Certification Exhibit

FCC ID: R7PGRAMCNLX1
IC: 5294A-GRAMCNLX1

FCC Rule Part: 15.247
IC Radio Standards Specification: RSS-210

ACS Report Number: 08-0433 - 15C

Manufacturer: Cellnet Technology, Inc.
Model: GasLX Residential American

Installation Guide

American Residential Meter
One-Way Gas Module
Installation Guide

98-3107 Rev AA

Landis+Gyr

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Table of Contents

1

Preface

This guide describes the installation process for Landis+Gyr American Residential Meter One-Way Gas Module.

Any training provided directly to installers by the utility or by the Landis+Gyr project management team takes precedence over this guide, as long as it does not involve altering the meter module retrofit process.

About This Guide

This is the November 2008 edition of the *Landis+Gyr American Residential Meter One-Way Gas Module Installation Guide*. It provides:

– basic information of the field installation, retrofit, and exchange procedure used for residential gas meters
– basic safety guidelines and detailed instructions for installing and exchanging of gas meters

Who Should Use This Guide

This guide is intended for use by utility employees responsible for installing meters and module retrofitting to already installed meters. It does not assume an expert level of industry or computer knowledge. This guide does assume that you are familiar with basic:

– utility operations.
– terminology of your industry.
– procedures for performing basic HandHeld operations.

How This Guide Is Organized

Table 1-2 illustrates how this guide is organized.

Table 1-1. Description of Chapters

Chapter	Title	Description
1	Preface	Provides information about how this manual is organized
2	Pre-Installation	Safety equipment and guidelines
3	Using the HandHeld Device	Step by step instructions on using the Handheld PC
4	On-Site Preparation	What to look for onsite
5	Gas Meter Exchange	Step by step instructions for exchanging gas meters
6	Meter Module Installation	Step by step instructions for installing the residential meter
7	Meter Install Conclusion	Completion instructions
8	Gas Meter Preparation Program (GREP)	Information about the Gas Meter Preparation Program tool.
Appendix A	Visual Inspection of Indexes	Exchange indexes
Appendix B	Using the RF Buster	Instructions on using the RF Buster
Appendix C	End of Day	What to do at the end of the day

Typographical Conventions

This section describes the conventions used in this guide to make finding and understanding information easier. The following kinds of formatting in the text identify special information.

Convention	Description
All **bold**, initial capital letters	Refers to field names, buttons, menus, menu options, and keys. Examples: **Device** field, **Open** button, **File** menu, or **Ctrl** key.
All **bold** lower-case letters	Refers to the exact keystrokes you enter. What you type is always shown in lowercase letters. Example: Type **local** in the **Device** field.
Italicized lower-case word between less-than sign (<) and greater-than sign (>)	Refers to variables that occur in item names. Example: Add Sub Network To *<network name>* dialog, where *<network name>* refers to the name of a network.
<menu> | *<option>* | *<option>*...	Refers to the sequence of choices you should make to access a specific dialog or menu option. Examples: choose **Start** | **Settings** | **Control Panel** or choose **File** | **Open**.

Convention	Description
Plus sign (+) between keys	Refers to pressing the keys at the same time. Example: **Alt+B**.
Comma (,) between keys	Refers to keys which are pressed sequentially. Example: **Alt,F**.

Note boxes provide essential information about Landis+Gyr Gas Meter Module and Meter Installation.

Cautions provide information that you must read to avoid making relatively moderate errors during Landis+Gyr Gas Meter Module and Meter Installation.

Warnings provide special, must-read information. If you ignore a warning, you may create a safety hazard, omit essential data or make a critical error. Warnings are in the same format as notes, except they are shown in bold text.

Contacting Technical Support

Landis+Gyr technical support is available by telephone or email. When you contact technical support, be prepared to give exact descriptions of:

- The problem you encountered
- What happened and what you were doing when the problem occurred
- How you tried to solve the problem
- The exact text of any error messages

Telephone Access

Technical support is available Monday through Friday from 8:00 a.m. to 5:00 p.m. (ET) by calling 800-791-2567. If all support technicians are helping other customers, your call will be routed to the Landis+Gyr Support voice mail system.

Leave a brief message that includes the following information:

- Your name
- Your company's name
- Your telephone number

A support technician will return your call as soon as possible within normal business hours. Technicians return all calls in the order that they are received.

Email Access

If you prefer, you may email a description of your problem to:

solutionsupport.na@landisgyr.com

A support technician will return your email as soon as possible within normal business hours. Technicians return all emails in the order that they are received.

General Inquiries

Your feedback is important in helping to provide the most accurate and high-quality information. If you want to reach a Landis+Gyr sales representative, or for other inquiries, do one of the following:

•   Telephone: 678-258-1500

•   Fax: 678-258-1550

You can also mail your comments or inquiries to:

Landis+Gyr
Attn: Customer Support
30000 Mill Creek Avenue
Suite 100
Alpharetta, GA 30022

Ordering Publications

You can order publications from your sales representative. To order additional copies of this manual, use order number:

98-3107 Rev AA

Publication Comments

Landis+Gyr welcomes your feedback and comments. If you have comments or suggestions for improving this publication, a form is provided at the back of this manual for reader's comments. If you would like a reply, please include your contact information:

•   Name

•   Telephone number or fax number

•   Email address

•   Company name and address

Be sure to include the following information along with your comment:

•   Title and number of this manual

•   Page number or topic related to your comment

Related Publications

The following document provides important related information.

Table 1-2. Related Publication

Document	Description
1-Way Module Programming Cable	Programming the module via a PC or laptop and the 1-way cable

Notes:

2
Pre-Installation

Landis⁺|Gyr⁺

Proper planning and thorough preparation are critical for successful installation. This chapter outlines basic requirements for the pre-installation phase.

SAFETY OVERVIEW

Prior to starting the installation process, you must develop and launch an installer safety training plan for initial, refresher, and ongoing safety training. Ensure that installers receive appropriate initial and refresher training to meet their specific safety-related responsibilities. You must provide safety training when:

- An existing installer assumes new duties for which he or she has not previously received training.
- New processes and methodologies representing new risks are introduced into the installation environment.
- Previously unidentified risks are reported.

The installation supervisory team assumes responsibility for ensuring that installers are properly trained, authorized, and continually qualified to perform their work. The team must also take responsibility for the safety of their installers and to assure safe work methodologies. Installers must understand that their supervisor's responsibility does not relieve them from their individual responsibility to perform the work safely and to follow all safety rules and procedures applicable to their work.

Table 2-1. Gas Meter Installation and Module Retrofit Tool List

Torque screwdriver with various slot and Phillips tips	5 - in - 1 screwdriver
14" Pipe wrench (2)	18" Pipe wrench (2)
24" Pipe wrench (1)	14" curved jaw channel locks
#1 and #2 Phillips screw driver	Screw driver - 1/8-inch slot blade
Ball Peen Hammer	Shovel and spade
Crescent wrench	WD-40
Thread Lubricant	Identification
Door Hangers	Clip Boards
Pens/Pencils	Safety cones
Screwdriver- ½" slot blade x 10"	Awl, Heavy duty
Headlight flashlight	Brass scraper 1 ¼-inch wide
Diagonal cutters	Handheld
Personal Protective Equipment	Clipboard

Table 2-1. Gas Meter Installation and Module Retrofit Tool List

Street Atlas	RF Buster, P/N 26-1050
Non-spark flashlight	Cell phone or 2-way communication device
Wire Brush	Cable ties
"Shooter" cable	Jumper cables
Leak detection soap	Pressure gauges
Grey spray paint and paint board (to prevent over spraying)	Dead blow hammer
Any required specialty tools	

> **Your supervisor carries shovels, spades, hack saws, other specialty tools, and ladders. Take care to check the work area each time you change locations. Be certain there are no tools left behind.**

RF Busters

Verify that the RF Buster is working correctly. Press and hold the push button Switch. The LED lights red, and the internal speaker sounds for approximately 1/2 second. If nothing happens or the LED lights and speaker sound continuously, then the 9V battery is probably low and needs to be replaced.

To access the battery compartment, open the spring-loaded cover on the back of the RF Buster. Take care not to misplace the cover or damage the battery door spring mechanism.

Figure 2 - 1. RF Buster

See Appendix B, *Using the RF Buster* for detailed instructions on how to use the RF Buster.

Handhelds (Handheld)

Handhelds are rugged, but you should still always handle them carefully. If the unit fails to operate in the field, page your Supervisor for help. If possible, the Supervisor will assist in correcting the problem or bring a replacement unit out to you.

Figure 2 - 2. Handhelds with programming cables

Handhelds differ by program, but the ones shown above are currently in service. On the left is the DAP PC9800, a DOS-based Handheld. In the middle is the DAP CE5320, a Windows CE-based Handheld. On the right is the DAP CE5320b, a Windows CE-based Handheld.

Install Material

The Gas Meter Exchange process consists of using predetermined route information that identifies the meters that need to be retrofitted with the Landis+Gyr Gas Meter Module and methods for recording data to document the installation. The route information describing the account address, existing meter ID, estimated meter reads, and any special instructions that describe circumstances unique to that particular account will reside in the installers Handheld.

From the Cross Dock, obtain your Handheld and the Meter Modules to be installed. The Handheld will be preloaded by the Cross Dock with all of the data for the assigned routes. The pre-loaded data includes the route, address, meter ID, and estimated read for the particular meters, plus specific instructions and required field collects information.

Each installer must validate that the handheld is properly loaded with the correct route information before leaving the Cross Dock.

Meter Compatibility

This Gas meter Compatibility List is the result of retrofit experience and feedback from American Meter.

Every attempt has been made to ensure the accuracy of the information in this table. There may be limitations to compatibility unknown to Landis+Gyr due to changes made which L+G has been unable to document through our research and substantial meter library. Any questions about the compatibility information should be forwarded to your L+G representative.

Table 2-2. Gas Meter Compatibility List

Model	Start Year	End Year	Drive	Part # w/ std. battery	part# w/ high capacity battery
AL 175	1958	1993	1' / 2'	26-0068	26-1074
AL 250	1966	1985	2'	26-0068	26-1074
AL 310	1979	1985	2'	26-0068	26-1074
AL 425	1965	Current	2'	26-0068	26-1074
AT 250	1968	Current	1' / 2'	26-0068	26-1074
AT 350	1998	Current	2'	26-0068	26-1074
AC 175	1965	Current	1' / 2'	26-0068	26-1074
AC 250	1976	Current	1' / 2'	26-0068	26-1074
AC 630	1998	Current	2'	26-0068	26-1074
AM 250	1985	Current	1' / 2'	26-0068	26-1074

Except for the AC-250, meters with the odometer-type dial on any of the models above are not supported.

Supported Odometer and Metal Indexes

Table 2-3. Odometer and Metal indexes

Housing	BOM	Pin Type	Index Type	Reference
29-1067-1	26-1237	Short pin	Odometer	TA, GasLX, Residential, American
29-1067-2	26-1204	Long pin	Plastic	TA, GasLX, Residential, American

Compliance

This apparatus is suitable for Class I, Division 1, Group D Hazardous Locations.

 Warning - Explosion Hazard - Substitution of components may impair suitability for Class I, Division 1.

Safety and Environment

Prerequisite Training

Installers should be instructed in the following safety elements as well as any site-specific safety issues:

* Hazard Communication (Employee Right to Know)
* Lifting
* Safe driving
* Use of hand tools
* Confined space

Preliminary Checks

The installer should already be able to operate the HandHeld computer. Additionally, you should already have route information and the required number of endpoints.

* Verify that you are at the correct site, specified on the handheld computer or work order.
* Verify that the site is safe for you and your equipment.
* Notify the customer of your presence. Tell the customer that you must have access to the water meter. If necessary, have the customer sign the work order.
* When installing meters, follow any guidelines issued by your company in addition to those given in this guide.
* Never perform an installation during a lightning storm or under excessively wet conditions.

Site Requirements

The site must comply with the following criteria:

* There is no chance that another object will be set over the antenna.
* Some instances may require additional cable.
* Maximum cable length is always 200 feet.

FCC & Industry Canada Information to the User

Manufacturer: Cellnet

Model Name: GasLX

FCC ID: R7PGRAMCNLX1

IC: 5294A-GRAMCNLX1

This device complies with Part 15 of the FCC rules. 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.

FCC Class B

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.

•   Consult Cellnet or an experienced radio technician for help.

Changes or modifications to this device not expressly approved by Cellnet Technology, Inc. could void the user's authority to operate the equipment.

RF Exposure

In accordance with FCC requirements of human exposure to radio frequency fields, the radiating element shall be installed such that a minimum separation distance of 20 centimeters will be maintained.

Notes:

One-way Gas Module Installation Guide

3
Using the HandHeld Device

The DAP 5320b is a portable and rechargeable HandHeld computer unit. Its electric components are protected in hard plastic housing.

The features of the DAP 5320B include

- Windows-CE-based color LCD display
- Alphanumeric keypad
- Integrated barcode scanner
- 7-pin LEMO is used for charging the HandHeld or uploading/downloading from RIMS
- Automatic shutoff to maximize battery life
- Hand strap for secure handling.

The Handheld PC (the "Handheld") communicates with a desktop or laptop computer through a communications cradle and a 7-pin LEMO charging/communications cable. It is configured to receive and transmit installation and manual meter read data to and from the RIMS and OCDB databases. The communications cradle and cable are also used for recharging (approximately 2.5 hours needed for full charge).
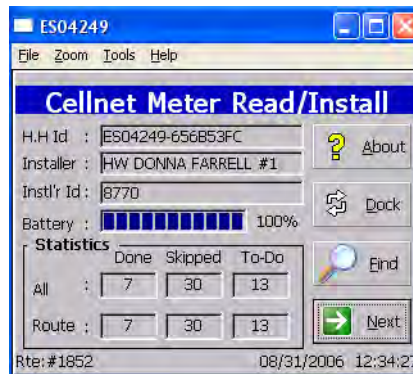

Figure 3 - 1. DAP PC5320B Hand Held PC and LEMO callout

Manufacturer Documentation

For more detail, visit the DAP website at https://www.daptech.com/docudap/.

Display

The DAP Handheld uses a TFT liquid crystal display (LCD).

Figure 3 - 2. CE Display

High-contrast characters are easily visible in normal light. Instructions for each screen display at the top of each screen in blinking red letters. The Handheld displays a tabbed view where you advance one screen at a time. You can go back as many screens as you want.

Keyboard

The keys on the keyboard are labeled with primary functions (such as: I/O (PWR), ESC, SP, BKSP), the 26-character alphabet, 0-9 numbers, and various symbols. Enter data by pressing the appropriate key. Enter other functions by pressing the FUNC (blue) key first, then pressing the corresponding alphanumeric keys.
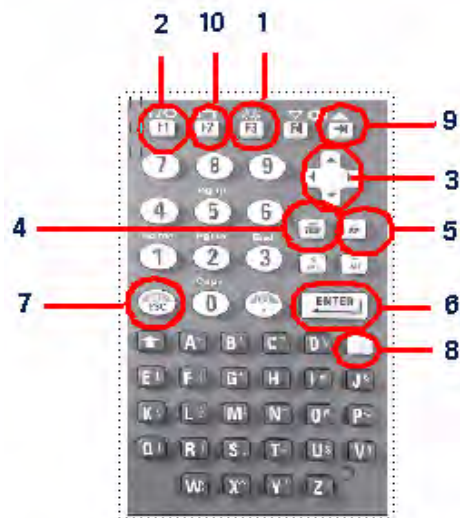
Figure 3 - 3. DAP Keypad

1   SCAN Button: small yellow F3 key; initiates scan of barcode

2   I/O / F1 power key; turns unit on - FUNC then F1 turns the unit off

3   Arrow Cursor Pad key: changes selection, tabs up, down, left or right

4   BKSP: erases last character entered during text entry

5   SP: adds space to text entry

6   ENTER: enters function; saves entry and exits function

7   ESC: displays previous screen

8   FUNC + Key: blue colored function key in combination with other keys allows the user to enter non-alpha characters, adjust the contrast, turn on the background light, etc.

    Entry Keys: alphanumeric characters (A-Z, 0-9)

    CTRL/ALT: not used

9   Tab key: changes selection

10 F2: Displays current battery life

You can shut off the Handheld PC during installation with the automatic shutoff feature or by pressing FUNC + F1 (PWR) key. The unit retains existing data and recalls the last step performed when it is turned on again.
Automatic shutoff is a sleep function. The unit shuts off after 3 minutes of inactivity. To turn on the Handheld PC after automatic shutoff, press the F1 key.

Program Conventions

- Keys are active for the displayed function. For example, if text is required, the alphanumeric keys are active; if a display option is to be selected, the Arrow Cursor Pad may be used as a tab key. If there is a list or drop-down type menu, there will be small arrows on the screen indicating that the Arrow Cursor Pad should be used for the selection.

- Most display options can be selected by pressing the hotkey (key corresponding to the first capital letter in the option). For example, N is the hotkey to select iNfo in the address screen. Pressing the hotkey is equivalent to tabbing to that item and pressing "enter".

- A hotkey that is not indicated in the on-screen text and is available on the "Functions" menu screen is: T - this takes you to the Date/Time menu.

- The following keys are available at most screens:
  ARROW CURSOR PAD - Advances to the next option
  ENTER - Selects and enters the highlighted option
  ESC - Exits current function and returns to previous function
  TAB KEY - Advances to the next option

- Other program conventions specific to a particular function are described in the appropriate section.

Using the DAP Handheld

This section goes through the process of using a DAP Handheld when installing a Landis+Gyr-ready meter at a customer account.

Getting Started with the Handheld

A typical gas meter installation route consists of the following basic steps:

1 Check out meters with modules already installed and meter modules for retrofit. Pick up Handheld PC and labels. Prior to meter checkout, the HandHeld PC is programmed for an assigned installer and an installation route (account address, current meter ID, meter location, etc.).

2 Check route. Review installer ID route status: number of installations per route ID, installations completed or skipped.

3 Check account address. Verify address and any special customer information upon arrival at the customer site.

4 Check Meter ID. Verify that the meter ID matches the one in the Handheld.

5 Enter meter read. Enter meter reading from existing meter.

6 Scan meter ID. Scan meter ID from the changeout meter labels.

7 To install changeout meter, label existing meter with a changeout label, remove existing meter, and replace with changeout meter.

8 Repeat steps 3 to 7 for each address.

9 Check in replaced meters. Return them to the Cross-Dock and dock the Handheld PC.

Standard Meter Installation and/or Module Retrofit

This section covers the installer steps and Handheld screens for the meter exchange process or gas module retrofit.

Check Route Status

1   Start the Handheld PC by pressing the **I/O / F1** power key . The screen below displays. If this screen does not display, press **Enter** or **ESC** keys to get to the Customer Address screen.
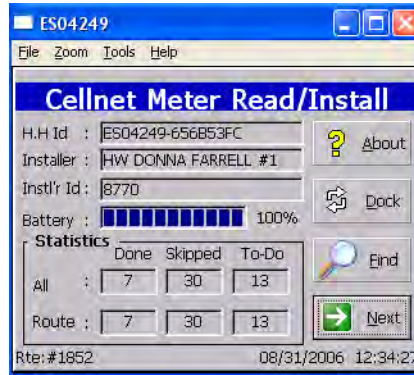
Figure 3 - 4. Handheld main screen

Initial boot screen displays the first work order's information:

- Handheld ID
- Installer name
- Installer ID
- Battery information
- Total route statistics
- Current route number

Table 3-1. Handheld Options and Active Keys for Check Route Status

| Option or Active Key	Function
About	Displays information about the meter install software including version, copyright, and modules installed
Dock	Ends installation process; all installations are checked. If some installations are not completed, a message appears to verify that you want to dock.
Find	Allows the installer to search for a particular account by address, meter ID, customer name, or account number.
Next	Selects the next option
Arrow Cursor Pad	Highlights the next option
Enter	Saves any changes and advances to the next screen.
ESC	Exits the application.

> **The Handheld PC can be shut off during installation with the automatic shutoff feature or by pressing the FUNC and then the I/O / F1 power key The unit retains existing data and remains at the last step performed until it is turned on again and additional data is entered.**

4   Press Enter to display first address for displayed route.

Check Address

The address screen shows the account's address and any other information pertinent to the installation process. If there are special instructions for the account, the screen displays an instructions prompt; otherwise, a standard address screen displays.
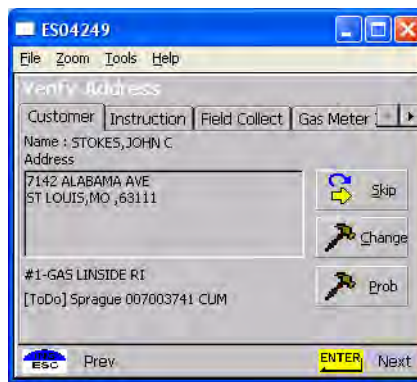
Figure 3 - 5. Handheld Address with special instructions

The Customer screen displays:

• Address information

• Sequence number in list of meters (#1 is first meter to be installed)

• Meter type (for example, gas meter)

• Meter location (Lxx or Lxxx, where xx or xxx is the utility-specific location code (for example L01)

• Read instruction code (R1xx, where xx is the utility-specific read) instruction code (for example RI00)

• Meter ID status of this record (ToDo, Skipped, or Completed)

Table 3-2. Handheld Options and Active Keys for Route Status screen

| Option or Active Key	Function
Instructions	Displays text information about the account (Bad dog, Ring doorbell, etc.)
Skip	Skips the current work order
Change	Opens the Change screen to update details about the account
Prob	Opens the Problem screen with a list of up to 4 problems

Table 3-2. Handheld Options and Active Keys for Route Status screen

Option or Active Key	Function
ESC	Returns to the Previous screen
Enter	Saves changes and advances to the next screen

> **i** If the address or instructions exceed the length of the window, vertical scroll bars display. Arrow Cursor Pad moves the display up or down.

1   Press **ENTER** to view instructions.
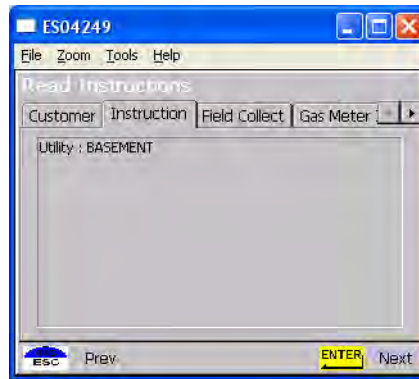
Figure 3 - 6. Handheld special instructions screen

Special instructions may include:

- Meter location
- Customer's medical condition
- Hazardous situation (guard dog, etc.).

Table 3-3. Handheld Options and Active Keys for Special Instructions

Option or Active Key	Function
Enter	Advances to the next screen
Arrow Cursor Pad	Highlights clientName
ESC	Exits the application

4   Press Enter. The Utility Field Data Collection or the Dial Read Entry screen displays.

Utility Field Data Collection
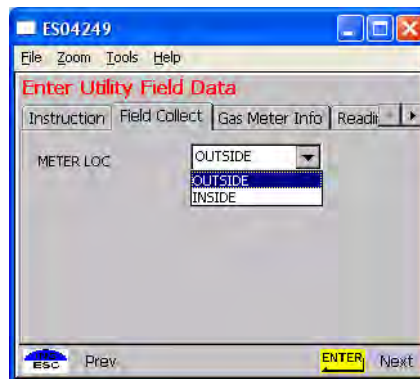
Figure 3 - 7. Handheld Utility Field Data screen

This screen varies—or is not used—depending on the utility. In this example, the utility company requires a description of meter location.

1   Select the relevant option and press the Enter key.

Meter Information

After pressing Enter, the Handheld PC displays the following prompts for drive constant and meter reading.

Figure 3 - 8. Handheld Dial read entry screen

The meter information screen displays various options for drive constant (also known as the meter constant or drive quantity). Residential gas meters have a drive constant of 1 or 2 (default value).

.

Table 3-4. Handheld Options and Active Keys for Meter Reading

| Option or Active Key	Function
Drive Constant	Enters drive constant.
Arrow Cursor Pad	Highlights the next option

Table 3-4. Handheld Options and Active Keys for Meter Reading

Option or Active Key	Function
Enter	Saves any changes and advances to the next screen.
ESC	Returns to the route status screen

1   Select the appropriate drive constant.

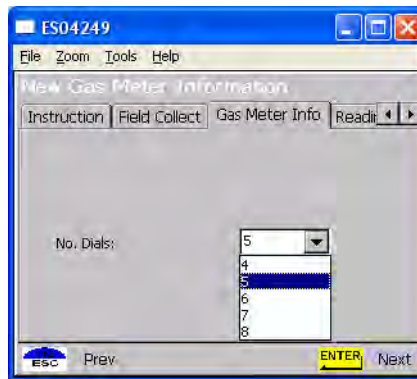> **Installer must verify that the drive constant is equivalent to the dial cubic foot as indicated below.**
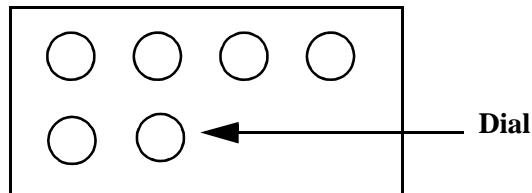
Figure 3 - 9. Generic Meter Dial Configuration

Table 3-5. Drive Constant Selection

Drive Constant	Dial Type
2	2 foot dial
1	1 foot dial

4   Press Enter. The Handheld PC displays the following prompts for meter reading.

Figure 3 - 10. Handheld number of dials selection screen

•   The meter information screen displays the following options for the number of reading dials: 4, 5, or 6.

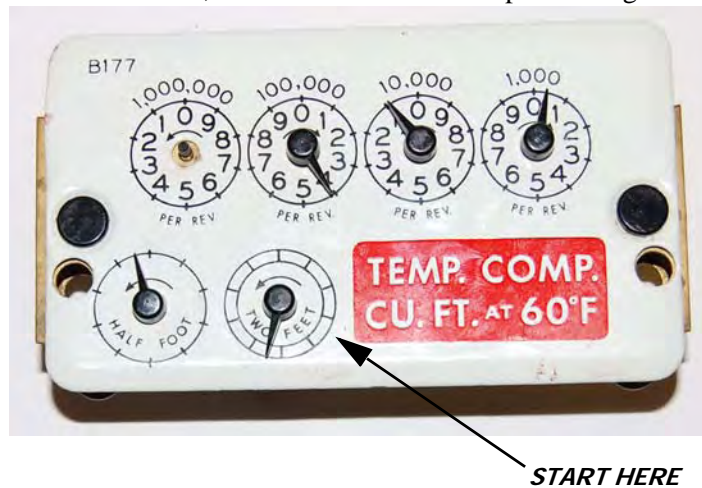• The first dial counted is the 1,000 CF/rotation. Count up to the highest dial.

START HERE

Figure 3 - 11. Handheld Start counting dials

Table 3-6. Handheld Options and Active Keys for Number of Dials selection

Option or Active Key	Function
No. of Dials	Displays dial count.
Arrow Cursor Pad	Highlights the next option
Enter	Saves any changes and advances to the next screen.
ESC	Returns to the route status screen

The Numeric field is highlighted for manual entry of meter reading from existing meter.
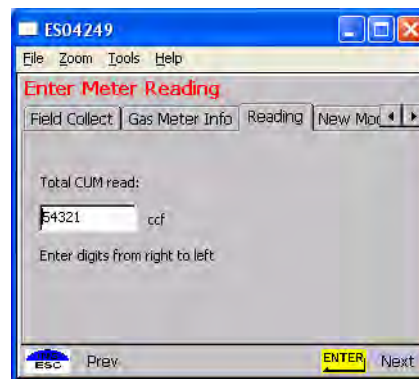

Figure 3 - 12. Handheld dial read entry screen

The meter reading is sometimes validated based on utility parameters, such as:

• Previous reading

• Read date

• Expected rate (ccf/day)

• Allowable percentage variation (utility specific).

If this check is not in place you will be prompted to enter the last four numbers of the meter ID and to re-enter the read.

.

Table 3-7. Handheld Options and Active Keys for Meter Reading

Option or Active Key	Function
0-9	Enters read.
Enter	Saves any changes and advances to the next screen.
ESC	Returns to the route status screen

1   Enter reading for existing meter in meter read screen. Enter values from right to left.
2   Press Enter. You are now ready to scan the changeout label.

> **If the meter reading does not pass validation, refer to the section on Meter Reading Out of Range.**

Program the Meter Module

The following steps apply to both a meter exchange or a module retrofit. New meters with modules do not require programming.

Begin installing the gas module by following the instructions in later chapters of this Guide.

Figure 3 - 13. Handheld Initial programming screen

Program screen displays the meter information and prompts the installer to connect to the meter module.

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**Table 3-8. Handheld Options / Active Keys for initial programming screen**

Option or Active Key	Function
Start	Begins programming the module
Enter	Saves any changes and advances to the next screen.
ESC	Returns to the previous screen

1   Connect the Handheld PC to the meter module (refer to appropriate installation procedure).

2   Check to ensure that the information that you entered into the Handheld is correct, such as drive constant, Index read, and meter ID. For example, dials=4, meter ID=0123456G, meter constant=2.

3   Press ENTER to begin programming the meter module. The Handheld PC will display the following screens during programming:

The Handheld PC searches for the connected meter module. This process will take a few seconds.

If the meter module is not connected, an error screen displays. Refer to *"Special Cases"* on page -27 for more information.
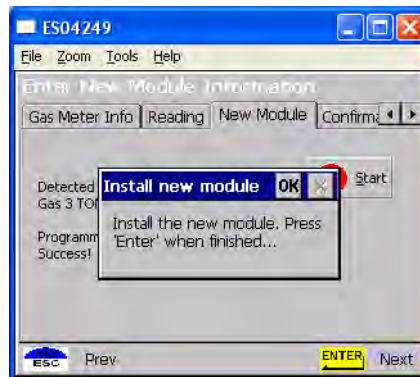
The meter information is downloaded to the meter module. This process takes a few seconds.
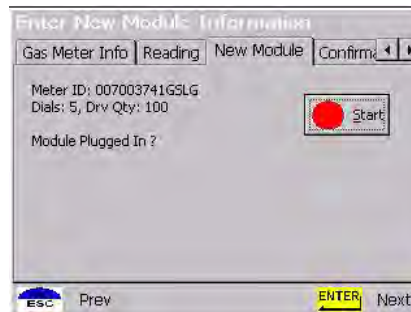
Figure 3 - 14. Handheld Enter New Module Information screen

Always enable tamper notification.

Figure 3 - 15. Handheld Install complete
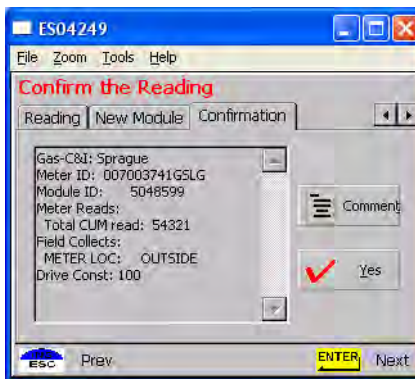
Confirmation that program has loaded.

Figure 3 - 16. Handheld redisplays information

Meter information redisplays to verify the meter read and meter ID.

.

Table 3-9. Handheld Options and Active Keys for Programming the Meter Module

Option or Active Key	Function
Yes	Accepts meter reading and continues to next address
No	Returns to the beginning of the current address
Comment	Enter if required
Enter	Saves any changes and advances to the next screen
Arrow Cursor Pad	Highlights options Yes/No

Special Cases

This section details causes of problems during an installation. However, this list may not cover all issues.

Meter Reading Out of Range

If the meter reading is out of range during standard meter installation, the software prompts for additional information (enter last four digits of meter ID, re-enter meter read, change meter ID if different that expected) before allowing meter installation.

1   Verify meter type and ID.

  a   Enter the existing meter serial number in the Handheld.

  b   Verify the existing meter serial number matches the existing meter serial number in the Handheld.

    —   If the existing meter serial number does not match the existing meter serial number, in the Handheld, verify the address.

2   Perform technical review of meter.
    Enter the appropriate code in your Handheld, and then call your Supervisor for support.
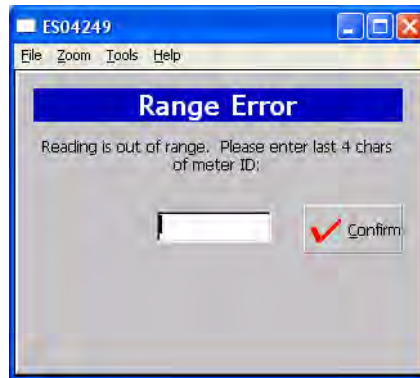
Figure 3 - 17. Handheld Read out of Range screen

The software requests the last four numbers of existing meter ID to confirm that the meter belongs to this account. If meter ID does not match, the account address is redisplayed for verification or depending on utility, specific instructions display.

.

Table 3-10. Handheld Options and Active Keys for Read Out of Range

Option or Active Key	Function
A-Z, 0-9	Enters the meter ID
Enter	Saves any changes and advances to the next screen
ESC	Returns to meter read screen

4   Enter the last four digits of the existing meter ID. The software requests verification of the meter read. This helps to confirm that the installer is at the right location.
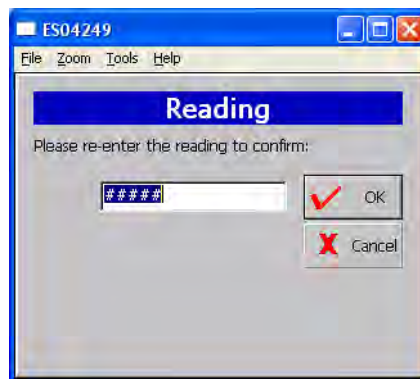
Figure 3 - 18. Handheld Re-enter meter read

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Table 3-11. Handheld Options and Active Keys for Read Out of Range

Option or Active Key	Function
0-9	Enters the meter ID
Enter	Saves any changes and advances to the next screen
ESC	Returns to meter read screen

4   Re-enter meter reading.

Meter ID Confirmation

This section covers possible screens generated for invalid meter ID entries.
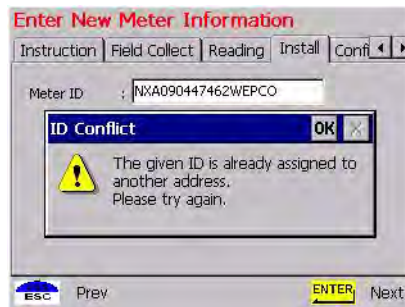
Figure 3 - 19. Meter already used

The changeout meter ID entered was used on another address.

Table 3-12. Handheld Options and Active Keys for Meter Already Used

Option or Active Key	Function
OK	Returns to scan scree
Enter	Saves any changes and advances to the next screen
ESC	Returns to scan screen

Change Meter ID

If the existing meter at the account address does not match the utility database, you can enter the correct meter ID. If so, enter skip code "Meter ID mismatch" and call Supervisor for instructions.

This function updates the HandHeld — even though the existing meter will be replaced with the new change-out meter.
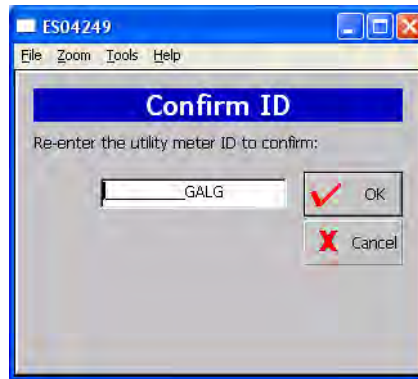
Figure 3 - 20. Handheld Meter ID Change screen

Skips

In some situations, you cannot install a gas module or replace the existing meter. You must skip it; for example, the meter is located in the house or an enclosed area and requires you to make arrangements with the customer for access.
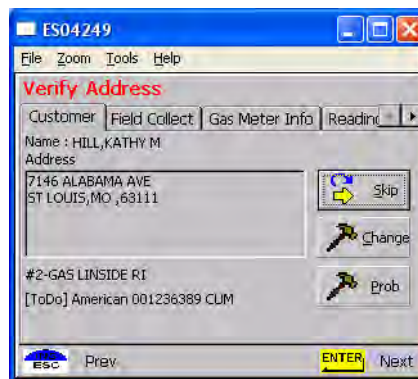
Figure 3 - 21. Options on address screen

1   Select the Skip option in the address screen and press Enter or S. The Skip screen displays.

Figure 3 - 22. Handheld Skip screen

Choices on the Skip screen include:

- No access
- Key needed
- Locking ring
- Unsafe condition exists
- Medical
- Dog
- Appointment needed
- No Meter
- Meter Damaged
- Red/Yellow Tag
- Diversion
- Violence code
- Buried meter
- Tilted meter
- Found meter
- Disconnected or Shutoff meter
- Obstacle/Blocked

Table 3-1. Handheld Options and Active Keys for Skips

Option or Active Key	Function
Yes	Accepts problems displayed and returns to address screen
No Access	Is the first of a list of skip choices displayed in this field
Comment	Allows the installer to enter comments
Enter	Selects options No Access, Yes, No, Comment
Arrow Cursor Pad	Scrolls through skip fields
ESC	Returns to address screen

4   Select reason for skipping meter and press ENTER.

5   Select Ok to accept reason for skipping meter ID. If you want to add a comment, select the Comment option. The software displays the selected skip cause and requests confirmation to skip meter installation.
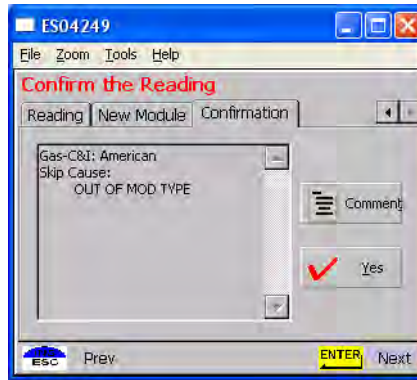
Figure 3 - 23. Handheld Skip Confirmation screen

Table 3-14. Handheld Options and Active Keys for Skip Confirmation

Option or Active Key	Function
Yes	Accepts skip cause and displays the next address screen
No	Rejects the skip cause and returns to the current address
Arrow Cursor Pad	Highlights Yes/No
ESC	Returns to current address screen

4   Select Yes to skip meter ID. The software records the skip in the route status and proceeds to the next address.

> **Medical alert is not normally used on gas meters (medical alert tags are commonly found on an electric meter).**

Other Features

The following functions are not directly related to the installation process, but are important features of the Handheld PC.

Problems

You can indicate up to four problems to record in a route's record.
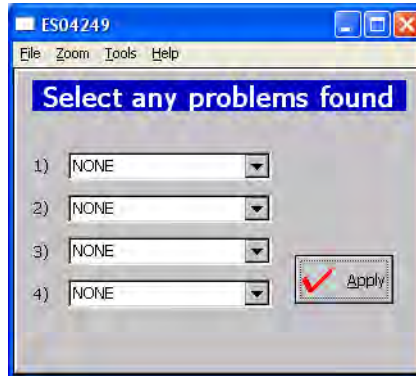
Figure 3 - 24. Problem Indication screen

Table 3-15. Handheld Options and Active Keys for Route Status

Option or Active Key	Function
Problem dropdown list	Displays problem options
Arrow Cursor Pad	Highlights Yes/No
Enter	Saves any changes and advances to the next screen
ESC	Returns to previous screen

Find

Use the Find feature to look up addresses, meter data, and route statistics.

1   Select Find from the Customer Address screen.
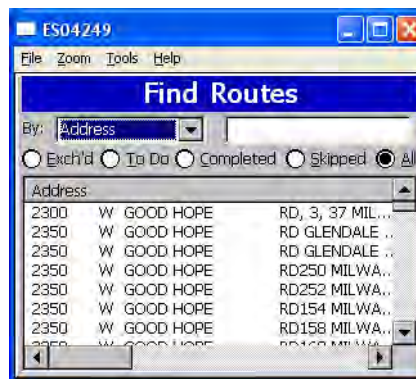
Figure 3 - 25. Handheld Find Screen

Meter data options include:

• Work Order

• MeterID

- Address
- Customer Name
- LAN Address

Route Status Options include:

- Exchanged
- All
- ToDo
- Completed
- Skipped

Table 3-16. Handheld Options and Active Keys for Find

Option or Active Key	Function
Search by	Displays meter data search options
Text field	Enter full or partial address information to reduce the list returned
Radio buttons	You can narrow your search to return only Exchanged, To Do, Completed, Skipped, or All routes
Enter	Selects highlighted option
Arrow Cursor Pad	Scrolls through search fields and highlights options
ESC	Returns to function screen

Select search criteria. Two search criteria must be selected: meter data and route status. For example, use the Arrow Cursor Pad to select Address (meter data) and Completed (route status) to search all addresses that have been completed.
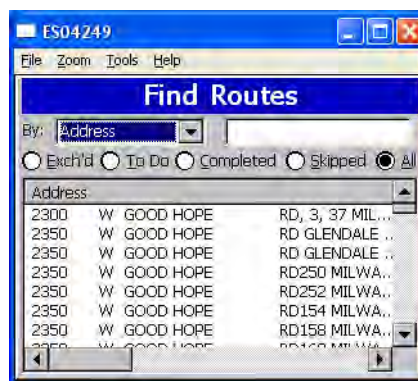
Figure 3 - 26. Handheld Sample search list

The screen shows all records containing the characters entered in the Find field.

- Alphanumeric keys are active in the Find field.
- Horizontal scroll bar is enabled if the text extends beyond the screen, as in this example.

- Arrow keys move the cursor from the Find field to the data records.
- Space (SP) key moves from addresses to Find field.

Table 3-17. Handheld Options and Active Keys for sample search list

Option or Active Key	Function
A-Z, 0-9	Enter search text into the Find field
Arrow Cursor Pad	Scrolls through search fields and highlights option **Address**, **ToDo**, **Ok**
Enter	Saves any changes and advances to the next screen
ESC	Returns to function screen

4   Select Ok or O to accept search criteria and display search records.
5   Go back to the Search list, and type Elm to search all addresses with "Elm" in the record. Then select the relevant one by using the space SP key to move from addresses to Find field.
6   Use the Arrow Cursor Pad to move the cursor to the data records and use ENTER to select the desired record.

From this screen, additional information may display or you can modify the data record (for example, reinstall meter, record problem conditions, or change status to skip meter).

Table 3-18. Handheld Options and Active Keys for sample search record

Option or Active Key	Function
Back	Returns to Find screen
Enter	Saves any changes and advances to the next screen
Arrow Cursor Pad	Highlights options back or Install

Notes:

One-way Gas Module Installation Guide

4

On-Site Preparation

Arrival at Install Site

1   Upon arriving at the installation site, verify the address in the Handheld. Check the Handheld for special instructions for that site (for example, medical customer, dog, key required for access to meter, meter location, and so on). If a medical alert code appears in the Handheld for that address they are to skip the install enter an appropriate skip code and move to the next exchange. A medical alert tag may be located on the electric meter.

2   If the installer comes across a meter where a medical alert code appears in the Handheld for that address, they are to discontinue the exchange, enter the appropriate skip code, and move to the next exchange.

3   Verify that the meter ID of the meter at the address is the same as that in the Handheld record; if not, verify it a second time. If the meter ID does not match, record the information to include mismatched ID on hard copy, record skip code of meter ID mismatch and call your Supervisor for direction.

4   Check to verify that the seals are intact and present. If the meter is unsealed and there is no evidence of tampering complete the meter exchange or module retrofit. If there is suspected tampering or evidence of diversion do not complete the install, record diversion on hard copy and enter skip code of diversion in Handheld and call your supervisor immediately.

5   If the premise is vacant and the service is shut off at the service riser valve, complete the meter exchange if at all possible. If you are unable to gain access to the premise finish your route, then try again before returning to the Cross Dock. Enter appropriate code in Handheld.

6   Inspect the meter for any gas leaks, unsafe conditions, excessive rusting or damage. While performing this technical review look over the meter for poor conditions such as excess rust, tampering, or odor of gas. If you judge the meter is seriously damaged, report it, enter the appropriate code in the Handheld, and call your supervisor for directions.

7   If it is determined that the meter has no unsafe conditions, you are ready to proceed with the module retrofit. Data will be required to be entered into the Handheld. If the reading is out of range (indicated by a prompt on the Handheld), then retype the meter identification number's last four digits to re-verify the correct meter. Reenter the gas meter index read into the Handheld.

See *"To Begin Meter Module Retrofit"* on page 43 for information about module exchange instructions.

8   If the meter is to be exchanged and it is partially buried, enter a skip code of "buried" and move to the next account. If a tilted meter is to be exchanged, perform the exchange and correct the tilt. If a module is to be installed on a tilted meter, complete the install, and enter a skip code of "tilted."

9   If the installer is met by a violent or threatening customer, immediately leave the premise and call your Supervisor. If necessary, dial 911, after which you will enter into the Handheld and on the hardcopy a skip code of "violence code."

Notes:

One-way Gas Module Installation Guide

5

Gas Meter Exchange

Meter Exchange Process

Arriving at the Location

1. The installer confirms that they are at the right route address for that appointment using the Handheld. The installer arrives at the location on-time and with all the tools and equipment necessary to complete the installation without having to return to the support vehicle. If applicable, locate the outside shutoff valve in case of trouble or emergency.

2. When the customer answers the door, introduce yourself and state the reason for your visit.
   – verify that the customer is at least eighteen years of age.
   – Show the customer your identification.

3. Confirm the nature of the appointment and the time commitment required from the customer. Make sure the customer knows and agrees that it is convenient for you to turn off the gas during the installation process.

Verifying the Meter Site

Locate the meter and confirm the existing meter number, type, and size.

– If the meter number is correct but type and size do not match the equipment that you have been issued, call your Supervisor and request the appropriate equipment.

– If the meter ID does not match the information in the handheld, call your Supervisor for meter number verification.

– If all information is correct, continue the installation process.

– Prior to proceeding with the meter exchange process, inspect the condition of the gas regulator. If the regulator is defective, it must be replaced. Follow the utility-specific guidelines for regulator exchange.

Confirming Proper Installation Conditions

1   For the installation to qualify, confirm *ALL* of the following pre-existing conditions:

 –   Visually examine the shut-off that it does *NOT* show signs of leaking or disrepair.

 –   Perform the sniff test for signs of gas leaks using the Natural Gas Detection Device, and then the soap test on the shut off and couplings.

 –   No Diversion or Tampering Evident - Visually inspect the service to the meter for signs of diversion or tampering.

 –   Appropriate Access - Confirm that access to the meter allows a minimum acceptable work area to be established. Minimum work area includes wrench clearance, access to shut-off.

 –   Appropriate Service & Piping Condition - Visually inspect the age and condition of the service and piping. Confirm that service and piping are fit for the removal and installation of a new meter and that there are no pre-existing leaks.

 –   Appropriate Meter Orientation - Confirm that the meter is installed horizontally or such that the meter exchange cannot take place.

 –   If any improper conditions are found contact your Supervisor immediately. The Supervisor will confirm your assessment and give you direction for either completing the installation or issuing a skip code in the HandHeld.

2   Set up the area for installation. For inside sets, turn all available lighting on. Clear an appropriate workspace and lay out all tools, equipment. Prepare for leaks or emergency shut-off.

Shutting Off the Service

1   Notify the customer that gas service will be interrupted (reconfirm all gas apparatuses are off). Inspect for the proper operation of each gas appliance. Inspect the meter set for corrosion, burial or overbuilding, damage, improper installation, misalignment, outdated regulator (Model 1213B or 043R), or the smell of natural gas.

2   Connect the bonding jumper from service riser to the premise line. Verify that the existing meter is off by isolating (shut off) all gas apparatuses and confirm that there is no flow on the meter and register. If the meter is not functioning correctly, contact the Supervisor immediately. The Supervisor will confirm your assessment and give you direction.

3   Manually close the customer's shut off valve.

 –   If you have any problem closing the valve, contact your Supervisor for direction which may include, if applicable, using the outside curb stop for shut-off.

 –   If the outside curb stop is activated, the Supervisor will notify the Utility Supervisor.

4   Remove the original meter.

 a   Using a pipe wrench and backup, attempt to loosen the meter coupling nuts.

 b   Use mild torque building to moderate steady torque until the coupling nut begins to turn.

 c   Do not jerk or snap the wrenches. Damage could occur.

 d   Loosen both coupling nuts and remove the old meter from the meter set.
      If you have any problem loosening the coupling nuts, contact your supervisor for direction.

 e   When applicable, remove all old gasket material in the coupling nuts . Inspect the regulator and exchange if it is damaged or defective.

Installing the New Meter

1   Remove the new meter tag from the new meter.

2   Write install date, address, and initials on new meter tag.

3   Place new meter tag on the old meter register.

4   Insert new gaskets where applicable.

5   Exchange the regulator if damaged or outdated, and exchange any damage insulating unions. Level the meter set if the set is tilted.

6   Tighten the inlet-coupling nut.

7   Install pressure gauge to meter outlet, slowly open the rise valve, and adjust regulator to appropriate gas pressure at the meter outlet.

    a   Close the riser valve and remove gauge.

    b   Verify meter operation.

    c   Reconnect the outlet piping.

8   Before re-servicing - if service was shut off prior to the meter exchange, do not restore service.

> **During the installation, replace all biscuits in the outlet piping, and leave meter off "as found".**

Restoring Service, Purging the Air, and Performing the Leak Test.

1   Open the shut-off valve very slowly.

    –   If you have any problem opening the valve contact your Supervisor for direction.

2   Check the test dial for movement to make certain no leaks occurred while performing the installation.

    a   Seal the regulator.

    b   Disconnect the bonding jumper.

    c   Clean and paint the meter set.

3   Check the coupling nuts, service and piping for leaks perform "leak test" (sniff test for signs of gas leaks using the Natural Gas Detection Device, and the soap test) and re-tighten if necessary.

4   Reenter the property and purge the air from the gas line by bleeding the furthest gas apparatus from the meter. You must bleed each individual apparatus.

Relighting All Apparatuses and Confirming Their Operation

Follow the procedure provided to you by the Utility for appliance relighting. If any adverse conditions arise, immediately shut off the gas, contact your supervisor for instructions, and record the appropriate comment in the Handheld such as, red/yellow tag defective appliance situation. Enter a Skip code such as, "red/yellow tag" in the Handheld.

Programming the Module

Refer to Chapter 3, *Using the HandHeld Device*.

Performing Data Collection

1   See Chapter 3, *Using the HandHeld Device*.
2   Seal the new meter.

Cleaning Up the Work Area

Clean up all installation tools, equipment and debris. Turn off any lights that you may have turned on. Restore the customer premise to the pre-visit condition.

Exiting the Premise

1   Do a last check to ensure that you have all of your equipment and tools.
2   Thank the customer for allowing us to service their gas meter, exit the premise, and provide the customer with a door hanger.

Module Retrofit (Index or Register) Replacement

Refer to Chapter 6, *Meter Module Retrofit*.

Customer Skip or Cancellation

If the customer's existing conditions do not qualify for new meter installation notify your Supervisor. Wait at the site until your Supervisor arrives for further instructions. If, in the Supervisor's opinion, the condition of the customer's existing service piping or appliances is such that significant damage would result from attempting to remove and replace the existing gas meter, your Supervisor will so inform the Utility of the condition. The Supervisor will advise you to:

•   Inform the customer as to why the change-out will not take place.

•   Document situation in handheld.

•   Direct you to your next appointment.

If There Is Damage On Site When You Arrive

IMMEDIATELY turn off the gas. This will eliminate or minimize any property damage to customer.

•   Call your Supervisor immediately. Communicate the gravity of the situation. Your Supervisor will immediately initiate any necessary actions.

•   Do not leave the customer site until directed to do so.

•   It may be necessary to dial 911.

Battery Change Out

When the NOC analyst notices that the battery flag (R) is set, it could be due to:

- a single end-point occurrence, where the end-point may require more current to operate. In this case, a single battery needs to be replaced

- occurrence on several end-points, where a battery change out program needs to be implemented within the following year

- the flag being set during the coldest part of the day, where the battery may have less than 20% of energy left (2-4 years of service time)

- occurrence more often even during the daylight hours. In this case, the battery has even less energy remaining (1-2 years of service time)

To Change Out The Battery

1 Swipe a magnet on the left hand side of the main board compartment
2 Listen for up to ten beeps on the RF buster (which ensures that the latest data is saved to non-volatile memory)
3 Remove the four meter mounting screws
4 Remove the Gas LX module from the gas meter
5 Open the battery compartment door
6 Replace the battery assembly with a new one (40-1590H)
7 Close the battery door
8 Replace the module onto the gas meter using the four original mounting screws
9 Insert two new security seals into the housing.

. .

If the gasket is old and no longer provides a good meter to module seal, replace the meter gasket with a new one.

If the module has already gone stale, perform the above steps, with the exception that when the battery door is open, connect the USB programming cable to Gas LX module. Use the HH to re-enter the energy value from the mechanical index dials and re-program the module.

Once the above steps are completed, wait for at least three hours for all flags to be cleared (based on five transmissions per hour and Alarm Count = 10).

Notes:

6

Meter Module Retrofit

This chapter outlines the procedure for Meter Module installation. There are many meter module types supported. Two examples appear below.

Figure 6 - 1. Two of the many supported Meter Module types

To Begin Meter Module Retrofit

Prior to beginning the meter module retrofit, make sure you have followed the steps in *"If the installer comes across a meter where a medical alert code appears in the Handheld for that address, they are to discontinue the exchange, enter the appropriate skip code, and move to the next exchange."* on page -37.

1   Plug the programming cable from the Handheld into the programming power cable on the Meter Module. Refer to Chapter 3, *Using the HandHeld Device*.

2   Program the Meter Module and check the Handheld for successful programming (example, Dials = 4, Meter ID = 0123456G, Meter Constant = 2).

3   Remove the tamper seals and index cover from the original gas meter.

A Count = 2 feet
of 1   X   2   =   2 ft^3

Figure 6 - 2. Meter Module kit before installation

4   Follow steps 1-4 in *"To Begin Meter Module Retrofit"* on page -45.

Figure 6 - 3. Index and Gas LX Index Cover

5   Remove all of the original gasket material. Replace the index if it is damaged or if the gears are discolored.

 Metal indexes cannot be used and must be replaced.

WHEN REPLACING AN INDEX, YOU MUST ENTER THE METER READ INTO THE HANDHELD AND NOTE "INDEX EXCHANGED" IN THE COMMENT SECTION. For Index visual verification and exchange, see Appendix A, *Supplemental Information About Indexes*.

Figure 6 - 4. Removing the Index (one screw on each side)

6   Clean the area behind the index and cover gasket surface on the meter with a wire brush and gasket scraper.

7   Make sure that the location of the dials on the meter is free of any debris that may hamper module installation.

8   Install the Meter Module to the meter by screwing in the four original mounting screws. Tighten the screws until the cover sits snug, then tighten and additional quarter-turn.

> **ⓘ**   **Use a torque screwdriver set at 10 inch-pounds to install the screws for all module installations.**

9   Plug the battery into the programming port power cable and place it in the battery compartment with the battery wires on top.

Figure 6 - 5. Connecting the battery
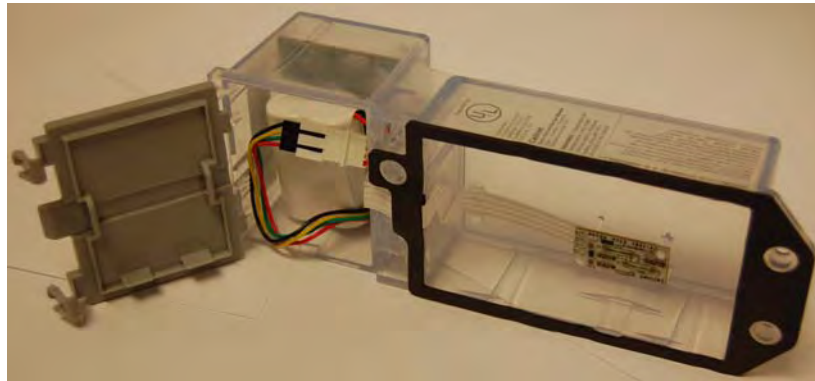
Figure 6 - 6.   Installing the battery with the battery cable on top
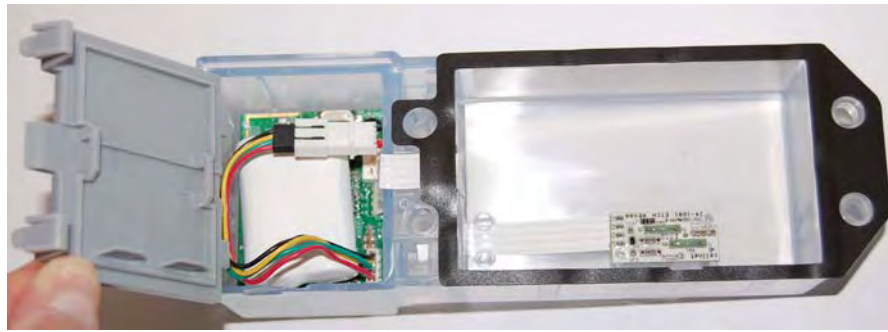
Figure 6 - 7. Properly installed battery

Figure 6 - 8. Battery Compartment closed

After the battery is installed, prepare to install the Dial Wheel .

Figure 6 - 9. Dial Wheel Kit

10   Clip the pieces apart.

Figure 6 - 10. Dial Wheel Kit separated for installation

Figure 6 - 11. Reader Interface Dial Wheel Needle Slot

11   While holding the Dial Wheel (DW), note the location of the Needle Slot. With the index sitting on a work surface, set the DW on the index face with the needle slot oriented towards the needle.

Figure 6 - 12. Dial Wheel with needle slot positioned for unit needle entrance

12   Slide the DW toward the needle...

Figure 6 - 13. Moving the Dial Wheel onto the index unit pointer

...until the DW center contacts the needle mount. The needle mount center will gently impede the Dial Wheel.

Figure 6 - 14. Reader Interface Wheel installed

13   Take the DW Pin and insert the pin into the DW hole. You will feel a gentle snap as the pin seats into place.

Figure 6 - 15. Installing the Dial Wheel Pin

14   Prepare to mount the Dial Wheel on the meter by locating the meter Wiggler and starting a bare minimum of the threads for one of the Meter Index mounting screws. The following picture shows the screw to the left of the wiggler installed.

Figure 6 - 16. Meter Index Mounting screw and Meter Wiggler

15   As you prepare to mount the meter index, note the drive pin on the rear of the meter index, and its position.

Figure 6 - 17. Meter Index Drive Pin

All photographs and installation steps in this procedure refer to "2-foot" meters. For a "1-foot" meter installation, the Meter Wiggler and the Meter Index Drive Pin are of a slightly different configuration, as shown in the following photograph. All installation steps are identical except for the meter and drive pin configuration.
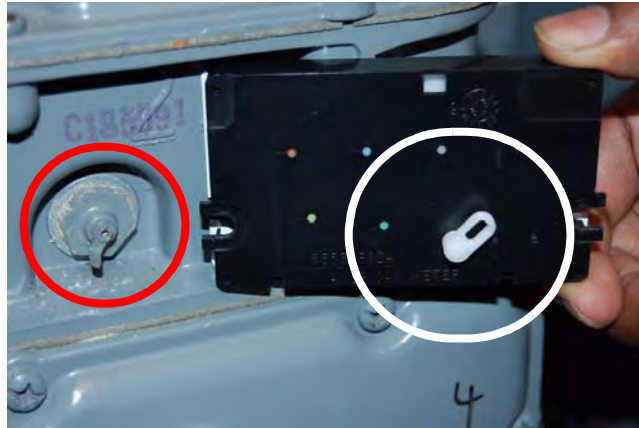
Figure 6 - 18. "1-foot" Meter Wiggler and "1-foot" Meter Index Drive Pin

16   While sliding the left-side Meter Index mounting slot under the MI mounting screw, align the Meter Index Drive Pin with the Meter Wiggler.
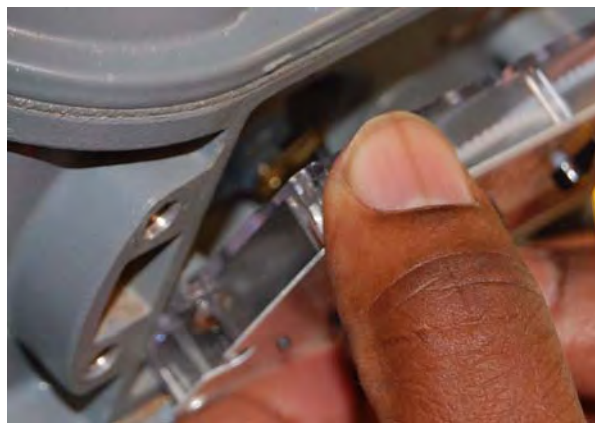
Figure 6 - 19. Aligning the Meter Index Drive Pin and mounting the Meter Index

17   After aligning the Meter Index Drive Pin with the Meter Wiggler, move the Meter Index into operating position, hold the Meter Index with one hand and tighten the mounting screw enough turns to hold the Meter Index in place as you prepare to install the other Meter Index mounting screw.
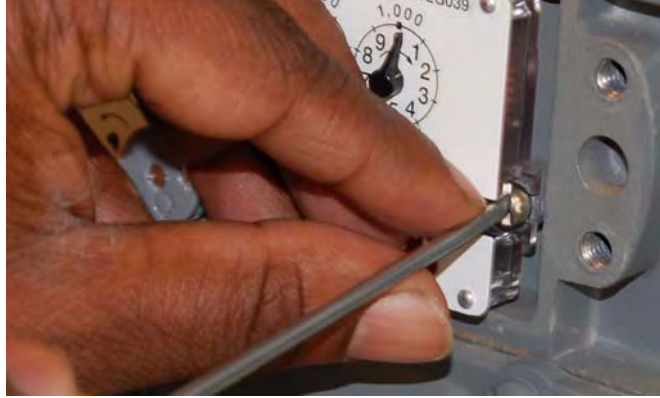
Figure 6 - 20. Installing the remaining Meter Index mounting screw

18   After both screws are tightened and the Meter Index is installed, position the Gas LX cover for installation. Install, but do not tighten to mounting torque, the first of the Gas LX cover mounting screws.

Figure 6 - 21. Installing the first Gas LX Cover mounting screw
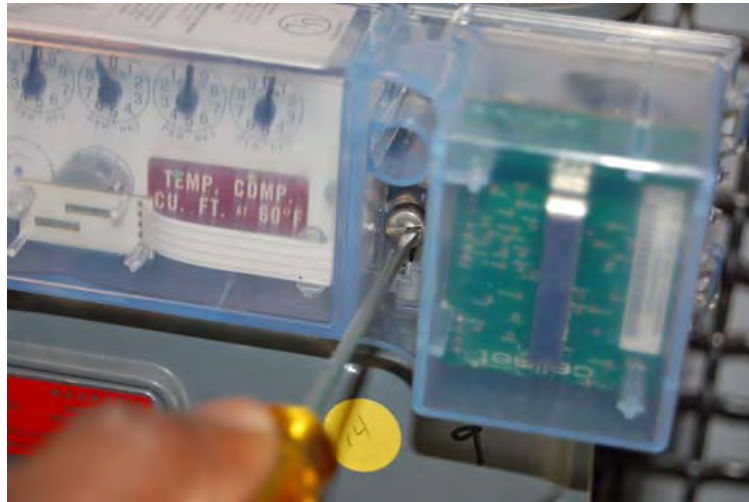
Figure 6 - 22. Installing the next Meter Index Cover mounting screw

19 Install the remaining screws. Tighten the screws until the cover sits snug, then tighten the screws an additional quarter turn. Prepare to verify that the module is transmitting.

Figure 6 - 23. RF Buster oriented to Gas LX Meter Module for testing

20 Use the RF Buster to verify that the module is transmitting by holding the RF Buster with magnet side to the top upper right quadrant of the module plastic housing. Hold the button until 10 beeps are received. See Appendix B, *Using the RF Buster* for more information.

21 Install new red tamper seals over two diagonal screws (upper right and lower left).

Figure 6 - 24. Meter module with tamper seals installed

22 Clean up debris from the retrofit and installation processes. Enter the appropriate infomation on a door hanger tag. A door hanger tag must always be left after a meter is exchanged.

23 At the end of the day, the installer returns to the Cross Dock for the check-in process. The installer should also turn in inventory of unused, defective, or broken gas Meter Modules. The Installer must check in all Handhelds issued. The installer is responsible for reconciling any discrepancies in changed data before the check-in process can be completed. Meters Modules will not be checked out to an installer who has not completed the previous day's check-in process.

7
Gas Meter Preparation Program (GPrep)

The Gas Meter Preparation Program (GPrep) is a software tool that facilitates Landis+Gyr processes. It also runs with water CPR modules. The data captured by GPrep is sent to RIMS to update the Landis+Gyr and utilities databases. GPrep was developed for Gas LX, ResGas, C&I Gas (Diaphragm), C&I Gas (Rotary), and Cellnet Pulse Recorder (CPR gas and water) modules to:

- Disassociate Module IDs from Meter IDs - "MRB (Material Repair Board) Mode" This feature most commonly captures the record of disassociation when removing a module from the field.

- Validate the programmed LAN Address with the Power LAN Address label and verify that the operational programmed parameters match those required. - "Inspect Mode".
  This feature is most commonly used when receiving meters from the factory with Landis+Gyr modules already installed (OEM Meters) or when receiving Landis+Gyr retrofit modules directly from Landis+Gyr's manufacturer. Different utilities use different sampling procedures. The meter shop should verify a percentage of inbound modules to ensure that the LAN Address that is programmed into the gas module and matches the LAN Address on the label outside of the module housing. The modules can also be inspected to verify that the correct Meter ID format was used, that the rollover point is correct, and that the meter constant is correct.

- Program the module with operational parameters, including the meter-specific values such as meter ID, rollover point, meter constant, and dial index reading (which for gas meters can be non-zero) - "Program New or Re-Program Old Mode".
  This feature is used when assembling Landis+Gyr modules on meters in the meter shop and in the field (for the O&M Processes).

- Save the inspection, programming, MRB disassociation record and index read results in separate files for delivery to Landis+Gyr and the utility.
  This can be an automatic process. It can be turned it off for a particular feature when it is not necessary to save the results.

Each of these functions are steps in Landis+Gyr processes. You should fully understand how data flows within the Landis+Gyr network and what data needs to be captured from or programmed into a module before using this software.

You can use GPrep in a meter shop, at a fixed location, or in the field. You can use a PC or laptop computer. Closely monitor GPrep usage, and make the data files easily accessible. GPrep is often used with operations and maintenance (O&M) processes. This chapter assumes that the user fully understands these O&M processes, and at which steps in these processes GPrep captures data and programs it into Landis+Gyr modules.

GPrep requires selective functionality depending on the site where it is in use, so there are administrative privileges for configuring options during software installation and setup.

Required Tools

The following is a list of required tools to operate GPrep, along with a PC / operating system recommendation:

- Desktop PC with Windows 2000 or higher (Windows NT is not recommended when using a laptop computer since there are sometimes problems configuring the ports)
- Copy of GPrep v. 2.3 or most recent version on a required tools CD
- Shooter Box with AC power cord, part number 26-3500 and gas shooter cable
  or
  1-Way Module Programming Cable PN 26-1179
- Battery, part number 40-1032 or 40-1590
- Laptop/PC
- DB9 to DB9 cable (male on one end female on the other) straight through (RS232).

Roles

- **GPrep Administrator** - is the local expert on GPrep. The Administrator is familiar with the entire functionality of GPrep. The Administrator knows how to configure all internal files, and how to grant certain permissions.
  The Administrator knows how to clean all files of bad records and supersedes. How to archive all files and e-mail them to the appropriate database administrator or RIMS analyst and how to train the day to day users of GPrep. This person has the daily task of maintaining GPrep and its files.
- **GPrep User** - needs to know the fundamentals of GPrep. They need to know how to log in, how to marry a meter with a module, and how to inspect a module to ensure that it is properly programmed, and what to do if it is not.

Procedures for GPrep Administrator

1. Verify your tools. GPrep does not operate without all of the tools listed in the Required Tools section.
2. Unzip GPrep files to your PC or laptop.

> **Before copying files go to "View" on the menu bar of your PC, select "Folder Options". Under a section titled "Advanced Settings" there is a folder called "Hidden files", under that folder choose "show all files", then click on the OK button.**

    a   Customize GPrep.
        The GPrep installation folder contains a file named GPREP.INI. This file defines all configuration parameters in its [Control] section and maintains settings from the last GPrep run in its [Default] section.

- If this is a new installation, GPREP.INI must be copied to the GPrep installation directory.
- If this is an upgrade, then you can use the existing GPREP.INI file to modify any configuration parameters as necessary.

    b   Edit the GPREP.INI file using Notepad or your preferred ASCII file editor.

c   Follow the instructions in that file to specify the required pattern for Meter IDs, file(s) for logging operations, menu selections that are available to the operator and the maximum memory used to track previous log file associations.

If you run GPrep in different modes and/or it requires different configuration settings at the same operator station, then install multiple copies of GPrep in different directories.

Following is an example of a GPREP.INI file.

```
; The Default section remembers GPrep settings from the last run.  These should
; not be changed manually.
; ------------------------------------------------------------------------------

[Default]

; The Control section contains GPrep operational parameters.
; ------------------------------------------------------------------------------
; Operator Meter Type selections are controled by variables:
;
;   RGAS for ResGas
;   CIGD for C&I Gas (Diaphragm)
;   CIGR for C&I Gas (Rotary)
;   CPRG for CPR Gas (Rotary)
;
; Setting any of these to "No" disables the menu item.  The default is "Yes".
;
; Example:
;   RGAS=No
;   CIGR=Yes
; Disables "ResGas" selection, leaving both C&I and CPR selections enabled.
; ------------------------------------------------------------------------------
; Operator Mode selections are controled by variables:
;
;   Inspect
;   ProgramNew
;   ProgramOld
;   IndexRead
;   MRBMode
;
; Setting any of these to "No" disables the menu item.  The default is "Yes".
;
; Example:
;   ProgramOld=No
;   Inspect=Yes
;   MRBMode=No
; Disables "Re-Program Old" and "MRB" selections, leaving "Inspect",
; "Program New" and "Index Read" modes enabled.
; ------------------------------------------------------------------------------
; Operator Port selections are controled by variables:
;
;   COM1, COM2, COM3 and COM4
;
; Setting any of these to "No" disables the menu item.  The default is "Yes".
;
; Example:
;   COM4=No
;   COM3=No
```

```
;    COM1=Yes
; Disables "COM3" and "COM4" selections, leaving "COM1" and "COM2" enabled.
; ----------------------------------------------------------------------------
; MeterID is a pattern string for scanned (or entered) Meter IDs.  The length
; of the pattern gives the number of characters required and each character
; in the pattern corresponds to a character in the Meter ID; if it's:
;
;   # - The character must be a decimal digit (0 - 9)
;   $ - The character must be alphabetic (A - Z)
;   _ - The character must be a blank
;   ? - The character may be anything
;   All other characters must match exactly.
;
; Note: If MeterID is not given then no pattern matching is done.
;
; Examples:
;   MeterID=ABC###      - IDs must must be 6 characters long, and start with
;                         "ABC" followed by 3 digits
;   MeterID=Q???##_$$### - IDs must be 12 characters long, start with a "Q",
;                         followed by any 3 characters, then 2 digits, a space,
;                         2 alphabetic characters, and end with 3 digits.
;   MeterID=- IDs are not checked against a prototype, only for
;                         valid characters.
; ----------------------------------------------------------------------------
; ProgramLog is the full path and file name for logging each time a module is
; programmed.  If not given, then no program log file is written.
;
; Examples:
;
; ProgramLog=c:\gprep\program.txt - program.txt in the gprep directory on drive C:
; ProgramLog=program.txt          - program.txt in the GPrep program directory
; ProgramLog=program              - program.txt in the GPrep program directory
; ProgramLog=- Do not write a program log file
; ----------------------------------------------------------------------------
; InspectLog is the full path and file name for logging each time a module is
; inspected.  If not given, then no inspection log file is written.
;
; Examples:
;
; InspectLog=c:\gprep\inspect.txt - inspect.txt in the gprep directory on drive C:
; InspectLog=inspect.txt          - inspect.txt in the GPrep program directory
; InspectLog=inspect              - inspect.txt in the GPrep program directory
; InspectLog=- Do not write an inspection log file
; ----------------------------------------------------------------------------
; MRBLog is the full path and file name for logging each time a module is
; inspected in MRB Mode.  If not given, then no MRB log file is written.
;
; Examples:
;
; MRBLog=c:\gprep\mrblog.txt - mrblog.txt in the gprep directory on drive C:
; MRBLog=mrblog.txt          - mrblog.txt in the GPrep program directory
; MRBLog=mrblog              - mrblog.txt in the GPrep program directory
; MRBLog=- Do not write an MRB log file
; ----------------------------------------------------------------------------
; ReadLog is the full path and file name for logging each time a module is
; inspected in Index Read Mode.  If not given, then no read log file is written.
;
; Examples:
;
; ReadLog=c:\gprep\readdlog.txt - readdlog.txt in the gprep directory on drive C:
; ReadLog=readdlog.txt          - readdlog.txt in the GPrep program directory
```

```
; ReadLog=readdlog              - readdlog.txt in the GPrep program directory
; ReadLog=- Do not write an inspection log file
; -----------------------------------------------------------------------------
; MaxAssociations is the maximum number of LANAddress / Meter ID associations
; checked from the log file to assure that duplications are not assigned.
; This requires 24 bytes of memory per association.  Set to 0 to disable.
;
; Examples:
;
; MaxAssociations=1000  - Previous 1000 records are checked (memory = 24,000)
; MaxAssociations=10000 - Previous 10000 records are checked (memory = 240,000)
; MaxAssociations=0     - Disables duplication association checking.
; -----------------------------------------------------------------------------
Mode=ReProgram
ModuleClass=1
RolloverPoint1=1000000
MeterConstant1=0.050000
SerialPort=1
Operator=Bill
Location=xdcsu
Utility=SCG
RolloverPoint0=10000
MeterConstant0=0.020000
RolloverPoint3=100000
MeterConstant3=1.000000
RolloverPoint2=100000
MeterConstant2=0.100000
MeterConstant4=0.250000
ProgramMode=Yes
ProgramDial=Yes
RolloverPoint=100000
MeterConstant=1.000000
LastFile=WCPR.SET

[Control]
meterID=?????????
DeviceID=?????
RGAS=yes
CIGD=yes
CIGR=yes
CPRANT=yes
CPRAWT=yes
CPRCWT=yes
WCPR=yes
Inspect=yes
ProgramNew=yes
ProgramOld=yes
MRBMode=yes
IndexRead=N
ProgramLog=c:\programlog.txt
inspectLog=c:\inspectlog.txt
MRBLog=c:\MRBlog.txt
ReadLog=c:\readlog.txt
wProgramLog=c:\wprogramlog.txt
winspectLog=c:\winspectlog.txt
wMRBLog=c:\wMRBlog.txt


[RGAS]
MeterConstantCount=4
```

```
MeterConstant1=.01
MeterConstant2=.0112
MeterConstant3=.02
MeterConstant4=.0225
RollOverPointCount=5
RollOverPoint1=100
RollOverPoint2=1,000
RollOverPoint3=10,000
RollOverPoint4=100,000
RollOverPoint5=100000000

[CPRAWT]
MeterConstantCount=9
MeterConstant1=.01
MeterConstant2=.01121
MeterConstant3=.02
MeterConstant4=.0225
MeterConstant5=.05
MeterConstant6=.0562
MeterConstant7=.1
MeterConstant8=.112
MeterConstant9=1.0
RollOverPointCount=6
RollOverPoint1=100
RollOverPoint2=1,000
RollOverPoint3=10,000
RollOverPoint4=100,000
RollOverPoint5=100,00000
RollOverPoint6=100,000000

[CPRANT]
MeterConstantCount=10
MeterConstant1=.01
MeterConstant2=.01121
MeterConstant3=.02
MeterConstant4=.0225
MeterConstant5=.05
MeterConstant6=.0562
MeterConstant7=.1
MeterConstant8=.112
MeterConstant9=1.0
MeterConstant10=2.0
RollOverPointCount=5
RollOverPoint1=100
RollOverPoint2=1,000
RollOverPoint3=10,000
RollOverPoint4=100,000
RollOverPoint5=100,000,000

[CPRCWT]
MeterConstantCount=9
MeterConstant1=.01
MeterConstant2=.01121
MeterConstant3=.02
MeterConstant4=.0225
MeterConstant5=.05
MeterConstant6=.0562
MeterConstant7=.1
MeterConstant8=.112
MeterConstant9=1.0
RollOverPointCount=5
```

```
RollOverPoint1=100
RollOverPoint2=1,000
RollOverPoint3=10,000
RollOverPoint4=100,000
RollOverPoint5=99999999

[CIGR]
MeterConstantCount=5
MeterConstant1=.05
MeterConstant2=.0562
MeterConstant3=.1
MeterConstant4=.112
MeterConstant5=1.0
RollOverPointCount=5
RollOverPoint1=100
RollOverPoint2=1,000
RollOverPoint3=10,000
RollOverPoint4=100,000
RollOverPoint5=100,0000

[CIGD]
MeterConstantCount=5
MeterConstant1=.05
MeterConstant2=.0562
MeterConstant3=.1
MeterConstant4=.112
MeterConstant5=1.0
RollOverPointCount=5
RollOverPoint1=100
RollOverPoint2=1,000
RollOverPoint3=10,000
RollOverPoint4=100,000
RollOverPoint5=100,0000

[WCPR]
MeterConstantCount=1
MeterConstant1=1
RollOverPointCount=5
RollOverPoint1=100
RollOverPoint2=1,000
RollOverPoint3=10,000
RollOverPoint4=100,000
RollOverPoint5=100,0000
```

Save your updates to the GPrep.ini file. GPrep is ready to use.

Data Transfer

A local RIMS analyst performs this process. The RIMS Analyst uploads MRB and Program files to the server via FTP.

Server Side Process

The person using GPrep, or the local administrator, posts the program log and MRB files to Landis+Gyr's FTP Server. You can use any SFTP Tool to post files from gas and water processes. The GPREP.ini file determines the name and path of the files generated in the local machine. Each

Utility shop location can post multiple files, as long as each file is uniquely identified. The local site can use any logic to name these files, preferably to include date and time.

Once these files are posted, the DES server validates file format and cleanup activities by eliminating duplicate entries and storing the program logs and MRB data in staging tables. The server emails subscribers from source location. RIMS CRON runs nightly, processing meters and updating the latest associations to OCDB.

Using GPrep

This section details the steps taken by the end user to operate GPrep on a daily basis. This set of procedures assumes the following:

- Your GPrep administrator has configured the .ini file.
- You have basic knowledge of the process that you are trying to perform and understand at which step of the process you need to use GPrep.
- Shooter box or 1-way programming cable

If you are using the programming cable (usually in the field):

1   Install drivers and set up the cable per instructions in the *1-Way Module Programming Cable Getting Started Guide*.
2   Plug one end of the cable into the module.
3   Plug the USB into the laptop or PC.

USB Connector

Module Connector
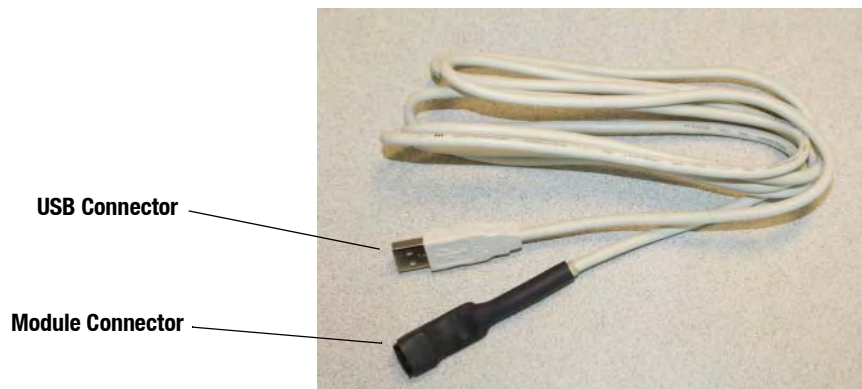
Figure 7 - 1. One-Way Programming Cable

If you are using the shooter box (usually in the office or shop):

1   Plug the battery into the shooter cable.
2   Power the shooter box.
3   Connect the shooter box to a COM port on your PC and choose the correct COM port from the dropdown menu on GPrep (or it defaults to that port).
4   Plug the shooter cable into the shooter box and the module

.

Figure 7 - 2. Shooter box with data cable

Logging On

The Log On window displays when you launch the program.

Enter your name and location in the appropriate fields. All tasks you perform for a given meter type (module inspection, new module programming, old module reprogramming, MRB and index read) will be recorded.
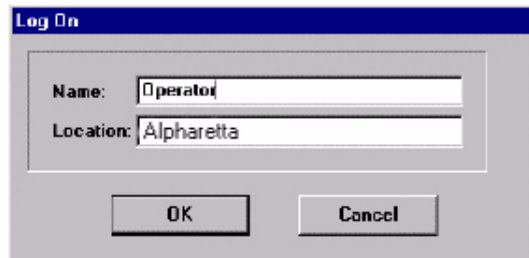

Figure 7 - 3. Log On screen

Accessing the Main Menu

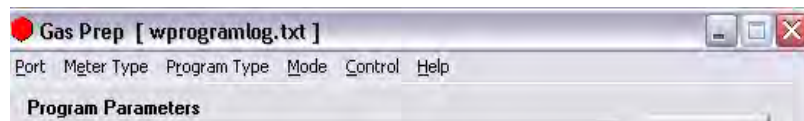The main menu screen displays after you log on.

Figure 7 - 4. GPrep Menu Bar

The GPrep menu bar includes the following options:

Port: enables the operator to select the PC port (usually COM: 1).

Meter type: Enables the operator to select meter type from the drop-down list. The options consist of Gas LX, ResGas, C&I Gas (Diaphragm), C&I (Rotary), CPR Form A No Tamper, CPR Form B Tamper, CPR Form C Tamper, and CPR Water.

 Certain sites may not use all options.

Program Type: Select Interval or Consumption type data.

Mode: provides the following choices:

- **Inspect**: Verifies that the programmed LAN Address has the same value as the Power LAN Address label. In addition, "Inspect" permits validating the other pre-configured operational parameters. Discrepancies are noted through message windows and the results of inspections are captured in associated files.

> The unique meter ID format for a given utility is defined in the ".ini" file. Any discrepancy in the meter ID format is noted in a message window, which prompts the operator to re-enter the meter ID prior to module programming. The association record of meter ID, module LAN Address, date, operator's name, and result of operation is captured in the file "programlog.txt".

- **Program New**: provides the capability to program a new meter for a specified rollover point and a meter constant for a specific utility meter ID format.

- **Re-Program Old**: provides the capability to program a meter with a non-zero index. This option was designed for utility meter shops to reprogram meter-modules pulled from the field or program a non-zero index read. All other features for this option are similar to the Program New mode. The "programlog.txt" file also includes the index read entered during the programming step as the field "opening read".

- **MRB**: captures the disassociation record for meters returned from the field. This option is mainly designed for meter shop use during the O&M phase.

The following screens show how the operator has the option of choosing inspect, program new, and index read when Gas LX is chosen as the Meter Type.
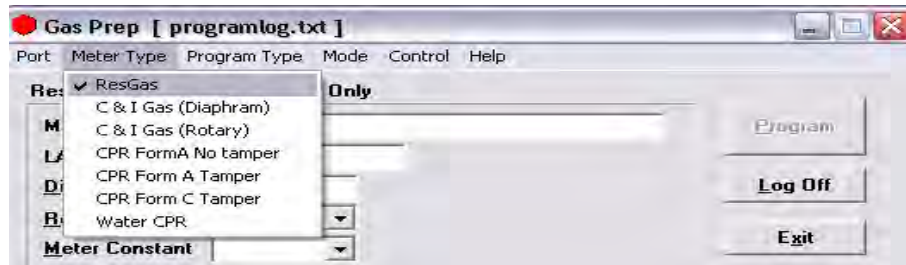

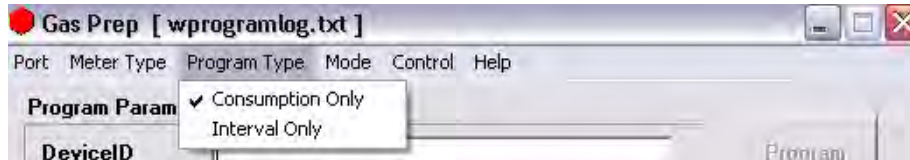*Figure 7 - 5. Choose Gas LX as the meter type*

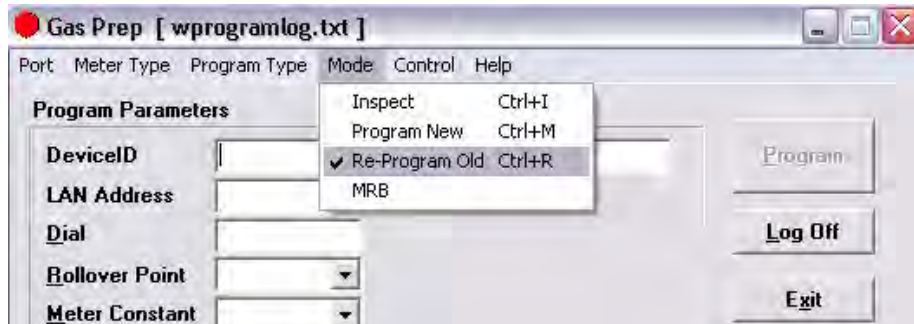*Figure 7 - 6. Indicate the Program Type*

Figure 7 - 7. Modes to choose from are "Inspect" or "Program New"

- **Control**: provides the capability to log on and off. The program setting remains the same when a new operator logs on.
- **Help**: provides a description of GPrep functionality for each mode of operation (not yet fully implemented).

Module Inspection

This feature is most commonly used when receiving meters from the factory with Landis+Gyr modules already installed (OEM Meters) or when receiving Landis+Gyr modules from Landis+Gyr's manufacturer. Different utilities use different sampling procedures. Landis+Gyr recommends that the meter shop verify a percentage of inbound modules to ensure that the LAN Address that is programmed into the module matches the LAN Address on the outside of the module housing. The modules can also be inspected to verify that the correct Meter ID format was used, that the rollover point is correct, and that the meter constant is correct.

> **Different modes of operation for Gas LX modules are provided in detail. All other meter/ module types follows the identical functionality and operations, except as noted for Water CPR.**

1   Select **Inspect** from the Mode drop-down window in the main menu. The following screen displays.

Figure 7 - 8. GPrep "Inspect Mode" screen

There are two distinct sections on the screen. The top section is the LAN Address field where the module power LAN label is either scanned or typed.

> **The program automatically truncates the leading zeros and any blank spaces in the LAN Address field. GPrep left justifies the value in this field.**

The lower section, "current parameters", displays the operational parameters and module programmed values.

2   Connect the shooter cable to the module programming port. The following screen displays.

Figure 7 - 9. "Inspect Mode" Screen With Module Plugged In

GPrep automatically reads and displays the current parameters programmed into the module.

> **If the Meter Type selected does not match the module under test, GPrep displays a dialog box indicating "wrong module Type" along with a blinking "Module reject" message. GPrep does not allow the operator to continue with this function.**

> **If the current parameters do not match the predetermined values, a warning message displays. (This is normal for new modules because a module coming from the manufacturer is programmed with test parameters).**

> **Module PCB ID (board ID) is populated during manufacturing. Upon verification of module inspection, this value is saved in combination with the module Power LAN Address in the Inspect file along with date, operator's name and location of inspection.**

3   Scan (enter) the Module ID in LAN Address field.

Figure 7 - 10. "Inspect Mode" With Power LAN Scanned In

GPrep compares the Module ID entered in this field with the LAN Address programmed into the module. If the populated field matches the programmed value, a message displays "address verified". If the entered value does not match the programmed value a dialog box displays, stating the "LAN Address does not match the programmed value" and instructs the operator to reenter the power LAN label value, due to a misinterpretation or mis-entered value. GPrep instructs the operator to route the module to MRB for further disposition if the entered values do not match again.

> **If the result of the inspection is verified, a record in the "inspect file" is created showing that the module Inspection is successful. It also captures the PCB ID of the module in the same record.**

If the power LAN value does not match the programmed value, a record is also generated in the "inspect file" showing the inspection has failed. Modules that fail inspection must be segregated and routed to MRB.

Module Programming

There are two modes for programming the modules. **Program New** is used when a module is installed on a new meter with an index that reads zero, and **Re-program old** is used for programming a module that is being installed on a meter that has an index with a value other than zero. This value is programmed into the module to log in the starting read for a meter to be installed.

(An example of this is a periodic meter check in which a meter is taken from a residence, inspected and then re-deployed again into another residence).

Program New

1   Select **Program new** from the mode drop-down window in the main menu. The following screen displays.

There are two distinct sections in this screen as well. The top section contains the following fields which can be modified by the user:

- Meter ID field

  If you are programming a Water CPR module, Device ID replaces Meter ID. A CPR module is programmed with 10-digit left-justified (zero) Module ID as MeterID. Water CPR programming also captures optional Encoder ID information.

- LAN Address
- Roll-over point
- Meter constant.

Figure 7 - 11. "Program New" Screen

2   Connect the 1-Way Programming Cable or shooter cable to the module programming port. The following screen displays.

Figure 7 - 12. "Program New" Screen with Module Plugged In

GPrep automatically reads and displays the current parameters programmed into the module.

> **If the Meter Type selected on the menu bar does not match the module type under test, GPrep displays a dialog box indicating "wrong module Type" and a blinking "Module reject" message. GPrep does not allow the operator to resume the programming function.**

> **If the current parameters do not match the predetermined value, a warning message, "reject parameters" displays. Upon successful completion of module programming, GPrep populates the "current parameter" fields with correct operational values.**

3   Scan or enter the meter ID in appropriate field.

Since the meter ID field is utility specific, there are provisions within GPrep to specify the meter ID format. Therefore, if the meter ID format entered in this field does not match the specified utility format, a dialog window displays indicating "meter ID field contains invalid characters" and the operator is instructed to either rescan or re-enter the meter ID value in this field. Module programming can not be resumed until the meter ID field populated matches the utility specific format.

Figure 7 - 13. Error Message Displayed when The Wrong Meter ID Format Is Entered

4   Scan (enter) the power LAN label in the LAN Address field.

"GPrep" compares the value entered in this field with the LAN Address programmed in the module. Similar to the inspection section, any discrepancies in the values are rejected.
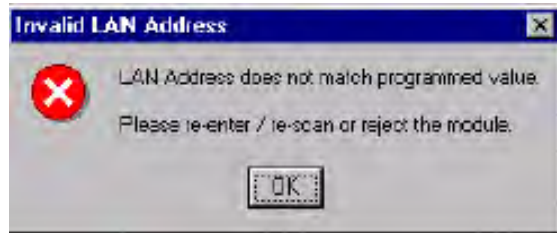

Figure 7 - 14. Error Message Displayed if The Scanned Power LAN Value Does Not Match the Programmed Value

Select the Rollover Point and Meter Constant (meter specific values) prior to programming the module from the drop-down windows. GPrep displays a message window verifying that the operator intends to change the Rollover point and meter constant. GPrep keeps the last value entered in the rollover point and meter constant fields as the default value.

If you do not know what to enter for the Rollover Point or Meter Constant STOP! Contact someone that does know or contact Landis+Gyr Customer Support. The wrong data entered in these fields significantly affects the billing read provided to the utility.

Upon successful programming, a message "program verified" displays. GPrep also displays a green square indicator at the lower left corner of the screen showing programming has been successful.

Figure 7 - 15. Display when parameters are verified

A record of the meter and module association is automatically captured in the "program file" including the date and the operator's name.

The "Programlog" only compiles the records when successful programming is verified. If a Meter ID record already exists in programlog, the following message displays.
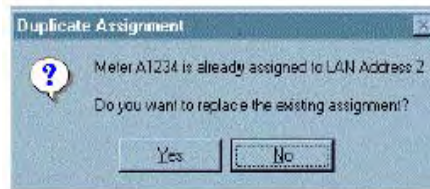
Figure 7 - 16. Error Message Indicating that a Meter ID Already Exists in the Programlog

- If you select "Yes", a new record is inserted with a timestamp. It is a valid new record if the program indicates "successful". If you select "No", the old record remains.
- If a record already exist in the programlog for a scanned module Power LAN Address, GPrep displays the following message:

Figure 7 - 17. Duplicate Power LAN Address

- If you select "yes", indicating that you entered the wrong module ID, then re-enter the meter ID field and Power LAN Address to correct possible mis-entered values.
- If you select "No", indicating the module ID has been entered correctly, GPrep displays a blinking message "route to MRB".

The result of this operation is not captured in the GPrep programlog file.

Re-Program Old

The instructions and procedures for **Re-Program Old** are the same as those for **Program New**, with the additional field "Dial". Populate it with the index reading (dial reading). This mode is mainly utilized during the O&M phase to program meters with non-zero indices.

1   Select **Re-Program Old** from the mode drop-down window in the main menu. The following screen displays.
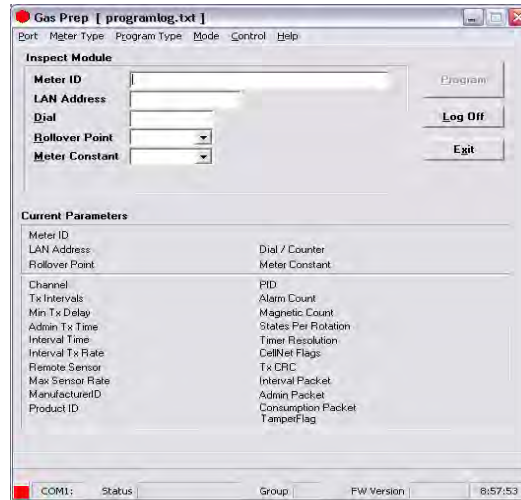

Figure 7 - 18. "Re-Program Old" Screen

There are two distinct sections in this screen as well. The top section contains the following fields which can be modified by the user:

- Meter ID field
- LAN Address
- Dial
- Roll-over point
- Meter constant

These are the only fields that can be populated.

2   Connect the 1-Way Programming Cable or shooter cable to the module programming port. The following screen displays.

Figure 7 - 19. Re-Program Old With Module Plugged In

GPrep automatically reads and displays the current parameters programmed into the module.

If the current parameters do not match the predetermined value, a warning message, "reject parameters" displays. Upon successful completion of module programming, "GPrep" populates the "current parameter" fields with correct operational values.

If the meter type selected from the "meter type" drop-down menu does not match the module type, GPrep displays a message "wrong module type" and a blinking message "reject module".

This functionality ensures that the correct meter type is chosen for a given meter.

3   Scan (enter) the meter ID in appropriate field.
Since the meter ID field is utility specific, there are provisions within GPrep to specify the meter ID format. Therefore, if the meter ID field format entered in this field does not match the specified utility format, a dialog window displays indicating "meter ID field contain invalid characters" and the operator is instructed to either rescan or re-enter the meter ID value in this field. Module programming can not be resumed until the meter ID field populated matches the utility specific format.

4   Scan (enter) the Module ID in LAN Address field.

GPrep compares the value entered in this field with the LAN Address programmed in the module. Similar to inspection section, any discrepancies in the values are rejected.

Select the Rollover point and meter constant (meter specific values) prior to programming the module from the drop-down windows. "GPrep" displays a message window verifying if indeed the operator intends to change the Rollover point and meter constant. "GPrep" keeps the last value entered in rollover point and meter constant fields as default value.

If you do not know what to enter for the Rollover Point or Meter Constant STOP! Contact someone that does know or contact Landis+Gyr Customer Support. The wrong data entered in these fields significantly affects the billing read provided to the utility.

5   Enter the index dial values by reading the dials and entering the values read from right to left.

The value entered in the dial field is programmed into the module as the starting meter read at installation. Consumption is based on the initial read programmed into the module. It is very important to be accurate on the dial index read. Note also that the dial field requires the number of digits that correspond to the roll over point.

Example: If the roll over point is set at 10,000, then a four digit dial read would need to be entered.

The index must have four dials if the roll over point of 10,000 is correct. Otherwise, the roll over point must be changed accordingly. If the index read number contains more digits than the corresponding rollover point, GPrep displays the following message prompting the operator to reenter the index read and a blinking message in the main screen "dial rejected" is also displayed.

Figure 7 - 20. Error Message Displayed when Entered Read is too large for the Rollover Point

Select the proper Meter Constant from the drop-down box. You can typically determine the Meter Constant from the meter index.

Upon successful programming a message "program verified" displays. GPrep also displays a green square indicator at the lower left corner of the screen showing that the programming has been successful (this is the same as the "verified" screen for Program New). A record of meter and module association is automatically captured in the "programlog" including the index read entered by operator as opening read.

MRB Mode

MRB (Material Repair Board) Mode captures the record of meter-module disassociation disassembly as the modules are removed from the meters.

1   Select the meter type from the menu bar corresponding to the meter –module combination.

2   Select MRB from mode in the menu bar. The following screen displays.

Figure 7 - 21. MRB Mode Main Menu

There are two distinct sections on this screen as well. The top section contains the following fields:

- LAN Address
- Dial

These are the only fields that can be populated.

3   Connect the 1-Way Programming Cable or shooter cable to the module programming port. The following screen displays.

Figure 7 - 22. MRB Screen with Module Plugged In

If the Meter Type selected on the menu bar does not match the module type under test, GPrep displays a dialog box indicating "wrong module Type" and a blinking "Module reject" message. GPrep does not allow the operator to resume programming function.

If the current parameters do not match the predetermined value, a warning message, "reject parameters" displays.

4   Scan (enter) the Module ID in LAN Address field.

GPrep compares the value entered in this field with the LAN Address programmed in the module.

GPrep rejects any discrepancies in values, and prompts you to re-enter the LAN Address or reject the module.

5   Enter the index dial values by reading the dials and entering the values read from right to left.

The value entered in the dial field are be compared with the module's programmed read. GPrep displays the following screen if there is any discrepancy and provides the option to change the dial read if the operator has entered the wrong value
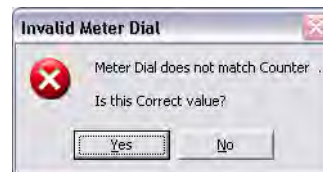
Figure 7 - 23. Error Message Displayed when Entered Value Does Not Match Programmed Value

If you select "Yes", GPrep displays a blinking message stating "Dial discrepancy" and the main screen displays that the new dial value has been logged in MRBlog. This is captured in the MRBlog as "dial Entered". GPrep does not capture the old value that was programmed into the module.

If you select "No", GPrep prompts the operator to enter the correct value.

Upon acceptance of entered values for LAN Address and dial, GPrep creates a record in the MRB including the closing index read and "Dial Verified" in addition to the association records.

The dial field requires the number of digits that correspond to the roll over point previously programmed into the module. Example: If the roll over point is set at 1,000, then a four digit dial (or less) read would need to be entered. The index must have four dials if the roll over point of 10,000 is correct. If the index read number contains more digits than corresponding rollover point, GPrep displays a message "entered value contains too many digits" prompting the operator to re-enter the index read and a blinking message in the main screen "dial rejected" is also displayed.

Frequently Asked Questions

1   What does GPrep stand for?
    Gas TOMM Preparation

2   What is GPrep used for?
    GPrep is a tool used in the Cross Dock or meter shop to program gas or water CPR modules
    without the use of a handheld. It is also used to disassociate gas or water CPR modules from
    meters.

3   What is programmed into the module?
    In the "Program New" and "Re-Program Old" modes, field operating parameters are
    programmed into the module. Meter ID, Rollover Point, Dial Read, and Meter Constant are the
    only parameters that can be changed by the operator.

4   How does a meter constant work?
    A meter constant is a multiplier that converts the pulses/turns of the module into cubic feet. The
    reason for the meter constant to be .02 on a meter with a 2ft drive is that for every rotation of the
    drive dog there has passed 2 cubic ft of gas. This is equivalent to 2% or .02 or 2/100ths of 1 point
    on the smallest of the four dials, which measures hundreds of cubic feet. For every 50 rotations
    of the 2-ft dog dial 100 cubic feet of gas has passed. For every 50 rotations, the 1,000 dial has
    increased 1 point (100 cubic feet) and our module (if it happens to transmit at that moment)
    sends out a packet with a count of 50. OCDB multiplies the 50 by the meter constant .02 to get a
    read of 1, which we pass on to the utility as a read of 1 for that meter. Therefore, if the meter
    constant were falsely set to .01 the 50 rotations would be multiplied by .01 and would only show
    that the meter used 50 cubic feet of gas.

5   Why don't you program the meter ID from the front of the meter into the module?
    The "Utility Billing ID" gets programmed into the meter; this is not usually the same as the
    Meter ID.

6   What is a rollover point, how is it used, and why is it important to make sure that it is right?
    The rollover point is the number at which the dials of a meter turn over and start at zero again.
    For a four-dial meter, the numbers on the dials cannot go over 9999. Therefore, the rollover
    point is 10000. For five- dial meters the rollover point is 100,000, etc. It is important to program
    the correct rollover point into the module so that our system read matches the dial plate.

7   What screen should I use in the sampling process?
    There are several different types of sampling done by the meter shop. Using the "inspect" mode,
    the most common sample Landis+Gyr-ready OEM meters and sampling modules from a
    Landis+Gyr manufacturer.

8   Who is responsible for transferring the data files, how often are the data files transferred, and
    who writes the scripts to pick up the data from the server?
    The local database analyst is usually responsible for transferring the data from GPrep to RIMS.
    Data transfer should be done every day that there is data available to transfer. A database group
    member writes the script to automatically pick up this data.

9   How soon does the data get updated in each system after a module is programmed?
    A CRON job runs nightly that picks up data put on the Landis+Gyr server and transfers it to
    RIMS. At a minimum there is a one day delay.

10 Why shouldn't I take GPrep to the field?
    Data management becomes difficult when the GPrep PC is not at a fixed location. The data
    captured by GPrep is time sensitive customer account information that should be copied and
    transferred daily. The equipment used to operate GPrep is not made to be used outdoors. If
    GPrep is taken to the field, it is vital that the data be transferred as soon as possible upon return.

11 What data is captured by GPrep?
    There is currently no screen that captures both the closing and opening reads on a module (as
    needed for index changes). MRB mode should be used to disassociate the module from the
    meter and capture the closing read. Program-old should then be used to re-program the module
    with the new index read.

12 What are some troubleshooting steps if GPrep is not working?
    – If you are using the shooter box, check:
        — AC power
        — module plugged in
        — shooter box turned on
        — correct DB9 to DB9 (RS-232) cable (Non-Null Modem)
        — correct COM port
        — correct meter type and mode (e.g. Gas LX v. commercial)
    – If you are using USB one way programming cable, refer to the *1-Way Module Programming Cable PC/Laptop Getting Started Guide*.

13 What are the benefits of using re-program old all of the time as opposed to program new?
    While some programs do this, there are no real benefits. It is a little easier to prepare the programlog to send, but involves extra work for the end user.

14 What does it mean when a file is superseded?
    A meter ID or LAN Address had to be re-entered.

15 Who is responsible for cleaning these files (removing supersedes, converting into an Excel spreadsheet, etc.)?
    Typically, the utility designated personnel to perform this task before sending these files to the database analyst.

16 Who should I contact if there is a problem?
    Contact a local database analyst. If needed, contact Landis+Gyr Customer Support at solutionsupport.na@landisgyr.com.

17 When using different screens, why does the phrase "parameter reject" flash yellow when I plug in a module that has just come from the manufacturer?
    When modules are manufactured and configured, test parameters are programmed to make the module transmit more frequently than every 15 minutes. These parameters also allow other tests to be run on the modules for quality control procedures. GPrep (or a handheld) replaces these test parameters with field parameters.

Notes:

One-way Gas Module Installation Guide

A

Supplemental Information About Indexes

Index Type

Metal indexes cannot be used with the Gas LX system. If the meter has a metal index, the index MUST BE EXCHANGED for a plastic index.

Figure A - 1. Metal American Index

Figure A - 2. Plastic American Index

Notes:

B

Using the RF Buster

Landis$^+$|Gyr$^+$

This Appendix provides instructions on the proper use of the RF Buster. It covers the proper placement of the RF Buster to ensure activation and troubleshooting for L+G gas modules.

Required Tools

RF Buster - part number 26-1050

Before using the RF Buster, test it. Press the button on the RF Buster. The RF Buster's LED lights red, and the internal speaker sounds for approximately ½ second. If nothing happens, or if the LED lights and the speaker sounds continuously, the 9V battery may be low. Replace the battery and repeat the test.

Residential Meter Modules

1   With the light facing you, press the button on the lower end of the RF Buster.

2   Place the corner of the RF Buster containing the magnet by the location of the reed switch on the Meter Module.

3   Continue to press the button. Hold the RF Buster within about six inches of the meter. The magnet triggers ten RF transmissions from the gas module, with each transmission separated by one second. The RF Buster LED lights and the internal speaker sounds about ½ second for each transmission detected.

If the RF Buster does not detect a transmission from the module, remove the four cover screws and place the RF Buster in the proper location. While pressing the Push Button, pull the cover off the module.

•   If the module is functional, it transmits.

If the RF Buster does not respond, consider the module defective and follow the appropriate procedure

.

Figure B - 1.   Proper Placement of the RF Buster

Notes:

One-way Gas Module Installation Guide

C
End of Day Handheld Instructions

This Appendix provides detailed instructions on docking the Handheld, power requirements, and how to change the Handheld ID. This information should only be used by experienced users.

Docking the Handheld

At the end of the day (and at other times for various reasons), dock the Handheld to upload meter installation data and plug it in to recharge the battery.

1   Select DOCK from the functions screen.
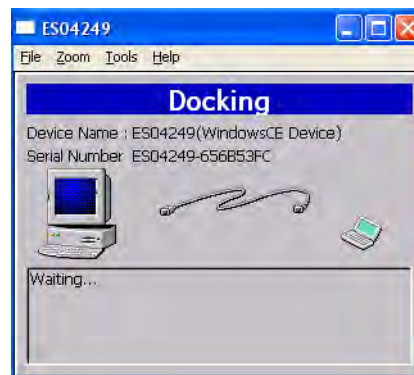
Figure C-1. Handheld after Dock has been selected

2   Follow instructions on the screen.

3   After data has been uploaded, plug Handheld into charging cable.

Figure C-2. Handheld DAP charging

Power Requirements

Never allow the battery to die completely. Although the route data saves to the flash memory card, there is no EPROM memory in the Handheld. You will have to reload the code and re-calibrate the battery.

 Do not remove the battery. The batteries are not made to be replaced as with the other Handhelds.

Rebooting

There are three ways to reboot the Handheld:

1   Press the F1, 9, and 0 simultaneously for approximately five seconds.
2   Press the following keys blue, CTL, ALT, blue, DEL.
3   Exit the application (From the Functions screen select Dock, do not place in cradle or plug in as requested. Press the shift key followed by F5). Type "C:" then press ENTER. Type "reset" then press ENTER.

How To Change The Handheld ID

Occasionally the Handheld ID may be entered incorrectly or the wrong Handheld ID may be in a Handheld because of a memory card exchange. This section tells how to change the Handheld ID to the correct number.

1   Place the Handheld in the cradle and dock it.

2   Open up the most recent version of Handheld Edit.

3   Select "Communication" then "Transfer Files" from the menu on Handheld Edit.

4   On the right side of the pop up window, double click on the [CELLNET] folder.

5   Select Unitinfo.dat and delete it. Select "Yes" to verify that you want to delete the file.

6   Select "OK" on the pop up window and close Handheld Edit.

7   The Handheld will then prompt you to enter the last 4 digits of the serial number on the back of the Handheld.

8   Before using the Handheld, make sure the proper route information is loaded into the Handheld.

Known Common Problems

•   If the Handheld gets jarred, the memory card may become dislodged slightly. This makes it look like all of the data has been lost- but it is still there. Unscrew the two screws at the top of the Handheld below the Infra-red scanner. Re-seat the card and re-tighten the cover. You may need to re-boot the Handheld.

•   If the blue key and then one of the arrow keys is pushed, part of the screen seems to disappear. The screen was designed to hold more data. Blue key + arrow is how you shift the screen to view that data. Push the blue button and the arrow key in the opposite direction of the screen shift.

Notes:

One-way Gas Module Installation Guide

GLOSSARY

AMR	Automated Meter Reading. Energy use data gathering from utility meters by any means other than walking up to the meter, looking at the dials, and recording the meter read for billing.
C.F.H.	Cubic feet per hour
DES Server	Data Exchange Server
GPrep	"Gas Prep" A software program that enables the user to program, reprogram, inspect, read, and disposition to scrap an L+G gas or CPR water module.
Handheld	A small portable computer held in the hand, used to manage data for field installation of meters and modules and the primary means of dispatching meter-install work orders during the endpoint deployment phase.
IDs	Utility-issued identification to denote an individual as an official Installer for the utility.
LAN	Local Area Network: the most basic level of the network. The LAN is the constellation of endpoints, collectors, and concentrators that feed data up through the network.
LP	Load Profile: method of obtaining a usage pattern, over a span of time, for an emergency customer, typically based on intervals of 15, 30, or 60 minutes.
MRB	"Material Repair Board" Process of removing modules from the field.
OCDB	Operations Center DataBase. Endpoint Management system that reports to network, exchanges information with the utility and RIMS.
Personal Protective Equipment	Personal Protective Equipment, all necessary equipment used for the safety of the installer while performing work on metering equipment as defined in this manual.
PSR	Packet success rate: Number of good data packets received per total number of packets sent, expressed as a percentage.
RIMS	Retrofit Information Management System, an Oracle program managing the shop floor assembly and programming of modules, also stands for myriad of data tables. Exchanges information with OCDB.

Notes:

One-way Gas Module Installation Guide

Reader's Comment Form

American Residential Meter One-Way Gas Module Installation Guide (98-3107 Rev AA)

Please use this form only to identify publication errors or to request changes in publications. Your comments assist us in improving our publications. Direct any requests for additional publications, technical questions about systems, changes in support, and so on, to your Landis+Gyr sales representative. You must use this form to communicate your comments about this publication, its organization, or subject matter, with the understanding that we may use or distribute whatever information you supply in any way we believe appropriate without incurring any obligation to you.

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