Certification Exhibit

FCC ID: R7PEG6R3S2
IC: 5294A-EG6R3S2

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

ACS Report Number: 08-0459 - 15C

Manufacturer: Cellnet Technology, Inc.
Model: 25-1078

Installation Guide (Part 2)

12 Install new tamper seals over two screws using the plastic sleeve provided (optional).

Figure 6.20 Rockwell/Equimeter/Sensus: center test dial, counter installed, or index

13 Utilize the RF Buster to verify module is transmitting, hold RF Buster with magnet side to the top upper left quadrant of the module plastic and hold the button until 10 beeps are received. See <u>Appendix C</u>, *Using the RF Buster* for more information.

14 Clean up any debris from the retrofit and installation processes and tie any loose cables with tie wraps.

15 Proceed to the next installation site.

16 At the end of the day, return to the Cross Dock for the check-in process. Turn in inventory of unused, defective, or broken gas Meter Modules. Check in all handheld computers issued. You must reconcile any discrepancies in the changeout data before the check-in process can be completed. Meter Modules will not be checked out to an installer who has not completed the previous day's check-in process.

Sprague/Actaris Meter Module Installation

Figure 6.21 Sprague/Actaris: Indexes before installation

1   Follow the steps in *"To Begin C&I Meter Module Installation"* on page 6-1.

2   Remove the tamper caps and index cover from the original meter. Remove all of the original gasket material. Clean the gasket surface on the meter with a wire brush and gasket scraper.

3   Open the package containing the Meter Module, screws, and battery.

Figure 6.22 Sprague/Actaris: screw kit

4   Open the bag containing the battery. Carefully remove the battery.

5   Open the Meter Module, taking care to avoid pulling on the cables.

6   Connect the battery to the Meter Module. Assemble the battery into the retaining clip on the metal bracket.

7   Connect the programming cable from the handheld computer to the programming port on the replacement Meter Module. Program the Meter Module. Check the handheld for successful programming.

8   Slide the metal bracket (not the green circuit board) into the slots of the clamshell (one of the clamshell halves has slots on opposite sides of the interior). If you are looking down into the slots, the battery clip should be towards the top - the large capacitors on the circuit board go deep into the clamshell. Assemble the Meter Module halves together with the four small self-tapping screws provided. The torque requirement is 6-10 inch pounds. Ensure that the gasket is in place and the wires are not pinched.   Install the tamper seals.

9   Slide the bracket between the index cover and the meter.

> **Check condition of the index for looseness of index pointers on shaft, cracks on face enamel, or peeling. Replace the index if dials are loose or if enamel is cracked or loose.**

10   Install the new gasket (if required) and index cover to the front of the index. Handle the index carefully. The torque requirement is 30-40 inch pounds. The screws go through the index cover and bracket, and fasten into the meter.

ℹ️   **Ensure that the counter is aligned with proving dial (on top).**

Figure 6.23 Sprague/Actaris: installing Index cover

11   Install new tamper seals.

Figure 6.24 Sprague/Actaris: installed tamper seals

12 Utilize the RF Buster to verify module is transmitting, hold RF Buster with magnet side to the top upper left quadrant of the module plastic and hold the button until 10 beeps are received. See Appendix C, *Using the RF Buster* for more information.

Figure 6.25 Sprague/Actaris: meter with module installed

13 Clean up any debris from the retrofit and installation processes and tie any loose cables with tie wraps.

14 Proceed to the next installation site.

15 At the end of the day, return to the Cross Dock for the check-in process. Turn in inventory of unused, defective, or broken gas Meter Modules. Check in all handheld computers issued. You must reconcile any discrepancies in the changeout data before the check-in process can be completed. Meter Modules will not be checked out to an installer who has not completed the previous day's check-in process.

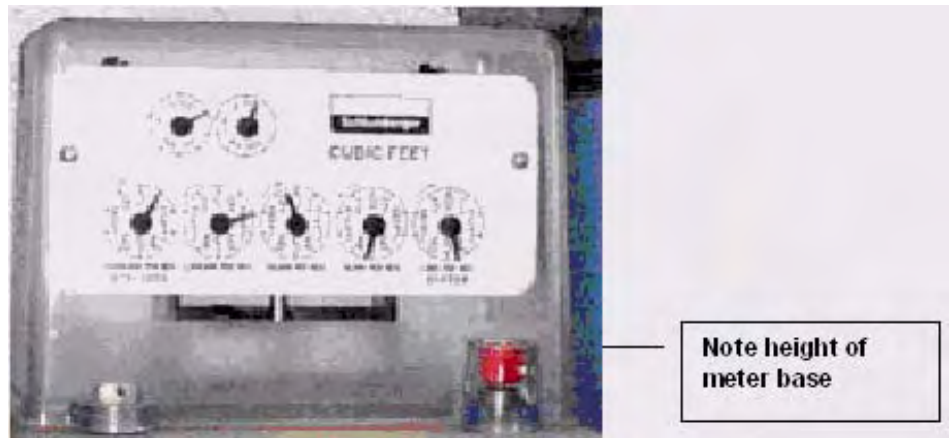## Schlumberger/Actaris Meter Module Installation

Figure 6.26 Schlumberger/Actaris: before installation

> ⚠ Only Schlumberger meters with the taller base (shown above) can accommodate Cellnet Meter Modules. Meters with the shorter base (shown below) will need to be retrofitted with a taller index bracket prior to module retrofit.
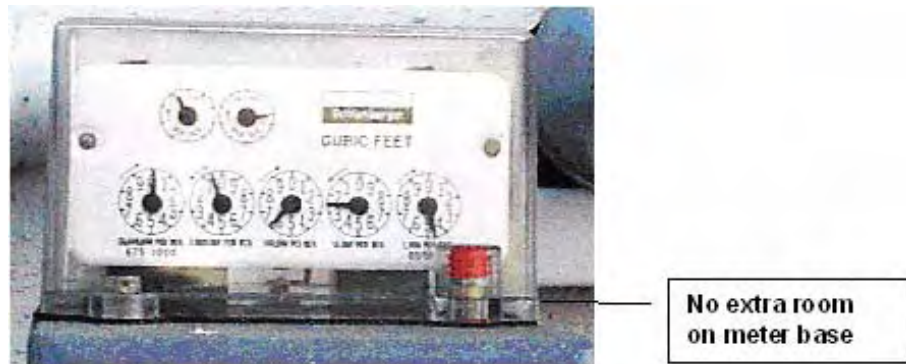

Figure 6.27 Schlumberger/Actaris: meter with short base

1   Follow the steps in *"To Begin C&I Meter Module Installation"* on page 6-1.

2　Remove the tamper caps and index cover from the original meter.　Remove the gasket if it is unserviceable. Clean the work areas with a wire brush or scraper as needed.

Figure 6.28 Schlumberger/Actaris: Index cover removed

3　Open the package containing the Meter Module, screws, and battery.

4　Open the bag containing the battery. Carefully remove the battery.

5　Open the Meter Module, taking care to avoid pulling on the cables.

6　Connect the programming cable from the handheld computer to the programming port on the Meter Module.　Program the Meter Module. Check the handheld for successful programming.

7　Connect the battery to the Meter Module. Assemble the battery into the retaining clip on the metal bracket.

8　Slide the metal bracket (not the green circuit board) into the slots of the clamshell (one of the clamshell halves has slots on opposite sides of the interior). If you are looking down into the slots, the battery clip should be towards the top - the large capacitors on the circuit board go deep into the clamshell. Assemble the Meter Module halves together with the four small self-tapping screws provided. The torque requirement is 6-10 inch pounds. Ensure that the gasket is in place and the wires are not pinched. Install the tamper seals.

Check condition of the index for looseness of index pointers on shaft, cracks on face enamel, or peeling. Replace the index if dials are loose or if enamel is cracked or loose.

9　Install the new index cover. Gently slide the cover over the index to avoid breaking the counter. Be careful not to damage the dials.

10   Attach the bracket and Meter Module to the meter. Note the order of installation: index cover, bracket, tamper cap, and screw. The torque requirement is 30-40 inch pounds.
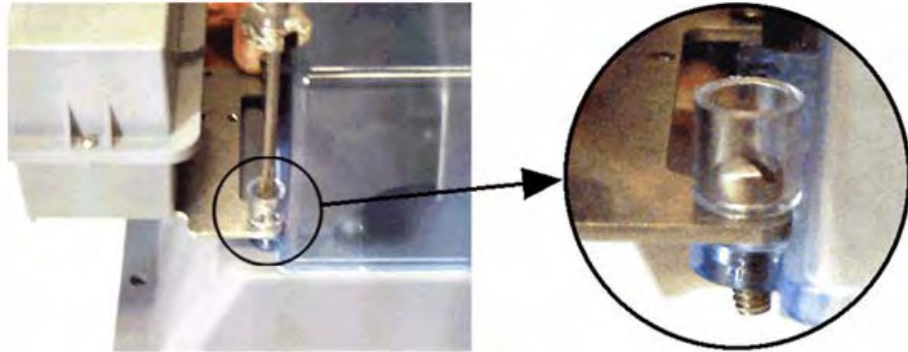

Figure 6.29 Schlumberger/Actaris: meter with bracket and meter module

11   Install new tamper caps over the screws using the plastic sleeves provided.

12   Utilize the RF Buster to verify module is transmitting, hold RF Buster with magnet side to the top upper left quadrant of the module plastic and hold the button until 10 beeps are received. See Appendix C, *Using the RF Buster* for more information.

13   Clean up any debris from the retrofit and installation processes and tie any loose cables with tie wraps.

14   Proceed to the next installation site.

15   At the end of the day, return to the Cross Dock for the check-in process. Turn in inventory of unused, defective, or broken gas Meter Modules. Check in all handheld computers issued. You must reconcile any discrepancies in the changeout data before the check-in process can be completed. Meter Modules will not be checked out to an installer who has not completed the previous day's check-in process.

Notes:

CHAPTER 7   CELLNET PULSE RECORDER METER MODULE INSTALLATION

TOOLS AND EQUIPMENT

This section outlines the necessary tools and equipment for installing a Cellnet Pulse Recorder.

Equipment

The following table contains all required equipment:

Table 7.1 Equipment

Image	Description
	CPR (External View)
	CPR (Internal View)
	Badger Field Splice Kit 62084-001 • Splice Enclosure • Tiewraps • 3M Scotchloks, Model UY2 or Equivalent
	Dow Corning 4 Electrical Insulating Compound (or equivalent) MSDS available at www.dowcorning.com.

Image	Description
	Dow Corning OS-2 Silicone Cleaner (or equivalent) MSDS available at www.dowcorning.com.
	PIN-IN-TORX Requires a TORX driver size T10 with a hole for the PIN
	Additional cable Specification: 22-AWG Solid Copper Colors: Red/Green/Black PVC Jacket
	Wall-mount Kit PN: 45-0090 or 2-3" Pipe-Mount Kit 45-0080
	Screws for meter indexes

Tools

The following table contains all required tools:

Table 7.2 Tools

Image	Description
Magnet located on top left →	RF Buster Magnet p/n 26-1050
	Screwdrivers (flat and Phillips)
	Wire Cutter and Stripper
	Scotchlok® E-9Y Crimping Tool or Equivalent www.3M.com
	Safety Goggles
	HandHeld Computer www.dap.com
	1-Way Module Programming Cable

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, the installer 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 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 INFORMATION

See <u>Appendix F</u>, *CPR Information*, for more information.

INSTALLING THE CELLNET PULSE RECORDER

The following includes information about installing the CPR endpoint.

Mounting the CPR

The CPR endpoint should be mounted above ground, outdoors, facing the nearest concentrator.

Identifying the Register for Installation

Refer to the Gas Module Compatibility Chart for compatibility and specific parts needed.

Connecting the PRECO Switch to the CPR

1 Install the PRECO switch on the gas meter index according to the instructions included with the PRECO kit.

2 Route the cable from the PRECO switch to the CPR mounting location. Splice the additional cable as necessary. When using additional cable, always match colors: PRECO blue to CPR white (via green extension wire), PRECO red to CPR red, PRECO white to CPR black (via black extension wire).

3 If you need to add cable for a remote wall-mounted CPR, follow the instructions here for removing the Molex connectors (if present) and splicing additional cable. Prepare cable ends for crimping:

a Using the cutting blade portion of the Wire Cutter and Stripper tool, cut the wire at the Molex connector (if present) coming from the PRECO switch. The wire attached to the PRECO switch contains three wires.
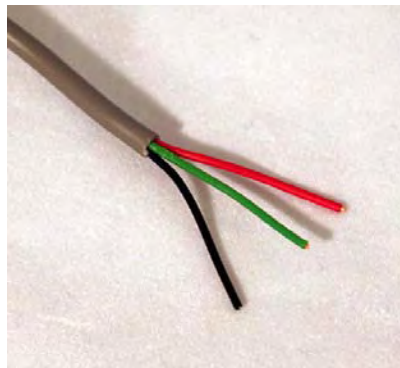

Figure 7.1 3-Wire Cable

Do not damage internal wire insulation when removing external insulation.

CPR ships with a female Molex connector at the loose end of the communication cable.

b Before proceeding with splicing, use the Wire Cutter and Stripper to cut the Molex connector off of the CPR Pulse Input Connector (identified by white wire).

CPR Pulse Input Connector with white wire

Figure 7.2 Molex Connector (as shipped)

c Splice wires from CPR to PRECO switch. Match colors carefully, according to the table below.

Table 7.3 Wire Color Matching

Encoder Register	PRECO Wire color/CPR Wire Color	
PRECO blue to green extension to CPR white	**blue**	**white**
PRECO red to red extension to CPR red	**red**	**red**
PRECO white to black extension to CPR black	**white**	**black**

ℹ️ **Connect only three wires using the color matching above.**

4   See Appendix A: Crimping Wires, for instructions on crimping wires.

Programming CPR Endpoint for Operation with PRECO Switch

You must program the CPR with the HandHeld computer (the "HandHeld").

1   Connect the CPR Programming Cable to the CPR Serial/Power Conenctor (yellow wire) below.

Programming Cable

CPR Serial/Power Connector
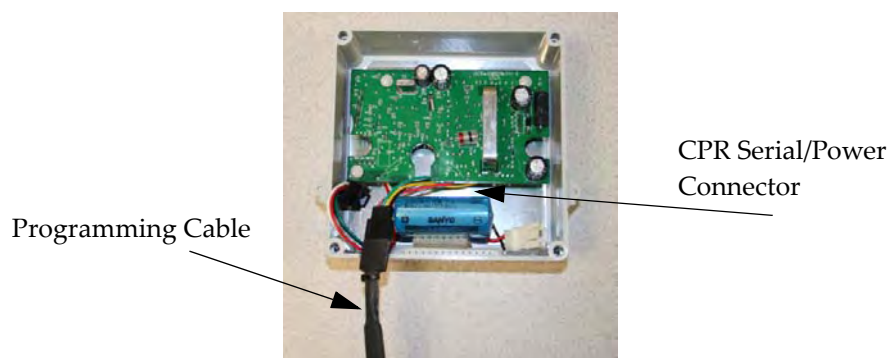
Figure 7.3 CPR Programming Cable Attached

2   Follow the HandHeld prompts to program the endpoint.

3   When programming is complete, disconnect the programming cable from the CPR.

4   Connect the battery to the CPR.

5   Dress the wires and crimp inside the CPR enclosure as shown.
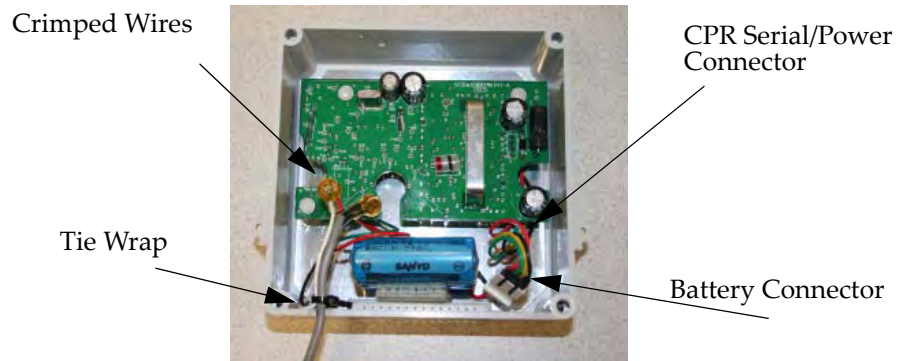
Figure 7.4 CPR Battery Connector Connected to CPR

Proceed to *"Testing the Endpoint"* on page 7-8.

TESTING THE ENDPOINT

After you have completed the installation process, test the installation by passing an RF Buster magnet near the CPR's sensor. The RF Buster detects the transmission, beeps and lights the LED.

1   Activate the CPR by passing the RF Buster magnet against the side of the CPR housing as shown.
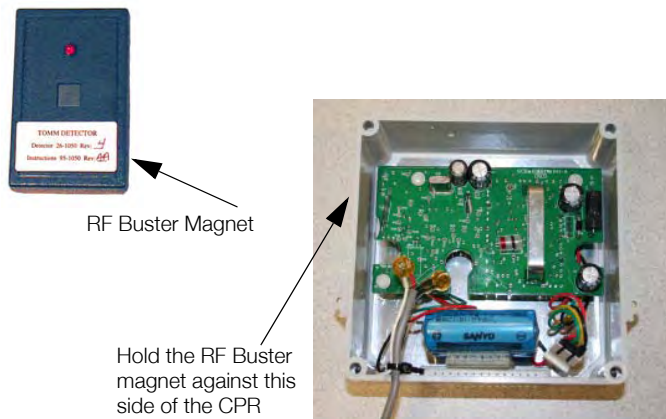
Figure 7.5 CPR Activation Using RF Buster

2   Press and hold the button on the RF Buster. Position the RF Buster less than six inches away from the left side of the CPR. The RF Buster makes audible beeps and the LED flashes to confirm transmission of the RF packets from the endpoint.

> **Do not use a cell phone or any other RF device while conducting this test.**

3   If the RF Buster detects packets within one minute, the installation is good. If the RF Buster does not beep, refer to *"Troubleshooting"* on page 7-9.

4   Attach the cover using the four screws included in the hardware kit.

5   Clean the area and remove all disposable materials.

ENDPOINT REPLACEMENT

Please follow the instructions below to replace an endpoint:

1   Open the face of the CPR.

2   Write down the color translation.

3   Carefully cut any tie wraps.

4   Cut off Scotchloks near the crimp.

5   Unmount the CPR.

6   Disconnect the battery.

Proceed to *"Connecting the PRECO Switch to the CPR"* on page 7-5.

TROUBLESHOOTING

RF Buster Does Not Beep When Testing

1   First, verify that the battery is properly connected, red wire to red wire.

2   Does the RF Buster beep and light the LED when the switch is initially pressed? If not, the battery in the RF Buster is dead. Replace the RF Buster battery, or use another RF Buster.

3   After activating the magnetic switch on the CPR, hold the RF Buster switch on continuously. Point the LED end of the RF Buster toward the front of the CPR. Hold the RF Buster between 6" and 12" from the front of the CPR. Wait ten seconds. If the RF Buster does not beep, replace the CPR battery.

Customer Support

To reach Customer Support at Cellnet:

Email: customersupport@cellnet.com

Telephone: 1-800-791-2567.

Hours of operation - 8:00 a.m. ET to 5:00 p.m. ET

CHAPTER 8   METER EXCHANGE OR MODULE RETROFIT CONCLUSION

Prior to leaving the premise, verify that all debris from the retrofit and/or exchange process is cleaned and removed. Leave a door hanger tag with any appropriate information filled in.

RETURNING MATERIAL

At the end of the day, installers will return to the Cross Dock with all equipment and any new meters or modules that were not installed. Each installer must account for every meter they were assigned.Turn in inventory of unused, defective, or broken gas Meter Modules. You must reconcile any discrepancies in changeout data before the check-in process can be completed. Meters and modules will not be checked out to an installer who has not completed the previous day's check-in process.

Notes:

CHAPTER 9   GAS METER PREPARATION PROGRAM (GPREP)

The Gas Meter Preparation Program (GPrep) is a software tool that facilitates Cellnet processes. It also runs with water CPR modules. The data captured by GPrep is sent to RIMS to update the Cellnet and utilities databases. GPrep was developed for ResGas, C&I Gas (Diaphragm), C&I Gas (Rotary), and 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 Cellnet modules already installed (OEM Meters) or when receiving Cellnet retrofit modules directly from Cellnet'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 Cellnet 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 Cellnet and the utility.
  This can be an automatic process or you can turned it off for a particular feature when it is not necessary to save the results.

Each of these functions are steps in Cellnet processes. You should fully understand how data flows within the Cellnet 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 Cellnet 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 any other 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 Cellnet'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.
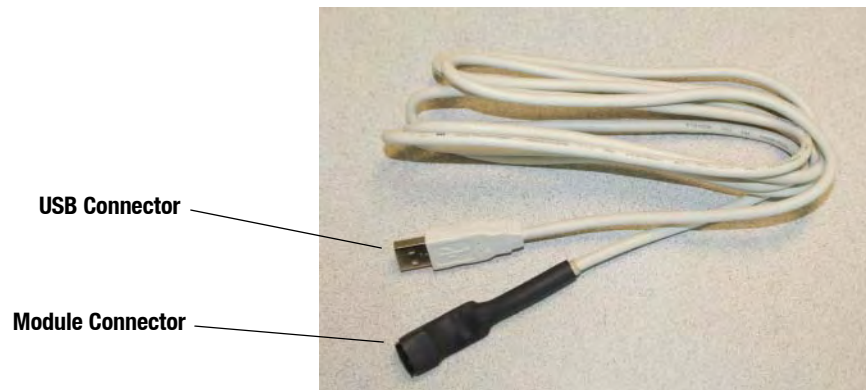
3   Plug the USB into the laptop or PC.

Figure 9.1 1-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).

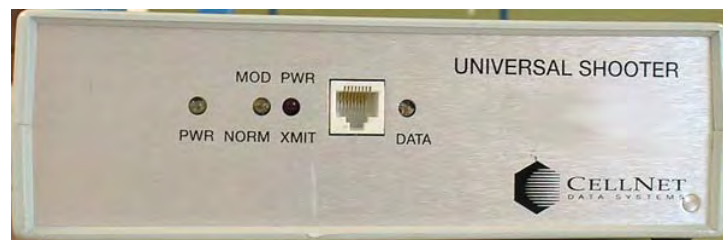4   Plug the shooter cable into the shooter box and the module.

Figure 9.2 Shooter box

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 and old module reprogramming, MRB and index read) will be recorded.
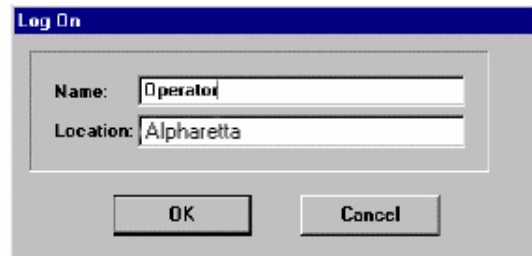

Figure 9.3 Log On screen

Accessing the Main Menu

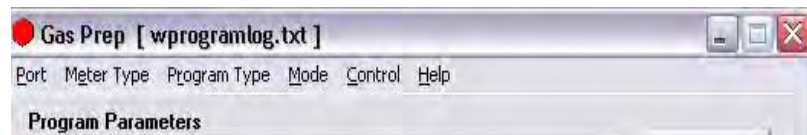The main menu screen displays after you log on.

Figure 9.4 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 drop down list. The options consist of 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 utilize 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 ResGas is chosen as the Meter Type.

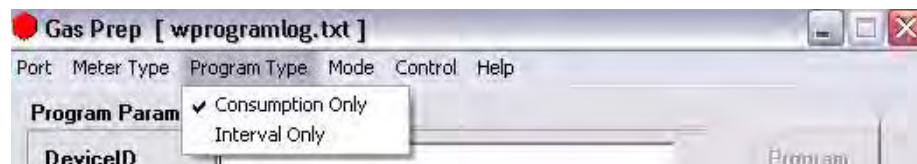**Figure 9.5 Choose ResGas as the meter type**

Figure 9.6 Indicate the Program Type

Figure 9.7 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 Cellnet modules already installed (OEM Meters) or when receiving Cellnet modules from Cellnet's manufacturer. Different utilities use different sampling procedures. Cellnet 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 ResGas 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 9.8 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 9.9 "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 9.10 "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 9.11 "Program New" Screen

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

Figure 9.12 "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 9.13 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.
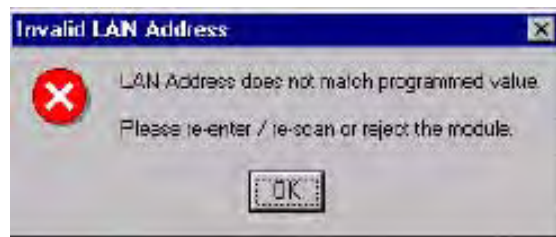

Figure 9.14 Error Message Displayed if The Scanned Power LAN Does Not Match Programmed

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 Cellnet 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 9.15 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..
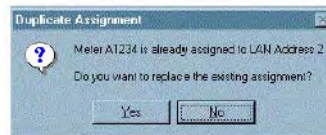

Figure 9.16 Error Message Indicating that a Meter ID Already Exists in the Programlog

• 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:
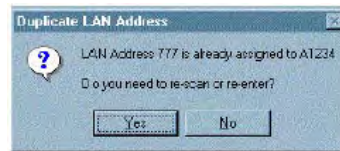

Figure 9.17 Duplicate Power LAN Address

- 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.

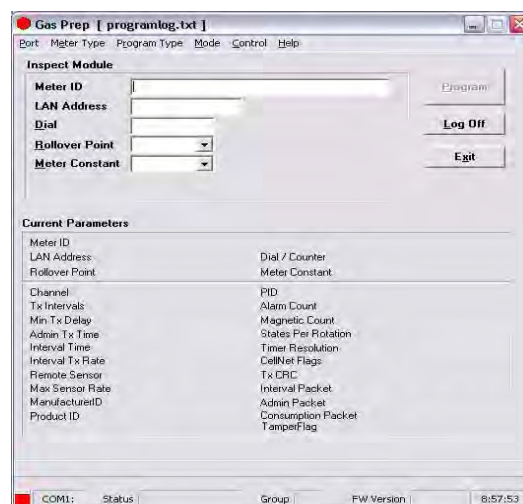1　Select **Re-Program Old** from the mode drop down window in the main menu. The following screen displays.

Figure 9.18 "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

ℹ️ **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 9.19 Re-Program Old With Module Plugged In

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

ℹ️ **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.**

ℹ️ **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 Cellnet 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 9.20 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 9.21 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 9.22 MRB Screen with Module Plugged In

> ℹ️ **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.**

> ℹ️ **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.

> ℹ️ **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**
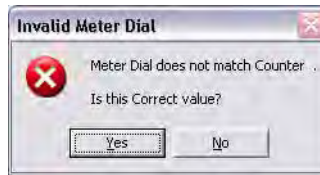
Figure 9.23 Error Message Displayed when Entered Value Does Not Match Programmed Value

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.

MOST COMMONLY ASKED QUESTIONS

1   What does GPrep stand for?
Gas TOMM Preparation

2   What is GPrep used for?
GPrep is a tool that is 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, why is it important to make sure that it is right?
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 5 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. The most common are sampling of Cellnet-ready OEM meters, and sampling modules from a Cellnet manufacturer, which are done using the "inspect" mode.

8   Who is responsible for transferring the data files, how often, 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. He/she should do this daily (as long as there is data to transfer). Someone in the database group writes the script to automatically pick up this data daily.

9   How soon does the data get updated in each system after a module is programmed?
A CRON job runs nightly that picks up the data that is put on the Cellnet 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 PC that GPrep is being used on is not at a fixed location. The data that is captured by GPrep is time sensitive, customer account information and should be copied and transferred daily. The equipment that is 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 the AC power, module plugged in, shooter box turned on, correct DB9 to DB9 (RS232) cable (Non-Null Modem), correct COM port, ensuring that you are using the correct meter type and mode, ex. ResGas 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?
Someone made a mistake and had to re-enter a meter ID or LAN Address.

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

16   Who should I contact if there is a problem?
First you should contact a local database analyst. Then try Cellnet Customer Support at customersupport@cellnet.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 being made there are test parameters programmed in that allow the manufacturer to make the module transmit more frequently than every 15 minutes, and allows other tests to be run on them for quality reasons. GPrep (or a handheld) replaces these test parameters with field parameters.

APPENDIX A   ALIGNING THE NEW AMERICAN METER DRIVE DOG

Cellnet modified the module wiggler in May 2005.   The module wiggler now has a slightly different interface to the meter drive dog.
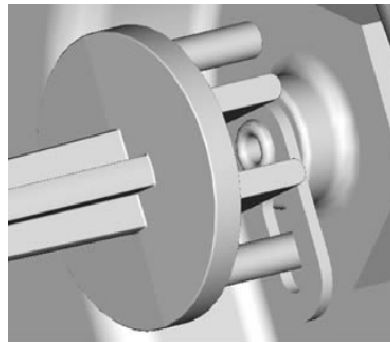

Figure A.1 Meter Drive Dog aligned with 2 ft. module wiggler

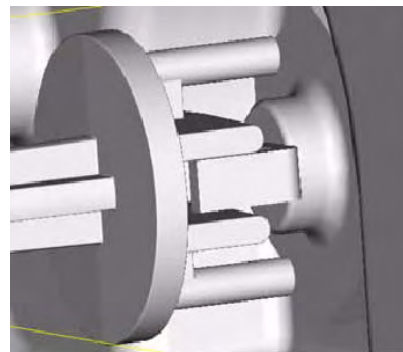Insert one of the new protruding pins through the hole of a 2-foot drive wiggler.

Figure A.2 Meter Drive Dog aligned with 1 ft. module wiggler

Insert one of the new protruding pins through the hole of a 1-foot drive wiggler.

Notes:

APPENDIX B   VISUAL INSPECTION OF INDEXES

The American Index on far right shows signs of fading from glossy black to a grey black color, in this case the Index MUST BE EXCHANGED.

Figure B.1 Fading American Index

On a Sprague meter if metal rivets are found on the index plate as shown on the far left the Index MUST BE EXCHANGED.

Figure B.2 Metal rivets on a Sprague cover

Notes:

APPENDIX C   USING THE RF BUSTER

This Appendix provides detailed instructions on the proper use of the RF Buster. It covers the proper placement of the RF Buster to ensure activation and troubleshooting for Cellnet 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 it.

RESIDENTIAL METER MODULES

American Modules

1   Press the button with the light facing you 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, separated by one second each transmission. The RF Buster LED lights red and the internal speaker sounds approximately 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 C.1 American proper placement of RF Buster

Rockwell/Equimeter/Sensus Modules

1   Press the button with the light facing you 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 gas 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 meter module, separated by one second each transmission. The RF Buster LED lights red and the internal speaker sounds approximately 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 holding the Push Button, pull the cover off of 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 C.2 Rockwell/Equimeter/Sensus RF Buster placement

Sprague/Schlumberger/Actaris Modules

1   Press the button with the light facing you on the lower end of the RF Buster.
2   Place the corner of the RF Buster containing the magnet at an angle by the location of the Reed Switch on the gas meter module (top left corner).
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 meter module, separated by one second each transmission. The RF Buster LED lights red and the internal speaker sounds approximately ½ second for each transmission detected.

Because of the proximity of the different switches on the Sprague Module board, ensure that you approach the module from the top left corner as seen in the picture below.

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

- If the module is functional, it transmits.

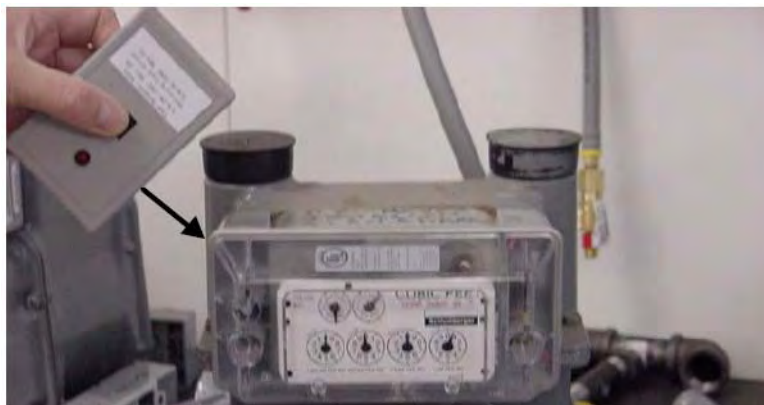- If the RF Buster does not respond, consider the module defective and follow the appropriate procedure.

Figure C.3 Sprague/Schlumberger/Actaris RF placement

COMMERCIAL GAS 3 METER MODULES

1. Press the button with the light facing you 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 RF Buster, separated by one second each transmission. The RF Buster LED lights red and the internal speaker sounds approximately ½ second for each transmission detected.

Figure C.4 Commercial Gas RF placement

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

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

Figure C.5 Commercial Gas Module uncovered

ROOTS/ROMETS ROTARY CPR MODULE

1　Press the button with the light facing you 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 CPR.

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

If there is no response, remove the cover of the CPR for proper orientation.

Figure C.6 ROOTS/Romets RG3 RF placement

APPENDIX D   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 D.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 D.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 Handheld's.

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:

APPENDIX E   DIFFICULT/NON-COMPATIBLE COMMERCIAL RETROFITS

This Appendix provides detailed instructions on installing commercial gas modules in difficult settings, as well as non-compatible module installations.
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INDEX BASE PLATES WITH INTEGRAL SEAL CAPS

1   Meters encountered with the index base plate (Figure E.1) require the base plate replaced with one that does not have integral "towers". The American Meter part number for a Base Plate with no towers for Diaphragm meters is 48828P038. Refer to www.americanmeter.com for more information.
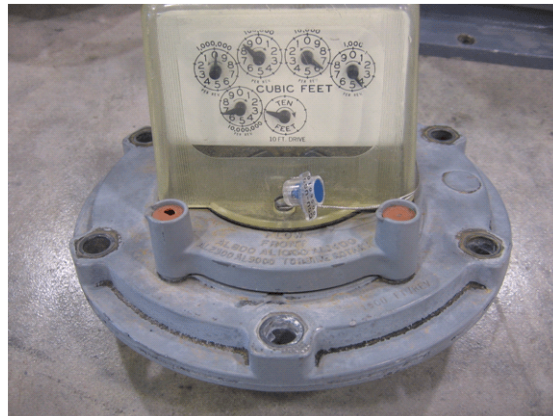

Figure E.1 Index Base Plate

Pressure Tabs

Meters with Pressure tabs on the surface near the Index must be retrofitted in such a way that access to the pressure tap is not comprised.
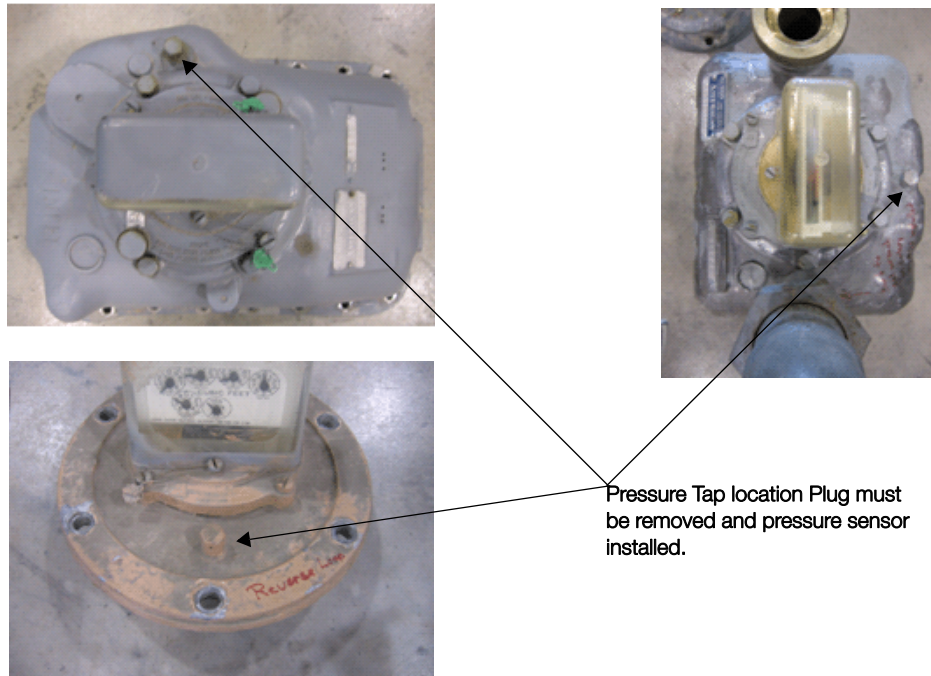

Pressure Tap location Plug must be removed and pressure sensor installed.

Figure E.2 Meters with Pressure Tabs

Figure E.2 indicates the locations of the pressure tap plugs that will be found on large meters. Figure E.3 shows a meter with an installed pressure fitting, a "Pete's Plug". The module installation must not interfere with the meter installation.
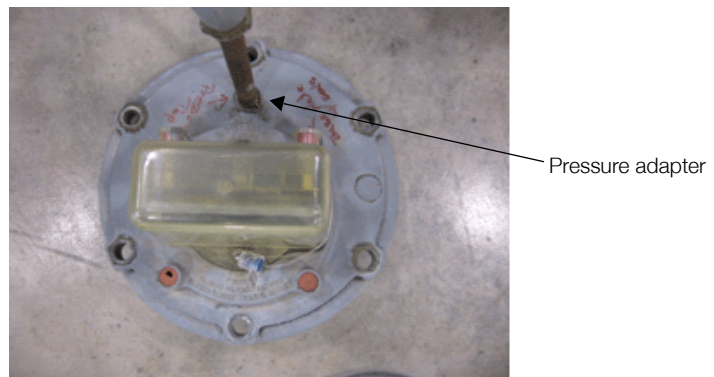

Pressure adapter

Figure E.3 Pressure Adapter

For all of these meters the transmitter portion of the module needs to be mounted so that access is still available to the pressure tap, as shown in Figure E.4.
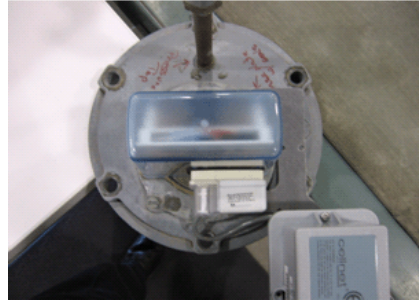

Figure E.4 Mounting Module's Transmitter

Reverse Loop Installations

Some meters will be installed with the piping reversed from the preferred orientation. In these cases the index is reversed to face the back of the meter. It is extremely important in these cases that the Base Plate be mounted such that the index drive from the meter be centered in the hole in the Base plate. See Figure E.5 for an example of the insert base plate mounted backwards.
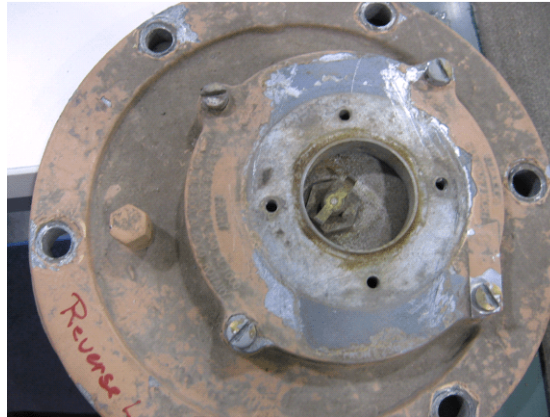

Figure E.5 Plate Mounted Backwards

If this is encountered it can be corrected by rotating the Index Base Plate 180 degrees.

Large Pipe Fittings

Figure E.6 shows a meter that does not have adequate clearance between the Pipe fitting nuts and the module transmitter. In installations such as this, the module bracket must be removed before the meter can be removed from service.

Figure E.6 Pipe Clearance

Protective Index Enclosures

Cellnet Commercial Gas Modules are not compatible with meters that use protective enclosures over the indexes (Figure E.7).

Figure E.7 Protective Index Enclosures

Notes:

APPENDIX F   CPR INFORMATION

Use this process to crimp wires for the Cellnet Pulse Recorder.

CRIMPING WIRES

1   Push the wires to be connected as far as possible into the Scotchlok connector.

Figure F.1 Wires Pushed into Scotchlok Connector

2   Place the Scotchlok connector (with wires) into the jaws of the crimping tool.
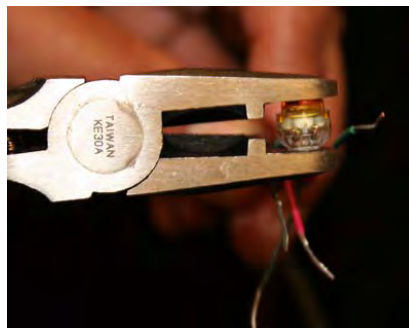

Figure F.2 ScotchLok Connector in Crimping Tool Jaws

Always use 3M Parallel Jaw Crimping Tool 3M Model E-9Y or equivalent.

3   Crimp the Scotchlok connector by squeezing the handles until it discharges gel. Continue to apply pressure for three seconds.
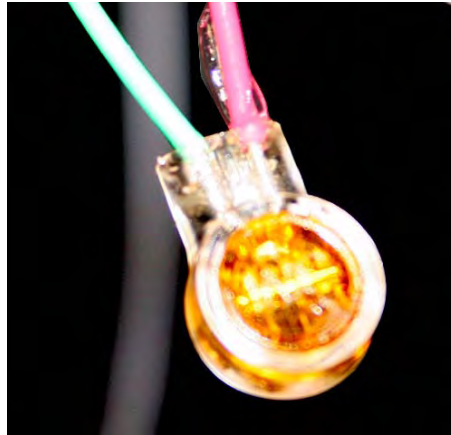

Figure F.3 Crimped Scotchloks Discharge Gel

4   Place two plastic cable ties on wires and tighten securely for strain relief. Remove excess cable tie with wire cutters.
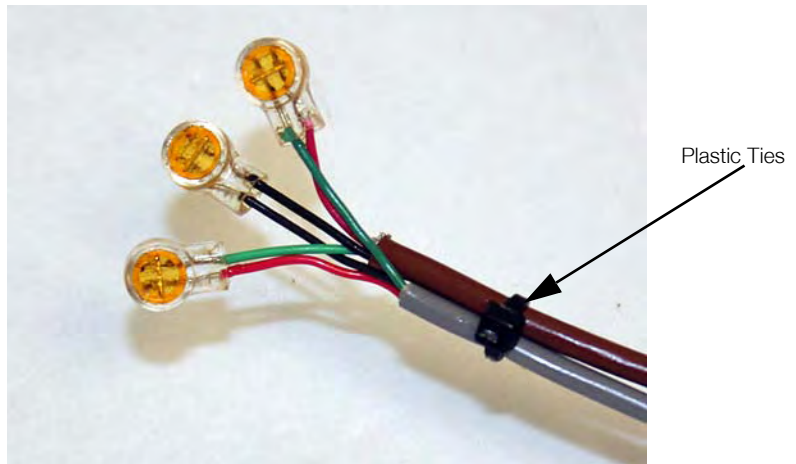
Plastic Ties

Figure F.4 Placing Plastic Ties on Cables

5   For splice connections outside the CPR enclosure, insert the entire splice assembly into the silicone-filled splice enclosure. Close the cover with leads exiting alternate sides.
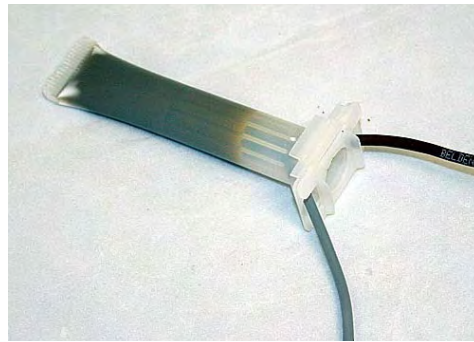

Figure F.5 Inserting Splice Assembly into Silicone-filled Splice Enclosure

The 3M Gel splice connector is NOT reusable. Replace the splice if necessary.

Cellnet strongly recommends a splice enclosure for all CPR applications.

APPENDIX G   FCC AND IC COMPLIANCE

FCC CLASS B

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.

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.

FCC ID and Industry Canada ID Compliance Labeling

Residential Gas 3 meter modules include the following internal and external labeling to comply to FCC and Industry Canada requirements:

• Cellnet Model: printed on the Printed Circuit Board internal to the unit

• FCC ID: R7PEG0R3S2 (visible on the label on the front of the unit and printed on the Printed Circuit Board internal to the unit)

• IC ID: 5294A-EG0R3S2 (visible on the label on the front of the unit and printed on the Printed Circuit Board internal to the unit)

Commercial Gas 3 meter modules include the following internal and external labeling to comply to FCC and Industry Canada requirements:

• Cellnet Model: printed on a label permanently affixed and laminated to the surface of the Printed Circuit Board internal to the unit

• FCC ID: R7PEC6R3S2 (visible on the label on the top of the unit's main plastic housing and printed on a label permanently affixed and laminated to the surface of the Printed Circuit Board internal to the unit)

• Industry Canada ID: 5294A-R7PEC6R3S2 (visible on the top of the unit's main plastic housing and printed on a label permanently affixed and laminated to the surface of the Printed Circuit Board internal to the unit)

Cellnet Pulse Recorder modules include the following internal and external labeling to comply to FCC and Industry Canada requirements:

• Cellnet Model: printed on a label permanently affixed and laminated to the surface of the Printed Circuit Board internal to the unit

• FCC ID: R7PEG6R3S2 (visible on the imprinted label on the plastic cover of the unit and printed on a label permanently affixed and laminated to the surface of the Printed Circuit Board internal to the unit)

• Industry Canada ID: 5294A-R7PEG6R3S2 visible on the imprinted label on the plastic cover of the unit and printed on a label permanently affixed and laminated to the surface of the Printed Circuit Board internal to the unit)

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

INDUSTRY CANADA

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

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

GLOSSARY

AMR	Automated meter reading. Gathering of energy use data 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
CG	Commercial gas
C&I	Commercial & Industrial. Non-residential applications of the Cellnet system.
CPR	Cellnet Pulse Recorder
DES Server	Data Exchange Server
GPrep	"Gas Prep" A software program that enables the user to program, reprogram, inspect, read, and disposition to scrap a Cellnet 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. It is 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 and concentrators that feed data up through the top layer of the network.
LP	Load Profile: method of obtaining complete usage pattern, over time, of 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.

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