



NEPTUNE
TECHNOLOGY GROUP

WATER | GAS | ELECTRIC

Field Programmer™ User's Manual



WATER | GAS | ELECTRIC

Field Programmer User's Manual

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FCC Conformity

CE5320 Handheld Computer

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 when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense."



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.

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:

- 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."



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.

Programmer Mouse

"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.”



Warning: Changes or modifications to this device not expressly approved by your company could void the user's authority to operate the equipment.

Industry Canada

DAP CE5320 Handheld Computer

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.

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.

Programmer Mouse

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.

CE Conformity

The CE5320 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 55022: Radiated, Class B
EN 55022: Conducted, Class B

EN 50082-2, Immunity
EN 61000-4-2: Electrostatic discharge
EN 61000-4-3: RF radiated
EN 61000-4-4: Fast transients
EN 61000-4-6: RF conducted

Field Programmer User's Manual
Literature No.
UM Programmer 04.09
Part No. 12938-001

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Chapter 1 Introduction

The Neptune *Field Programmer User's Manual* describes how to install and operate the Neptune Handheld Programming System (NHPS). This device is a self-contained, portable programming unit designed for “in-the-field” programming ProRead™ encoder registers and R900G endpoints.

The Field Programmer is also capable of interrogating ProRead registers through an attached receptacle after installation has been completed. This feature provides a means of testing the final installation and eliminates the need to remove a register for reprogramming.

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 NHPS.



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 NHPS operator.

Field Programmer System

The Field Programmer System (Part No. 12913-000) consists of the following components:

Table 1.1 Field Programmer System Components

Quantity	Item Description	Part Number
1	CE5320B Handheld with Field Programmer software (NHPS)	12935-200
1	Programming Mouse	12908-000
1	Programming Adapter (Coil to Terminal) for Programming Mouse	12937-000
1	Hand Strap (for the handheld)	12249-012
1	Power Adapter (for the handheld cradle)	12303-001
1	Field Programmer User's Manual	12938-001

Product Support within North America

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 for the Support Technician who helps you, and will expedite the problem-solving process.

Finding the Software Version Number

The procedures for finding the software version number differ depending on if you are logged on to NHPS.

If you have not yet accessed on to NHPS, complete the following.

- 1 Turn the handheld **ON**.
The handheld can take a few minutes to load.
- 2 On the Main CE.net screen, touch the screen.
- 3 Touch the **NHPS** folder.
- 4 Touch **NHPSProSys** file.
- 5 Touch **NHPSProSys.exe**.

The Neptune Handheld Programmer System opening screen appears.



Figure 1.1 Neptune Handheld Programmer System Screen

Within a few seconds, a screen similar to the following screen appears.

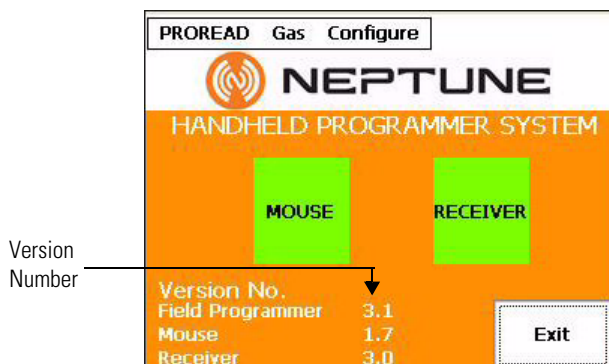


Figure 1.2 NHPS Start Screen

The version number is located in the lower middle of the screen. See Figure 1.2.

Contacting Technical Support

Within North America, Neptune Technical Support is available Monday through Friday, 8:00 AM to 7:00 PM Eastern Standard Time by telephone, e-mail, or fax.

To contact Technical Support by phone, call **1-800-647-4832**. You are directed to the appropriate team of specialists. These specialists are dedicated to you until the issue is resolved to your satisfaction. When you call, be prepared to provide your name, the

name of your company, your company's End User ID, and your telephone number. You will be directed according to the options shown in Figure 1.3.

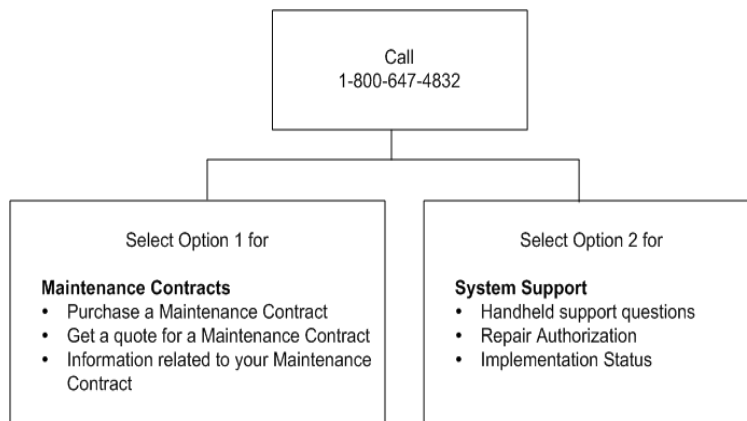


Figure 1.3 Technical Support

To contact Technical Support by fax, send a description of your problem to 1-334-283-7497. Please include on the fax cover sheet the best time of day for a Support Specialist to contact you.

To contact Technical Support by e-mail, send your letter to the following address:

hhsupp@neptunetg.com

Notes:

Chapter 2 Getting Started

This chapter describes how to connect the mouse to the Field Programmer handheld, and to be sure that the handheld recognizes it. In addition, this chapter illustrates the keyboard and presents a brief description of the types of keys you can use on the Field Programmer handheld.

Connecting the Mouse

The Field Programmer mouse allows you to query or program a ProRead register by using one of the following methods:

- Touch-read, or
- 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.

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

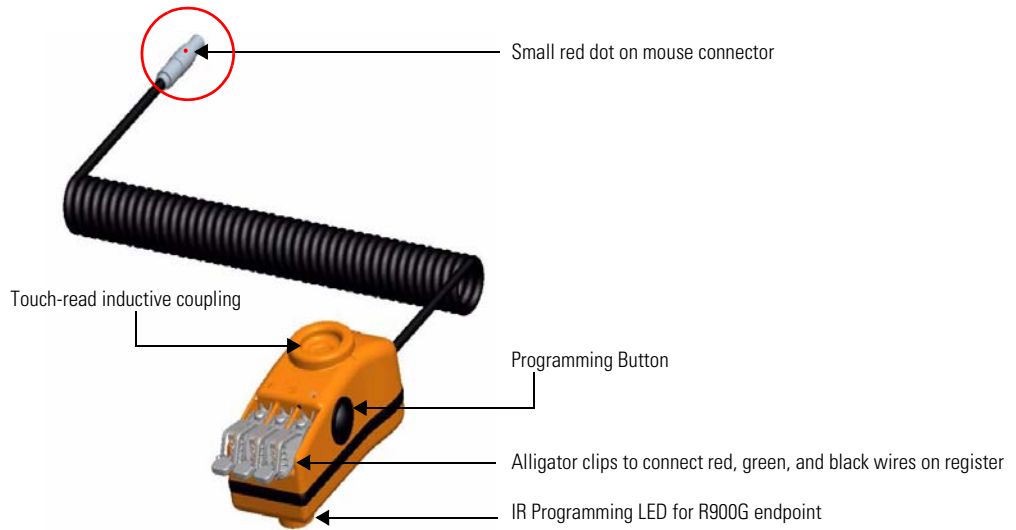


Figure 2.1 Field Programmer Mouse

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

- 1 Locate the small red dot at the end of the mouse connector cable. See Figure 2.1.
- 2 Locate the small red mark on the port at the right of the display on the Field Programmer. See Figure 2.2 on Page 2-3.
- 3 Push the mouse connector into the lemo port, lining up the red marks.



Figure 2.2 Connecting Mouse to Field Programmer

Verifying the Handheld Recognizes the Mouse

If the handheld does not recognize the mouse, complete the following steps.

- 1 Exit the **NHPSProSys** software. (See "Exiting the Software" on page 6-3.)
- 2 Verify that the mouse and/or receiver are connected to the handheld device.
- 3 Run **InstallEngine_HH.exe** and wait for it to finish.
- 4 Restart the handheld using the **Software Reset** located in **Options** in the CE window.
- 5 When the handheld is running, select **NHPSProSys.exe**.
- 6 Verify that the program recognizes the mouse or receiver.



This can take some time for the handheld to check for the mouse. Wait at least 30 seconds for the handheld to recognize the mouse.

Reviewing the Keyboard

The CE5320 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.

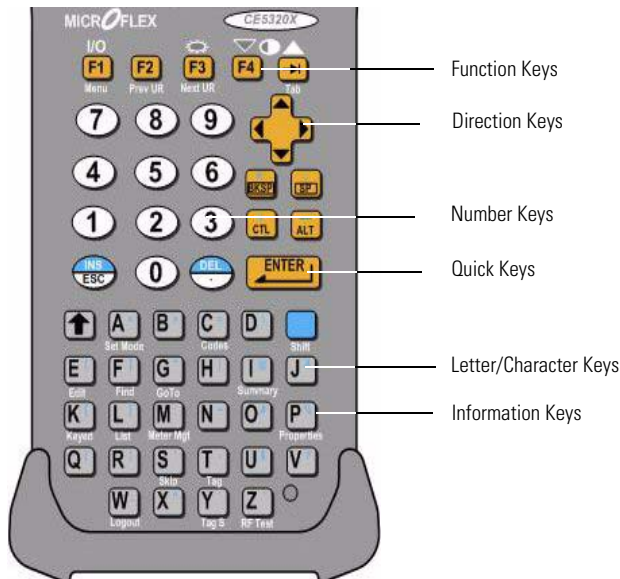


Figure 2.3 Keyboard Layout

- **Function Keys or Hot Keys**—allow you to perform special tasks quickly.
- **Direction Keys**—allow you to move up or down a list of items and to move forward or backward in a data-entry space.
- **Number Keys**—allow you to enter a number in the display or to select an item from a list of items shown.
- **Quick Keys**—allow you to execute a task quickly by pressing certain keys at once or in a particular order.
- **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.

Chapter 3 Basic Operating Instructions

This chapter provides fundamental instructions for operating the Field Programmer. It contains basic features of the NHPS, and it also gives instructions for setting up the CE5320 so that it can be used to collect information from the field.


Basic Functions of the Field Programmer

To better understand how the CE5320 handheld operates, please refer to the following sections of the *ARB N_SIGHT Mobile User's Manual for the CE5320 Handheld* (Part No. 11769-016).



- “Basic Features of the CE5320X”
- “Determining the System Configuration”
- “Adjusting System Settings,” which include Calibrating the Stylus and Configuring RF/Serial Properties

Starting the Field Programmer Software

To start the Field Programmer, complete the following steps.

- 1 Press  to turn on the Field Programmer.



You can manually turn off the handheld by pressing the blue  key followed by the  key. After pressing these keys, the display goes blank, indicating that the handheld is off.

The Windows CE screen appears. See Figure 3.1.

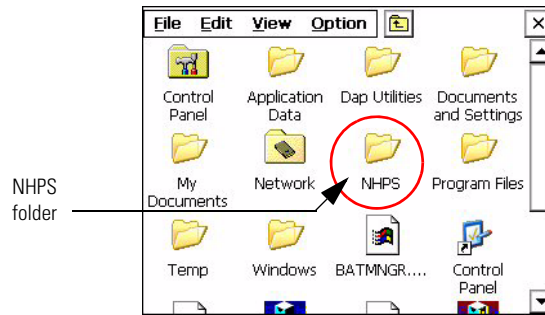


Figure 3.1 Programmer Start Screen

- 2 Double-click the **NHPS** icon.

The following screen appears.

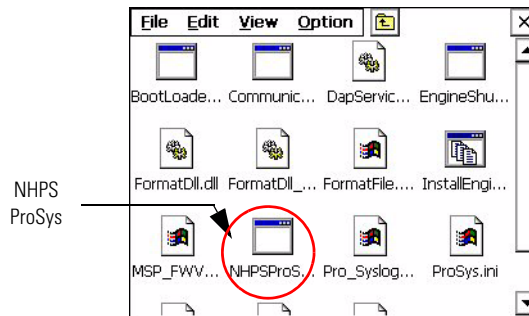


Figure 3.2 NHPS Folder

- 3 Click **NHPSProSys.exe**, as illustrated in Figure 3.2.

The software initializes, and the following screen appears briefly.



Figure 3.3 NHPS Initialization Screen

After after initializing, the Neptune Hand-held Programmer System start screen appears. See Figure 3.4.

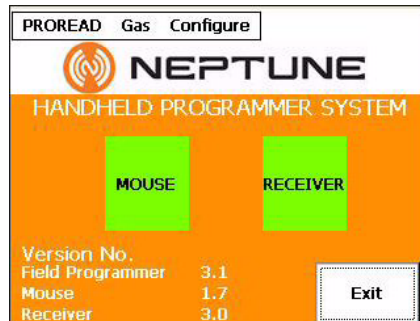


Figure 3.4 NHPS Start Screen

Two options appear for using the devices:

- Mouse
- Receiver

Two represent the status for the options:

- Green = The device is connected and ready to use.
- Red = The device is not connected.

Three menus appear at the top of the screen:

- PROREAD
- Gas
- Configure

Programming the ProRead

The first time you use the Field Programmer software after the installation, you need to program the ProRead.

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

- 1 Select **PROREAD** from the top of the screen.

The ProRead Programming screen appears. See Figure 3.5.

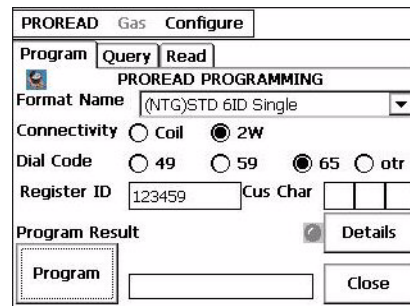



Figure 3.5 ProRead Configuration Screen

- 2 Touch  for **Format Name**.

A selection list similar to Figure 3.6 appears.



Figure 3.6 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 as illustrated in Figure 3.7. However, one of these values usually is not selected. (To return to the screen from this list, select **None**.)

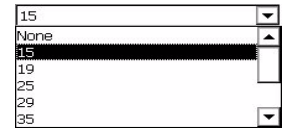



Figure 3.7 Otr Selection List



The water utility often requires modification so that a reading matches their 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 or clips 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** as:

- **PASS**
- **FAIL**

(See Figure 3.8.)

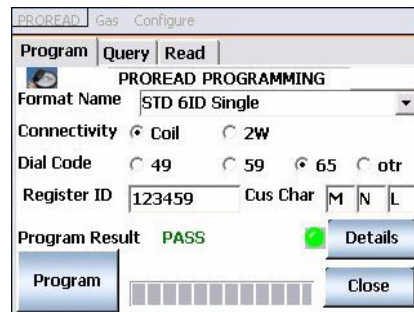


Figure 3.8 Program Result -- Pass Screen

- 10 If you want to view detailed information, touch or click **Details**.

Details display the data in raw format. (See Figure 3.9.)

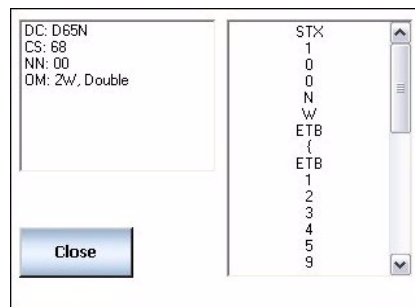




Figure 3.9 ProRead Program Details Screen

- 11 You can program a similar register that can automatically generate a new ID number by pressing  again.
- 12 You can program a different type of register by repeating steps 1 through 10.
- 13 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. You must first configure the programmer 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 **PROREAD** from the Neptune Programmer System start screen.

- 2 Select the **Query** tab.

The ProRead Query screen appears. See Figure 3.10.

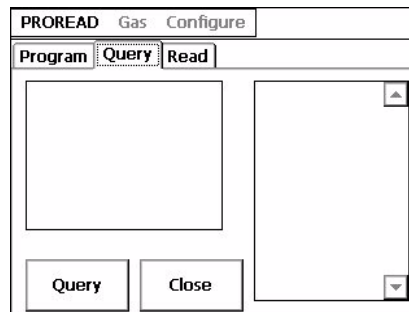



Figure 3.10 ProRead Query Screen

- 3 Touch or click  to perform a query.

The query results appear similar to that of Figure 3.11.

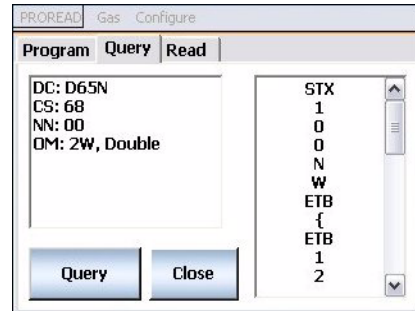



Figure 3.11 ProRead Query Results

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 Neptune Programmer System start screen.
- 2 Select the **Read** tab.
The ProRead Read screen appears. See Figure 3.12.

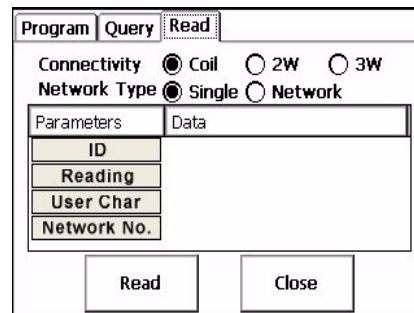


Figure 3.12 ProRead Read Screen

- 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 registers programmed for RF MIUs or other 3W devices.

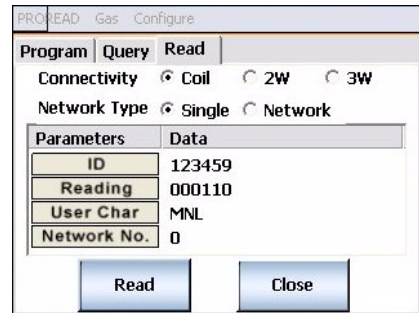



Figure 3.13 ProRead Reading Result Screen



If an error message appears during a read attempt, it is most likely due to improper format information.

- 5 Repeat steps 1 through 4 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.

Programming the R900G Endpoint

To program the R900G endpoint, use the NHPS and complete the following steps.

- 1 Start the Neptune Field Programmer software; refer to "Starting the Field Programmer Software" on page 3-1.
- 2 Select **GAS** from the top of the screen.


The Gas Meter Configuration screen appears. See Figure 3.14.

Figure 3.14 Gas Meter Configuration Screen

- 3 Touch  for **Format Name**.

A selection list similar to Figure 3.15 appears.

Figure 3.15 Format Name Selection List

- 4 Touch or click the format you want and press **Enter**.
- 5 For **Initial Reading**, type a value.
- 6 Align the IR LED to Gas Programming post, and do one of the following to program gas:
 - Press the program button on the mouse. (This button can only be used for Programming; it cannot be used for Read or Query.)
 - Press **Enter**.
 - Touch or click .

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 3.16.

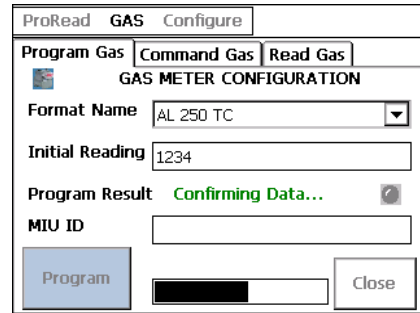


Figure 3.16 Program Result – Confirming Data

An audible tone signals the **Program Result** as:

- **PASS**
- **FAIL**

The MIU ID displays the ID or serial number of the MIU. See Figure 3.17.

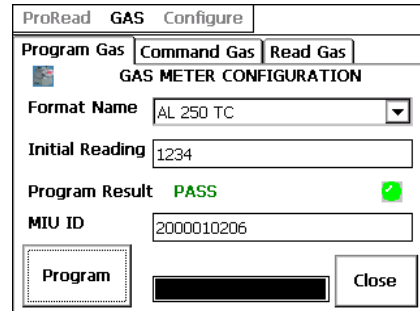



Figure 3.17 Program Result -- Pass Screen

- 7 You can program another gas endpoint by repeating steps 1 through 6, or touch or click  to close the Program Gas tab and 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 R900 G endpoint and complete the following steps.

- 1 Select **GAS** from the Neptune Programmer System start screen.
- 2 Select the **Query** tab. The Gas Query screen appears. See Figure 3.18.

ProRead GAS Configure

Program Command Read **Query**

MIU ID

Multiplier Input

PCF

Display Digits

Query Close

Figure 3.18 Gas Query Screen

- 3 Touch or click to perform a query.

The query results appear similar to that of Figure 3.19.

ProRead GAS Configure

Program Command Read **Query**

MIU ID

Multiplier Input

PCF

Display Digits Done

Query Close

Figure 3.19 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:
 - 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 Neptune gas meter program.

- **Refresh** the data for the R900G endpoint.
- Place the R900G endpoint in **Sleep** mode.
- **Wake up** the R900G endpoint from sleep mode.
- **Close** the Neptune gas meter program tab.



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 the Field Programmer Software" on page 3-1.
- 2 Select **GAS** from the top of the screen.
- 3 Select **Command Gas**.

The Command Gas screen appears as illustrated in Figure 3.20.

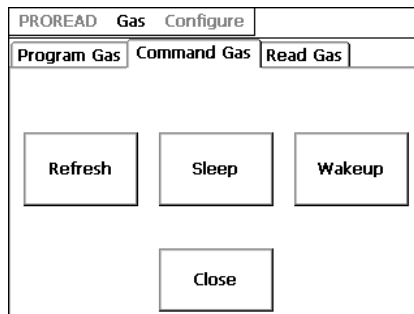



Figure 3.20 Command Gas Screen

- 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.
 - Touch or click **Wakeup** to activate the R900G endpoint from sleep mode.
 - Touch or click  to close the Neptune gas meter program tab.



Any time you are using the gas meter program you can use the functions on the Command Gas screen.

Reading the R900G Endpoint

The NHPS 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 an R900G endpoint, 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 3.21.

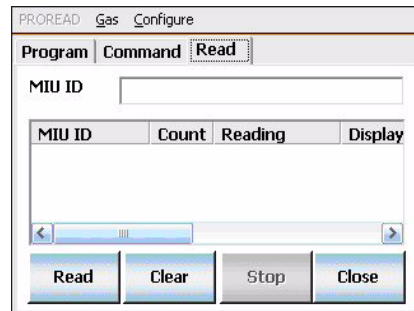


Figure 3.21 Gas Read Screen

- 3 Enter the **MIU ID** to read a specific unit.

Leaving the MIU ID blank allows you to received all readings in a range.

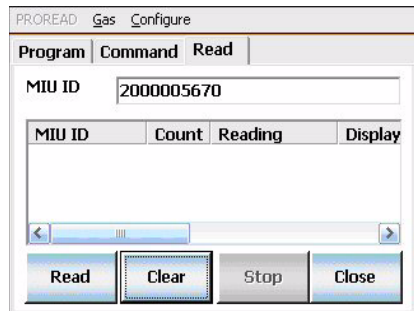



Figure 3.22 Gas Reading Result Screen

- 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 a problem with receiving. Try the following:

- Wait at least one minute.
- Move the handheld farther away from the R900G to prevent saturating the receiver.
- If this does not solve the problem, remove the antenna from the handheld to reduce the likelihood of interfering signals in the area.

- 5 Press **Clear** to clear the reading and repeat steps 1 through 4 to read another MIU.

Chapter 4 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 (R)ed terminals and interconnect all (B)lack 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

Chapter 5 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 Pro-Read register, complete the following steps.

- 1 On the Neptune Handheld Programming System start screen, touch or click **Configure** at the top of the screen. See Figure 5.1.

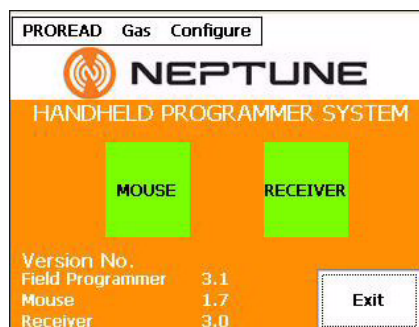


Figure 5.1 Neptune Programmer System Start Screen

- 2 Touch or click **ProRead**.

The Login screen appears as illustrated in Figure 5.2.

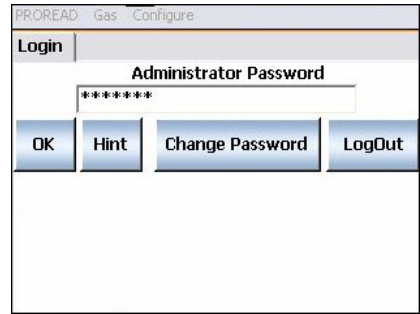


Figure 5.2 ProRead Login Screen



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 to cancel logging in to the system.

- 3 Type the password, and touch or click **OK**.

The Preferences screen appears as illustrated in Figure 5.3.

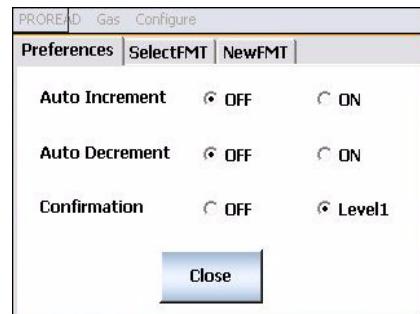


Figure 5.3 ProRead Preferences Screen

On this screen, select one for each of the following:

- | | |
|-----------------------|---|
| Auto Increment | Allows the system to automatically increment the ID numbering by one digit. |
| Auto Decrement | Allows the system to automatically decrement the ID numbering by one digit. |
| Confirmation | Allows additional dialog to confirm the action to be performed. |

- 4 Do one of the following:
 - Touch or click **Close** to close the ProRead configuration and return to the previous screen.
 - 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.

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 5.4.

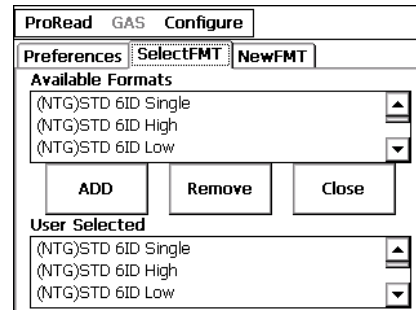


Figure 5.4 Available Formats Screen



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 (both standard and custom).
- **User Selected** shows the formats already selected.

2 On this screen do any the following:

- Add** Allows you to select from the **Available Formats**, and touch or click Add to place it in the **User Selected** list.
- Remove** Allows you to select a format from the **User Selected** 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.

Editing a ProRead Format



Most user-created formats are simple modifications to the Neptune standard formats.

To make changes to an existing format, complete the following steps.

- 1 Log in to the field programmer by completing steps 1 through 3 in "Selecting ProRead Preferences" on page 5-1.
- 2 Select **NewFmt**.

The New Format screen appears as illustrated in Figure 5.5.

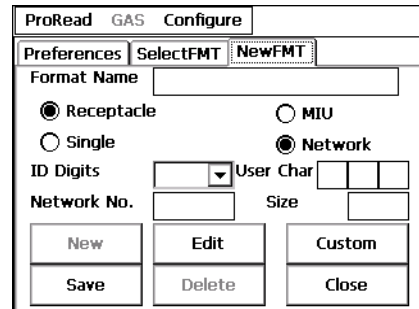







Figure 5.5 ProRead New Format Screen

- 3 Touch or click  .
- 4 Touch or click  to select the format to edit from the list of available in **Format Name**.
- 5 Make any necessary changes on this screen, if applicable.
 - Touch or click  to make changes to Stop Bits, Clock Divisor, or Tokens. See "Creating a New ProRead Format" on page 5-7. (These changes are rarely needed.)
 - Touch or click  twice to return to the NewFMT screen.
- 6 Touch or click  to save the changes for the new format created.

A confirmation dialog appears similar to the following asking you to confirm the changes to the present format.

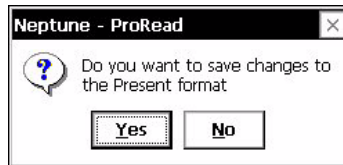


Figure 5.6 Save Changes Dialog

- 7 Touch or click **Yes** to save the format or **No** to cancel.
- 8 If you selected a standard format and made changes to it, you must save it as a new format. Touch or click **Save As**.

A dialog appears similar to the following, asking you to enter a different name for the format.

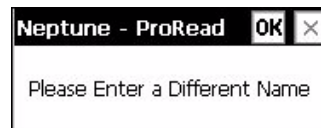


Figure 5.7 Enter Different Name Dialog

- 9 Touch or click **OK**, 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 5-3.
- 3 Refer to "Programming the ProRead" on page 3-3 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 5-1.
- 2 Select **NewFmt**.

The New Format screen appears as illustrated in Figure 5.5 on Page 5-4.

- 3 Touch or click  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 you to confirm the deletion.

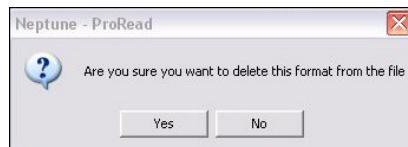


Figure 5.8 Delete Confirmation Dialog

- 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 reading systems. 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 Log in to the field programmer by completing steps 1 through 3 in "Selecting ProRead Preferences" beginning on page 5-1.
- 2 Select **NewFMT**.


The New Format screen appears as illustrated in Figure 5.9.

Figure 5.9 ProRead New Format Screen

- 3 Touch or click  .

- 4 Type a name that identifies the type of format you are creating in **Format Name**. (See "Editing a ProRead Format" on page 5-4.)



You can touch or click  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.

- 5 Select one of the following:


- Receptacle
- MIU

- 6 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.

- 7 Touch or click  to select from the list of available values of 1 to 10 for **ID Digits**.
- 8 Type three alphanumeric character for **User Char**.
- 9 Type the number for the **Network No**.
- 10 Enter the size, if applicable.

- 11 On the **NewFMT** screen, select



The **Cus_FMT1** screen appears as illustrated in Figure 5.10.

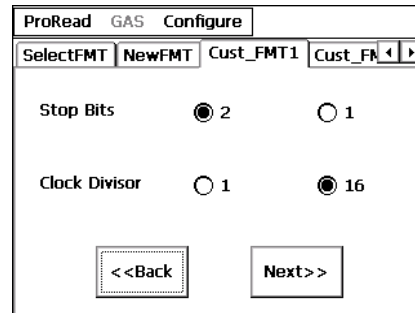



Figure 5.10 Custom Format 1 Screen

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 or click  or the **Cus_FMT2** tab.

The **Cus_FMT2** screen appears as illustrated in Figure 5.11.

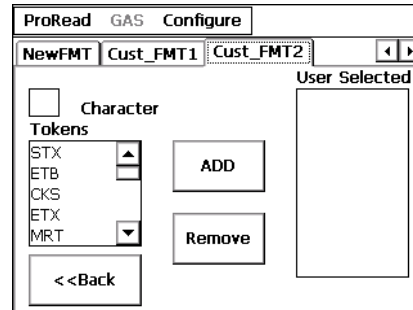



Figure 5.11 Custom Format 2 Screen

- 4 Type an alphanumeric character in **Character**, if applicable.
- 5 Touch or click .

The character you typed now appears in the **User Selected** list.


- 6 From the selection list of **Tokens**, touch or click 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".

- 7 Touch or click  .


The token you selected now appears in the **User Selected** list.

- 8 Repeat steps 5 to 8 to add more characters and tokens.
- 9 If there is a character or token in the User Selected that you no longer need, touch or click  .

The item is removed from the User Selected list.

- 10 Touch or click  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 can work with the format you need. You can do 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.

- 1 On the Neptune Handheld Programming System start screen, touch or click **Configure** at the top of the screen. See Figure 5.12.

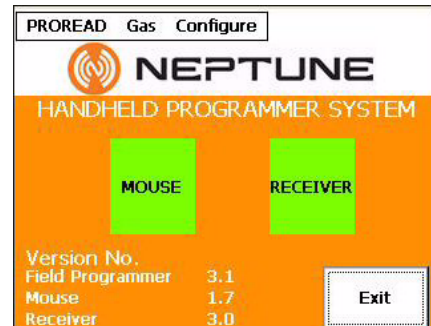


Figure 5.12 Neptune Programmer System Start Screen

- 2 Touch or click **Gas**.
The Login screen appears as illustrated in Figure 5.13.

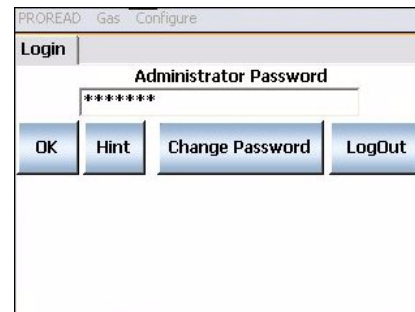


Figure 5.13 Gas Login Screen



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, or cancel logging in to the system.

- 3 Type the password, and touch or click **OK**.

The Preferences screen appears as illustrated in Figure 5.14.

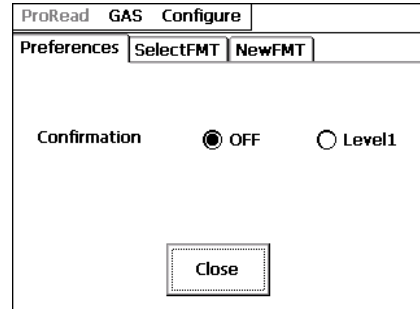


Figure 5.14 Gas Preferences Screen

- 4 Select one of the following for Confirmation:
 - **OFF** to turn **off** some confirmation dialogs for actions.
 - **Level 1** to allow all confirmation dialogs for actions
- 5 Do one of the following:
 - Touch or click **Close** to close the gas configuration and return to the previous screen.
 - 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.

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 3-9.

To select a format for programming an R900G endpoint, complete the following steps.

- 1 Touch or click **SelectFMT** to formats available to use for programming R900G endpoints. See Figure 5.15.

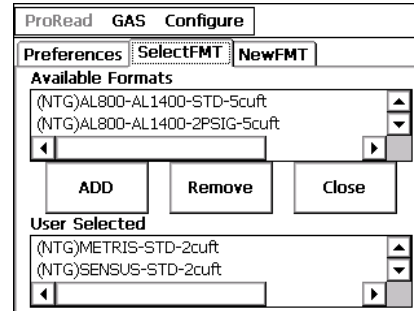


Figure 5.15 Available Gas Formats Screen

The following information appears:

- **Available Formats** display at the top of the screen.
 - **User Selected** shows the formats already selected.
- 2 On this screen, do any the following by selecting the corresponding button or tab.

Add	Allows you to select from the Available Formats , and touch or click Add to place it in the User Selected list.
Remove	Allows you to select a format from the User Selected list and touch or click Remove to remove it from the User Selected 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 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 Log in to the field programmer by completing steps 1 through 3 in "Selecting a Gas Format" on page 5-13.

- 2 Select **NewFMT**.

- 3 Touch or click

 because the NewFMT screen now defaults to **New**, then shift the numbers to compensate.

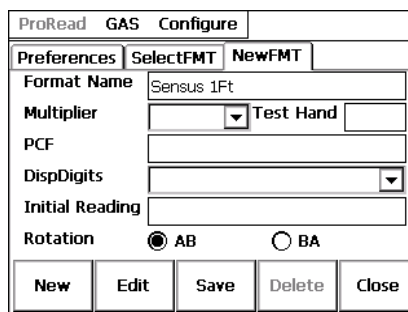



Figure 5.16 Gas New Format Screen

- 4 Touch or click  in **Format Name** to select a format from the available gas formats.

A selection list similar to Figure 5.17 appears.

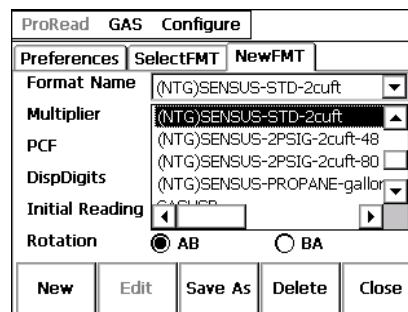



Figure 5.17 Gas Format Name Selection List

After you select a format, all the values associated with it appear. You can then make any necessary changes.

-
- 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 **Test Hand** 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 in Appendix A, "Pressure Configuration Factor Indexes Available from American Meter, Sensus, and Actaris". 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 or click  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 5-16.

Table 5.1 Meter Input Drive Rotation

Meter		Rotation
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 5-14.
- 2 Touch or click  .

A dialog appears similar to the following, asking you to enter a different name for the format.

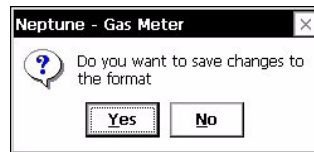


Figure 5.18 Gas Save Change Dialog

- 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 similar to the following asking you to enter a different name for the format.

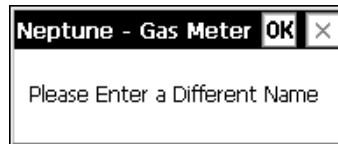



Figure 5.19 Enter Different Name Dialog

- 5 Touch or click **OK**, and type the name of the new format in **Format Name**.
- 6 Touch or click  .

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 Log in to the field programmer by completing steps 1 through 3 in "Selecting a Gas Format" on page 5-13.

2 Select **NewFMT**.

3 Touch or click



The New Format screen appears with a blank line and no  for **Format Name**.

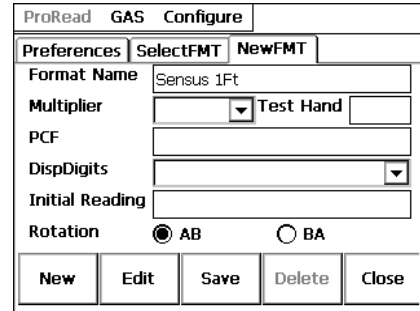



Figure 5.20 Gas New Format Screen

4 Type the name of the new format in **Format Name**.

5 Complete information for the following items, where applicable.

- Multiplier
- Test Hand
- PCF (See "Pressure Configuration Factor Indexes Available from American Meter, Sensus, and Actaris" on page A-1. Contact the meter manufacturer if you have any questions.)
- DispDigits
- Initial Reading
- Rotation (See "Meter Input Drive Rotation" on page 5-16.)

6 Touch or click .

A dialog appears similar to the following, asking you to enter a different name for the format.

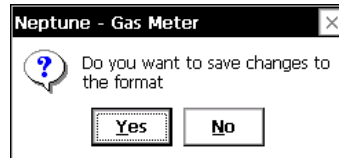


Figure 5.21 Save Changes to Format Dialog

7 Touch or click **Yes** to save the changes to the new format or **No** to cancel.

8 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 the **SelectFMT** tab.
- 2 Complete the steps outlined in "Selecting a Gas Format" on page 5-13.
- 3 Refer to "Programming the R900G Endpoint" on page 3-9 to program or read the ProRead register 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 Log in to the field programmer by completing steps 1 through 3 in "Selecting a Gas Format" on page 5-13.
- 2 Select **NewFmt**.

The New Format screen appears as illustrated in Figure 5.16 on Page 5-14.

- 3 Touch or click  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 format.

A confirmation dialog similar to the follow appear asking you to confirm the deletion.

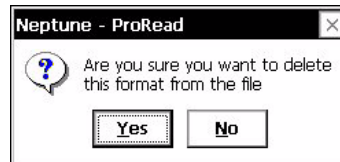


Figure 5.22 Delete Confirmation Dialog

- 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. You can only delete user defined formats.

Chapter 6 Troubleshooting

This chapter provides a list of the system messages for the Field Programmer and when they display. Use the information in this chapter to solve any problems. If you still cannot solve the problem, contact a Neptune Support Technician. For help in contacting Neptune, refer to the topic "Product Support within North America" on page 1-3.

Basic Tasks

Question


Answer

The Field Programmer is not working.

If something is not working, go back to the Main screen.

1. Restart **NHPS**.
2. Turn the unit **OFF** then **ON**.
3. Reinsert the mouse.
4. Try again.

The display is empty and the Field Programmer does not beep when I press a key.

The Field Programmer might be turned off. Press the I/O  key to turn the unit on.

The Field Programmer does not refresh when I place it in a communication cradle.

- If the battery indicator is not red, make sure that the communication cradle is connected to a proper outlet.
- Check that all cables are secure.

Basic Tasks

Question

Answer

When I press the I/O  key, the Field Programmer does not turn on.

The battery may be too low. Place the Field Programmer handheld in a communication cradle. Then, check the color of the battery indicator in the bottom right corner of the Field Programmer handheld. The indicator turns red if the battery is low. x



WARNING: On Battery x % (indicating a very low battery life remaining).

If this message appears, place the Field Programmer handheld in the cradle and allow to remain until the indicator turns green, indicating that the battery is fully charged. Recharging the battery can take from three to six hours.

The Field Programmer Handheld locks and does not respond when I press keys.

- Press .
- Reset the unit.

The display contrast is weak or the display background is very dark.

- Press  and  to brighten the display.
- The Field Programmer 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.

The Field Programmer Handheld does not turn off automatically or manually.

The Field Programmer Handheld is in a communication cradle, in which case the Field Programmer Handheld remains on until you remove it from the cradle and then turn it off.

When I am on the main NHPS screen, one of the buttons is red.

- If the mouse button is red, reattach the mouse and restart the ProSys application.
- If the Receiver button is red, or there is no receiver, reconnect the receiver and restart the ProSys application.

System Messages

Question

Answer

Time-out

ProRead

- Press OK.
- Check alignment of coil.
- Check that the mouse is properly inserted.
- Try again.

Gas

- Clear error.
- Check alignment of IR LED with Gas priming post.
- Try again.

Reboot

If you need to reboot the Field Programmer, it will automatically go to the ARB N_SIGHT Mobile Login screen. See "Exiting the Software" which follows.

Exiting the Software

To exit the ARB N_SIGHT Mobile software, complete the following procedure.

- 1 Exit the ARB N_SIGHT Mobile software by

pressing .

The Confirm Resequencing screen appears as illustrated in Figure 6.1.

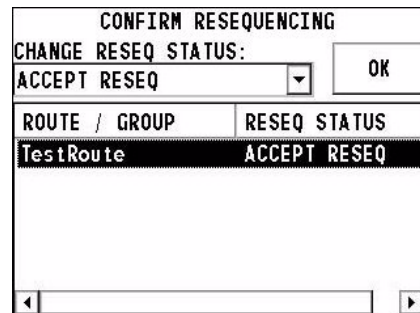


Figure 6.1 Confirm Resequencing Screen

- 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 6.2.

Figure 6.2 ARB N_SIGHT Mobile Handheld Logout Screen

- 4 Enter the following information, if applicable,
 - **Vehicle #**
 - **Mileage**
 - Any notes
- 5 Touch **Logout**.

The Hold Routes screen appears as illustrated in Figure 6.3.

ROUTE	HOLD
01-0101-01-Test...	NONE

Figure 6.3 Hold Routes Screen

- 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 remain in the handheld after the route is unloaded.

- Select the route to hold, if applicable.
- Touch **OK**.

The ARB N_SIGHT Mobile Login screen appears as illustrated in Figure 6.4.

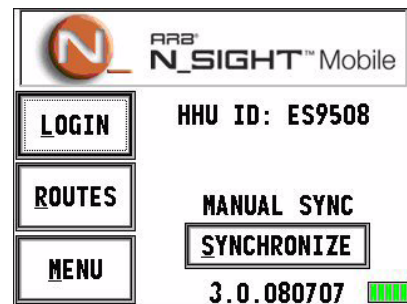


Figure 6.4 ARB N_SIGHT Mobile Login Screen

Rebooting the Field Programmer



Rebooting the handheld will not cause you to lose route information within the ARB N_SIGHT Mobile application.

NHPS Storage NAND Operation

Recovery from full battery discharge

When the battery is fully discharged, the program and data are deleted from the volatile memory (RAM). To recover from this situation you must do the following;

- 1 Charge the handheld.
- 2 Reinstall the .NET framework.
- 3 Run the utility to recover the data from memory (Nand Storage).
- 4 Restart the communications engine.
- 5 Reset the handheld.
- 6 Restart the application.

Reinstalling the .NET framework

- 1 Go to **Storage_Nand/NHPS**.
- 2 Select and run **NHPSUpdate.exe**
A window appears stating: **Dotnet not installed**.
- 3 Click **OK**.
- 4 Wait for Program to load.
A window appears to install **.NET Compact Framework**.
- 5 Click **OK**.

NHPS Nand Storage utility (Object Store)

- 1 Select and rerun **NHPSUpdate.exe**.



Figure 6.5 NAND Object Store Area

NHPS_Update reinstalls the .NET Framework back into the main memory (RAM) and restores information to and from the NAND Memory. This application has options that allow you to copy the contents of the NHPS folder to or from the main memory of the device to the Object store area of the device.

- For X series handhelds, the object store is called Storage_Nand.
- For Bulverde processor devices, the object store is called DiskOnChip.

This following figure illustrates the main screen of NHPS_Update.

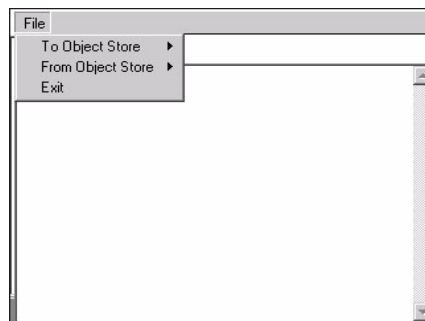


Figure 6.6 NHPS_Update Main Screen

The File Menu has three options:

- To Object Store
- From Object Store
- Exit

To Object Store

This option takes place during initial installation of the software. Complete the following steps.

- 1 Select **To Object Store**.
- 2 Click **Start**.

This selection copies the NHPS folder to the object store of the device.

From Object Store

Use this option to recover from a full battery discharge or lost memory. Complete the following steps.

- 1 Select **From Object Store**.
- 2 Click **Start**.

This selection copies the NHPS folder to the RAM memory of the device.

Exit

A condition is added when saving files in the NHPSProSys application. This condition checks for the presence of the object store on the device. If the object store is found, the NHPSProSys application saves all the format files and log files to the object store. This also depends on the presence of NHPS folder in the object store.

Appendix A Pressure Configuration Factor Indexes Available from American Meter, Sensus, and Actaris

Table A.1 Pressure Configuration Factor Index Table

Index Part Number	Drive	Gauge Pressure	Atmospheric Pressure	Base Pressure	Actual Gear Ratio	Pressure Compensation Factor
American Meter - AL/AR/AC/AM/AT 175/210/250/350/425/630						R900G: 12750-000
52180G066	1 ft ³	2 psig	14.40	14.73	900	1.111111
28538G151	1 ft ³	2 psig	14.73	14.73	883.333333	1.132075
52180G067	2 ft ³	2 psig	14.40	14.73	450	1.111111
04972G116	2 ft ³	2 psig	14.73	14.91	443.055556	1.128527
04972G122	2 ft ³	2 psig	14.40	14.65	445.454545	1.122449
04972G118	2 ft ³	2 psig	14.73	14.73	442.000000	1.131222
04972G124	2 ft ³	2 psig	14.55	14.73	443.055556	1.128527
04972G120	2 ft ³	5 psig	14.40	14.73	381.944444	1.309091
04972G117	2 ft ³	5 psig	14.73	14.91	376.125000	1.329345
04972G119	2 ft ³	5 psig	14.73	14.73	374.305556	1.335807
04972G127	2 ft ³	5 psig	14.40	14.65	376.125000	1.329345
04972G121	2 ft ³	10 psig	14.40	14.73	303.333333	1.648352
Sensus/Equimeter - R-275 / R-315:						R900G: 12821-000
001-63-537-48	2 ft ³	2 psig	14.40	14.73	445.867	1.121411
001-63-537-41	2 ft ³	5 psig	14.40	14.73	379.911	1.316098
001-63-537-49	2 ft ³	10 psig	14.40	14.73	300.781	1.662339
Sensus/Equimeter - # 415:						R900G: 12821-100
001-41-537-48	2 ft ³	2 psig	14.40	14.73	445.867	1.121411
001-41-537-41	2 ft ³	5 psig	14.40	14.73	379.911	1.316098
001-41-537-49	2 ft ³	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
Sensus/Equimeter - S-275:					R900G: 12821-200	
Propane	1 ft ³				36.3025	2.7546296
Sprague/Schlumberger/Actaris - 175/240/250/Metris/400A					R900G: 12861-000	
017289	2 ft ³	2 psig			447.619050	1.1170213
018207	2 ft ³	14" W.C			491.666700	1.0169491
017228	2 ft ³	5 psig			375.000000	1.3333333
017308	2 ft ³	2 psig			447.916700	1.1162790
135543	2 ft ³	2 psig			447.619050	1.1170213
017308	2 ft ³	2 psig			447.916700	1.1162790
037223	2 ft ³	10 psig			293.333300	1.7045456
037234	5 ft ³	2 psig			178.800000	1.1185682
037237	5 ft ³	10 psig			120.000000	1.6666667
017317	2 ft ³	2 psig			447.619050	1.1170213
017318	2 ft ³	14" W.C			491.666700	1.0169491
017366	2 ft ³	2 psig			447.619050	1.1170213
017367	2 ft ³	14" W.C			491.666700	1.0169491
091238	2 ft ³	2 psig			447.619050	1.1170213
091240	2 ft ³	14" W.C			491.666700	1.0169491
135547	2 ft ³	2 psig			447.619050	1.1170213

Appendix B Tokens List for Custom Format Screen

Tokens are constants and special characters used as part of a ProRead format to:

- Indicate a constant value
- Indicate where an inserted value, such as reading or checksum, 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)
NULL	Null (0x00)
USR	USR User characters (USR1, USR2, USR3).

Table B.1 Custom Format Tokens

Token	Explanation
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 (0x FC)
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.

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