calibration Error Messages**

|   |  |
|---|--|
| AC power is in an unknown or uncontrolled state; aborting | Plug in unit and restart calibration. Try a different power supply and restart calibration. If it continues to fail, have the unit serviced. |
|---|--|

**Nomad Notification LEDs**

At the top of the Nomad are two LEDs that provide status information. The LED states are shown in the following table.

**Table 9.2 Nomad Calibration Error Messages**

| Right LED       | Function  |
|-----------------|---|
| Off             | On battery power  |
| Solid yellow    | Charging on power supply  |
| Solid green     | Fully charged on power supply   |
| Blinking yellow | Battery problem during charging (temperature out of range, defective, or missing battery) |

| Left LED        | Function                       |
|-----------------|--------------------------------|
| Off             | No notifications and phone off |
| Blinking yellow | Microsoft notifications        |



If the left LED is blinking green, the battery power is being consumed due to the cellular modem being turned on, even when the device is suspended.



---

## Maintaining the Ranger

### Ranger Battery Life

The lithium ion battery life is dependent upon the usage and operating environment.

#### Tips for Extending the Ranger Battery Life

- **Keypad backlight:** The default is OFF. Using this backlight could reduce your battery life by up to 25%. **Display backlight:** Tap **Start** | **Settings** | **System** | **Backlight** to minimize the amount of time the backlight stays on, and dim it to only as bright as required to view the display.
- **WiFi, Bluetooth, camera, or barcode scanner:** If your unit comes with any of these options installed, use ONLY when necessary. Turn off when not needed. Minimize the flash intensity and the use of the flashlight.
- **Cold temperatures:** Keep the unit as warm as possible. If feasible, keep it inside your coat or a vehicle when not in use.
- **GPS:** Ensure that the GPS-aware applications that communicate with the GPS are closed when not in use.
- **Expansion ports:** Select low-power consumption CF and SD cards and use them only when necessary.
- **Auto features:** Tap **Start** | **Settings** | **System** | **Power** | **Advanced**. To conserve battery power, specify your unit to turn off in a short time if not in use.

Other factors that may have some impact on battery life include heavy usage of the Bluetooth radio and heavy processing by the CPU, but these factors are typically less significant.



## Charging the Ranger Battery



Fully charge the battery at least 4 hours after installing in the unit. The battery LED (left LED) turns green when fully charged.

You can charge the battery in the unit or apart from the unit with an external battery charger (sold separately as an accessory). Connect the power adapter for your country to the power cord and attach to the power supply. Plug into an electrical outlet and plug the barrel end of the power supply into the unit. The unit will be charged in about 4.5 hours.

A full charge is indicated by the battery LED (left side of the unit) turning green. The recommended temperature range for charging is between +32°F and +113°F (0°C and +45°C). If the battery temperature is outside of this range, the battery will not charge.



The power supply that ships with your unit has four international plugs that fit almost every electrical outlet in the world.

1. Connect the appropriate plug to the power cord and attach to the power supply.
2. Plug into an electrical outlet and plug the barrel end of the power supply into the unit.



Be sure to only use the power supply included with your unit. Use of other adapters may void the product warranty.



## Checking the Ranger Battery Status

To check the status of the battery, place the Ranger in a communication cradle. Then, check the battery indicator in the upper right portion of the unit, shown in Figure 10.1.

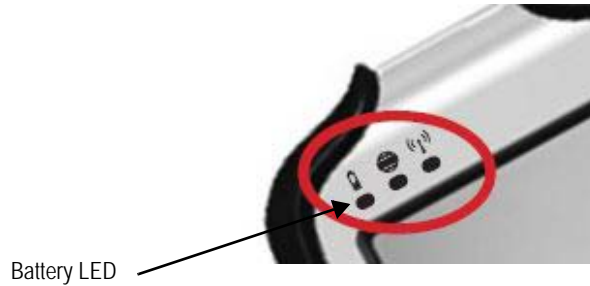



Figure 10.3 Battery Status Indicator on Ranger

Refer to Table 9.3 for a description of the battery LED indicators.

**Table 9.3 Ranger Battery LEDs**

| Icon   | LED Indicators  | Function  |
|--|-----------------|---|
|  | Solid yellow    | Charging on power supply  |
|  | Solid green     | Fully charged on power supply   |
|  | Blinking yellow | Battery problem during charging (temperature out of range, defective, or missing battery) |

## Replacing the Ranger Battery

The Ranger was designed to be able to change the battery quickly without resetting it. The unit saves enough power (in Replace Battery mode) that if you swap the battery within approximately one minute, it will not trigger a reset.



If the saved power runs out before the new battery is installed, the unit will reset. This will not impact saved data, programs, or configuration; however, unsaved data will be lost and the time settings may be reset.



To change a battery assembly, perform the following steps:

1. Close open applications and save data, in case the battery exchange takes too long.
2. Remove the handstrap from the unit.
3. Enter the **Replace Battery** mode (so alarms will not wake up the unit while changing the battery).
  - Hold down the Power key for about 3 seconds then release to display the power menu.
  - Tap Replace Battery/SIM. See page 33.
4. Turn the latch located above the battery counterclockwise.
5. Remove the battery from the unit.
6. Quickly insert the replacement battery onto the unit.



Figure 10.4 Changing the Ranger Battery

7. Turn the latch located above the battery clockwise.
8. Replace the handstrap.
9. Turn on the unit to resume operation.



## Ranger Battery Power


To manage the power settings for the Ranger, complete the following steps.

1. Tap | **Settings** | **Power** to see how much battery power remains.
2. Tap **Advanced** to turn the display off when not in use to conserve battery power.

## Ranger Notification LEDs

At the top of the Ranger are three LEDs that provide status information. The LED states are shown in the following table.

**Table 9.4 Ranger Notifications LED**

| Left LED - Battery  | Center LED - OS Status<br>(application dependent)  | Right LED - Bluetooth Status  |
|---|--|---|
| <i>Colors:</i> amber, green, red  | <i>Colors:</i> amber, green, red   | <i>Colors:</i> amber, blue, green   |
| <b>Green:</b> fully charged<br><b>Amber:</b> charging<br><b>Red:</b> battery error  | <b>Red:</b> battery error<br><b>WWAN Status:</b><br><b>Amber-blinking:</b> 2G connection<br><b>Green-blinking:</b> 3G connection | <b>Blue-blinking:</b> Bluetooth on<br><b>Amber-blinking:</b> WiFi on<br><b>Green-blinking:</b> LED flashes in a sequence if multiple features are on. |
|  | If OS status alarm and WWAN is on, the red blinks faster.  |   |



---

## Maintaining the R900 Belt Clip Transceiver

### Recommended Maintenance

To ensure a watertight seal, occasionally inspect the battery door gasket and bottom plug door to make sure they are free from dust and debris. These can be cleaned by wiping with a damp cloth. If any wear or tear is observed, please contact Neptune Customer Support for repair. Refer to “Contacting Customer Support,” on page 1-5.

### Battery Life

The lithium ion battery life is dependent upon the usage and operating environment. Under normal operating conditions, the battery should be replaced every two years.

### Tips for Extending the Battery Life

Neptune suggests the following tips for the lithium ion battery in your R900 BCT.

- **Room temperature:** Try to store the battery at room temperature at all times.
- **Cold temperatures:** Keep the unit as warm as possible. If feasible, keep it inside your coat or a vehicle when not in use.
- **Keeping a charge:** Try to maintain at least a 40% charge on the battery to extend battery life.

### Charging the Battery

You can charge the battery in the unit or apart from the unit with an external battery charger (sold separately as an accessory). Connect the power adapter for your country to the power cord and attach to the power supply. Plug into an electrical outlet and plug the barrel end of the power supply into the unit. The unit will be charged in about 4.5 hours.

You can charge the battery for the unit R900 BCT in one of two ways:

- Through the USB port
- Using the external battery charger, (sold separately as an accessory PN: 13148-001).



## Using the USB Port

To charge the battery using the USB port, complete the following steps.

- 1 Using the supplied USB cable, connect the R900 BCT to a USB wall or car charger.



The charger must be capable of supplying at least 500 mA to charge the battery while OFF, and 1A to charge the battery while running. For instructions on using the standalone charger, see the manual included with it.

- 2 Connect the power adapter for your country to the power cord and attach to the power supply.
- 3 Plug the power adapter into an electrical outlet.
- 4 Plug the micro USB into the R900 BCT.

The unit is charged in about eight hours.



Be sure to only use the power supply included with your unit. Use of other adapters may void the product warranty.

## Charging Considerations

Refer to the following table for charging considerations.

**Table 9.5 Charging Considerations**

| Consideration     | Description  |
|-------------------|--|
| Green LED         | Full charge  |
| Temperature range | Recommended between +32°F and +113°F (0°C and +45°C) |
| Outside range     | Battery will not charge                              |



## Using the Charger

The supported lithium ion battery charger is designed to charge the Neptune 3.7VDC 5000mAh Li-Ion battery P/N 13143-001. The following illustration shows the supported external battery charger, sold separately as an accessory PN: 13148-001.

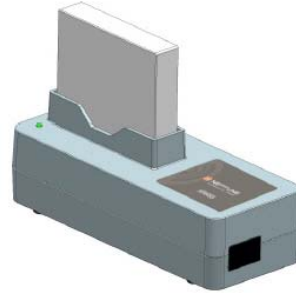


Figure 10.5 External Battery Charger



**Do not try to charge any other battery with this device.**

To charge the battery using the external battery charger, complete the following steps.

- 1 Place the charger on a flat and stable surface.
- 2 Connect the charger to an AC wall plug using the AC cable delivered together with the device.

The three colors of the LED flash for about one second each (red – yellow – green). After that, the LED sequence flashes, and the charger is ready for use.

- 3 Remove the charger from the wall plug if it will not be used for long period of time.



**If an error is identified, the LED turns red. Immediately remove the battery from the charger.**



## Replacing the R900 Belt Clip Transceiver Battery

The following section explains how to replace the battery for the R900 BCT.



Be sure the battery is free of dust and debris, and only replace the battery in a dry environment.

### Removing the Battery

To remove the battery from the R900 BCT, complete the following steps.

- 1 Hold the R900 BCT firmly with left side facing up. See Figure 10.6.



Figure 10.6 R900 Belt Clip Transceiver Side View

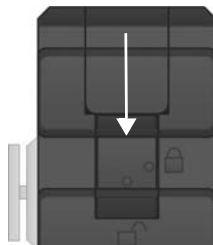


Figure 10.7 Latch Direction to Open

- 2 Push the lock latch down toward the unlock symbol. See Figure 10.7.
- 3 Once the latch is in place, push the latch button inward to open the battery compartment door.



- 4 Pull the door toward you to access the battery.
- 5 Hold the R900 BCT vertically, right side facing up, with one hand over the open compartment.

The battery is located on the right side. See Figure 10.8.

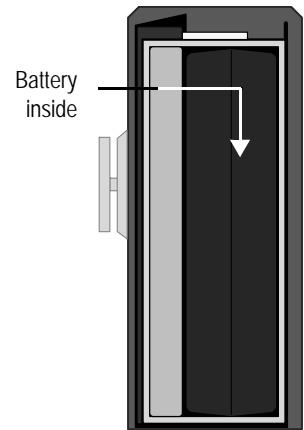


Figure 10.8 Battery Inside Compartment

- 6 Vigorously tap the top of the R900 BCT until the battery loosens for removal



The battery can be difficult to remove when fully charged.

## Replacing the Battery

To replace the battery in its compartment, complete the following steps.

- 1 Open the battery door of the R900 BCT. See Steps 1 through 4 of “Removing the Battery,” on page 10-15.
- 2 Have the front view of the R900 BCT facing up.
- 3 Hold the battery horizontally with the label facing down.



- 4 Insert the battery into the R900 BCT until the battery snaps in place.

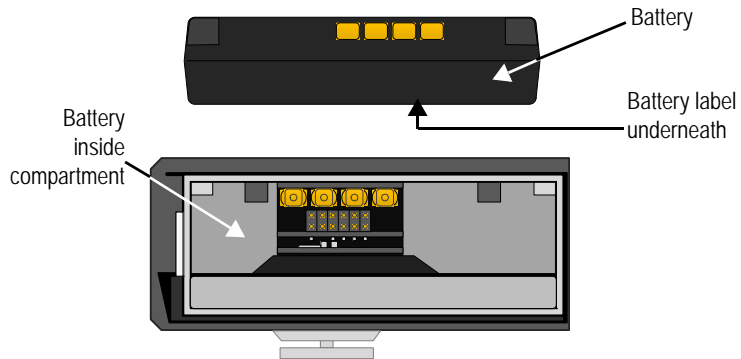


Figure 10.9 R900 Belt Clip Transceiver Battery Inside Compartment

- 5 Close the battery door, and lock it.



The battery should be replaced every two years.

## LED Status Indication

The battery charging starts immediately after inserting a battery pack into the charging cradle. The LED color indicates the status of the charger and charge process. The LED states are shown in the following table.

Table 9.6 LED Status Indicators

| LED                        | Indicates                                  |
|----------------------------|--|
| Red, yellow, green, or OFF | Startup initialization when applying power |
| OFF                        | No battery inserted                        |
| Yellow                     | Battery charging                           |
| Solid green                | Battery charged successfully               |
| Red                        | Error condition                            |



## Checking the Battery Status

The battery indicator is one of the four visible on the front of the R900 BCT. The battery percentage can also be seen on the status screen for the R900 BCT.

---

## Recommended Spare Parts

### Ordering Parts

To order new parts for one of the Neptune handheld system devices, refer to the following tables to find the part number that you need. Then, place an order for the parts by contacting your local Neptune Distributor. You may also contact Neptune Customer Service at (800) 645-1892. Business hours are Monday through Friday, 7:30 a.m. to 4:30 p.m. Central time.

### Ranger Spare Parts

Neptune recommends that you keep the following spare parts on hand for each Ranger that you have. Use Table 9.7 to find the part number of the item that you need.

**Table 9.7 Ranger Part Numbers**



| Description                         | Part Number |
|-------------------------------------|-------------|
| Lithium ion battery                 | 12249-047   |
| Spare hand straps<br>(package of 4) | 13245-008   |
| Spare shoulder strap                | 12249-014   |

### Nomad Spare Parts

Neptune recommends that you keep the following spare parts on hand for each Nomad that you have. Use Table 9.8 on Page 10-19 to find the part number of the item that you need.



**Table 9.8 Nomad Part Numbers**

| Description  | Part Number |
|--|-------------|
| Lithium ion battery<br>               | 13245-002   |
| Spare handstrap<br>(package of 4)<br> | 13245-008   |

To obtain a replacement stylus, Neptune recommends that you purchase one from a local electronics store. A Belkin model P45470 for the HP iPAQ 2200 fits into the stylus slot of the handheld.

### R900 Belt Clip Transceiver Spare Parts

Neptune recommends that you keep the following spare parts on hand for each R900 BCT that you have. Use Table 9.9 to find the part number of the item that you need.

**Table 9.9 R900 Belt Clip Transceiver Part Numbers**




| Description                    | Part Number |
|--------------------------------|-------------|
| R900 BCT spare battery charger | 13148-001   |
| R900 BCT replacement battery   | 13143-001   |



---

## Returning Your Neptune Handheld System

Use the following procedure to pack the Neptune handheld system so that it can be shipped without damage to Neptune.

- 1 Contact a Neptune Customer Support Specialist to confirm whether or not the handheld should be shipped. Contact Customer Support at (800) 647-4832 to request a Return Material Authorization (RMA) number. The RMA number must be legibly printed on the outside of the box.
- 2 Turn the handheld off by doing the following:
  - Pressing BLUE , **F1**  on the Ranger handheld
  - Pressing and holding the I/O  key on the Nomad handheld until the five-second message appears, then release. Now press power on the menu and then select **Yes** to confirm.



Use the original packing box that you received from Neptune. The handling involved in land and air transport often subjects the handheld to impact beyond that which occurs during normal use. The original packing box is designed to reduce the vibrations and shocks caused during shipping. If the handheld is not properly packaged, it can be damaged during shipping.

- 3 Repack the handheld in the original packing box that you received from Neptune, making certain to use plenty of packing material to absorb shocks and vibrations caused during shipping.
- 4 Send the package to the address of the repair facility as directed by Neptune.



## 11 Troubleshooting

---

Use the information in this chapter to solve any problems. If you still cannot solve the problem, contact a Neptune Customer Support Specialist. For help in contacting Neptune, refer to the topic “Contacting Customer Support,” on page 1-5.




---

### Troubleshooting the Handheld


This section contains questions and answers for troubleshooting the Neptune handheld system. It is in the format of questions that can arise if a problem occurs. Answers represent possible solutions to these problems.




## Basic Tasks for the Handheld

| Question   | Answer   |
|--|--|
| The display is empty and the handheld does not beep when I press a key.  | The handheld can be turned off. Press the I/O  key to turn the unit on.   |
| <i>When I press the I/O  key, the Nomad does not turn on.</i> | <p>The battery can be too low. Connect the handheld to its power. Then, check the color of the battery indicator on the handheld. The indicator turns red if the battery is low or not functioning.</p> <p>WARNING: On Battery ____ % (indicating a very low battery life remaining).</p> <p>If this message appears, place the handheld in the cradle, and allow it to remain until the indicator turns green, indicating that the battery is fully charged. Recharging the battery can take from three to six hours.</p> |
| The Nomad does not refresh when I place it in a communication cradle.  | <p>If the battery indicator is not red, make sure that the communication cradle is connected to a proper electrical outlet.</p> <p>Check that all cables are secure.</p>   |
| When trying to log in, I receive the error "DB Uninitialized."   | <p>Check that the Reader ID is set up in the N_SIGHT R900 host software.</p> <p>Reload the handheld.</p> <p>Press Synchronize to communicate with the DB.</p>  |
| The Nomad handheld locks and does not respond when I press keys.   | <p>Press .</p> <p>Reset the unit. For help with this task, refer to the procedure "Resetting the Handheld," on page 11-5.</p>   |



| Question  | Answer  |
|---|---|
| The display contrast is weak or the display background is very dark.                      | <p>Click  in the upper left corner.</p> <ul style="list-style-type: none"> <li>- Click <b>Settings</b>.</li> <li>- Click the <b>System</b> tab at the bottom of the screen.</li> <li>- Click <b>Backlight</b> at top center.</li> <li>- Click the <b>Brightness</b> tab at the bottom of the screen.</li> <li>- Adjust with the slider bar.</li> </ul> <p>The Nomad handheld has been exposed to temperatures outside the range of -30°C to +50°C (-22°F to 122°F). Short exposure to temperatures lower or higher than these can cause the display to turn very dark or very light until the unit returns to the recommended operating temperature.</p> |
| The Nomad does not turn off automatically or manually.                                    | <p>Check the screen timeout in the <b>Settings  System  Backlight</b>.</p> <ul style="list-style-type: none"> <li>- Select "<b>Turn off backlight if device is not used for.</b>"</li> <li>- Select a time from the drop down.</li> </ul> <p>The Nomad is in a communication cradle in which case the Nomad remains on until you remove it from the cradle and then turn it off.</p>  |
| When I try to communicate with the host computer, I receive the error "Last Sync Failed." | <p>Make sure that you have set up the communications peripheral you are using according to the directions provided in "Connecting to the Host Computer and Power Supply," on page 3-5 or "Connecting to the Host Computer and Power Supply," on page 3-4.</p>   |
| I am unable to load or unload data to or from the host computer.                          | <p>Check that all the cables are correctly attached and secure.</p> <p>At the Synchronize screen (N_SIGHT R900 Login screen), confirm that the server name is correct.</p>  |

## Reading Entry Tasks

| Question  | Answer   |
|---|--|
| When I try to tag an account, the tag indicator  does not appear on the display. | <p>If your display does not show the tag indicator after you tag an account, the tag option is not selected on the host computer. For help in selecting this option, the host operator should refer to the <i>N_SIGHT R900 Online HTML Help</i>.</p> |



## Communication Tasks

| Question   | Answer  |
|--|---|
| I cannot get routes to load or readings to unload. | <p>The problem can be hardware or software based. Try the following solutions.</p> <p><b>Hardware</b></p> <p>Make certain that your system is set up as described in Chapter 3.</p> <p>Check that cables and connectors are secure.</p> <p><b>Software</b></p> <p>Make certain that the software is set up as described in Chapter 3.</p> <p>Check with the operator of the host computer to make sure that the Communications Manager function or SQL Anywhere service is running.</p> <p>Check that routes are properly assigned.</p> |

## Starting the N\_SIGHT R900 Program

If you quit the N\_SIGHT R900 application program by clicking OK in the upper right corner of the screen, the handheld automatically returns to the N\_SIGHT R900 Login screen.

## Loading Data Initially

When your handheld arrives, it should contain the file to load N\_SIGHT R900. It also includes the necessary data files already in their proper locations that support the N\_SIGHT R900 executable.



These files do not include your route data that is downloaded from the host system during the communications process.

If any of these files are missing when you receive the handheld, or if any are subsequently erased, several scenarios are possible.



## Missing Route Files

If a complete system is loaded but there are no route data files present, the **DB Uninitialized** message appears when N\_SIGHT R900 is executed. Check the Reader ID in the N\_SIGHT R900 host software. Then, reload the handheld.

## Resetting the Handheld



Never reset the CE5320B without first checking with your supervisor. Under certain circumstances, resetting the CE5320B will cause you to lose data.

Follow these steps to reset the CE5320B.

- 1 From the N\_SIGHT R900 Login screen, touch **Menu** or press **M**. See Figure 11.1.

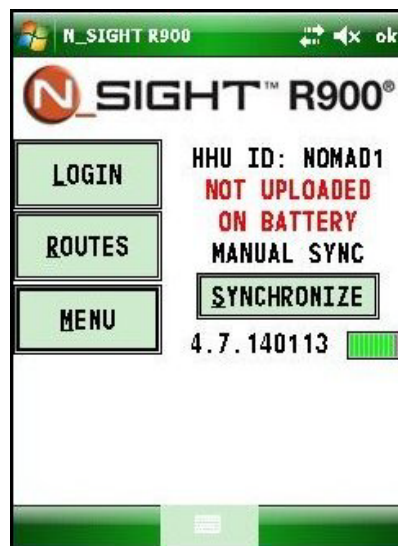



Figure 11.1 N\_SIGHT R900 Login Screen



The N\_SIGHT R900 Main Menu appears, as illustrated in Figure 11.2.

- 2 Touch ONE  for ADMIN.

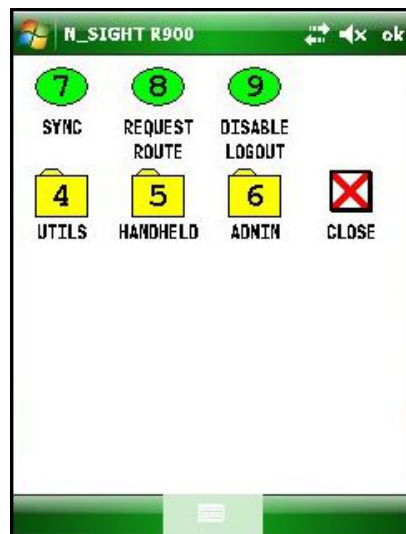



Figure 11.2 N\_SIGHT R900 Main Menu

The Handheld Menu appears as illustrated in Figure 11.3.

- 3 Touch FOUR  for RESET HANDHELD.

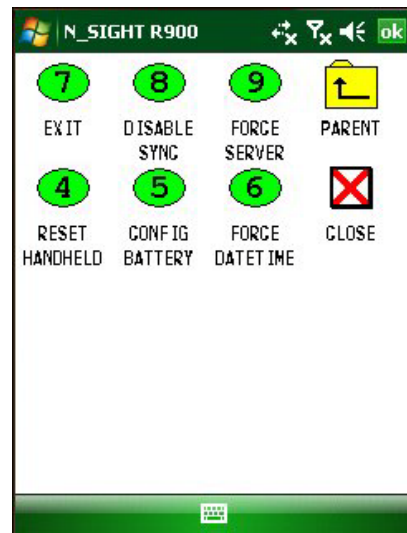


Figure 11.3 N\_SIGHT R900 Admin Menu



A warning message appears as illustrated in Figure 11.4.

- 4 Touch **YES** to proceed.

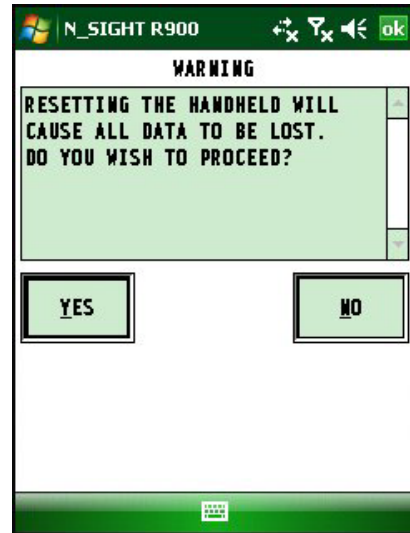


Figure 11.4 Reset Warning Message

- 5 Select **YES** to proceed.

This action clears all routes from the handheld.

## Rebooting the Handheld




Rebooting the handheld differs from resetting the handheld because it does not delete the routes from the handheld. Only resetting deletes routes from the handheld.


### Rebooting When Logged into a Route in N\_SIGHT R900

Follow these steps to reboot the handheld when logged on to N\_SIGHT R900.



- 1 Press .

The N\_SIGHT R900 Menu appears, as illustrated in Figure 11.5.

- 2 Touch SEVEN  for HANDHELD.

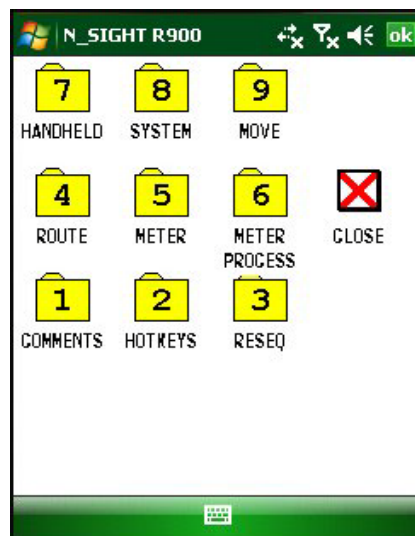



Figure 11.5 N\_SIGHT R900 Menu

The Handheld Menu appears, as illustrated in Figure 11.6.

- 3 Touch SEVEN  to REBOOT.

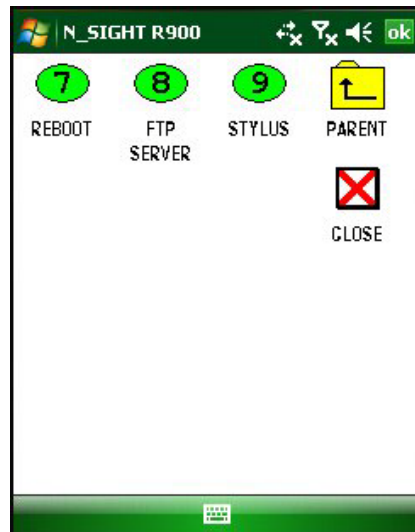


Figure 11.6 N\_SIGHT R900 Handheld Menu



A warning message appears as illustrated in Figure 11.7.

- 4 Touch **YES** to proceed.

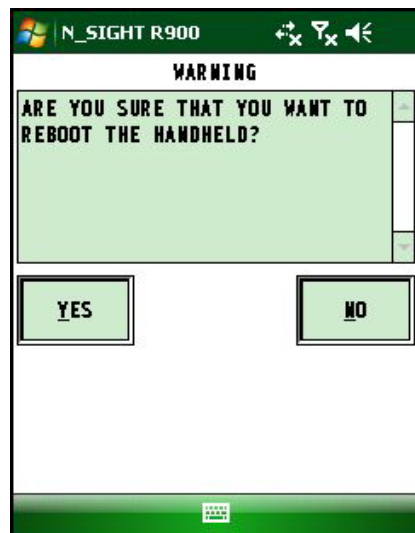




Figure 11.7 Reboot Handheld Screen

A beep sounds and the N\_SIGHT R900 Login screen appears as illustrated in Figure 11.1 on Page 11-5.

## Rebooting When Logged Off N\_SIGHT R900

Follow these steps to reboot the CE5320B when logged off N\_SIGHT R900.

- 1 From the N\_SIGHT R900 Login screen, touch **Menu** or press **M**. See Figure 11.1 on Page 11-5.
- 2 The N\_SIGHT R900 Main Menu appears as illustrated in Figure 11.2 on Page 11-6.
- 3 Touch SIX  for **HANDHELD**.
- 4 Touch FOUR  for **REBOOT**.

A beep sounds and the N\_SIGHT R900 Login screen appears as illustrated in Figure 11.1 on Page 11-5.



*Notes*



## Appendix A Changing Volume Settings

---

---

### Adjusting Customized Sounds

The volume of the handheld is actually controlled through N\_SIGHT host software and the handheld-specific settings. If you change the volume on the handheld, it reverts to the default setting the next time the unit synchronizes. The volume on the handheld is controlled by a scroll bar.

### Changing the Volume Settings



To adjust the volume control setting on the handheld, complete the following steps.

- 1 On any screen in N\_SIGHT R900, click the volume icon at the top of the screen. The following drop-down scrollbar appears. See Figure A.1 on page A-2.



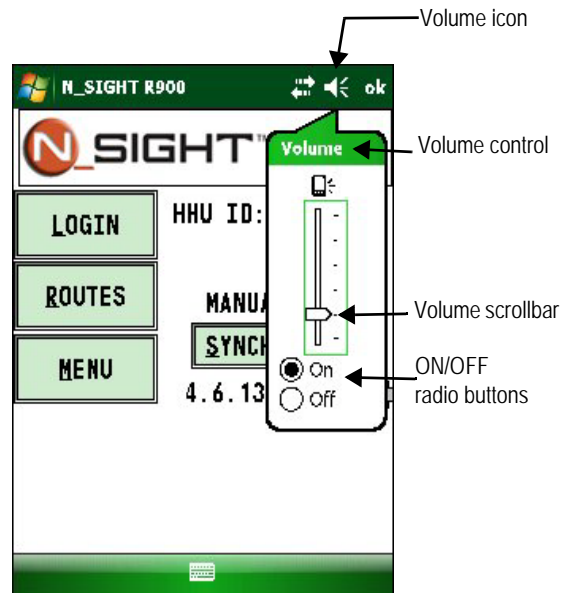


Figure A.1 Handheld Volume Control

- 2 Referring to Figure A.2, do one of the following.
  - Move the scrollbar up or down to adjust the level of sound.
  - Click one of the radio buttons to turn the sound on or off.

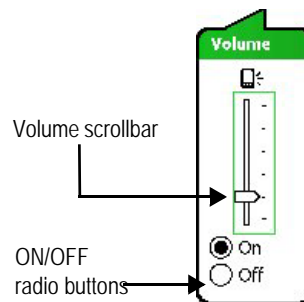


Figure A.2 Handheld Scrollbar and Radio Buttons

- 3 Click **OK**.



On this screen you are enabling the volume level of the key clicks and screen tabs to be loud or soft. To turn key clicks on or off in N\_SIGHT R900, for the Nomad, refer to "Turning Key Clicks On and Off," on page 3-28, or for the Ranger, "Turning Key Clicks On and Off," on page 4-25.



## Changing Sounds and Notifications



To change the types of sounds and notifications that you hear on the handheld, complete the following steps.

- 1 On the N\_SIGHT R900 Login screen, press **M** or touch **Menu**.

The N\_SIGHT R900 Main menu screen appears.

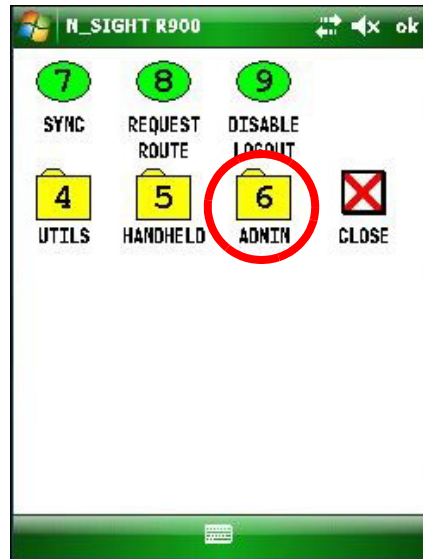


Figure A.1 N\_SIGHT R900 Main Menu

- 2 Select **6**, **Admin**.

The Admin menu appears as illustrated in Figure A.2.

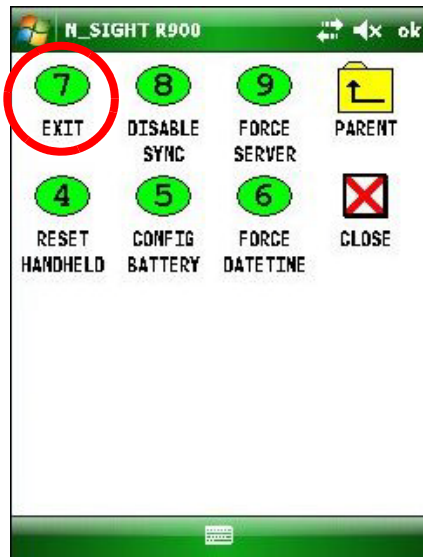


Figure A.2 N\_SIGHT R900 Admin Menu

- 3 Select **7**, **Exit**.



The Admin Password screen appears as illustrated in Figure A.3.

- 4 Type your **ADMINISTRATOR PASSWORD**, and click **OK**.



Figure A.3 Administrator Password Screen

The CE.Net Windows Screen appears as illustrated in Figure A.4.

- 5 Touch Windows **Start**.

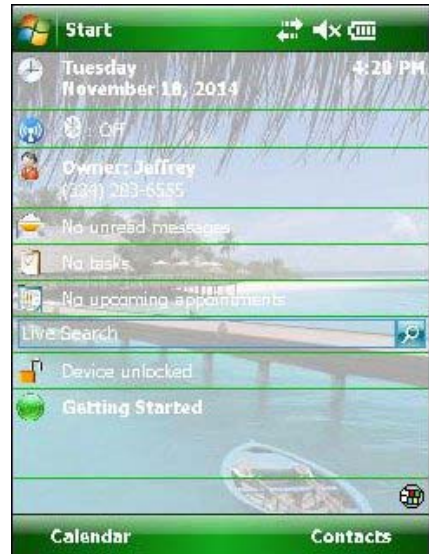


Figure A.4 CE.Net Windows Screen



The Windows Start menu appears as illustrated in Figure A.5.

- 6 Select **Settings**.



Figure A.5 Windows Start Menu

The Windows Settings menu appears as illustrated in Figure A.6.

- 7 Select **Sounds & Notifications**.

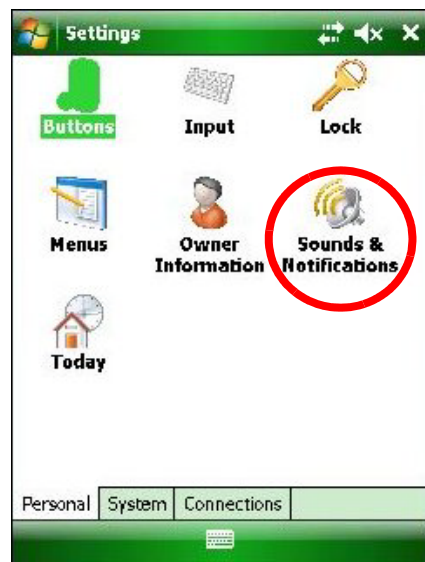


Figure A.6 Windows Settings Menu



## Enabling Sounds

Complete the following steps to enable specific sounds.

- 1 On the **Sounds & Notifications** screen, click whichever sound you want to enable. See Figure A.7 on page A-6.

- Events (warnings, system events)
- Programs
  - Notification (alarms, reminders)
- Screen taps
  - Soft
  - Loud
- Hardware buttons
  - Soft
  - Loud

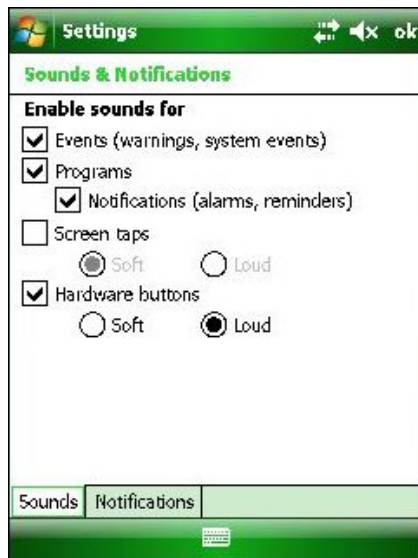


Figure A.7 Sounds & Notifications Screen

- 2 Do one of the following.
  - Click the **Notifications** tab to enable notifications on the handheld.
  - Click **OK**, if you do not want to enable notifications.

## Enabling Notifications

Complete the following steps to enable which notifications you want to receive.



1 On the **Sounds & Notifications** screen, click whichever sound you want to enable. See Figure A.8 on page A-7.

- Events (list of options)
- Play sound
  - Drop-down list of sounds
  - Repeat (if you want the notification repeated.)
- Display message on screen
- Flash light for
  - Drop-down list



Figure A.8 Notifications Tab



Not all options are available for all the events listed. If an option is not available, it is disabled.



- 2 Select the **Event** from the drop-down list. See Figure A.9.

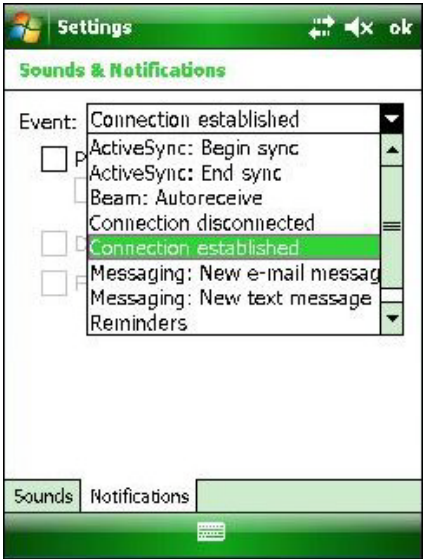


Figure A.9 Event Notification Options

- 3 Click **Play sound**, if you want to link a sound with your event selection. See Figure A.10.
- 4 Click the drop-down list to select a sound for the event.

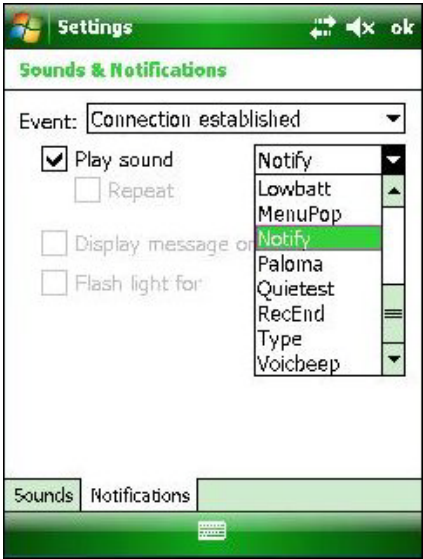




Figure A.10 Sound Selection Options






- 5 Do one of the following:
  - Click  to play a sound to be sure it is what you want for the event notification.
  - Click  to stop the sound.

- 6 Select additional notification settings for the selected event.

Figure A.10. illustrates the type of setting available for the Reminders event.



Figure A.11 Sample Reminder Notification

- 7 Continue adding sounds for more events, if applicable, by repeating steps 1 through 6.
- 8 Touch **OK**, when finished.  
The CE.Net Windows screen appears.
- 9 Touch , to return to the Windows menu.
- 10 Touch .
- 11 Touch  to start N\_SIGHT R900.



***Notes:***



## Appendix B Tokens List for Custom Format Screen

---

---

### Field Programmer Tokens

With the Field Programmer, tokens are constants and special characters used as part of a ProRead format to do the following:

- Indicate a constant value.
- Indicate where an inserted value, such as reading or check sum, goes.

The following table describes tokens used on the Custom Format screen.

**Table B.1 Custom Format Tokens**

| Token | Explanation   |
|-------|---|
| STX   | Starting character (0x02)   |
| ETB   | End of text block constant (0x17)   |
| CKS   | Check Sum (programming byte checksum after eliminating tokens)              |
| ETX   | End of programming frame  |
| MRT   | Meter reading token (0x7B)  |
| ID    | Register ID based on the selection of ID digits on NewFMT tab (1-10 digits) |



**Table B.1 Custom Format Tokens**

| Token               | Explanation   |
|---------------------|---|
| NULL                | Null (0x00)   |
| USR                 | USR User characters (USR1, USR2, USR3)  |
| CR                  | Carriage returns (0x0D)   |
| LF                  | Line Feed (0x0A)  |
| SP                  | Space Character (0x20)  |
| MID                 | Meter ID (0x4E ('N'))   |
| FT                  | Flow Token (0xA0)   |
| NIDS                | Network ID Size (Two nibbles of values 00 to 99 that provide network number)  |
| NN                  | Network Number (Net ID constant. Upper digit of network ID sent to reading equipment, Net ID constant. Lower digit of network ID sent to reading equipment. Primary register usually has size of network in these digits) |
| MR                  | Mode Flag   |
| RF                  | Read Flag (dial code)   |
| CKST                | Check sum token (0xFC)  |
| FC                  | Format Constant (0x31 '1'))   |
| MT                  | Meter type (0x57)   |
| Printable character | Any printable ASCII value can be entered in the character box and it can be added to the list   |



## Appendix C Pressure Configuration Factor Indexes

### Available Formats

The following table is used for selecting gas formats available from American Meter, Sensus, and Actaris when using the Field Programmer.

**Table C.1 Pressure Configuration Factor Index Table**

| Index Part Number  | Drive             | Gauge Pressure | Atmospheric Pressure | Base Pressure | Actual Gear Ratio | Pressure Compensation Factor |
|--|-------------------|----------------|----------------------|---------------|-------------------|------------------------------|
| <b>American Meter - AL/AR/AC/AM/AT 175/210/250/350/425/630</b> |                   |                |                      |               |                   | <b>R900G: 12750-000</b>      |
| 52180G066  | 1 ft <sup>3</sup> | 2 psig         | 14.40                | 14.73         | 900               | 1.111111                     |
| 28538G151  | 1 ft <sup>3</sup> | 2 psig         | 14.73                | 14.73         | 883.333333        | 1.132075                     |
| 52180G067  | 2 ft <sup>3</sup> | 2 psig         | 14.40                | 14.73         | 450               | 1.111111                     |
| 04972G116  | 2 ft <sup>3</sup> | 2 psig         | 14.73                | 14.91         | 443.055556        | 1.128527                     |
| 04972G122  | 2 ft <sup>3</sup> | 2 psig         | 14.40                | 14.65         | 445.454545        | 1.122449                     |
| 04972G118  | 2 ft <sup>3</sup> | 2 psig         | 14.73                | 14.73         | 442.000000        | 1.131222                     |
| 04972G124  | 2 ft <sup>3</sup> | 2 psig         | 14.55                | 14.73         | 443.055556        | 1.128527                     |
| 04972G120  | 2 ft <sup>3</sup> | 5 psig         | 14.40                | 14.73         | 381.944444        | 1.309091                     |
| 04972G117  | 2 ft <sup>3</sup> | 5 psig         | 14.73                | 14.91         | 376.125000        | 1.329345                     |
| 04972G119  | 2 ft <sup>3</sup> | 5 psig         | 14.73                | 14.73         | 374.305556        | 1.335807                     |
| 04972G127  | 2 ft <sup>3</sup> | 5 psig         | 14.40                | 14.65         | 376.125000        | 1.329345                     |
| 04972G121  | 2 ft <sup>3</sup> | 10 psig        | 14.40                | 14.73         | 303.333333        | 1.648352                     |
| <b>Sensus/Equimeter - R-275 / R-315:</b>                       |                   |                |                      |               |                   | <b>R900G: 12821-000</b>      |
| 001-63-537-48  | 2 ft <sup>3</sup> | 2 psig         | 14.40                | 14.73         | 445.867           | 1.121411                     |
| 001-63-537-41  | 2 ft <sup>3</sup> | 5 psig         | 14.40                | 14.73         | 379.911           | 1.316098                     |
| 001-63-537-49  | 2 ft <sup>3</sup> | 10 psig        | 14.40                | 14.73         | 300.781           | 1.662339                     |
| <b>Sensus/Equimeter - # 415:</b>                               |                   |                |                      |               |                   | <b>R900G: 12821-100</b>      |
| 001-41-537-48  | 2 ft <sup>3</sup> | 2 psig         | 14.40                | 14.73         | 445.867           | 1.121411                     |
| 001-41-537-41  | 2 ft <sup>3</sup> | 5 psig         | 14.40                | 14.73         | 379.911           | 1.316098                     |
| 001-41-537-49  | 2 ft <sup>3</sup> | 10 psig        | 14.40                | 14.73         | 300.781           | 1.662339                     |



| Index Part Number   | Drive             | Gauge Pressure | Atmospheric Pressure | Base Pressure | Actual Gear Ratio       | Pressure Compensation Factor |
|---|-------------------|----------------|----------------------|---------------|-------------------------|------------------------------|
| <b>Sensus/Equimeter - S-275:</b>                              |                   |                |                      |               | <b>R900G: 12821-200</b> |                              |
| Propane   | 1 ft <sup>3</sup> |                |                      |               | 36.3025                 | 2.7546296                    |
| <b>Sprague/Schlumberger/Actaris - 175/240/250/Metris/400A</b> |                   |                |                      |               | <b>R900G: 12861-000</b> |                              |
| 017289  | 2 ft <sup>3</sup> | 2 psig         |                      |               | 447.619050              | 1.1170213                    |
| 018207  | 2 ft <sup>3</sup> | 14" W.C        |                      |               | 491.666700              | 1.0169491                    |
| 017228  | 2 ft <sup>3</sup> | 5 psig         |                      |               | 375.000000              | 1.3333333                    |
| 017308  | 2 ft <sup>3</sup> | 2 psig         |                      |               | 447.916700              | 1.1162790                    |
| 135543  | 2 ft <sup>3</sup> | 2 psig         |                      |               | 447.619050              | 1.1170213                    |
| 017308  | 2 ft <sup>3</sup> | 2 psig         |                      |               | 447.916700              | 1.1162790                    |
| 037223  | 2 ft <sup>3</sup> | 10 psig        |                      |               | 293.333300              | 1.7045456                    |
| 037234  | 5 ft <sup>3</sup> | 2 psig         |                      |               | 178.800000              | 1.1185682                    |
| 037237  | 5 ft <sup>3</sup> | 10 psig        |                      |               | 120.000000              | 1.6666667                    |
| 017317  | 2 ft <sup>3</sup> | 2 psig         |                      |               | 447.619050              | 1.1170213                    |
| 017318  | 2 ft <sup>3</sup> | 14" W.C        |                      |               | 491.666700              | 1.0169491                    |
| 017366  | 2 ft <sup>3</sup> | 2 psig         |                      |               | 447.619050              | 1.1170213                    |
| 017367  | 2 ft <sup>3</sup> | 14" W.C        |                      |               | 491.666700              | 1.0169491                    |
| 091238  | 2 ft <sup>3</sup> | 2 psig         |                      |               | 447.619050              | 1.1170213                    |
| 091240  | 2 ft <sup>3</sup> | 14" W.C        |                      |               | 491.666700              | 1.0169491                    |
| 135547  | 2 ft <sup>3</sup> | 2 psig         |                      |               | 447.619050              | 1.1170213                    |



## Glossary

---

|                         |   |
|-------------------------|---|
| alphanumeric            | Having or using both alphabetical and numerical symbols. For example, an alphanumeric password contains both letters and numbers.   |
| application program     | Usually referred to as an <i>application</i> , rather than an <i>application program</i> , it is a type of software program that performs a specific task useful to the user. Examples include database management applications, such as N_SIGHT R900, or word processing applications, such as Microsoft® Word®.   |
| bit                     | Short for <i>binary digit</i> , the smallest unit of information on a machine. A single bit can hold only one of two values: 0 or 1. More meaningful information is obtained by combining consecutive bits into larger units.   |
| blank route             | A route made up entirely of meters for which readings have not been attempted. Compare with <i>skip route</i> .   |
| broadcast message       | A statement that is sent from the host computer along with an assigned route to all handhelds of a specific office. The statement appears on the displays of each handheld when each meter reader completes the initial daily LOGIN procedure. Compare with <i>route message</i> and <i>survey message</i> .  |
| central-processing unit | Often abbreviated as CPU, the CPU is the brains of the computer. Sometimes referred to simply as the processor or central processor, the CPU is where most calculations take place. In terms of computing power, the CPU is the most important element of a computer system.  |
| code table              | A group of codes that are classified according to the type of information they capture. For example, a skip code table contains all of the skip codes used by a company. Codes allow you to pass on detailed information about a customer, meter, or route in an abbreviated form. For example the skip code "s1" might indicate that a meter was skipped because the glass of the meter was fogged and the meter reader could not see the reading. |



|                      |   |
|----------------------|---|
| communication cradle | A device used to charge and exchange data with a handheld. Whenever a handheld is placed in a communication cradle, the battery of the handheld begins recharging, and it is ready to exchange data with the host computer  |
| company code         | In the N_SIGHT R900 application program, company codes are used to indicate which company a field office belongs to or to indicate the employees of a company. Company codes can be two digits, two letters, or a digit and a letter.   |
| constant             | A multiplier used to determine the customer's final bill.   |
| cycle                | A group of routes that is always processed together. Most utility companies process 21 cycles each month.   |
| data entry screen    | A type of screen used by the handheld. Whenever a data entry screen is displayed, the handheld enables the appropriate keys so that you can enter data in the handheld.   |
| default setting      | A computer term that is similar in meaning to factory setting. The default setting is one that the handheld automatically applies to an item. For example, the default setting for the direction that routes are read is "top to bottom." Routes are always displayed in this order unless a meter reader or N_SIGHT R900 operator changes the setting. |
| direction key        | A special key on the handheld keyboard that allows you to move up or down a list of items and left or right in a data entry space or through the meters of a route. This is actually a single key shaped like a cross with arrowheads printed on it indicating the direction of movement.   |
| display              | The area at the top of the handheld where information about routes and meters are shown.  |
| download             | The process of sending readings and route information from the host computer to the handheld.   |
| export               | A function of the N_SIGHT R900 application program or the host computer. The export function creates a file containing readings and route information that is UPLOADED from the handheld. The export file is then sent to your company's billing computer.  |
| function key         | Special keys on the handheld keyboard that allow you to perform tasks quickly. Function keys are the top row of yellow keys labeled F1 to F5.   |
| GB                   | An abbreviation for gigabyte. One gigabyte is equal to 1,024 megabytes.   |



|                       |   |
|-----------------------|---|
| highlighted           | Describes an item that is selected. When you select an item in a menu, the handheld lets you know that it has been selected by accenting the item with a black band. See also <i>select</i> .   |
| host computer         | A computer that is accessed by a user working on another PC or workstation; for example, the N_SIGHT R900 host computer contains all N_SIGHT R900 data to which the billing computer and other PC operators can connect.  |
| hot key               | A type of key that allows you to select an item from a list of items by pressing a single key. The key that you should press is shown next to each item on the list.  |
| information keys      | A type of handheld key that allows you to get information about a meter or a route. Information keys are the letter/character keys that have information printed in white above them.   |
| LAN                   | See <b>local area network</b> .   |
| letter/character keys | Keys on the keypad of the handheld that allow you to enter a letter or a character in the handheld display. Letter/character keys are the small, rectangular keys on the bottom portion of the keypad.  |
| local area network    | <p>A computer network that spans a relatively small area. Most local area networks (LANs) are confined to a single building or group of buildings. However, one LAN can be connected to other LANs over any distance via telephone lines and radio waves. A system of LANs connected in this way is called a wide area network (WAN).</p> <p>Most LANs connect workstations and personal computers (PC). Each node (individual computer) in a LAN has its own central processing unit with which it carries out programs, but it is also able to access data and devices anywhere on the LAN. This means that many users can share expensive devices, such as laser printers, as well as data. Users can also use the LAN to communicate with each other by sending e-mail.</p> |
| location code         | An arrangement of up to four numbers, letters, or both numbers and letters that tell where a meter is located. For example, a code of "carp" might be used to indicate that a meter is located in the carport of a home. See also <i>code tables</i> .  |
| menu screen           | A type of screen that contains a list of items from which to choose.  |
| message screen        | A type of screen that displays a message.   |
| meter number          | The number by which a utility identifies a meter.   |



|                              |  |
|------------------------------|--|
| MHz                          | Abbreviation for megahertz. One MHz represents one million cycles per second. The speed of microprocessors, called the clock speed, is measured in megahertz.  |
| microprocessor               | A chip that contains a central processing unit. At the heart of all personal computers and most workstations sits a microprocessor. Microprocessors also control the logic of almost all digital devices from clock radios to fuel-injection systems for automobiles.  |
| MIU ID                       | An abbreviation for <i>m</i> eter <i>i</i> nterface <i>u</i> nit <i>i</i> dentifier, which is a discrete number used to identify a specific meter interface unit.  |
| modem                        | A device that allows two computers to communicate via telephone lines by modulating and demodulating the signals from each. The name modem is a contraction of the words <i>m</i> odulate and <i>d</i> emodulate.  |
| MS-DOS                       | <p>An abbreviation for <i>M</i>icrosoft <i>D</i>isk <i>O</i>perating <i>S</i>ystem. Originally developed by Microsoft for IBM, MS-DOS was the standard operating system for IBM-compatible personal computers.</p> <p>The initial versions of DOS were very simple. However, MS-DOS is still a 16-bit operating system and does not support multiple users or multi-tasking as do newer operating system such as Windows Vista, Windows 7, or Windows 8.</p> |
| multiple-route assignment    | A type of assignment in which more than one route is assigned to one meter reader.   |
| multi-tasking                | The ability to carry out more than one task at the same time, a task being an application program.   |
| N_SIGHT R900 database server | A type of software that receives, stores, and passes on information. Because handheld computers cannot send information directly to your company's billing computer (and the system cannot send information directly to each handheld computer), the server is needed to translate information from one source to another.   |
| number keys                  | Keys that allow you to enter a number in the display of the handheld. Number keys are the large, white oval keys in upper portion of the keypad.   |
| office code                  | In the N_SIGHT R900 application program, office codes are used to indicate the office to which a meter belongs or to indicate the employees of an office. Office codes can be two digits, two letters, or a digit and a letter.  |




|                      |  |
|----------------------|--|
| operating system     | The most important program that runs on a computer. Every general-purpose computer must have an operating system to run other programs. Operating systems perform basic tasks, such as recognizing input from the keyboard, sending output to the display screen, keeping track of files and directories on the disk, and controlling peripheral devices, such as disk drives and printers. Usually, users interact with the operating system through a set of commands. For example, graphical user interfaces, such as WINDOWS 7 and WINDOWS NT, allow you to enter commands by pointing and clicking at objects that appear on the screen. The MS-DOS operating system contains commands such as COPY and RENAME for copying files and changing the names of files, respectively. |
| order                | A meter reading, service order, or similar transaction that takes place on the handheld.   |
| PC                   | An abbreviation for personal computers.  |
| pop-up               | A special message that appears (pops up) automatically just before the reading entry screen that is associated with the message. You can control whether the special message appears as a pop-up message or does not appear.   |
| prompt               | A symbol, such as "C : \>" that appears on a display, indicating that the computer is waiting for the operator to enter information. Once the computer has displayed a prompt, it waits for you to enter some information. Generally, it will wait forever, but some programs have built-in time-outs that cause the program to continue after it has waited a specified amount of time.   |
| quick keys           | Keys that allow you to execute a task quickly by pressing specific keys at once or in a particular order.  |
| reading entry screen | A specific type of data entry screen used by the handheld. The reading entry screen is used to enter readings.   |
| read-type code       | An arrangement of up to four numbers, letters, or both numbers and letters that explain how the reading is obtained. For example, a code of "r0" might be used to indicate that the reading is entered manually. See also <i>code tables</i> .   |
| region code          | In the N_SIGHT R900 application program, region codes are used to indicate the regional headquarters for a field office or to indicate the employees of a regional headquarters. Region codes can be two digits, two letters, or a digit and a letter.   |



|                 |   |
|-----------------|---|
| route message   | A free-form statement sent from N_SIGHT R900 operators to the handheld computers of meter readers assigned to a specific route. A route message can contain as many as 80 characters. Compare with <i><b>broadcast message</b></i> and <i><b>survey message</b></i> .   |
| router          | One of the most commonly used devices to connect several handheld at a time. The router device allows you to connect as many communication cradles to the host computer. Because the router provides communication connections for the cradles, whenever a handheld is placed in a communication cradle, it is ready to exchange data with the host computer. |
| screens         | The graphic portion of a display. N_SIGHT R900 uses three different types of screens to present the information shown in the display: a menu screen, a data entry screen, and a message screen.   |
| select          | To choose an item by using the arrow keys or by using a hot key. N_SIGHT R900 indicates that an item is selected by highlighting the item. See also <i><b>highlighted</b></i> .   |
| sequence number | A number assigned to each meter indicating the location of the meter in relation to other meters in the route. For example, a sequence number of 000003 indicates that the meter is the third meter of a route. The meter reader may change the sequence number on the handheld computer, indicating a preferred placement of that meter within the route.    |
| sign off        | The act of exiting the meter reading portion of the handheld application program. By exiting the meter reading portion, you can access the communication function and send information to or receive information from the host computer.  |
| sign on         | The act of accessing the meter reading portion of the handheld so that you can obtain route assignments or collect readings.  |
| skip code       | An arrangement of up to four numbers, letters, or both numbers and letters that explain why a reading was skipped. For example, a code of "s1" might be used to indicate that a reading was skipped because the glass of the meter was fogged and the meter reader could not see the usage display. See also <i><b>code tables</b></i>                        |
| skip route      | A route made up entirely of meters for which readings were attempted but could not be obtained. For example, the glass on the meter may have been fogged and the meter reader could not see the usage display. Compare with <i><b>blank route</b></i> .   |



|                |  |
|----------------|--|
| survey message | A free-form question sent along with assigned routes to the handheld of a specific CYCLE. A survey message can contain up to 40 characters. Compare with <i>broadcast message</i> and <i>route message</i> .   |
| synchronize    | The process of communications to send readings and route data to and from the handheld and the host computer.  |
| tag            | A handheld feature that allows you to tag one or more meters in a route and then have the handheld display only the tagged meters.   |
| tag indicator  | An icon  that appears in the display of the handheld to indicate that the meter is tagged. When this symbol appears, the <b>TG</b> is hidden.   |
| trouble code   | An arrangement of up to four numbers, letters, or both numbers and letters that explain why there is trouble with a meter. For example, a code of "t10" might be used to indicate that the battery of a meter is low. See also <i>code tables</i> .  |
| upload         | The process of sending readings and route data from the handheld to the host computer.   |
| user ID        | An identifier that is assigned to each user of the handheld. Entering a user ID number when you LOG IN ensures that only someone with a user ID can use the handheld. A user ID can contain up to ten digits, ten characters, or a combination of ten digits and characters. There can be no spaces in a user ID.  |
| Windows        | Microsoft Windows operating system. Windows supports 32-bit and 64-bit applications, which means that application programs written specifically for these operating systems run much faster.   |
| workstation    | <p>A type of computer used for engineering applications, desktop publishing, software development, and other types of applications that require a moderate amount of computing power and relatively high quality graphics capabilities. Like personal computers, most workstations are single-user computers. However, workstations are typically linked together to form a local area network, although they can also be used as stand-alone systems.</p> <p>In networking, workstation refers to any computer connected to a local-area network. It could be a workstation or a personal computer.</p> |



*Notes:*



# Index

---

## A

- A key 3-16, 4-15
- access
  - reading mode 5-13
  - RF test mode 5-13
- access Codes menu 3-16, 4-15
- activation, R900 BCT with data logging 7-1
- actual gear ratio A-1
- add, gas format 9-40, 9-43
- adding meters to routes 6-31 to 6-33
- alphanumerics, defined G-1
- AMR mode key 3-16, 4-15
- application programs, defined G-1
- assign MIUs for appointments 7-20
- atmospheric pressure A-1
- audit failed error message 6-28
- auto increment 9-27
- automatic off
  - described 2-12
- automatic off, described 2-7
- automatic return, described 2-7, 2-12

## B

- B key 3-16, 4-15
- backward keys, illustrated 3-12, 3-19, 4-18
- base pressure A-1
- batteries
  - checking status of 10-3, 10-9
  - conserving 3-19
  - described 2-6, 2-11
  - low charge warning 3-31, 4-28
  - ordering replacement 10-5, 10-6, 10-11, 10-13, 10-17 to 10-19
  - status indicator (illus.) 10-3, 10-9
  - using 3-30, 4-28
- battery
  - error 5-9
  - Nomad cable 3-6
  - Ranger cable 4-5
  - recharge contacts 2-6, 2-11
- beepers, described 2-7, 2-12
- Belt Clip Transceiver, R900 (R900 BCT)
  - explained 5-1
  - USB transfer cable 5-16
- bits, defined G-1

- BKSP key 3-21, 4-19
- blank readings, entering 6-20
- blank routes
  - See also* skip routes
  - defined G-1
- Bluetooth 7-1
- bluetooth, LED 5-9
- bookmarks, problems with 10-3
- broadcast messages 3-32, 4-30, 5-11
  - See also* route messages, survey messages
  - defined G-1
- browse key 3-17, 4-16
- button, mouse 9-17

## C

- C key 3-16, 4-15
- cable 3-6, 4-6
  - charger 3-4, 4-4
- cable, USB transfer 5-16
- capture, reads 7-1
- central processing units, defined G-1
- change modes, R900 BCR 5-4
- changing
  - keyboard click setting 3-28, 4-25
  - keyin direction 6-23
  - meter information 6-33, 6-35
  - route direction 3-28, 4-25
- character keys
  - defined G-3
- charger
  - cable 3-4, 4-4
  - Nomad 3-3, 4-3
  - Nomad battery 3-5, 3-6, 4-5, 4-6
  - Nomad illus. 3-3
  - Nomad 4-3, 4-4, 4-5, 4-6
- checklist 9-22
- clearing, readings and skip codes 6-9, 6-19, 6-29, 6-41, 6-43
- code tables, defined G-1
- codes, *see* specific code
- Codes key 3-16, 4-15
- Codes menu, key 3-16, 4-15
- collecting meter readings 6-5
- color-coding, on keyboard 3-19
- command gas 9-20



- communication cradles
  - defined G-2
  - with cradle-charging kit 3-3, 4-3
- communication methods 8-1, 9-25, 9-36
- company codes, defined G-2
- components, R900 BCR 5-3
- connect to receptacle 9-24
- connect, wiring 9-24
- connecting
  - power cable to device (illus.) 3-6
  - power supply 3-4, 4-4
  - router 3-5, 4-5
- constants, defined G-2
- conventions, used in the manual 1-1 to 1-2
- correcting
  - See also changing
  - meter information 6-33 to 6-35
- CPUs, see central processing units G-1
- cradle and charging kits
  - illustrated 3-3, 3-4, 4-4, 10-3, 10-9
  - with communication cradle (illus.) 3-4, 4-4
- create format 9-32
- custom formats 9-25
- customer support 1-5
- cycles, defined G-2

## D

- damage, inspecting for 3-1, 4-1, 5-2
- data logging
  - accessing 7-2
  - activate with flashlight 7-7
  - appointments 7-20
  - explanation 7-1
  - flashlight 7-1
  - graph examples 7-11
  - graph legend 7-11
  - graph options 7-12
  - illustrated 7-2
  - initialize 7-4
  - meter size 7-6
  - methods of activation 7-1
  - MIU ID 7-1
  - option on Utils menu 7-3
  - report 7-7
  - unit of measure 7-6

- data-entry screens
  - defined G-2
  - described 2-14
- decimal
  - entering points 3-20, 4-18
  - using key 3-20, 4-18
- default settings, defined G-2
- delete
  - gas format 9-45
  - ProRead format 9-31
- description of
  - automatic off 2-7, 2-12
  - automatic return 2-7, 2-12
  - batteries 2-6, 2-11
  - battery status indicators 2-5, 2-10
  - communication ports 2-5, 2-10
  - data-entry screens 2-14
  - direction keys 3-12, 3-18, 4-11, 4-17
  - displays 2-14
  - hot keys 3-13, 4-12
  - information keys 3-18, 4-15 to 4-17
  - keyboard backlights 2-5, 2-10
  - keyboards 2-4, 2-9
  - menu screens 2-14
  - meter reader tasks 2-3
  - meter readers 1-7
  - number keys 3-12, 4-11
  - operator tasks 2-3
  - operators 1-7
  - quick keys 3-19
- devices
  - connecting 3-5, 4-5
  - defined G-6
- direction keys
  - defined G-2
  - described 3-12, 3-18, 4-11, 4-17
- displaying
  - meters 3-12, 3-18, 4-11, 4-17
  - meters of a route 3-12, 4-11
  - reading-entry screens 2-20, 3-12, 4-11, 6-36
  - screens 6-4
- displays
  - defined G-2
  - described 2-14
  - problems with 10-2, 10-3



down keys, illustrated 2-17, 2-18, 3-18, 4-17  
downloading  
    defined G-2  
    problems with 10-4  
downloading information  
    See sending and receiving information  
drive A-1

## E

edit  
    gas format 9-40  
    ProRead format 9-28  
Edit key 3-16, 4-15  
efficiency, performance 5-12  
electromagnetic resistance 2-8, 2-13  
e-mail, customer support 1-6  
enhanced R900 MIU, data logging 7-1  
entering  
    blank readings 6-20  
    decimals 3-20, 4-18  
    skip codes 6-7 to 6-8  
entry key 3-17, 4-16  
error codes, LEDs 5-9  
Ethernet ports, described 2-5, 2-10  
examples of data logging graphs 7-11  
exchanging information  
    methods of 9-36  
exchanging information, methods of 8-1, 9-25, 9-36  
export, defined G-2  
extended screens, example (illus.) 2-14  
extended screens, explained 2-18 to 2-19

## F

F key 3-16, 4-15  
fax, customer support 1-6  
features  
    automatic off 2-7, 2-12  
    automatic return 2-7, 2-12  
    battery status indicator 2-5, 2-10  
    beeper 2-7, 2-12  
    display 2-4, 2-9  
    keyboard 3-9, 4-9  
    keyboard backlight 2-4, 2-9  
    LEMO communication port 2-5, 2-10  
    manual off 2-7, 2-12

Nomad 2-4 to 2-8  
optical-infrared port 2-6, 2-11  
Ranger 2-9 to 2-13  
Find key 3-16, 4-15  
firmware  
    update 5-16  
    web update 5-16  
firmware updates, R900 BCT 5-1, 5-15  
firmware, R900 BCT 7-1  
flashlight, for activation 7-7  
flashlight, for data logging 7-1  
format  
    add gas 9-40, 9-43  
    create 9-32  
    custom 9-25  
    delete gas 9-45  
    delete ProRead 9-31  
    edit gas 9-40  
    edit ProRead 9-28  
    gas 9-42  
    manage 9-25  
    name 9-33  
    save ProRead 9-36  
    select gas 9-38  
    select ProRead 9-31  
    standard 9-30  
forward keys, illustrated 3-12, 3-19, 4-11, 4-18  
found meters  
found meters, *see also* adding meters to routes  
function keys, defined G-2

## G

G key 3-17, 4-16  
gas  
    command 9-20  
    preferences 9-36, 9-37  
    program 9-15  
    program register 9-36  
    readings 9-21  
gauge pressure A-1  
GBs, defined G-2  
gear ratio, actual A-1  
GoTo key 3-17, 4-16  
graph examples, data logging 7-11  
graph legend, data logging graph 7-11



**H**

## handhelds

- dropping 2-8, 2-13
- durability 2-7, 2-12
- illustrated 2-4, 2-9, 3-10, 4-10
- inspecting 3-1, 4-1, 5-2
- notifications A-3 to A-9
- shipping to Neptune 5-2, 10-20
- sounds A-3 to A-9
- use with N\_SIGHT R900 2-1
- using 2-1
- volume control A-1

## handstraps, replacing 10-7

## HHU

- set the clock 7-4, 7-15
- synchronized 7-4, 7-15

## highlighting

- See also* selecting
- defined G-3

## host computers

- connecting equipment to 3-4, 4-4
- defined G-3
- exchanging information with 8-1

## host computers, exchanging information with 9-25, 9-36

## host software 7-20

## hot keys

- defined G-3
- described 3-13, 4-12

## hourly interval data 7-1

**I**

## index part number A-1

## information exchange 8-1

## information key 3-17, 4-16

## information keys

- defined G-3
- described 3-18, 4-15 to 4-17

## infrared (IR), data logging 7-1

## initialize device 7-5

## inspecting, equipment 3-1, 4-1, 5-2

## installing

- handstrap 10-7
- power supply 3-4, 4-4
- router 3-5, 4-5

## interconnect wires, networking 9-24

## interval data, hourly 7-1

**J**

## J key 3-17, 4-16

**K**

## key

- browse 3-17, 4-16
- edit 3-16, 4-15
- entry, manual 3-17, 4-16
- for screen information 3-17, 4-16
- for Search 3-16, 4-15
- GoTo 3-17, 4-16
- information 3-17, 4-16
- list 3-17, 4-16
- Logout 3-18, 4-17
- manual entry 3-17, 4-16
- meter 3-17, 4-16
- Properties 3-17, 4-16
- RF test 3-18, 4-17
- Skip 3-17, 4-16
- Tag 3-18, 4-17
- Tag search 3-18, 4-17
- to exit 3-18, 4-17
- W, to logout 3-18, 4-17

## key AMR mode 3-16, 4-15

## key, Find 3-16, 4-15

## keyboard backlights, described 2-5, 2-10

## keyboard click, selecting 3-28, 4-26

## keyboards

- backlight 2-5, 2-10
- character keys (illus.) 3-10, 4-10
- color coding 3-11, 4-11
- described 2-4, 2-9
- direction keys 3-12, 3-18, 4-17
- direction keys (illus.) 3-10, 4-10
- enabling Keyboard Click 3-28, 4-25
- function keys (illus.) 3-10, 4-10
- illustrated 3-11
- information keys 3-15 to 3-18, 4-15 to 4-17
- letter keys (illus.) 3-11
- number keys 3-12, 4-11
- quick keys 3-19
- quick keys (illus.) 3-10, 3-11, 4-10



- selecting Keyboard Click 3-28, 4-25 to 4-26
- Trimble Nomad (illus.) 2-4, 2-9
- keyin direction, selecting 3-27, 4-25
- keys, color-coding 3-19

## L

- L key 3-17, 4-16
- LANs, see local area networks
- LEDs
  - bluetooth 5-9
  - error codes 5-9
  - explained 5-8
  - mode 5-8
  - power 5-8
  - RF mode 5-9
- letter keys
  - defined G-3
  - illustrated 3-11, 4-10
- list key 3-17, 4-16
- local area networks, defined G-3
- location codes, defined G-3
- login screen 9-26, 9-37
- Logout key 3-18, 4-17

- low-power state 2-7, 2-12

## M

- M key 3-17, 4-16
- Main Menu screen, illustrated 6-12, 6-14, 6-16, 6-18, 6-19, 6-40
- main screens
  - example (illus.) 2-14, 2-16
  - illustrated 2-14
- main screens, explained 2-16 to 2-18
- maintenance
  - frequency of 10-1
  - recommended 10-1
- manage formats 9-25
- manual entry key 3-17, 4-16
- manual OFF, described 2-7, 2-12
- menu screens 2-15
  - defined G-3
  - described 2-14
  - example (illus.) 2-14
  - example of (illus.) 2-14
- menu screens, example (illus.) 2-14
- menu screens, explained 2-15



- menus
  - Main 6-40
  - Utility 3-29, 4-26
- message screens
  - defined G-3
- messages
  - e-mail 1-6
  - See route messages, survey messages, error messages, broadcast messages
- Meter 2-1
- meter key 3-17, 4-16
- meter numbers, defined G-3
- meter reader tasks
  - defined 1-7
  - described 2-3
- meter readers
  - described 1-7
  - responsibilities 1-8
- meter reading cycle, illustrated 5-2
- meter readings
  - See *also* readings
  - collecting manually 6-5
- meter size, for data logging 7-6
- meters
  - changing information about 6-4, 6-33, 6-35
- methods of activation, data logging 7-1
- MHz, defined G-4
- microprocessors
  - See *also* central processing units
  - defined G-4
- MIU ID
  - data logging 7-1
  - defined G-4
  - enhanced R900 data logging 7-1
  - from N\_SIGHT R900 7-21
  - off-cycle reads 7-17
- mode LED 5-8
- mode, suspend 2-7, 2-12
- modems, defined G-4
- moderate performance 5-12
- modes
  - access RF test mode 5-13
  - bluetooth 5-9
  - error codes LEDs 5-9
  - LED 5-8
  - modes (continued)
    - normal filtered reading 5-5
    - RF 5-9
    - RF performance 5-11
    - RF test 5-13
    - SD card error, LED 5-9
    - unattended 5-5
    - unfiltered reading 5-5
  - more information screens, example (illus.) 2-18
- mouse, button 9-17
- moving
  - in a data-entry space 3-12, 3-18, 4-11, 4-17
  - within a route 6-36, 6-38, 6-38
- MS-DOS
  - See *also* Windows operating systems
  - defined G-4
- MTR INFO key 3-17, 4-16
- multiple-route assignments, defined G-4
- multiplier, gas 9-41
- multitasking, defined G-4
- N**
- N\_SIGHT R900
  - database server, defined G-4
  - status screen 5-7, 5-11
  - data logging 7-1
  - login screen 7-13
- Neptune key, illustrated 5-7
- networking 9-23
- new meters, adding 6-31, 6-33
- NEW MTR key 3-17, 4-16
- Nomad
  - charger 3-3, 3-4, 3-5, 3-6, 4-3, 4-4, 4-5, 4-6
  - charger illus. 3-3
  - display 2-4, 2-9
  - features 2-4 to 2-8
- Nomad, basic features 2-4 to 2-7
- normal filtered reading mode 5-5
- notifications, handheld sounds A-3 to A-9
- number keys
  - defined G-4
  - described 3-12, 4-11
  - illustrated 3-10, 4-10



**O**

- off-cycle
  - read appointments 7-20
  - readings 7-13
  - MIU IDs 7-17
- office codes, defined G-4
- operating environment 2-12
- operating systems
  - See also* Windows, MS-DOS
  - defined G-5
- operating temperatures 2-7, 2-12
- operator tasks
  - defined 1-7
  - described 2-3
- operators
  - described 1-7
  - responsibilities 1-9
- options, Customer Support 1-6
- options, for data logging graphs 7-12
- order, defined G-5
- ordering parts 10-18
- overview, R900 BCR 5-1

**P**

- P key 3-18, 4-17
- packing the handheld 10-20
- pair, R900 BCT 5-10
- parts
  - list of replaceable 10-18
  - ordering 10-18
  - recommended spare 10-18
- password
  - Gas login (Field Programmer) 9-37
  - ProRead login 9-26, 9-37
- PCF 9-41
- PCs
  - See also* personal computers
  - defined G-5
- performance, best 5-12
- pop-ups, defined G-5
- power supply, connecting 3-4, 4-4
- preferences
  - Gas 9-37
- preferences, ProRead 9-26

- press 3-21, 4-19
- pressure
  - atmospheric A-1
  - base A-1
  - gauge A-1
- pressure compensation factors, table of A-1
- Pressure Configuration Factor 9-41
- problems
  - See also* troubleshooting
  - solving 10-1, 10-4
- program
  - gas 9-15
  - gas register 9-36
  - network secondary register 9-24
  - R900G 9-15
- program result, gas 9-17
- prompts, defined G-5
- Properties key 3-17, 4-16
- ProRead
  - preferences 9-26
  - query 9-11
  - read 9-12
  - select format 9-28

**Q**

- Q key 3-18, 4-17
- query ProRead 9-11
- query, results 9-12
- quick keys
  - defined G-5
  - described 3-19
  - illustrated 3-11

**R**

- R key 3-18, 4-17
- R900 BCT
  - change modes 5-4
  - components 5-3
  - firmware 5-15
  - overview 5-1
  - read route 5-11
  - SD card 5-14
  - status screen 5-11
  - USB transfer cable 5-16



- R900 BCT modes
    - explanation 5-5
    - LED operating 5-8
    - operation 5-4
    - summary 5-4
  - R900 BCT
    - data logging 7-1
    - firmware 7-1
    - firmware updates 5-1, 5-15
    - pair bluetooth 5-10
    - transmission to MIUs 7-19
  - R900 Belt Clip Transceiver, overview 5-1
  - R900, enhanced MIU for data logging 7-1
  - R900G, program 9-15
  - radio frequency (RF), data logging 7-1
  - Ranger 10-7
    - electromagnetic resistance 2-13
    - features 2-9, 2-12 to 2-13
    - resistance, water 2-12
    - temperature range 2-12
  - ratio A-1
  - read
    - gas 9-21
    - ProRead 9-12
  - read appointments, off-cycle 7-20
  - reading a route 5-11
  - reading mode, access 5-13
  - reading, off-cycle 7-13
  - reading-entry screens
    - defined G-5
    - displaying 2-20
    - sample used in manual 6-1
  - readings
    - bypassing 6-5
    - clearing 6-9, 6-19, 6-29, 6-41, 6-43
    - collecting 6-5
    - entering into the handheld 6-5 to 6-6
    - entering skip code 6-7
    - leaving blank 6-20
    - problems with uploading 10-4
    - validating 6-27
  - readings, store 5-1
  - readings, validate 6-27
  - read-type codes, defined G-5
  - reboot
    - handheld 10-7
    - logged off 10-9
    - logged on 10-7
  - receiving information from host 8-4, 8-5
  - refresh, R900G 9-20
  - region codes, defined G-5
  - register, program secondary 9-24
  - registers, network 9-23
  - replacing, handstrap 10-7
  - reset handheld 10-5, 10-7
  - resistance
    - electromagnetic 2-8, 2-13
    - shock 2-8, 2-13
    - water 2-7
  - returning CE5320B 10-20
  - RF
    - mode 5-9
    - test key 3-18, 4-17
    - test mode 5-13
  - rotation, clockwise or counter-clockwise 9-42
  - route directions, changing 3-28, 4-25
  - route messages
    - See also* broadcast messages, survey messages
    - defined G-6
  - router, connecting 3-5, 4-5
  - routes, problems with downloading 10-4
- ## S
- save
    - gas format 9-42
    - ProRead format 9-36
  - screens
    - Beeper Menu (illus.) A-2
    - data-entry 2-16
    - data-entry example (illus.) 2-14, 2-16
    - defined G-6
    - extended screens, explanation 2-18 to 2-19
    - extended, example (illus.) 2-14
    - GoTo 6-40
    - Main Menu (illus.) 6-40
    - main screens, explained 2-16 to 2-18
    - main, example (illus.) 2-14, 2-16
    - menu 2-15
    - menu example (illus.) 2-14



- screens (continued)
  - menu screens, explanation 2-14 to 2-15
  - more information, example (illus.) 2-18
  - overview 2-14
  - types 2-14
  - Utility Menu (illus.) 3-29, 4-26
- SD card 5-6, 5-14
- SD card error 5-9
- search, Y key for Tag search 3-18, 4-17
- select format
  - gas 9-38
  - ProRead 9-28, 9-31
- select preferences
  - gas 9-36, 9-37
  - ProRead 9-26
- selecting
  - See also* highlighting
  - defined G-6
  - items from menu screens 3-13, 3-18, 4-12, 4-17
  - Keyboard Click 3-28, 4-25 to 4-26
  - keyin direction 3-27, 4-25, 6-23
  - menu items 3-12, 4-11
  - search feature 6-24
- selection list
  - gas 9-16
  - gas formats 9-40
  - ProRead 9-7
  - tokens 9-35
- sending and receiving information
  - described 8-1
  - with device 8-4
- sequence numbers, defined G-6
- setting up, hardware for communication 3-4, 4-4
- shipping
  - damage 3-1, 4-1, 5-2
  - instructions for 10-20
  - packing required for 10-20
  - packing requirements 5-2
  - to Neptune 10-20
- shock resistance 2-8, 2-13
- signing off
  - defined G-6
  - how to 3-36, 4-34
- signing on 3-31, 4-29, G-6
- skip code 6-9
- skip codes
  - clearing 6-9, 6-19, 6-29, 6-41, 6-43
  - defined G-6
  - entering 6-7
- Skip key 3-17, 4-16
- skip routes
  - See also* blank routes
  - defined G-6
- sleep mode, gas 9-20
- sounds
  - notifications A-3 to A-9
  - volume control A-1 to A-2
- software
  - finding version number 1-4
  - resetting 10-5, 10-7
  - starting from MS-DOS 10-4
- SP key 3-20, 4-19
- standard format 9-30
- status indicators, battery
  - described 2-5, 2-10
  - location (illus.) 2-5, 2-10
  - using 10-3, 10-9
- status screen, N\_SIGHT R900 5-7, 5-11
- store R900 readings 5-1
- support, customer 1-5
- survey messages
  - See also* broadcast messages, route messages
  - defined G-7
- suspend mode 2-7, 2-12
- symbols, used in manual 1-1
- synchronize
  - screen 5-7
  - defined G-7
- system configuration, equipment needed 3-3, 4-3
- system settings
  - adjustment options 3-23, 4-20
  - overview 3-23, 4-20
- T
- tag
  - defined G-7
  - indicators, defined G-7
- Tag key 3-18, 4-17
- Tag search key 3-18, 4-17



- temperature
  - operating 2-7, 2-12
  - range 2-12
- test hand, gas 9-41
- tokens, custom format 9-35
- TOTAL key 3-17, 4-16
- transmission to MIU, R900 BCT 7-19
- Trimble Nomad, keyboard 2-4, 2-9
- trouble codes, defined G-7
- troubleshooting
  - Audit Failed error message 6-27
  - bookmark feature 10-3
  - display 10-2, 10-3
  - non-responsive unit 10-2
  - unit non-responsive 10-2
  - unit won't turn off 10-3
  - upload/download unsuccessful 10-4
- turning off
  - automatic return 2-7, 2-12
  - automatically 3-31, 3-36, 4-29, 4-34
  - handheld 3-31, 4-29
  - keyboard backlight 3-21, 4-19
  - problems with 10-3
- turning on
  - automatic return 2-7, 2-12
  - handheld 3-30, 4-28
  - keyboard backlight 3-21, 4-19
- U**
  - unattended mode 5-5
  - unfiltered reading mode 5-5
  - unit of measure, for data logging 7-6
  - unloading information, *see* sending and receiving information
  - unpacking, equipment 3-1, 4-1, 5-2
  - up key, illustrated 3-18, 4-17
  - uploading
    - defined G-7
    - overview 2-1
    - problems with 10-4
  - USB mass storage 5-6
  - USB transfer cable 5-16
  - user IDs, defined G-7
  - Utility Menu screen, illustrated 3-29, 4-26
- V**
  - validate readings 6-27
  - validating readings 6-27
  - version number 3-17, 4-16
  - volume control, settings A-1
- W**
  - W key, to exit 3-18, 4-17
  - wake up, gas 9-20
  - warranty, voiding 2-5, 2-10
  - water resistance 2-7, 2-12
  - Windows, CE.Net screen, illustrated A-2
  - Windows, defined G-7
  - workstations, defined G-7
- Y**
  - yellow keys, using 3-11, 4-11



***Accu-Flo***  
***1-800-921-2228***  
***www.accuflo.com***





Neptune Technology Group Inc.  
1600 Alabama Highway 229  
Tallassee, AL 36078  
USA  
Tel: (800) 633-8754  
Fax: (334) 283-7293

Neptune Technology Group (Canada) Ltd.  
7275 West Credit Avenue  
Mississauga, Ontario  
L5N 5M9  
Canada  
Tel: (905) 858-4211  
Fax: (905) 858-0428

Neptune Technology Group Inc.  
Avenida Ejército Nacional No 418, Piso 12,  
Despacho 1203,  
Colonia Polanco V Sección,  
C.P. 11560  
Delegación, Miguel Hidalgo  
11560 México D. F.  
Tel: (525) 55203 4032 / (525) 55203 6204  
Fax: (525) 55203 5294



**NEPTUNE**  
TECHNOLOGY GROUP  
TAKE CONTROL  
[neptunetg.com](http://neptunetg.com)