Intelis Gas Meter Proving and Setup Guide

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08 July 2020

815-0154-00 REV 000

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New in this Document

Revision	Date	Description
REV 000	July 2020	Original publication date. **Note:** The content in this document used to be part of the *Intelis Gas Meter Installation Guide*, which has since been redacted and merged with the *Intelis Gas Meter Technical Reference Guide*.

1 Important Safety and Compliance Information

This section provides important information for your safety and product compliance.

USA, FCC Part 15 Spectrum Compliance

This device complies with Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference that may cause undesirable operation.

This device must be installed to provide a separation distance of at least 20 centimeters (7.9 inches) from all persons to be compliant with regulatory RF exposure.

USA, FCC Class B-Part 15

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

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

Modifications and Repairs

To ensure system performance, this device and antenna shall not be changed or modified without the express approval of Itron. Per FCC rules, unapproved modifications or operation beyond or in conflict with these instructions for use could void the user's authority to operate the equipment.

Canada, ISED Spectrum Compliance

Compliance Statement Canada	Déclaration de Conformité
This device complies with Innovation, Science and Economic Development Canada (ISED) license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, (2) this device must accept any interference, including interference that may cause undesired operation of the device.	Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.
Under Innovation, Science and Economic Development Canada (ISED) regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.	Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

RF Exposure (FCC/ISED)

This equipment complies with radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.	Cet équipement est conforme aux limites d'exposition aux radiations dans un environnement non contrôlé. Cet équipement do it être installé et utilisé à distance minimum de 20 cm entre le radiateur et votre corps. Cet émetteur ne doit pas être co-localisées ou opérant en conjonction avec tout autre antenne ou transmetteur.

Australia, ACMA Spectrum Compliance

When this device is sold and shipped to Australia, it is configured and labeled accordingly to be compliant with ACMA Standards for the Radio, EMC and RF Exposure. This includes standard AS/NZS 4268 RF spectrum standard for frequency and power out.

Electromagnetic Compatibility

Warning! Use only approved accessories with this equipment. All cables must be high quality, shielded, and correctly terminated. Unapproved modifications or operation beyond or in conflict with these use instructions may void the authority's authorization to operate the equipment.

Intrinsic Safety

Warning! Substitution of components may impair intrinsic safety.

Lithium Battery

Warning! Follow these procedures to avoid injury to yourself or others.

- The lithium battery may cause a fire or chemical burn if it is not disposed of properly.
- Do not recharge, disassemble, heat above 212°Fahrenheit (100°C Celsius), crush, expose to water, or incinerate the lithium battery. Fire, explosion, and severe burn hazard.
- The battery used in this device may present a risk of fire or chemical burn if mistreated.
- Keep the lithium battery away from children.

Transportation Classification

The Federal Aviation Administration prohibits operating transmitters and receivers on all commercial aircraft. When powered and not in Factory ship mode, the Itron device is considered an operating transmitter and receiver and cannot be shipped by air. All product returns must be shipped by ground transportation.

Electrostatic Discharge

Warning! Internal circuit components can be sensitive to electrostatic discharge. Before installation, discharge electrostatic buildup by touching a metal pipe or other earth-grounded metal object prior to touching the meter body, register housing, or Itron device.

Electrostatic Ignition Hazard

Warning! Verify the area is not hazardous when installing, servicing, cleaning, or touching the Itron device.

Device Cleaning

Warning! Clean only with a damp cloth.

Do Not Drop

Warning! While Itron meters are designed to withstand a drop, dropping the meter may damage the device, impact the meter accuracy, and void the warranty.

Product Standards

These instructions are not intended to replace any utility or company-established meter installation procedures. These instructions are provided for additional information. The meter installation must comply with all country, state, and local building and safety regulations as well as federal regulations including Section 192.353 of Title 49 of the Code of Federal Regulations. Two pertinent paragraphs of the code are:

- Each meter and service regulator, whether inside or outside of a building must be in a readily accessible location and be protected from corrosion and other damage.
- Each meter installed within a building must be located in a ventilated place and not less than 3 feet from any source of ignition or any source of heat which might damage the meter.

The Intelis Gas Meter is rated for the following operating and storage temperature ranges. Use of the meter outside of the listed temperature ranges is not recommended.

- Operating ranges:
  - **Measurement**: -30° F (-34° C) to +131° F (55° C)
  - **Valve**: -13° F (-25° C) to +131° F (55° C)
  - **RF**: -40° F (-40° C) to +158° F (70° C)
- Storage range:
  - -40° F (-40° C) to +158° F (70° C)
- Direct inquiries as to the selection and application of gas meters to your local Itron sales representative or Itron Support.
- Itron does not endorse or warrant the completeness or accuracy of any third-party meter installation procedures or practices, unless otherwise provided in writing by Itron.
  - Follow your company's standard operating procedures regarding the use of personal protection equipment (PPE).
  - Adhere to guidelines issued by your company in addition to those given in this document when installing or repairing meters.

2 Overview

The Intelis Gas Meter is a solid state ultrasonic smart meter equipped with the following features:

- High flow alarm with optional automatic valve shutoff
- High temperature alarm with an optional automatic valve shutoff
- Built in temperature conversion
- Integrated RF communications module
- Air detection
- Reverse flow detection

The internal automatic safety shutoff valve can be configured to function similarly to an excess flow valve downstream of the meter. The meter delivers distributed intelligence to gas metering by providing the ability to self-monitor and close the valve during a high flow incident.

Weighing in at 4-1/2 pounds, this 250 cubic-feet-per-hour (CFH) residential gas meter with 6 inch center-to-center hub connections mounts easily within existing meter footprints for simple meter installation and replacement of existing gas meters. An integrated communications module enables 100S Mobile Mode with mobile reading systems or OpenWay Riva Network Mode based on IPv6 standards that allow users to migrate to AMR or AMI systems.

Caution: Always follow your company's procedures for gas meter installation and operation.

Related Documents

For more information about the Intelis Gas Meter and compatible system architecture documentation, see your product's documentation. The following table lists documentation that might be relevant to the setup of your meter. All Itron product documentation can be located and accessed through **https://access.itron.com/**.

Note: Where the part number is not specifically listed below, refer to the documentation that matches your version of the indicated product.

- *Intelis Gas Meter Ordering Guide* (815-0335-00)
- *Intelis Gas Meter Technical Reference Guide* (815-0119-00)
- *Intrinsic Safety Control Drawing for Index Module Replacement of Itron Model Intelis Gas Meter* (TDC-0978-009)
- *Replacing Batteries in the Itron Intelis Gas Meter* (TDC-978-011)
- *Intelis Gas Meter* Specification Sheet (101584SP)
- *Field Deployment Manager Mobile Application Guide*
- *Field Deployment Manager Tools Application Guide*
- *Field Deployment Manager Tools Configuration Guide*
- *Itron Security Manager User Guide*
- *OpenWay Operations Center Collection Manager Device Interface Guide*

Specifications

The following table lists the Intelis Gas Meter product specifications.

Table 1 Intelis Gas Meter specifications

Specification	Specification value
Meter capacity	250 CFH at ½ w.c. / 7.1 m^3/h @0.125 kPa
Measurement principle	Ultrasonic time of flight
Accuracy	Class 1 and ±0.5% at room temperature
Meter type	Temperature compensated (TC) or non-temperature compensated (NTC)
Hub center-to-center	6 inches (152.4 mm)
Hub size options	▪ 10LT

Table 1 Intelis Gas Meter specifications (continued)

Specification	Specification value
	▪ 20LT ▪ 30LT ▪ 1A/Sprague standard ▪ 1-1/4", 1" Pittsburgh ▪ ISO G 1-1/4"
Meter MAOP	5 PSIG (35 kPa)
Valve	Actuated swing valve, maximum 0.035 CFH (1 L/H) leakage rate
LCD displayed units	CCF (100 x cubic foot) or cubic meter
LCD resolution	00000.001 CCF (0.1 CF) or 00000.001 m^3
Case	Aluminum case with ASA 49 gray powder coat finish
Weight	4.5 lbs (2.0 kg)
Gas type	▪ Natural gas Type H, E, L (per EN 437) ▪ Reference gases G20, G21, G23, G25, G26, G27
Component materials	▪ UMU (ultrasonic measuring unit): polybutylene terephthalate (PBT) and polycarbonate (PC) ▪ Valve plastics: PBT ▪ Inlet and outlet tubes: polyoxymenthylene (POM)
Intrinsically safe	For use in Class I, Division 1, Group D hazardous locations. Temp Code T1 -40°C ≤ Ta ≤ +70°C IECEx UL 18.0144X Ex ia IIA T1 Ga
Regulatory	▪ **FCC:** Part 15.247, Part 15.249 (programming) ▪ **FCC ID:** EWQINTELISG ▪ **Innovation, Science, and Economic Development Canada (ISED):** RSS-247 and RSS-210 (programming) ▪ **IC ID:** 864D-INTELISG ▪ **Measurement Canada:** Pending
Operational	All Intelis Gas Meters operate without the need for an FCC or ISED license. ▪ **Frequency:** 902-928 MHz ISM band ▪ **Program frequency:** 908-923.8 MHz
Australia	▪ ACMA AS/NZS 4268 ▪ **Frequency:** 915-928 MHz ISM band ▪ **Program frequency:** 916-926.8 MHz
Operating temperature ratings	▪ **Measurement:** -30° F (-34° C) to +131° F (55° C)

Table 1 Intelis Gas Meter specifications (continued)

Specification	Specification value
	■ **Valve:** -13° F (-25° C) to +131° F (55° C) ■ **RF:** -40° F (-40° C) to +158° F (70° C) ■ **LCD:** -40F (-40C) to 185F (85C)[1]
Storage temperature ratings	-40° F (-40° C) to +158° F (70° C)
Battery information	4 Lithium manganese dioxide (LiMnO2) 'A' cell batteries, replaceable
Battery life	20 years for meter, RF, and valve using recommended operating parameters
Badging	Standard aluminum manufacturing and optional customer badge
Test pulse weight (volume per pulse)	0.10CF, 0.25CF, 0.50CF, 1.0CF, 10dm^3, 50dm^3
Test pulse width	10 ms - 1000 ms (1 second)
Minimum compatible collection software for Mobile and Riva network	■ FCS v4.1 ■ FDM Tools v4.2 ■ ISM v3.6 (if using enhanced security) ■ Itron Mobile v1.5 ■ Mobile Collection v3.8.2
Minimum compatible collection software for Gen5 network	■ Gen3, 4, or 5 constantly powered device (CPD) hardware running UtilOS v5.0 ■ FCS v4.3.1 ■ FDM Tools v4.3 ■ ISM 4.2 ■ UtilityIQ v4.15
Standards	Designed in compliance with ANSI B109.1, ANSIB109.0 (draft), and Measurement Canada PS-G-06

[1]Electro-optical characteristic and optical performance is affected during high temperature operation (approximately 176°F/80°C to 185°F/85°C) and low temperature operation (approximately -22°F/-30°C to -40°F/-40°C). Performance recovers under normal temperature range.

Dimensions

This section lists the Intelis Gas Meter dimensions. Dimensions are listed in Imperial and Metric units.

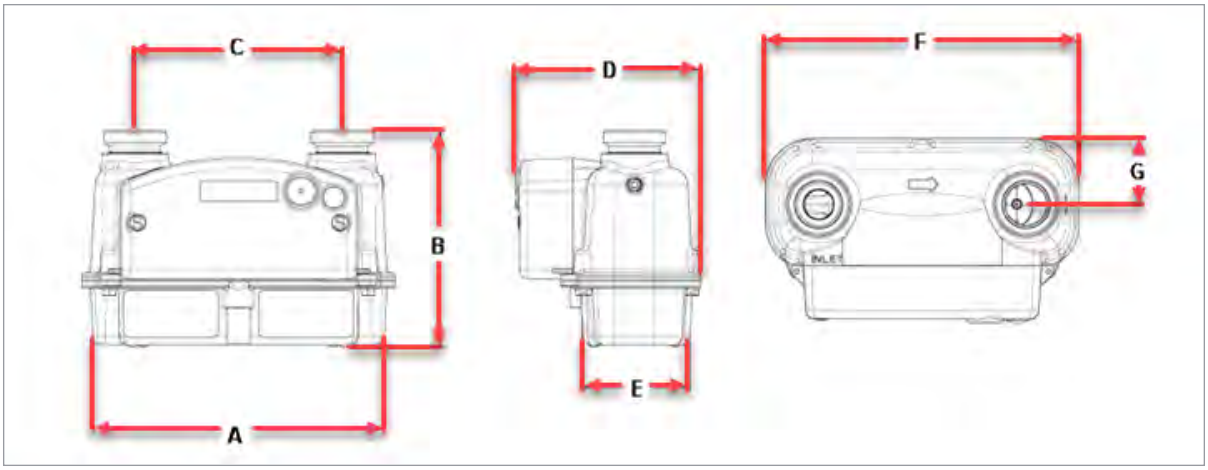


Table 2 Intelis Gas Meter dimensions

A	B	C	D	E	F	G
8.4 inches	6.4 inches	6.0 inches	5.4 inches	3.1 inches	9.1 inches	1.9 inches
214.4 mm	161.9 mm	152.4 mm	138.3 mm	78.6 mm	230.6 mm	48.8 mm

Note: B dimension can vary with different hubs options. (20LT is shown).

3 Proving

This section provides information about proving the Intelis Gas Meter. Meteorological proving allows users to test the Intelis Gas Meter accuracy. Temper meters unpackaged in the proving area for 24 hours prior to the testing.

> **Warning!** Follow your company's standard operating procedures regarding the use of personal protection equipment (PPE). Adhere to guidelines issued by your company in addition to those contained in this document when proving meters.

The Intelis Gas Meter Test Mode and a prover station are used to confirm the accuracy of the meter. Proving the Intelis Gas Meter requires attaching the pulse output prover cable between the meter and the proving station. After the test is complete, the proving cable is removed and the meter returns to normal operation.

> **Note:** The Intelis Gas ultrasonic meter is highly accurate and sensitive to air flow. The meter displays registration to 0.001 CCF. The meter sensitivity makes it possible to see the index incrementing even with the hub caps in place.

For documentation information, see **Related Documents on page 11**.

Prover Station

The prover station captures and counts pulses from a pulse output proving cable. Each pulse reflects a specific volume (pulse weight) of gas measured by the meter. Pulse width is a length of time for the pulse. Both pulse width and pulse weight are configurable parameters using FDM. The Intelis Gas Meter pulse weight must match the prover setup as described in this section's proving instructions.

Test Mode

The Intelis Gas Meter cannot be programmed (configured) or calibrated while the meter is in Test Mode. You must exit Test Mode to program or configure the meter. Attempting to program or configure parameters while the meter is in Test Mode will result in a *temporary error*. If the valve icon is blinking, the meter is unable to go into Test Mode. Wait a few minutes and try again.

> **Note:** If the valve icon is blinking, the meter is unable to go into Test Mode. Wait a few minutes and try again.

Test Mode is used in a meter shop or by a regulatory body. Some meter configuration and prover setup are required for the prover to properly interpret the meter pulses. Meter configuration is completed using FDM.

Table 3 Accessory name and part number

Proving accessory	Itron part number
Honeywell SNAP pulse output prover cable	CFG-7100-100
Measurement Systems pulse prover cable	CFG-7100-500
Energy Economics (EEI) pulse prover cable	CFG-7100-400
Can-Tronics pulse prover cable	CFG-7100-200
Itron BPG SONICAL SN G6 pulse prover cable	CFG-7100-700
Intelis Gas Meter proving stand	FIX-7100-001

You must exit Test Mode to program Test Mode parameters. Attempting to program Test Mode parameters while the meter is in Test Mode will result in a *temporary error*. The configurable parameters for Test Mode are listed in the table below.

Table 4 Test Mode configurable parameters

Parameter	Default	Range
Pulse width	150 ms.	10 ms–1000ms (1 second)
Pulse weight	0.25 cf/pulse	▪ 0.10CF ▪ 0.25CF ▪ 0.50CF ▪ 1.0CF ▪ 10dm3 ▪ 50dm3
Maximum Test Mode time	1 hour **Important:** The Intelis Gas Meter will automatically time out after 1 hour in Test Mode whether there is activity or not.	1–255 hours (whole numbers only)

Test Mode configuration can be completed at the factory at the time the meter is manufactured. Parameters are configured in one of three ways:

- Through a custom programming file.
- Through programmed default configuration.
- In the field using FDM Tools.

> **Note:** Refer to the instructions for your prover type in the following sections for the recommended Test Mode pulse width and pulse weight parameters.

Entering Test Mode

Entering Test Mode is accomplished using either the FDM mobile client or through the magnet in the prover connection end of the prover cable. After the Intelis enters Test Mode, the following steps occur.

1. The Intelis Gas Meter logs an Entering Test Mode event.
2. The Intelis Gas Meter enters Test Mode.
3. The Intelis Gas Meter Test Mode index is reset to a zero reading.
4. The Intelis Gas Meter starts an optical pulse output.

   > **Caution:** There are some parameters that could result in the Intelis Gas Meter constantly pulsing (such as a small pulse weight and a long pulse width with a high flow rate.) Adjust the pulse width, the pulse weight, or flow rate as needed.

5. The Intelis Gas Meter LCD moves to Test Display Mode.

Recording Test Mode Consumption

While the Intelis Gas Meter is in Test Mode, the following occurs:

1. The Intelis Gas Meter records the Test Mode consumption in the Test Mode index register.
2. The Intelis Gas Meter continues to output an optical pulse.

   > **Note:** While the Intelis Gas Meter is in Test Mode, the LCD refresh rate is more frequent than when the meter is operating in Normal Mode.

3. The Intelis Gas Meter continues to update the normal volume registers.

Exiting Test Mode

The Intelis Gas Meter exits Test Mode after it receives a command from the FDM mobile client, after the proving cable is removed from the meter, or when the Test Mode timeout is reached. The following operations occur when the Intelis Gas Meter exits Test Mode:

1. The Intelis Gas Meter logs an Exiting Test Mode event.
2. The Intelis Gas Meter ends the optical pulse output.
3. The Intelis Gas Meter LCD returns to normal display mode.

   > **Note:** Check the LCD display to verify the Intelis Gas Meter is no longer displaying Menu.

Prover Types

The Intelis Gas Meter compatible prover types are listed below. See the procedure for your prover type. For questions about your specific prover type, see the manufacturer's prover documentation.

- Honeywell SNAP
- Measurement Systems
- Energy Economics, Inc (EEI) Sonic Nine
- Can-Tronics (TBD)
- Itron BPG SONICAL SNG6 (TBD)

4 Proving the Intelis Gas Meter Using the Honeywell SNAP Proving System

This section provides the information to set up an Intelis Gas Meter using a Honeywell SNAP proving system.

> **Note:** Proving the Intelis Gas Meter requires Honeywell SNAP prover software .NET X.Y.

Temper meters unpackaged in the proving area for 24 hours prior to testing. If tempering is not possible,follow the instructions described in **Tempering the Meter by Exercising on page 20**. If the meters are tempered, continue to **Setting Up the Prover on page 21**.

> **Warning!** Follow your company's standard operating procedures regarding the use of personal protection equipment (PPE). Adhere to guidelines issued by your company in addition to those contained in this document when proving meters.

Adjust the proving table to accommodate the height of the Intelis Gas Meter. If necessary, use the Intelis Gas Meter prover stand (Itron part number FIX-7100-001). Place the prover stand on the prover table and set the meter on the stand. See the image below for reference.

> **Note:** To hold the meter properly in place, the meter should be placed in the fixture such that the meter flange is below the fixture's edge.

Itron recommends these Intelis Gas Meter Test Mode parameter settings when testing on the Honeywell SNAP proving system:

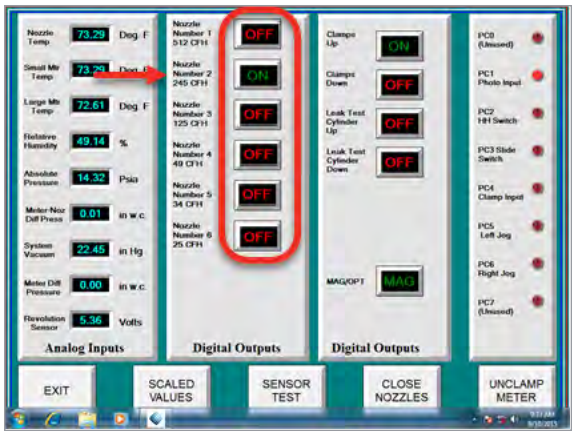
- Test Mode pulse weight: 0.25 CF
- Test Mode pulse width: 150 ms

Tempering the Meter by Exercising

1. Log on to the prover as a **Supervisor**.
2. Select **Special Functions**.
3. Select **Diagnostics** (local).

4. After the Diagnostics screen opens, clamp the meter in place by pressing **Clamp** in the lower right screen corner.
5. Press the clamp buttons on both sides of the SNAP prover.
6. After the Intelis Gas Meter is clamped to the prover, turn on the appropriate nozzles in the center of the screen to exercise the meter.

> **Note:** Typically, Nozzle Number 2-245 CFH is used to exercise the Intelis Meter.



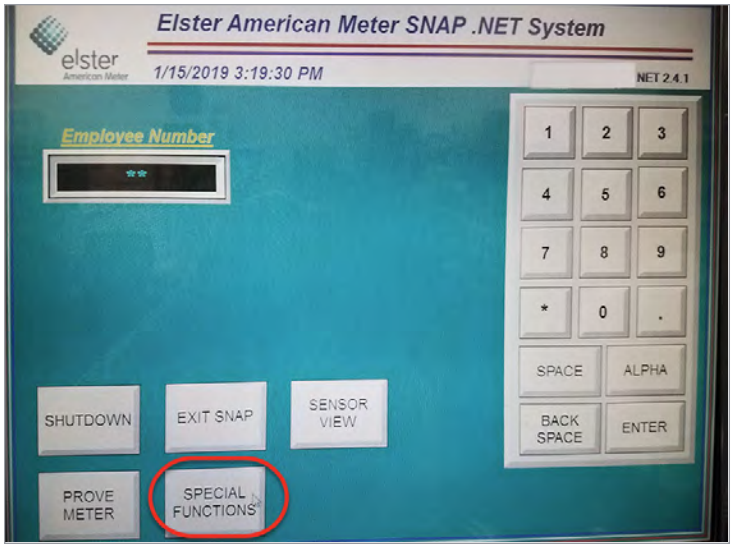
7. Exercise the meter for 10 to 15 minutes prior to proving the meter.
8. Select **Close Nozzles**.
9. Unclamp the meter.
10. Exit Special Functions.

Setting Up the Prover

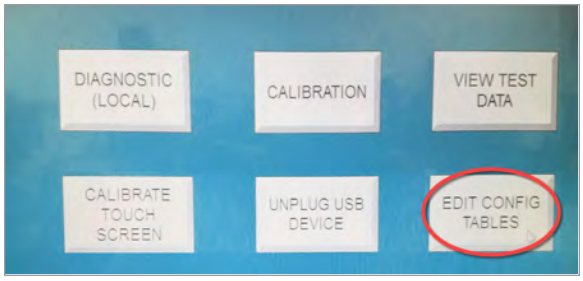
1. Log on to the prover.

> **Note:** If you are proving an Intelis Gas Meter for the first time on the prover or if you are changing proving parameters for the Intelis Gas Meter, you must log on as a Supervisor. To set up Itron Intelis Gas Meter and ITRON-RTY for the first time, follow steps 2 through 10.

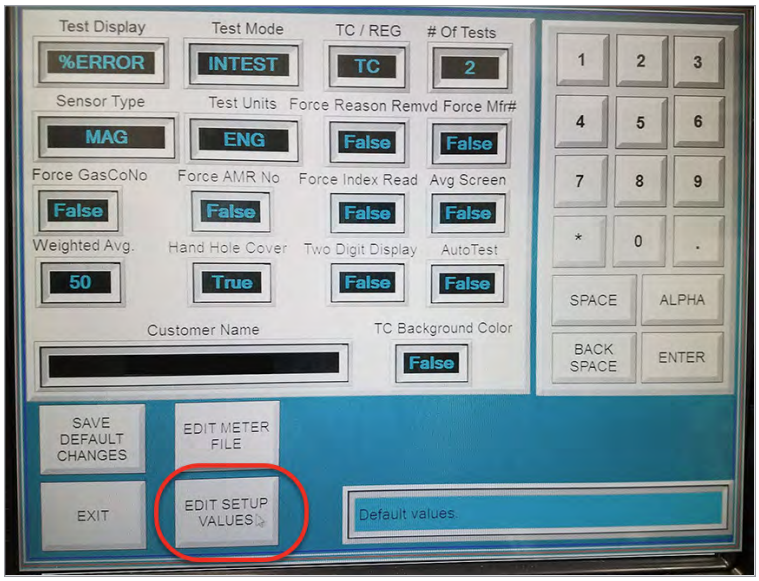
2. Select **Special Functions**.



3. Select **Edit Config Tables**.

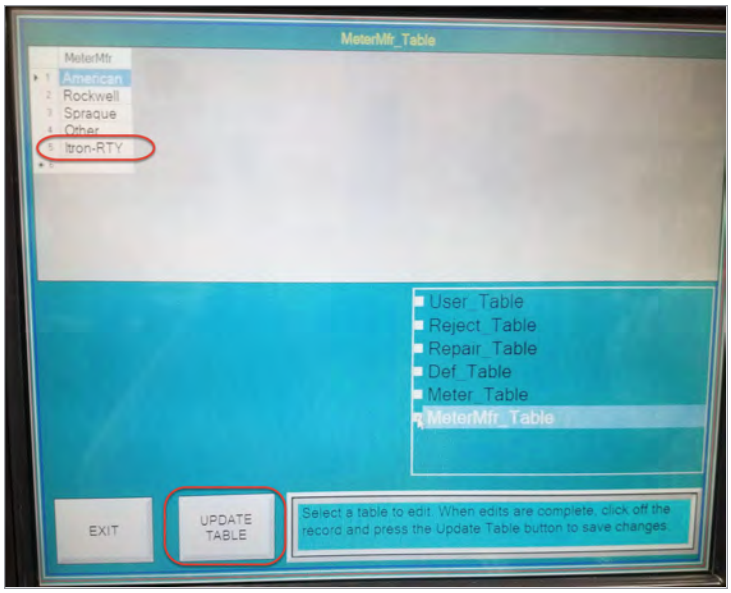


4. Select **Edit Setup Values**.



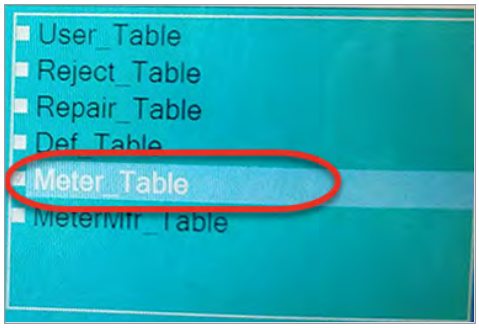
5. Select the MeterMfg_Table checkbox.

6. Click in the next available (open) row in the top left table and enter ITRON-RTY for the meter manufacturer. Click off of the table and select **Update Table**.

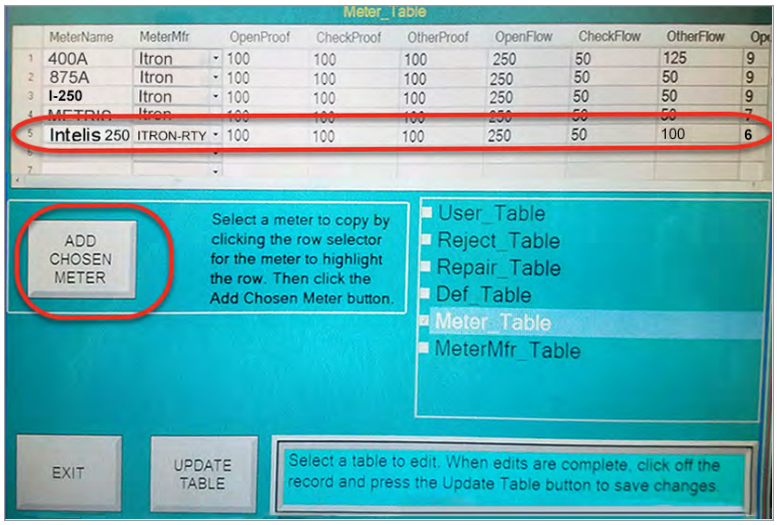


Important! If Itron, Actaris, Sprague, or other is listed, it is still necessary to add a new manufacturer name specifically for the Intelis Gas Meter. Itron suggests using ITRON-RTY following the steps listed below. The MFR Type must have the RTY suffix to allow setting and saving the revs desired for any given test and flow rate. Without the RTY suffix, the settings will not be saved.

7. Select **Meter_Table** checkbox.

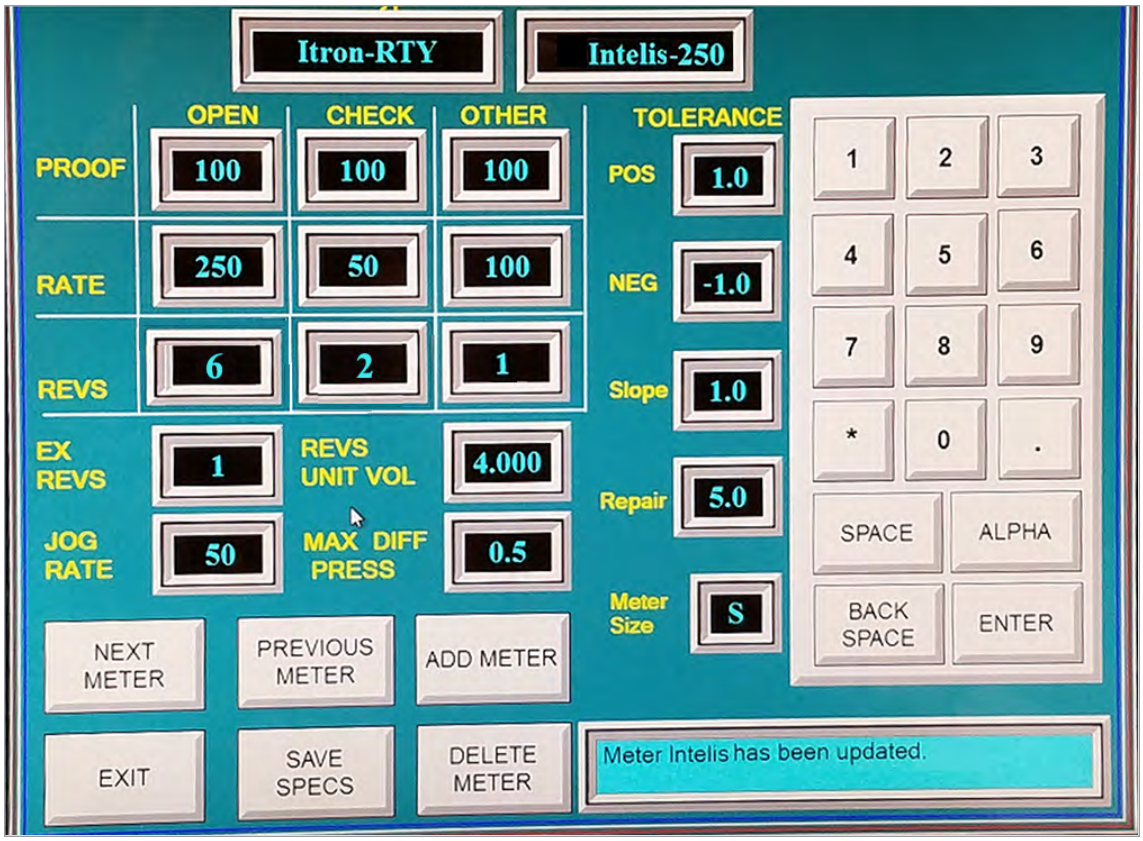


This step allows you to copy an existing meter setup and modify it to create the new Intelis Gas Meter (for example, choose I-250, Itron). Select a similar meter's row. Follow the Meter-Table instructions: Click on the next open/empty row. To complete the addition, click off of the table and select Add Chosen Meter. The following illustration shows the successful copy of the I-250 meter to create the Intelis 250 MeterName, ITRON-RTY MeterMfr.



8. Update the parameters in the table.
   - **MeterName:** Intelis 250
   - **MeterMfg:** ITRON-RTY
   - **Open proof:** 100
   - **Check proof:** 100
   - **Other proof:** 100
   - **Open flow:** 250 (or the setting required by your utility)
   - **Check flow:** 50 (or the setting required by your utility)
   - **Other flow:** 100
   - **Open revs:** 6

- **Check revs:** 2
- **Other revs:** 1
- **Exercise revs:** 1
- **Revs unit volume:** 4
- **Jog rate:** 50
- **Max press diff:** 0.5
- Miscellaneous utility-specific parameters as required (covered in Step 9)

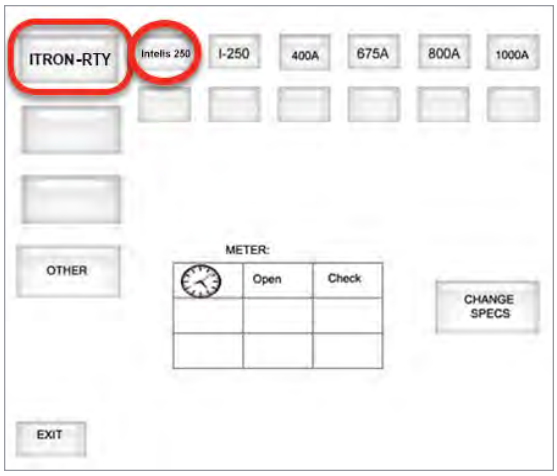


9. Verify or enter the TOLERANCE values for POS, NEG, Slope, Repair, and Meter Size. These settings (values) are utility-specific.

10. Click off the table and select **Update Table**.
11. Exit the program.

Proving the Intelis Gas Meter

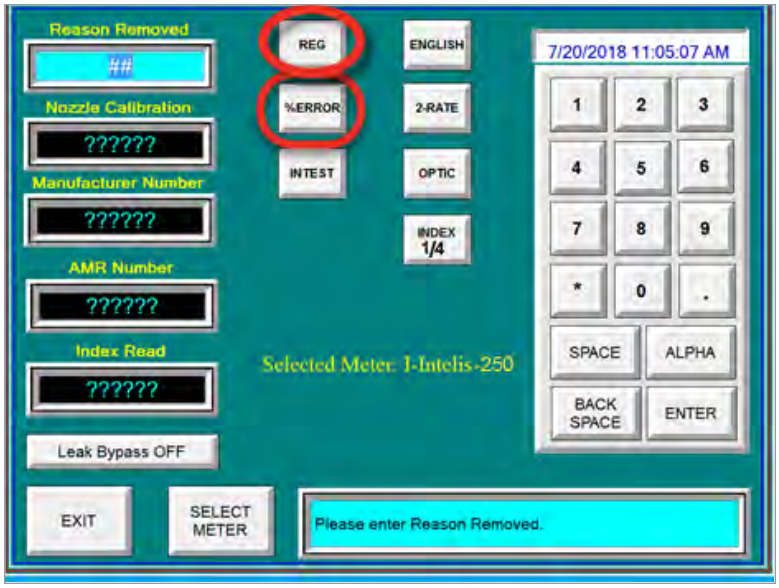
1. Select **Prove Meter**.
2. Select the meter manufacturer (ITRON-RTY).



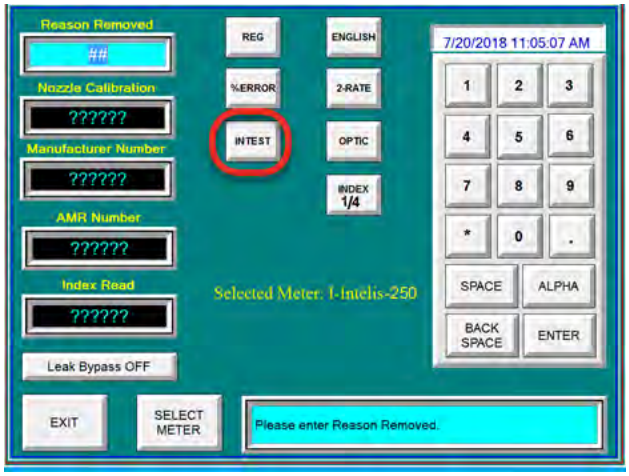
3. Select **Intelis 250**.
4. Select the correct mode for your meter (TC or NTC).

> **Note:** REG is equivalent to NTC

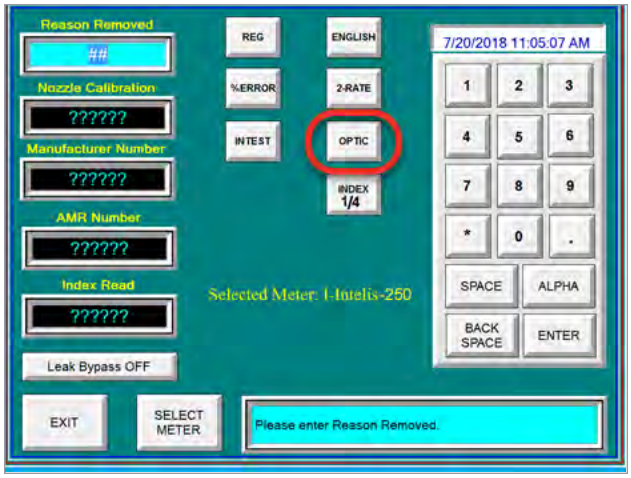
5. Select the meter results mode (% error, % accuracy, % proof).



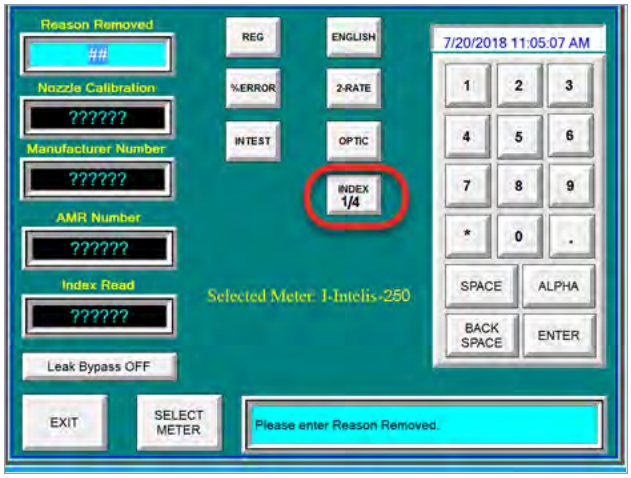
6. Select the test mode (intest, outtest).



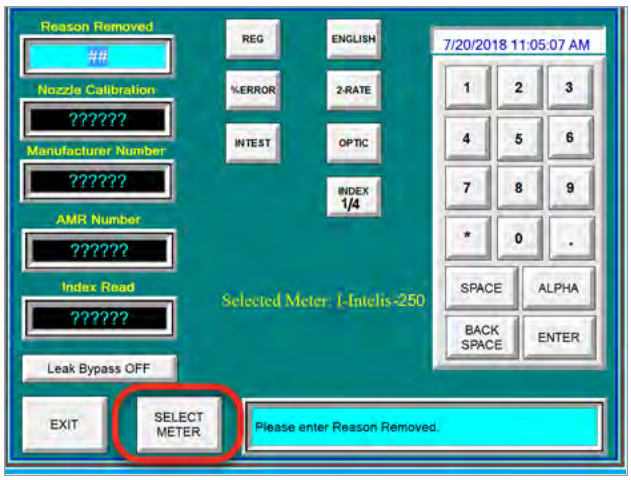
7. Select the optic test method (optic, mag).



8. Select the correct Index (volume per pulse) setting (Imperial, ¼ CF; Metric, 10 dm3).



9. Click **Select Meter** to advance to the next screen.

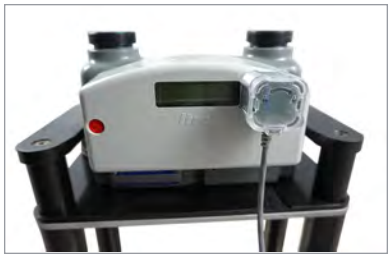


10. Connect the SNAP pulse prover cable end (Itron part number CFG-7100-100) to the J4 (1)

optical sensor port typically on the top of the SNAP prover electronic enclosure, next to the meter temperature probe port.

11. Connect the Intelis Gas Meter end of the SNAP pulse prover cable to the Intelis Gas Meter optical port by firmly pressing the aluminum round threads of the cable into the port. Begin by positioning the cable at the 4:30 o'clock position. Tighten the cable to the 6:30 o'clock position.

Caution: Do not over tighten this, as doing so could damage the index housing or the proving cable head.



Note: The Intelis Gas Meter will automatically go into Test Mode (Menu 6) when the pulse prover output cable is connected.

12. Start the proving test by clicking **RUN** on the SNAP prover.
13. Verify the LED blinks (pulses) when the air begins to flow through the meter.

5 Proving the Intelis Gas Meter Using the Measurement Systems Proving System

This section provides the information to set up an Intelis Gas Meter using a Measurement Systems proving system.

> **Note:** Proving the Intelis Gas Meter requires Measurement Systems prover software. See the Measurement Systems prover documentation for version requirements.

Temper meters unpackaged and uncapped in the proving area for 24 hours prior to testing. If tempering is not possible, follow the instructions described in **Temper the Meter by Exercising the Meter on page 33**. If the meters are tempered, continue to **Setting Up the Measurement Systems Prover on page 34**.

> **Warning!** Follow your company's standard operating procedures regarding the use of personal protection equipment (PPE). Adhere to guidelines issued by your company in addition to those contained in this document when proving meters.

Adjust the proving table to accommodate the height of the Intelis Gas Meter. If necessary, use the Intelis Gas Meter prover stand (Itron part number FIX-7100-001). Place the prover stand on the prover table and set the meter on the stand. See the image below for reference.

> **Note:** To hold the meter properly in place, the meter should be placed in the fixture such that the meter flange is below the fixture's edge.

Tip: The Measurement Systems application software on the Measurement Systems proving system provides touch screen functionality. You may prove the Intelis Gas Meter using the Measurement Systems Prover screen or a traditional mouse-click to complete the steps.

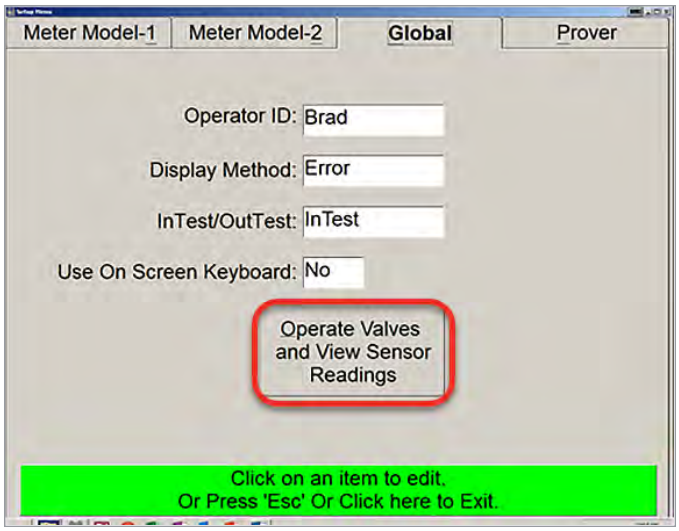
Itron recommends these Intelis Gas Meter Test Mode parameter settings for the Measurement Systems proving system:

- Test Mode pulse weight: 0.25 CF
- Test Mode pulse width: 150 ms

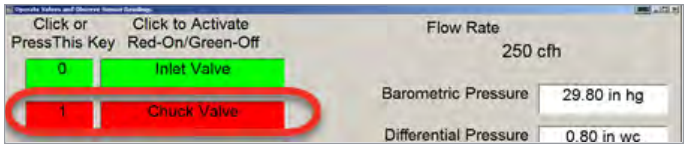
Temper the Meter by Exercising the Meter

1. Open the Measurement Systems Proving System application software.
2. Select **Meter Setup** to exercise the meter.

3. Select the **Global** tab > **Operate Valves and View Sensor Readings**.

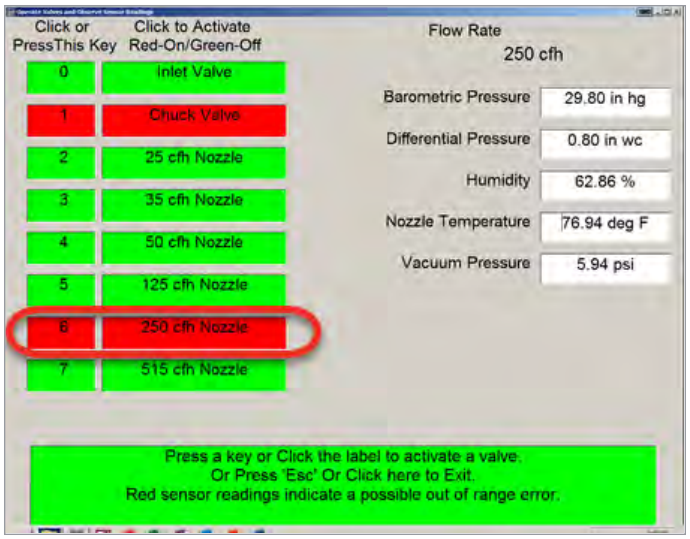


4. From the Operate Valves and Observe Sensor Readings screen, press the 1 key or Chuck Valve to clamp the meter in place.



5. After the Intelis Gas Meter is clamped to the prover, turn on the appropriate nozzle in the center of the screen to exercise the meter.

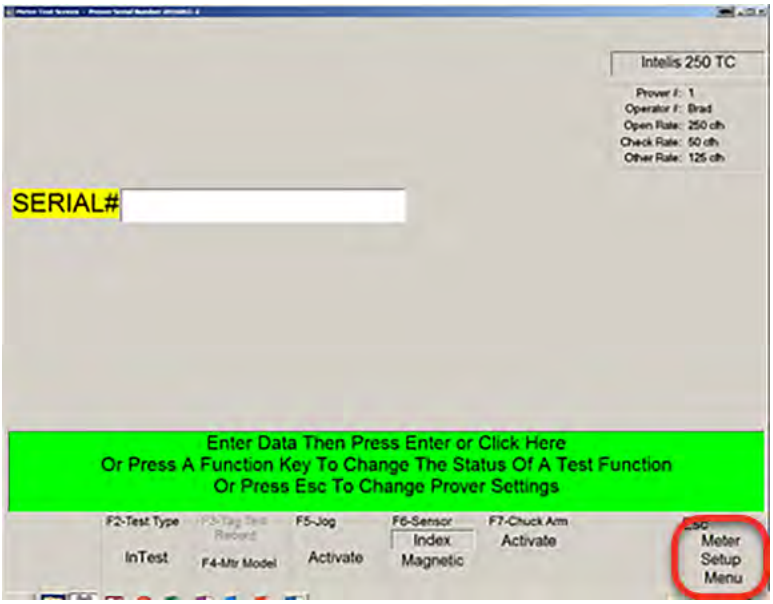
> **Note:** Nozzle 6-250 is typically used for the Intelis Gas Meter.



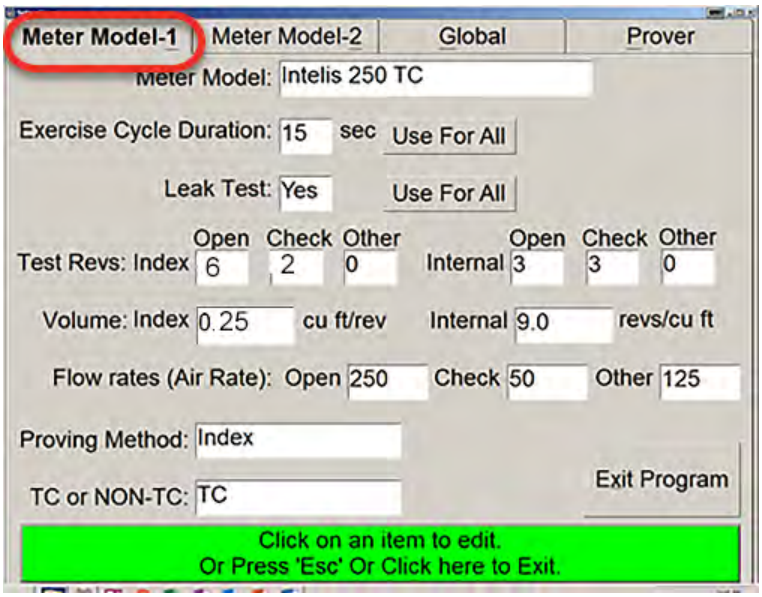
6. Exercise the meter for 10 to 15 minutes before proving the meter.
7. Close the nozzle.
8. Unclamp the meter by pressing the Chuck Valve button.
9. Exit Operate Valves and Observe Sensor Readings.

Setting Up the Measurement Systems Prover

1. Open the MMS prover application.
2. Select **Meter Setup Menu**.

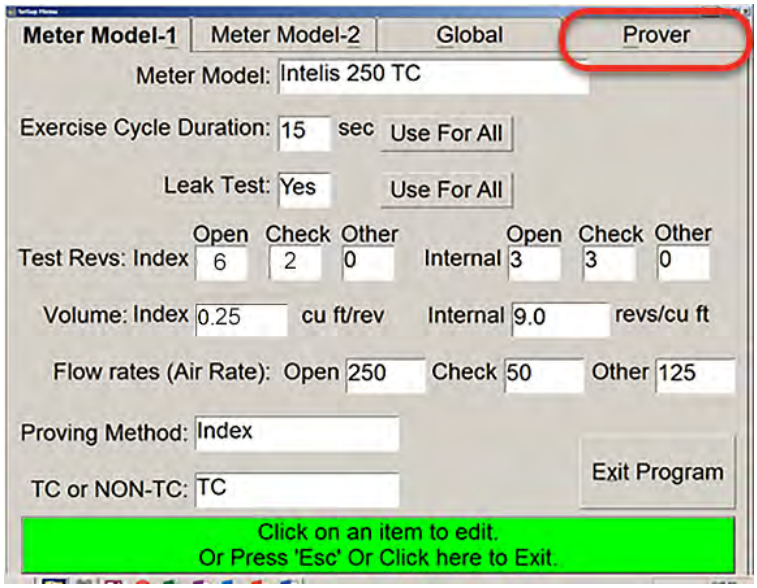


3. Select the **Meter Model-1** tab.

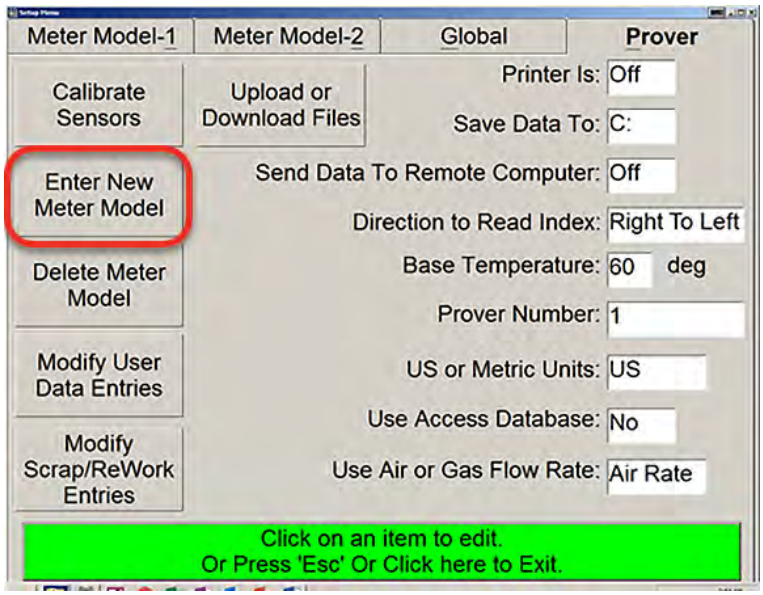


4. Select the meter model. If the Intelis 250 or Intelis 250 TC are set up in the MMS prover, go to step 10. If the Intelis 250 or Intelis 250 TC is not listed, continue to step 5.
5. Select the **Prover** tab.

> **Note:** To access the Prover tab, you will be asked for a password. Contact Measurement Systems if you do not have a password.

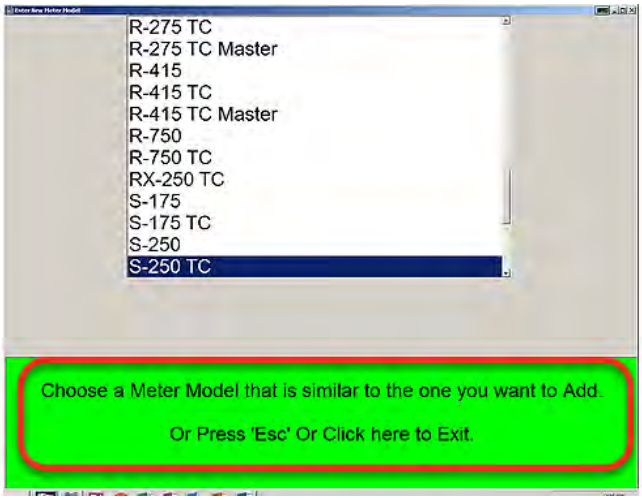


6. Select **Enter New Meter Model**.

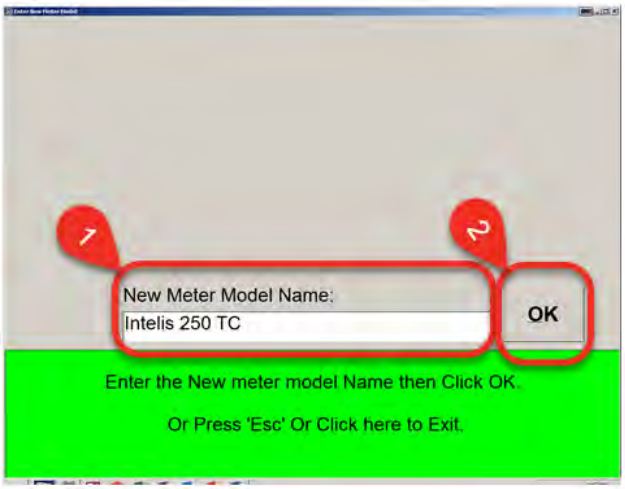


7. Select an existing meter model similar to the new meter as a template. Itron recommends using the S-250 for an Intelis 250 gas meter and an S-250 TC for the Intelis 250 TC gas meter. Select the green bar on the bottom of the screen to use the selected meter as the starting point.

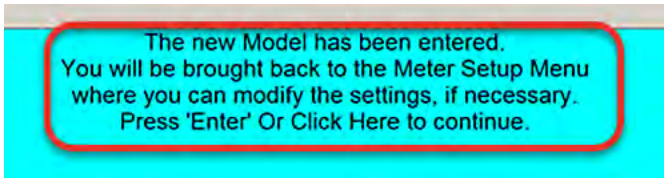
> **Note:** Measurement Systems uses the lack of TC at the end of the meter name to designate a non-TC meter, for example; an S-250 is an Itron I-250 CFH non-TC meter and an Intelis 250 would designate an Intelis 250 CFH non-TC meter.



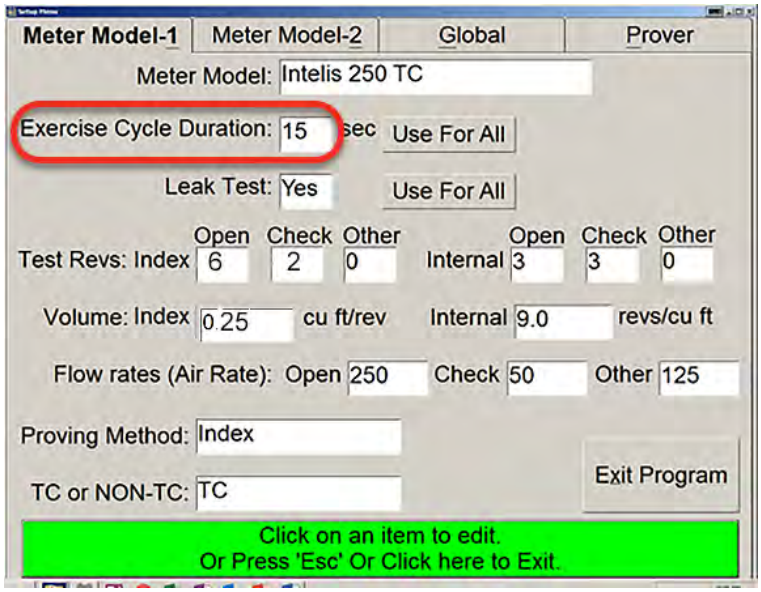
8. Enter the new meter name in the New Meter Model Name text box (1) and click OK (2).



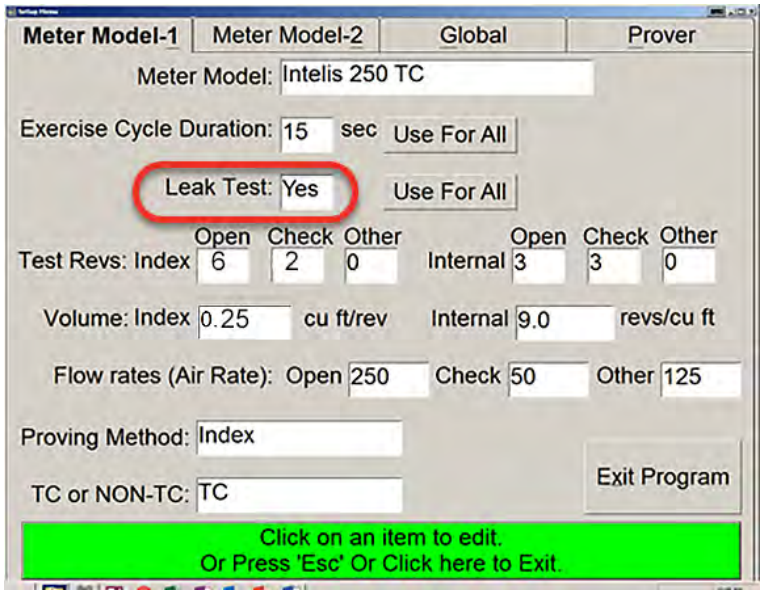
9. Press Enter or click the blue bar at the bottom of the screen to go back to the meter setup menu.



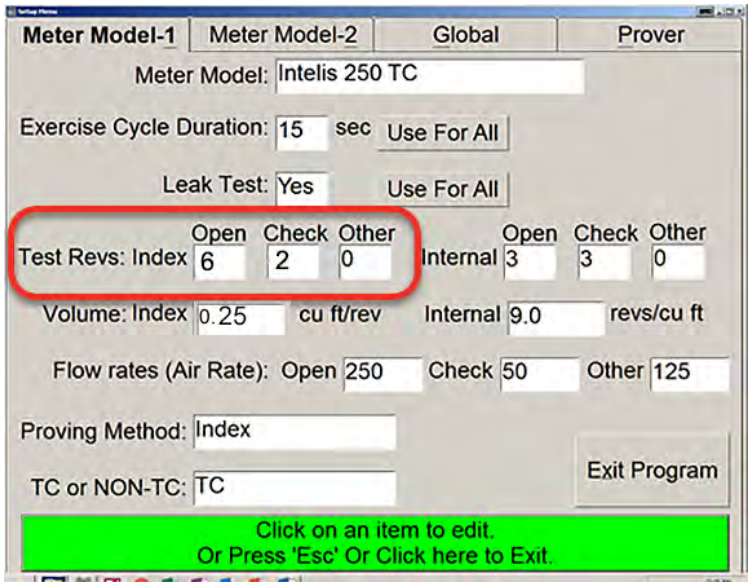
10. Select the **Exercise Cycle Duration**. The Intelis Gas Meter Exercise Cycle Duration is typically 15 seconds.



11. Set Leak Test to **Yes**.



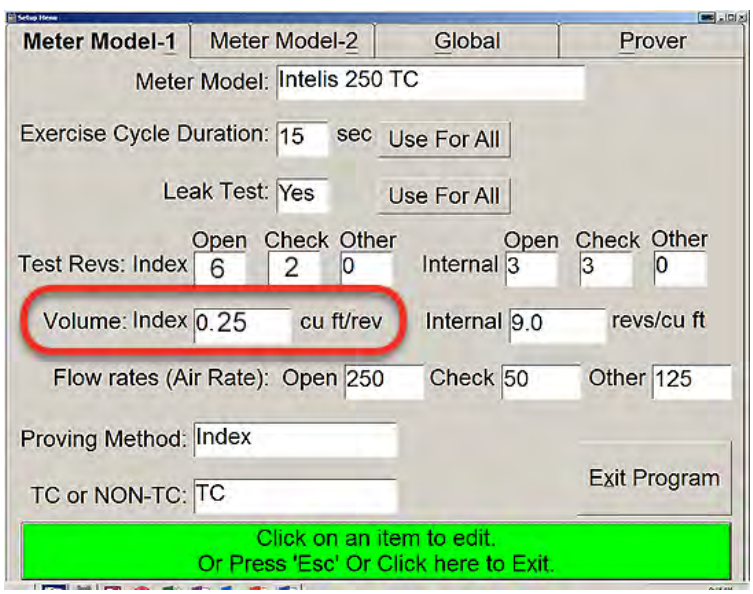
12. Verify or enter Test Revs: Index Open, Check, Other settings. Itron recommended settings are listed.
    - Open: 6
    - Check: 2
    - Other: 0



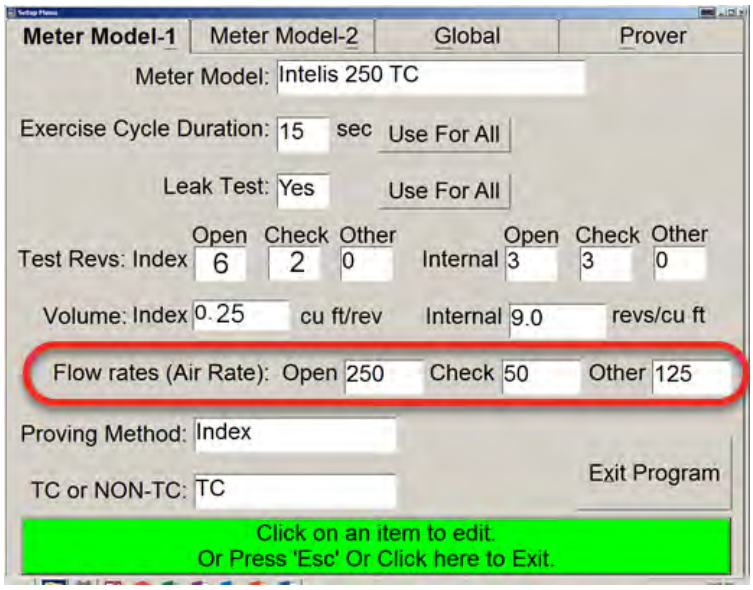
> **Note:** Testing has shown acceptable results with settings as low as 4 pulses on open and 1 on check but Itron recommends more pulses to obtain better results.

13. Select the **Volume: Index** setting. The Volume: Index setting is the recommended volume per pulse. Itron recommended settings are listed.
    - Imperial setting: 0.25 cu ft/rev
    - Metric setting: 0.01 m3/rev

> **Note:** Intelis Gas Meter volume per pulse is in dm3; 10dm3 = 0.01 m3.

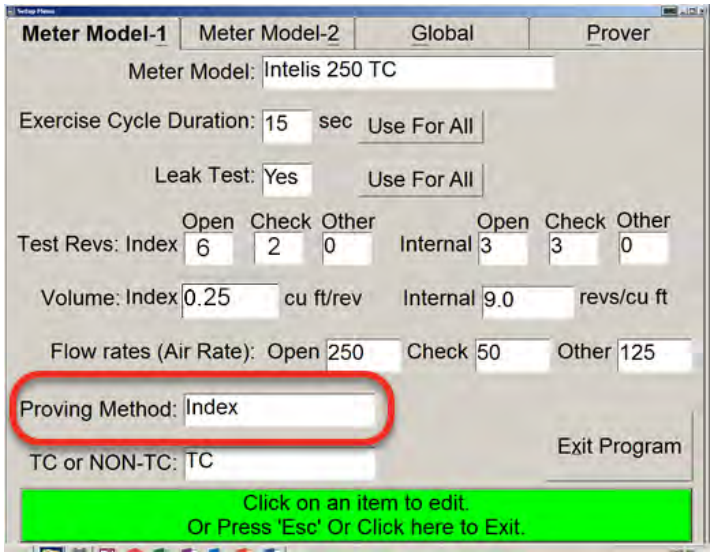


14. Verify or enter Flow rates (Air Rate): Open, Check, Other settings. Itron recommended typical settings are listed. For metric flow rates: choose from the flow rate dropdown list options. These convert the Imperial (CFH) flow rates to Metric (CMH). The *Other* flow rate is not required if the *Test Revs: Index-Other* is set to 0.
    - Open: 250
    - Check: 50
    - Other: 125

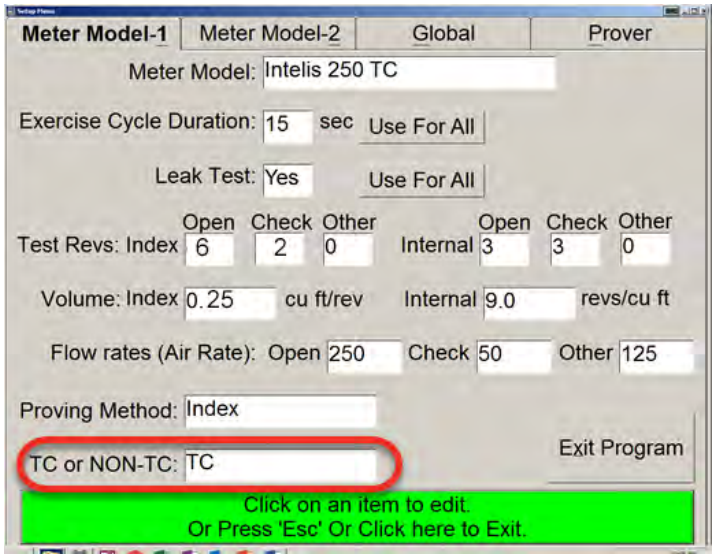


> **Important!** Required Open and Check flow rates may be different than those shown here.

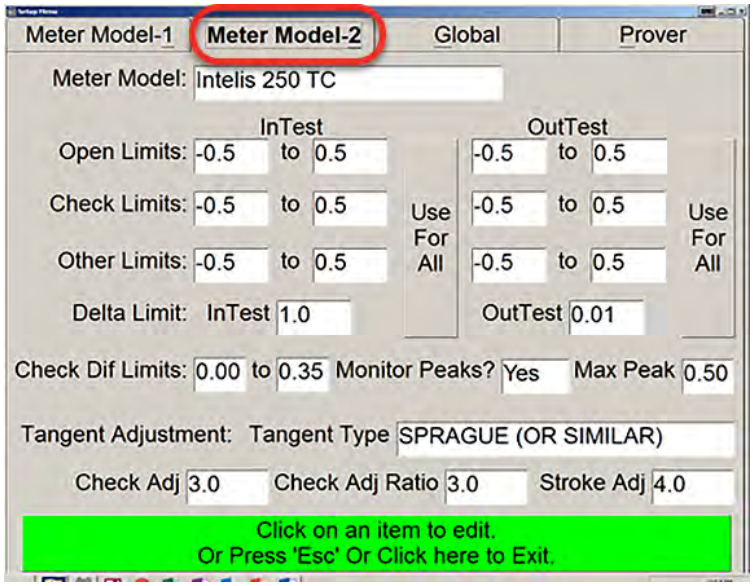
15. Select the **Proving Method**: Index. The options are Index or Magnetic.



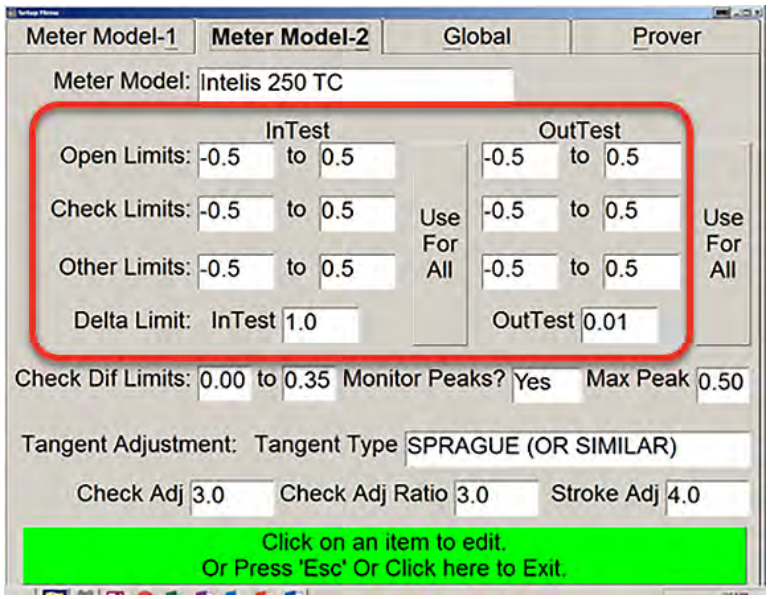
16. Select the mode for your meter. Available options are TC or NON-TC.



17. Select the Meter Model-2 tab.

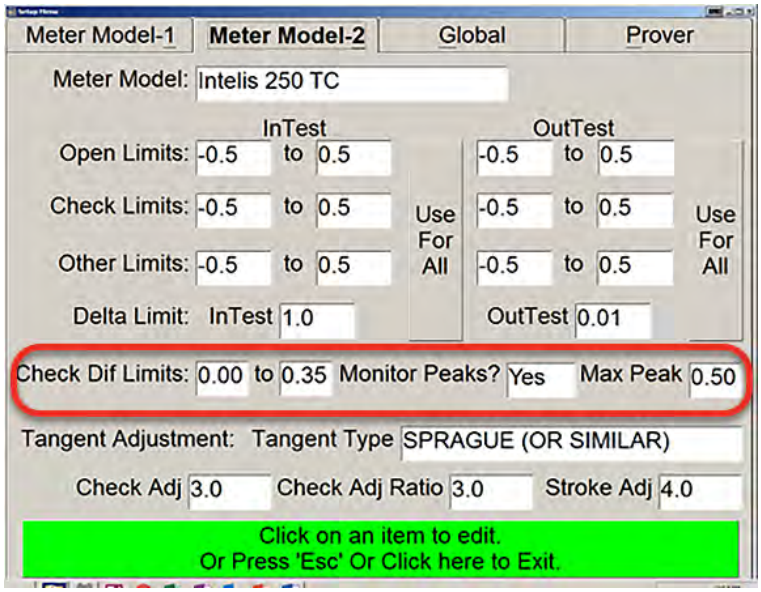


18. Verify or enter the InTest and OutTest limit values for Open Limits, Check Limits, Other Limits, and Delta Limit. The Open, Check, Other, and Delta Limit settings (values) are utility-specific.



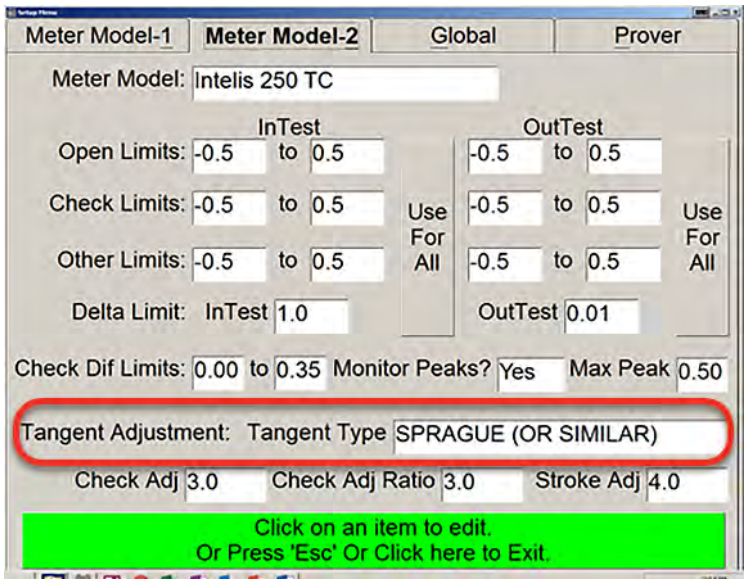
19. Verify or enter the limit values for Check Dif Limits, Monitor Peaks?, and MaxPeak.

    The Check Dif Limits, Monitor Peaks?, and MaxPeak settings (values) are utility-specific.

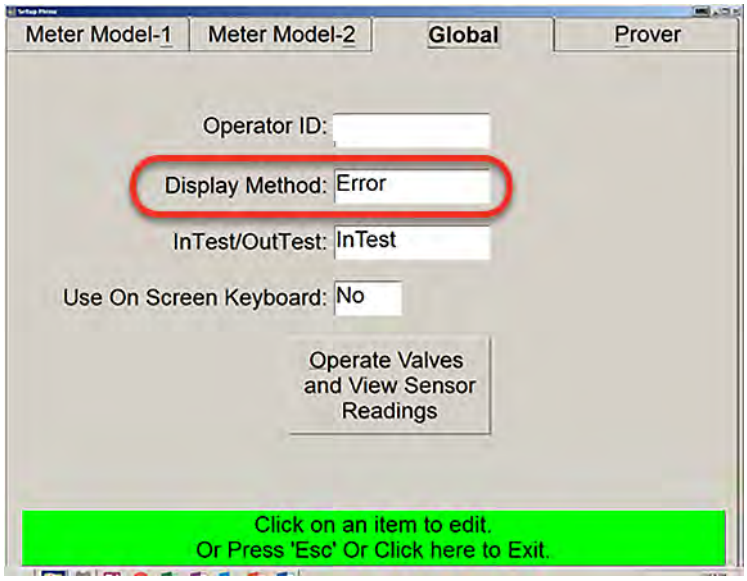


20. Verify or enter Tangent Adjustment: Tangent Type.

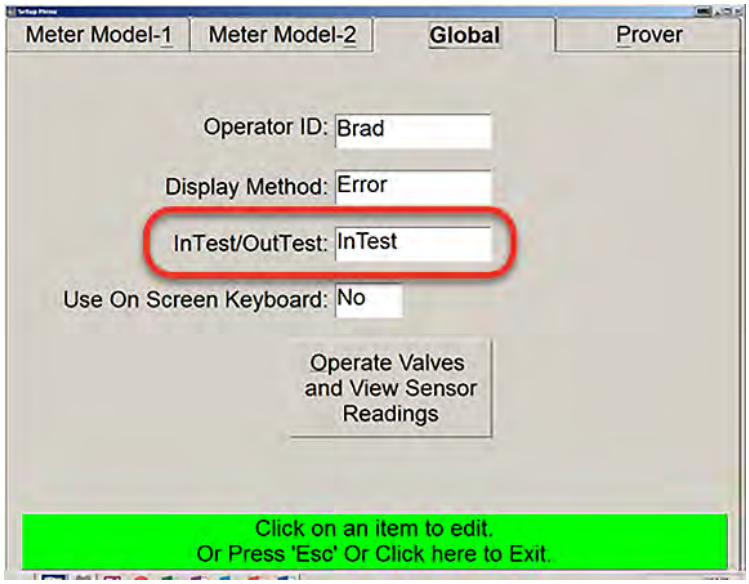
> **Note:** The Tangent Adjustment: Tangent Type setting can be any non-blank value. The Tangent Adjustment: Tangent Type value is not used to prove the Intelis Gas Meter.



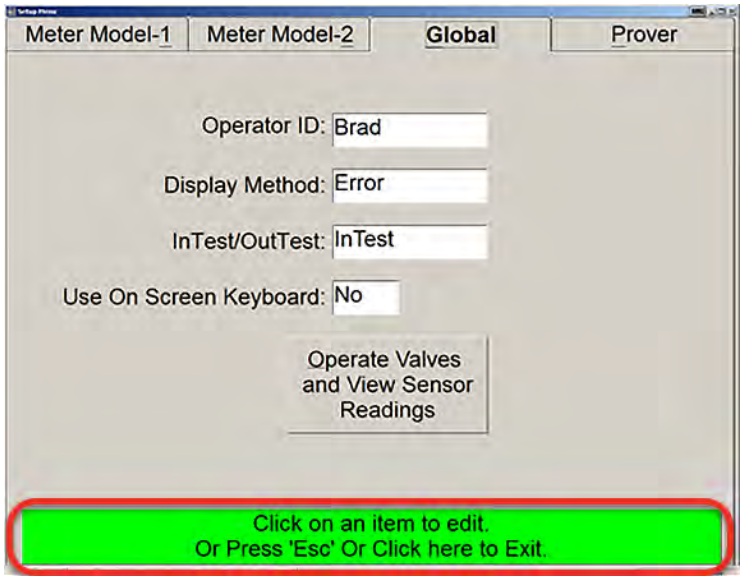
21. Select the Global tab and Display Method for your meter results. Display Method options are listed.
    - Error
    - Accuracy
    - Proof



22. Select **InTest/OutTest**. The options are InTest or OutTest.



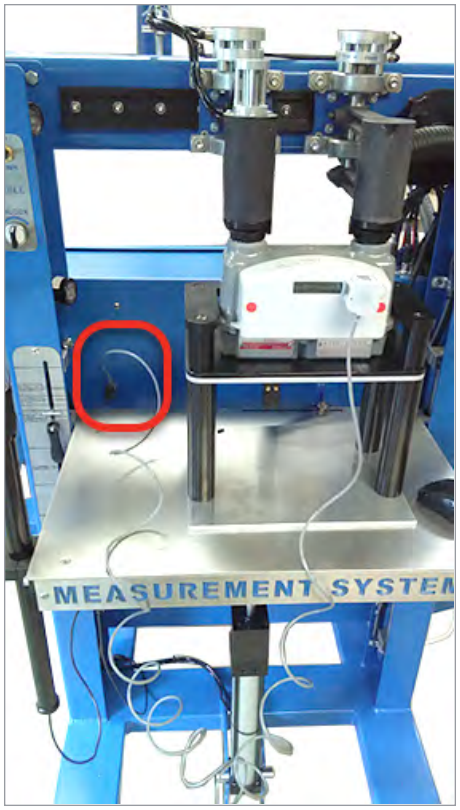
23. Press or click the green bar at the bottom of the screen to exit the Meter Setup Menu.



Proving the Intelis Gas Meter

1. Connect the Measurement Systems pulse prover cable (Itron part number CFG-7100-500) to the port on the left side of the Measurement Systems prover.

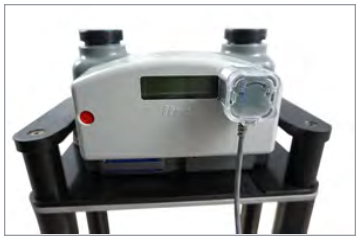
> **Note:** If your Measurement Systems prover does not look like the illustration, contact Measurement Systems for an adapter cable to connect the Measurement Systems pulse prover cable to your prover.



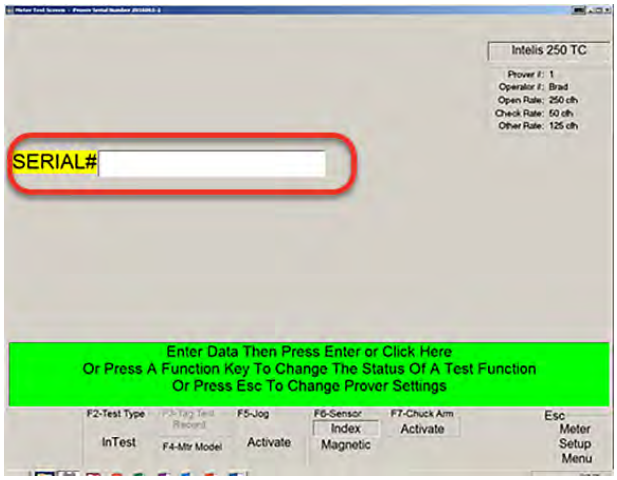
2. Connect the Intelis Gas Meter end of the Measurement Systems pulse prover cable to the Intelis Gas Meter by firmly pressing the aluminum round threads of the cable into the port. Begin by positioning the cable at the 4:30 o'clock position. Tighten the cable to the 6:30 o'clock position.

> **Caution:** Do not over tighten this, as doing so could damage the index housing or the proving cable head.

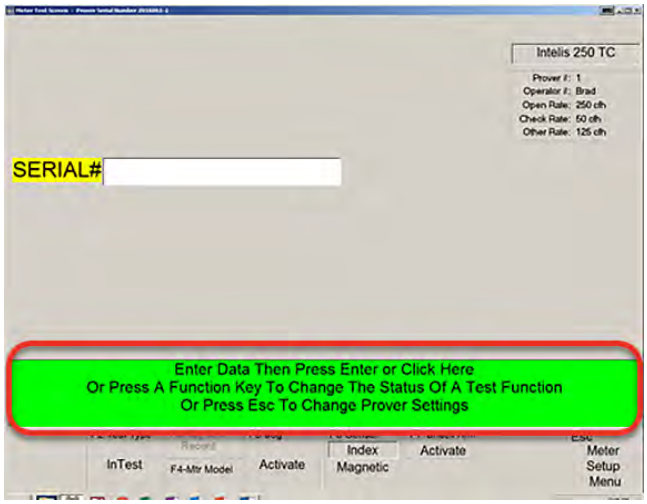
> **Note:** The Intelis Gas Meter automatically goes into Test Mode (Menu 6) after the cable is properly connected to the optical port.



3. Enter the Intelis Gas Meter serial number.



4. Press or click the green bar on the bottom of the screen to begin the Measurement Systems proving test.



5. Verify the LED blinks (pulses) when the air begins to flow through the meter.

6 Proving the Intelis Gas Meter Using the Energy Economics (EEI) Proving System

This section provides the information to set up an Intelis Gas Meter using an EEI proving system.

> **Note:** Proving the Intelis Gas Meter requires Energy Economics prover software.

Temper meters unpackaged in the proving area for 24 hours prior to testing. If tempering is not possible, follow the instructions described in **Temper the Meter by Exercising the Meter on page 50**. If the meters are tempered, continue to **Setting Up the EEI Prover on page 52**.

> **Warning!** Follow your company's standard operating procedures regarding the use of personal protection equipment (PPE). Adhere to guidelines issued by your company in addition to those contained in this document when proving meters.

Adjust the proving table to accommodate the height of the Intelis Gas Meter. If necessary, use the Intelis Gas Meter prover stand (Itron part number FIX-7100-001). Place the prover stand on the prover table and set the meter on the stand. See the image below for reference.

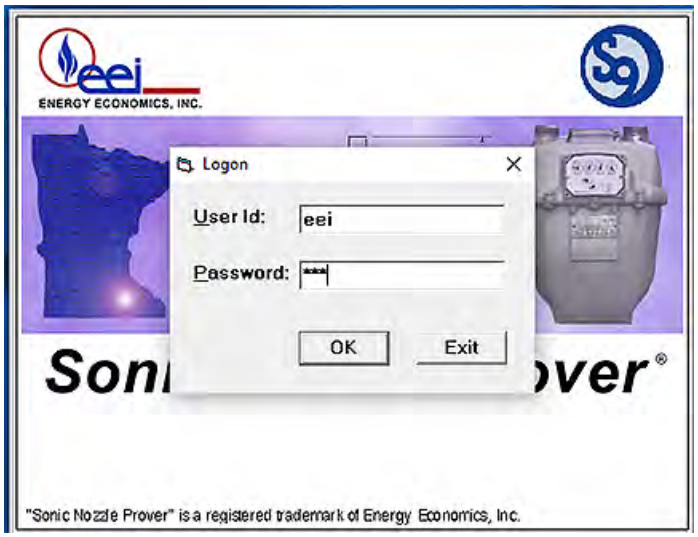
> **Note:** To hold the meter properly in place, the meter should be placed in the fixture such that the meter flange is below the fixture's edge.

Itron recommends these Intelis Gas Meter Test Mode parameter settings when testing onthe EEI proving system:

- Test Mode pulse weight: 0.10 CF
- Test Mode pulse width: 150 ms

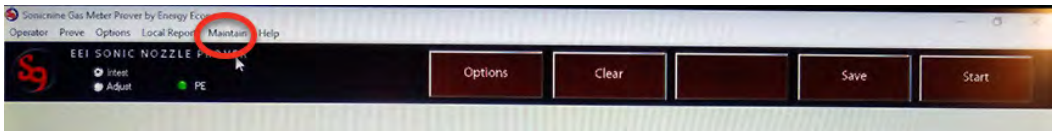
Temper the Meter by Exercising the Meter

1. Log on to the EEI prover application.



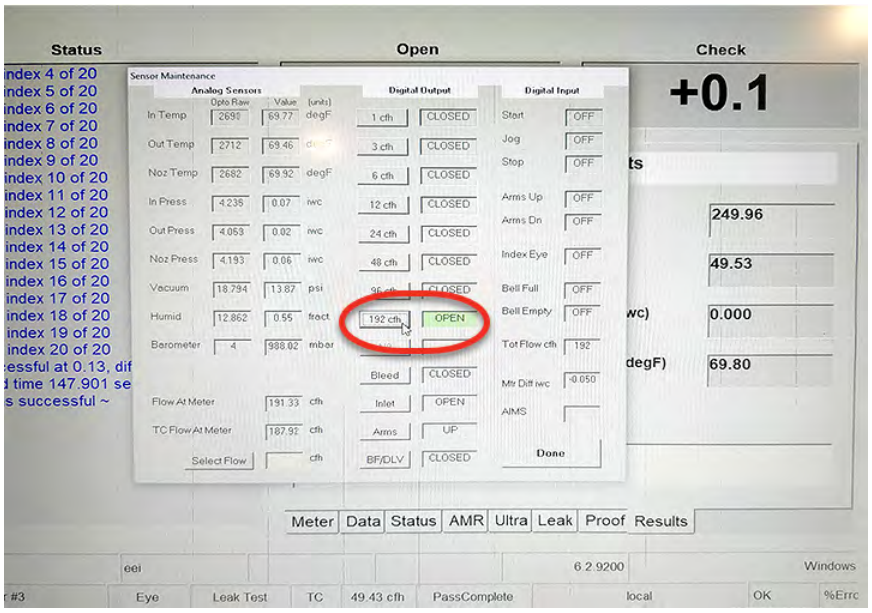
> **Note:** Logging on to the EEI prover application requires maintenance level security.

2. Select **Maintain** > **Sensor Maintenance**.

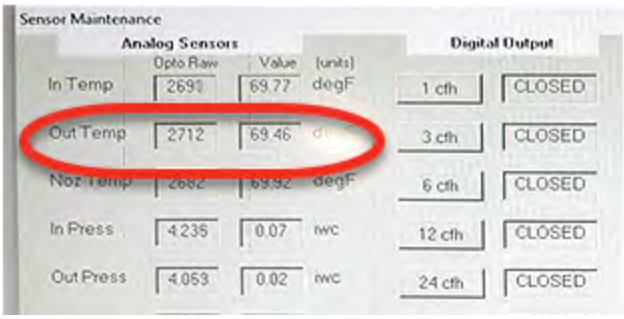


3. Clamp the Intelis Gas Meter to the prover and turn on appropriate nozzles in the center column of the Sensor Maintenance window to exercise the meter.

Note: Nozzle 192 CFH is typically used to exercise the Intelis Gas Meter.



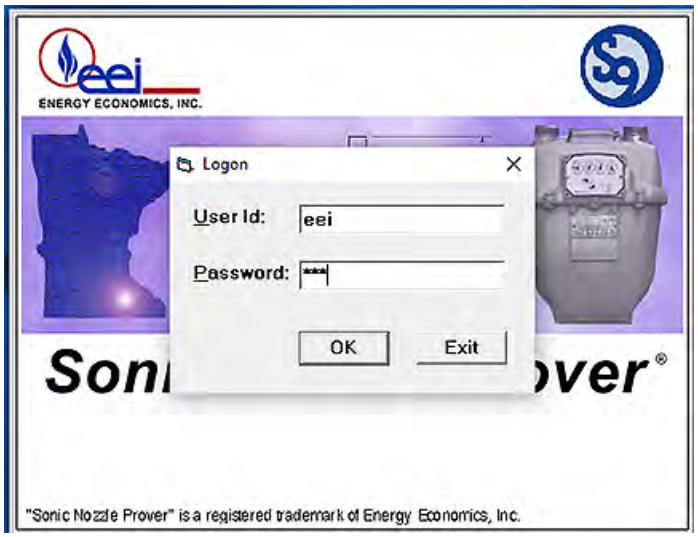
4. Exercise the meter for 10 to 60 minutes until the Out Temp value does not vary by more than 0.2° F within a minute.



5. Close the nozzle.
6. Unclamp the meter.
7. Exit the Sensor Maintenance window by clicking Done in the lower right corner of the window.

Setting Up the EEI Prover

1. Log on to the EEI prover application.



2. Clamp the Intelis Gas Meter to the EEI prover.
3. Select the **Meter** tab and choose **ITRON** from the **Manuf** drop-down list.

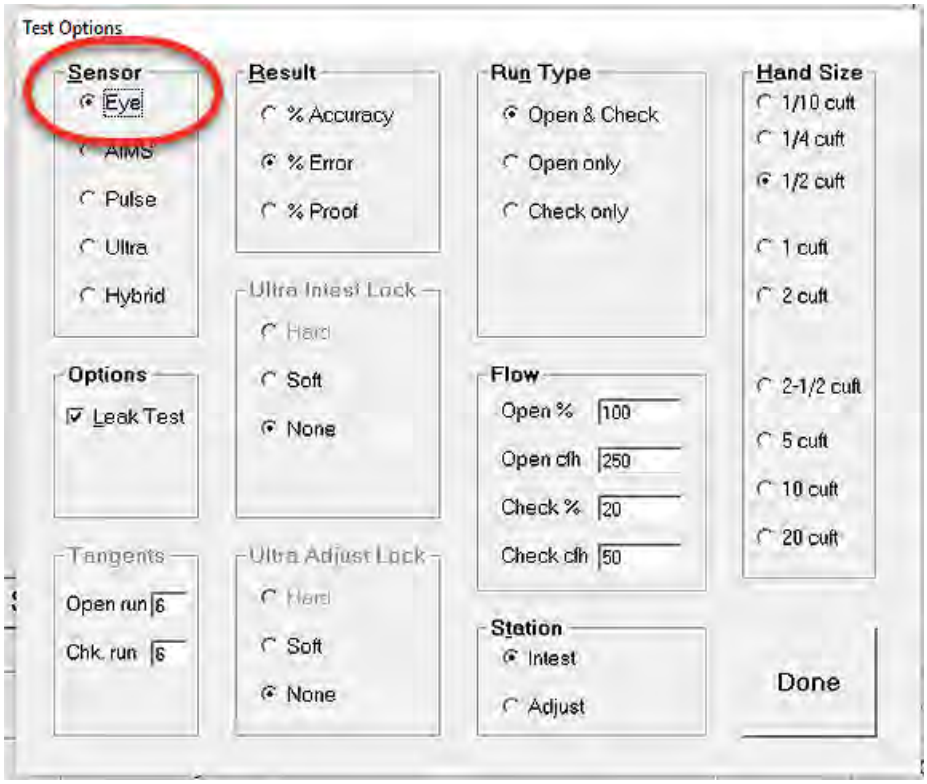
> **Important!** If ITRON is not in the Manuf. drop-down list, contact EEI Prover Systems for help in adding ITRON to your EEI Systems Prover.

4. Select **Intelis 250**, **Intelis 250 TC**, or the name for the Intelis Gas Meter designated by your company from the Type drop-down list.

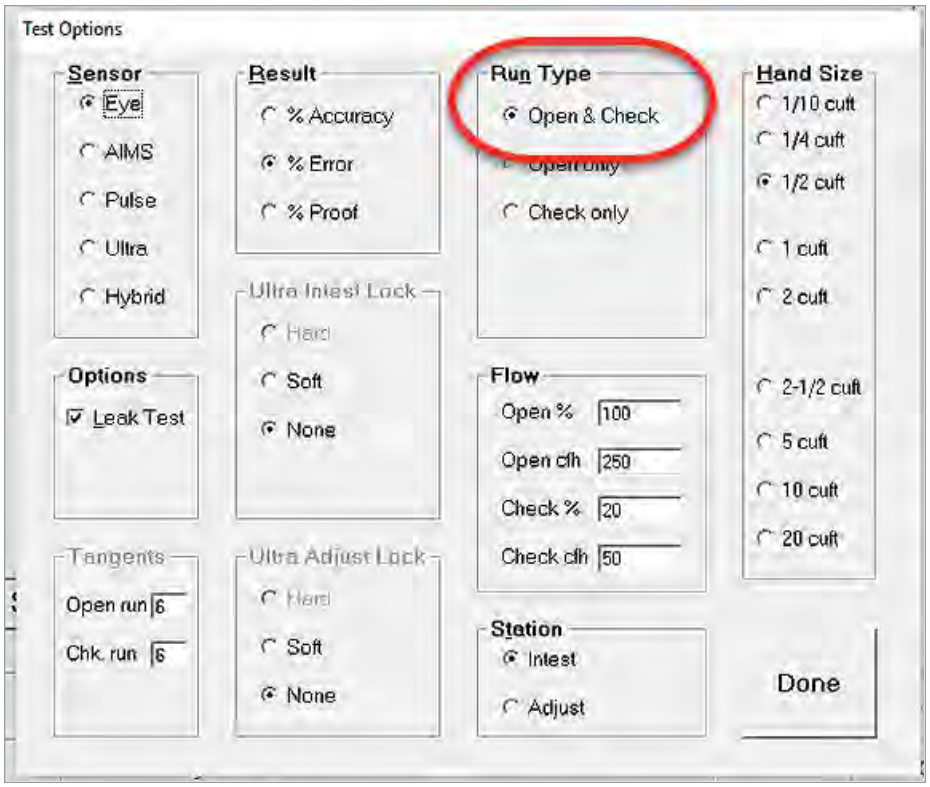
> **Important!** If the correct Intelis Gas Meter type is not in the Type drop-down list, contact EEI Prover Systems for help adding the correct meter type to your EEI Systems Prover.

5. Click the **Options** tab.

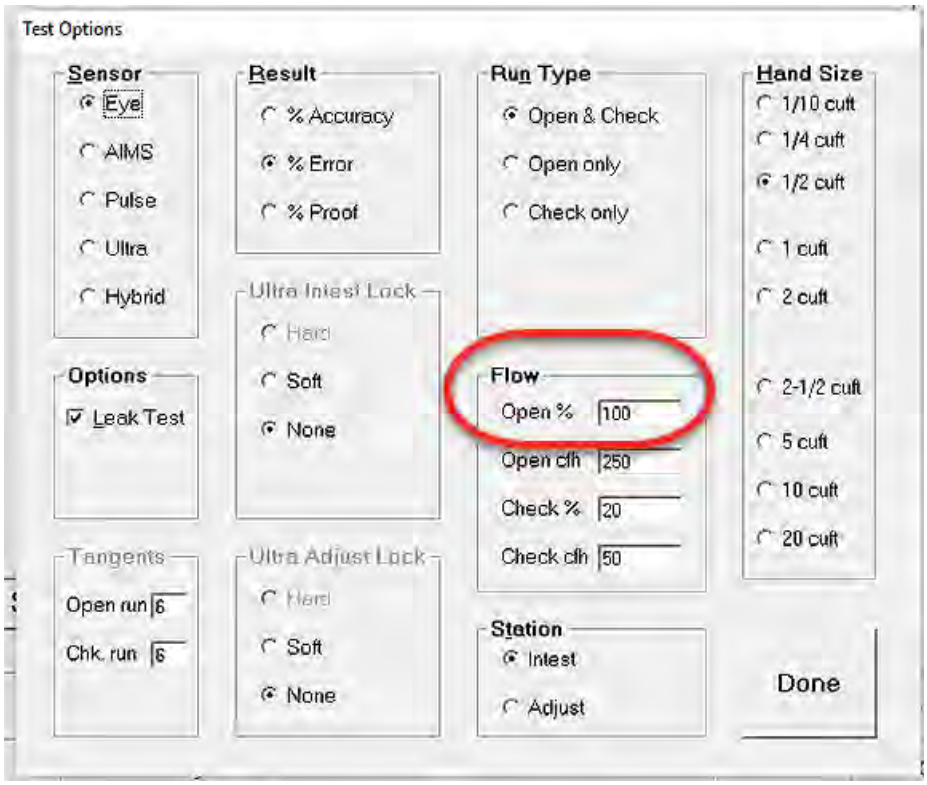
6. The Meter Information > Test Options window opens.
7. Select **Eye** for the Test Options Sensor.



8. Select **Open & Check** for the Run Type Test Options.

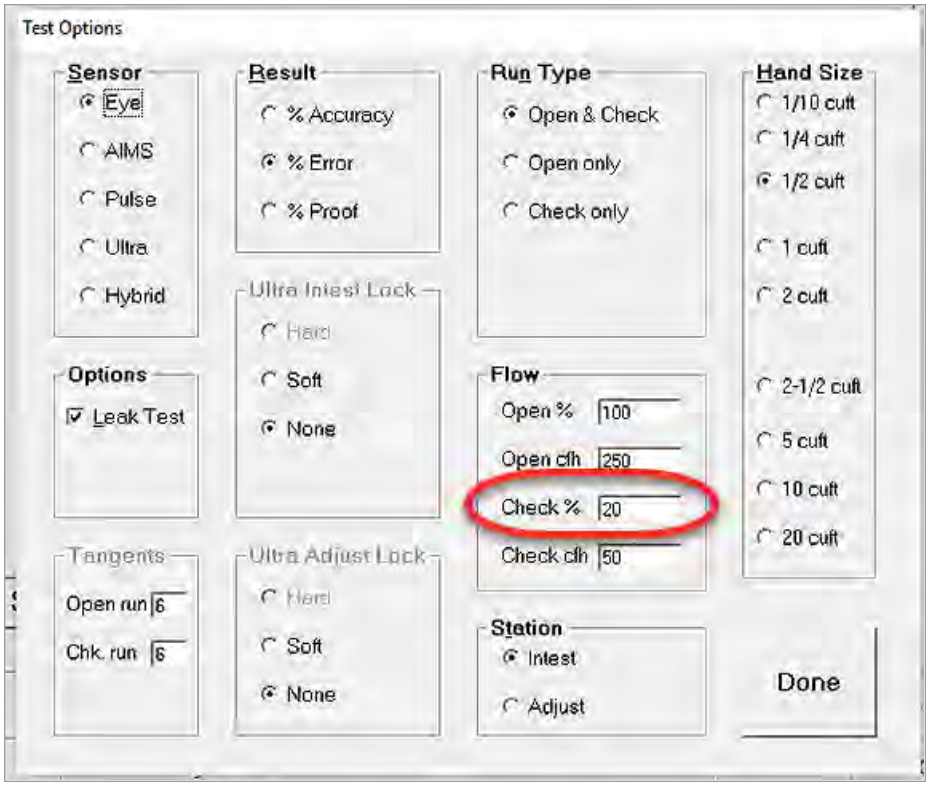


9. Enter 100 for Flow > Open %.



Important! Required Open flow rates may be different than those shown here.

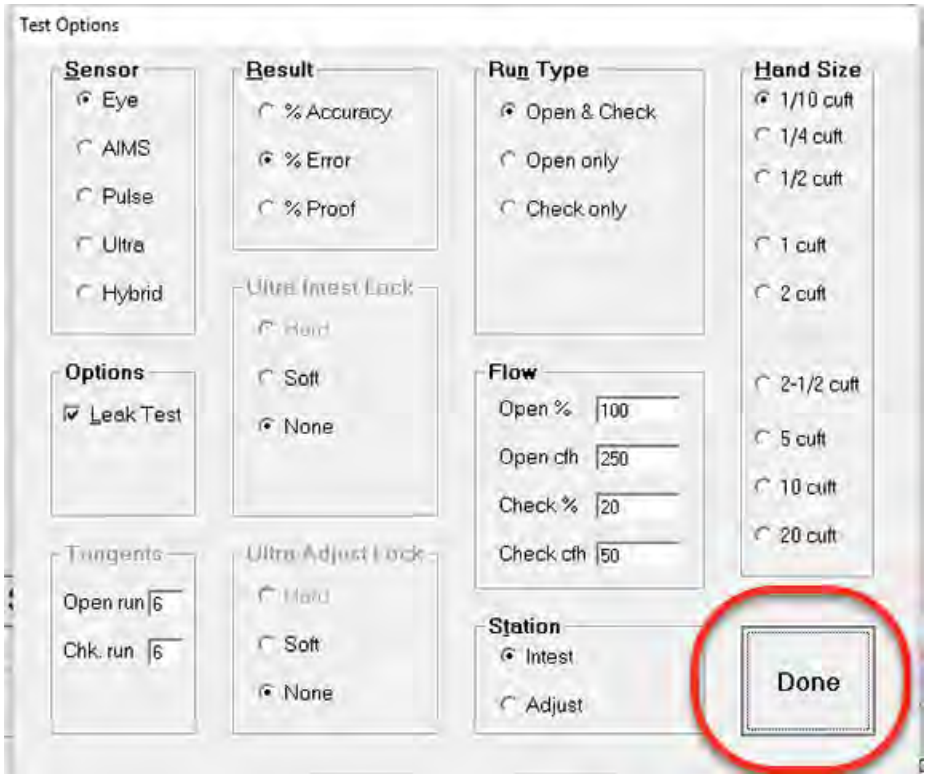
10. Enter 20 for Flow > Check %.



Important! Required Check flow rates may be different than those shown here.

11. Select 1/10 cuft for Hand Size.

12. Click **Done** to complete the Meter Information > Test Options and close the window.



> **Note:** All other settings (Tangents, Ultra Intest Lock, Ultra Adjust Lock and Station) on the Test Options window are not relevant for the Intelis meter.

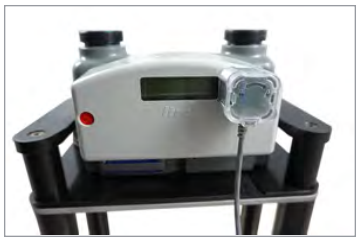
Proving the Intelis Gas Meter

1. Connect the EEI pulse prover cable (Itron part number CFG-7100-400) to the EEI prover index eye connector.

2. Connect the Intelis Gas Meter end of the EEI pulse prover cable to the Intelis Gas Meter by firmly pressing the aluminum round threads of the cable into the port. Begin by positioning the cable at the 4:30 o'clock position. Tighten the cable to the 6:30 o'clock position.

> **Caution:** Do not over tighten as doing so could damage the index housing or the proving cable head.

> **Note:** The Intelis Gas Meter automatically enters Test Mode when the pulse output cable is connected to the meter.



3. Press the EEI prover's green button to begin the proving test.

4. Verify the LED blinks (pulses) when the air begins to flow through the meter.

7 Calibrating the Intelis Gas Meter

FDM allows users to re-calibrate the Intelis Gas Meter accuracy. The Intelis Gas Meter Test Mode and a prover station are used to confirm the accuracy of the meter and FDM is used to recalibrate the meter if necessary.

The Intelis Gas Meter cannot be programmed (configured) or calibrated while the meter is in Test Mode. You must exit Test Mode to program or configure the meter. Attempting to program or configure parameters while the meter is in Test Mode will result in a temporary error in FDM. If the valve icon is blinking, the meter is unable to go into Test Mode. Wait a few minutes and try again.

Some meter configuration is required for the meter to communicate with the prover type. Configuration is completed using the FDM configuration (snapshot) file or using the handheld programmer and FDM Tools.

Intelis Gas Meters are calibrated at the factory prior to shipment. Recalibrating the Intelis Gas Meter requires FDM and the results of the accuracy test. For proving instructions, refer to earlier chapters in this guide. For more information about calibrating the Intelis Gas Meter using FDM, see the *FDM Mobile Application Guide*. For more documentation information, see **Related Documents on page 11**.

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Adjusting the Calibration

Follow the steps below to send new calibration values to the meter.

1. Run the meter on a prover.
2. Exit Test Mode.
3. Enter the prover station results values into FDM.

   > **Note:** The Intelis Gas Meter must be unsealed to adjust the meter calibration.

4. Wait for the meter to complete calibration.
5. Enter Test Mode.
6. Re-prove the meter to verify the calibration.
7. Exit Test Mode.

To Adjust the Calibration of an Intelis Gas Meter

Before you perform the Adjust Calibration command, you are required to run the meter on a prover station. This determines the meter's accuracy, and the results are used during the Adjust Calibration workflow.

> **Note:** The meter must be out of test mode to perform the Adjust Calibration command. If the meter is in test mode, perform the Exit Test Mode command before you start this procedure.

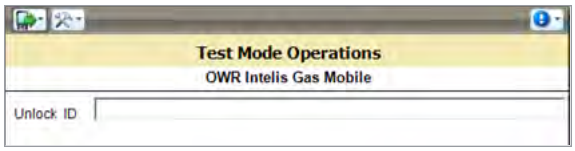
Part of this Adjust Calibration workflow includes unsealing the meter. After you complete this workflow, you must use the separate Seal Meter command to re-seal the meter.

If the meter is operating in mobile mode, you must know the meter's Unlock ID to complete the Adjust Calibration command.

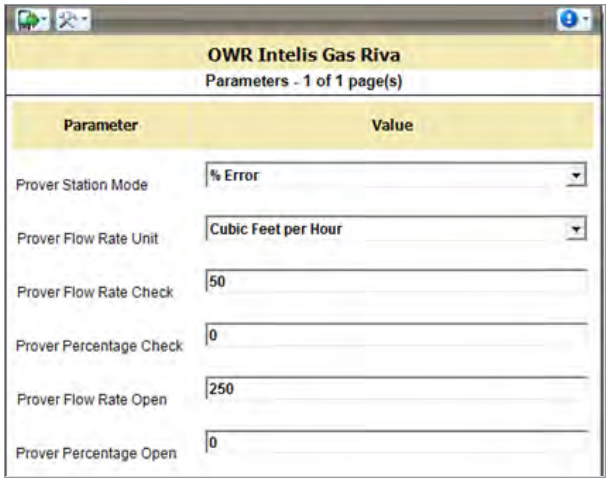
1. From the **Tools** menu, select **Intelis Gas Meter**.
2. Select **Test Mode Operations**.
3. Select **Adjust Calibration**.

   A warning message appears indicating that Adjusting Calibration will unseal the meter.

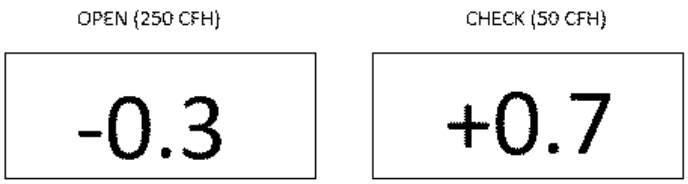
4. Select **Yes**.
5. *(Mobile ChoiceConnect mode only)* If you are prompted to enter the Unlock ID, enter the Unlock ID.



6. Select **Next**. The Parameter screen appears.



A sample prover station test result is displayed below to demonstrate an example of adjusting the calibration.



> **Note:** Depending on the meter's firmware version, FDM may accept flow rate entries only in a whole number format or it may accept flow rate entries of up to two decimal places.

7. Use the following settings to adjust the meter calibration as it relates to your test results:

   Prover station mode. Use the drop-down menu to select the % in which your prover station results are expressed:

   - *(Example selection)* % Error
   - % Accuracy
   - % Proof

   Prover flow rate unit. From the drop-down menu, select the flow rate unit:

   - *(Example selection)* Imperial (cubic feet per hour)
   - Metric (cubic meters per hour)

   Prover flow rate check. Enter the prover station check flow rate. This is typically 20-35% of the meter capacity. *(Example entry 50)*

Valid values:

- **Cubic Meters Per Hour**. 0.01-11.32
- **Cubic Feet Per Hour**. 0.01 to 400.00
- **Station Mode of % Error**. -7.00% to +7.00%
- **Station Mode of % Proof**. 93.00% to 107.00%
- **Station Mode of % Accuracy**. 93.00% to 107.00%

> **Note:** The Prover flow rate check value must be lesser than the Prover flow rate open value.

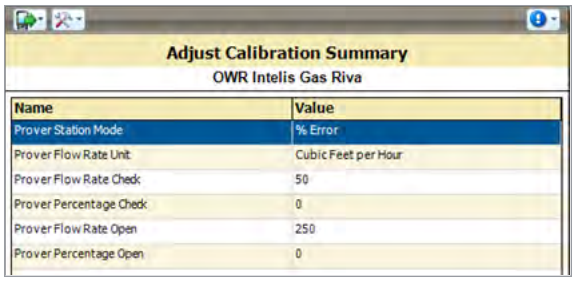
Prover percentage check. Enter the value from the test mode screen for the meter's check result. *(Example entry +0.7)*.

Prover flow rate open. Enter the prover station open flow rate. This is typically 80-100% of the capacity. *(Example entry 250)*.

> **Note:** The Prover flow rate open value must be greater than the Prover flow rate check value.

Prover percentage open. Enter the value from the prover screen for the meter's open result. *(Example entry -0.3)*.

8. Select **Next**. The Adjust Calibration Summary appears so that you may review your parameter changes.



Adjust Calibration Summary

OWR Intelis Gas Riva

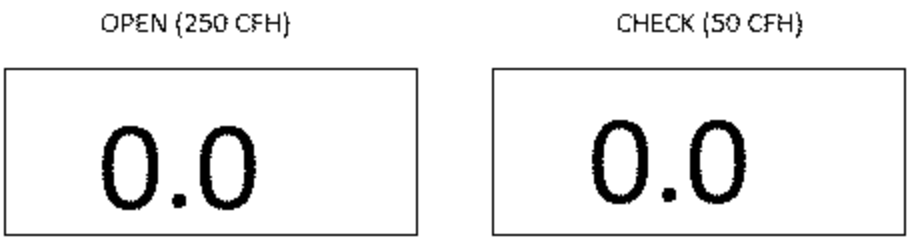
Name	Value
Prover Station Mode	% Error
Prover Flow Rate Unit	Cubic Feet per Hour
Prover Flow Rate Check	50
Prover Percentage Check	0
Prover Flow Rate Open	250
Prover Percentage Open	0

9. Select **Next**. A progress bar indicates that the meter's calibration is being adjusted.

The meter uses the entered values to calculate the required calibration parameters to a target of one of the following, depending on your selected prover station mode:

- **% Proof**. 100% open, 100% check
- **% Accuracy**. 100% open, 100% check
- **% Error**. 0% open, 0% check

10. Click **Quit** or **Finish** to return to the Tools screen.
11. *(Recommended)* Rerun the meter on the prover station to verify the meter calibration. It is expected that you see the results that match the following example:



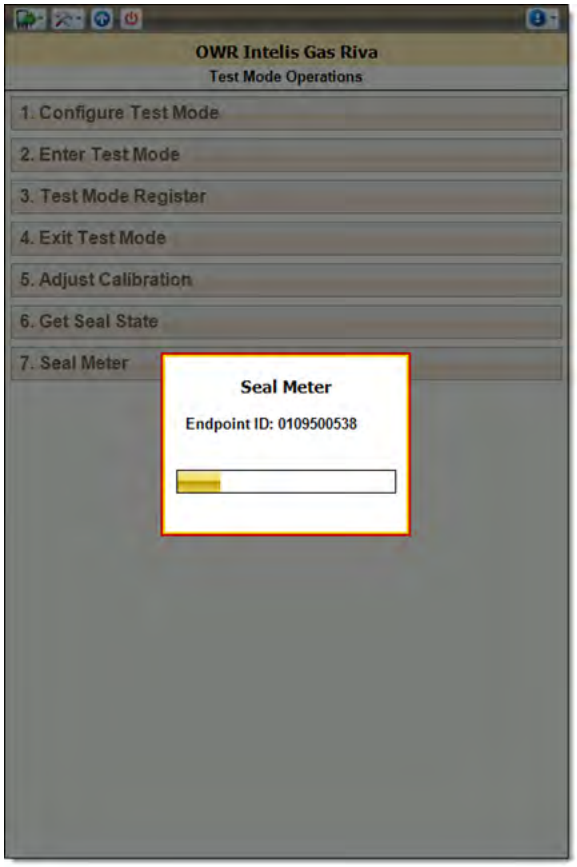
If the accuracy results are not as expected, repeat the calibration steps.

> **Note:** Prover station accuracy is estimated to be +/- 0.15-0.25%.

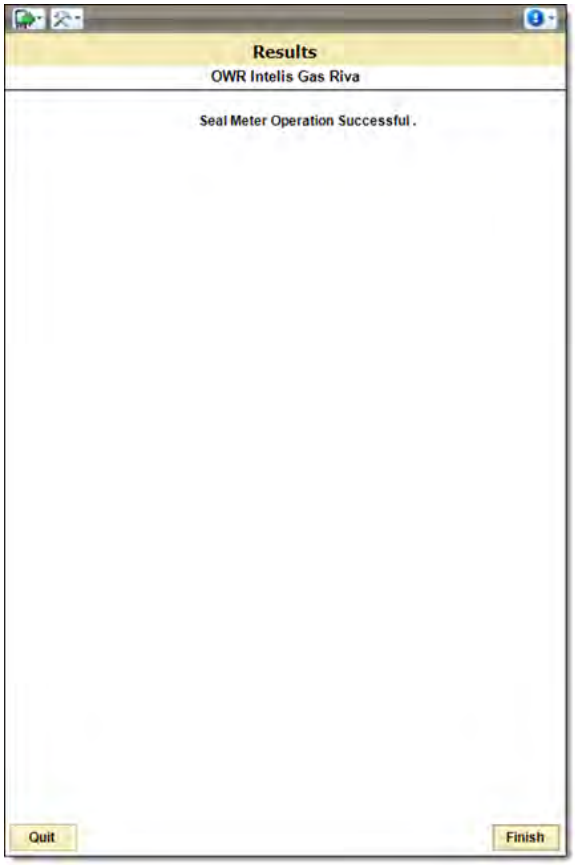
To Seal an Intelis Gas Meter

1. From the **Tools** menu, select **Intelis Gas Meter**.
2. Select **Test Mode Operations**.
3. Select **Seal Meter**.

   A progress bar indicates that the meter is sealing.



The Seal Meter Operation Successful screen indicates that the meter is sealed.

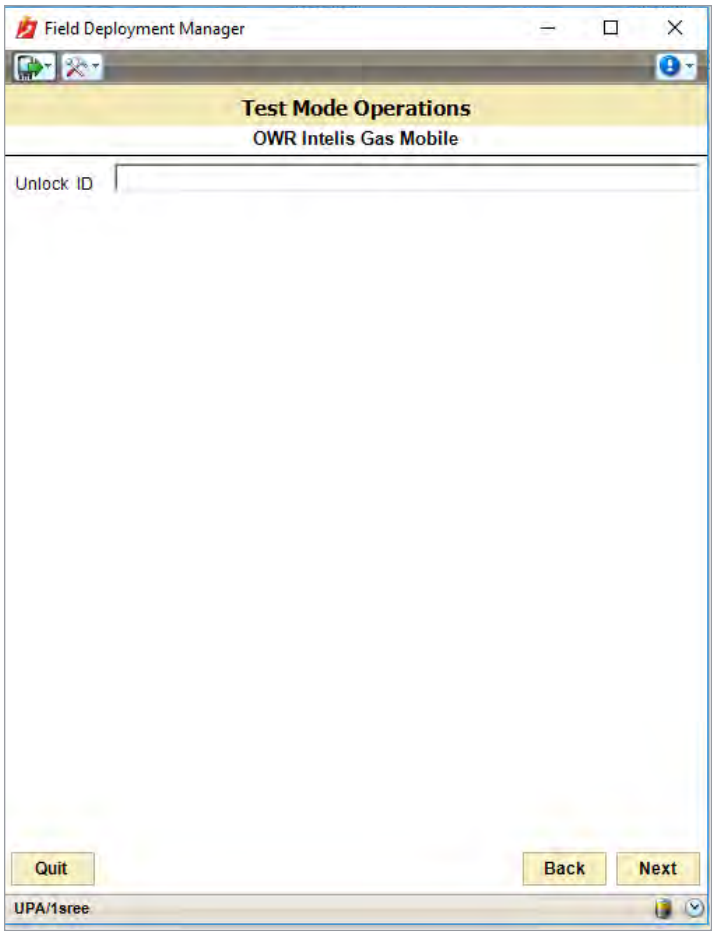


4. Select **Finish** to return to the Tools screen.

To Unseal an Intelis G~~g~~as Meter~~'s UMU~~

1. From the **Tools** menu, select **OWR Intelis Gas Riva**.
2. Enter the **Endpoint ID**.
3. Select the **Endpoint Mode**.
4. Select **Next**.
5. Select **Test Mode Operations**.
6. Select the Utility ID.
7. Click **Next**.
8. Select **Adjust Calibration** for a device with a Seal State of Sealed. A warning message appears indicating that Adjusting Calibration will unseal the meter.
9. Select **Yes**.

10. *(Moblie endpoint mode only)* Enter the Unlock ID.



11. Select **Next**.

    The Adjust Calibration screen appears.

12. Click **Quit** or **Finish** to return to the Tools screen.