



Gas IMU Installation and Configuration

February 14, 2011



Overview

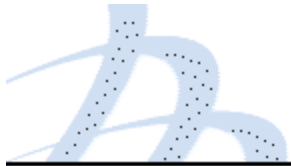
- Remove existing index and prepare the meter
- Attach the tamper magnet holder
- Attach the index to the IMU
- Attach the IMU assembly to the meter
- Inspect
- Prepare IMU for programming



Safety First!



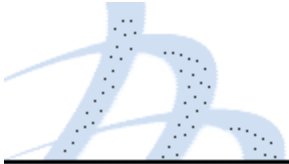
- **Always follow applicable standards for safety!**
- **Refer to the meter documentation for further safety information.**
- **Follow your employer's best practices.**
- **If you smell gas, report it to the utility.**
- **Do not use power tools!**



RF Exposure Notice (509)

- The antenna of this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
- The device should be installed so that people will not come within 20 cm (8 in.) of the antenna.
- This equipment has been tested and found to comply with Part 15 of the FCC Rules. 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 disconnected.
 - Consult the dealer or an experienced Radio/TV technician for help.

Modifications to the IMU not expressly approved by Silver Spring Networks may void your authority to operate the IMU.



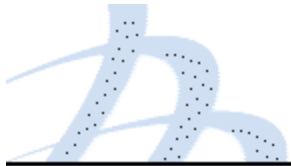
Components and Tools

- Components:

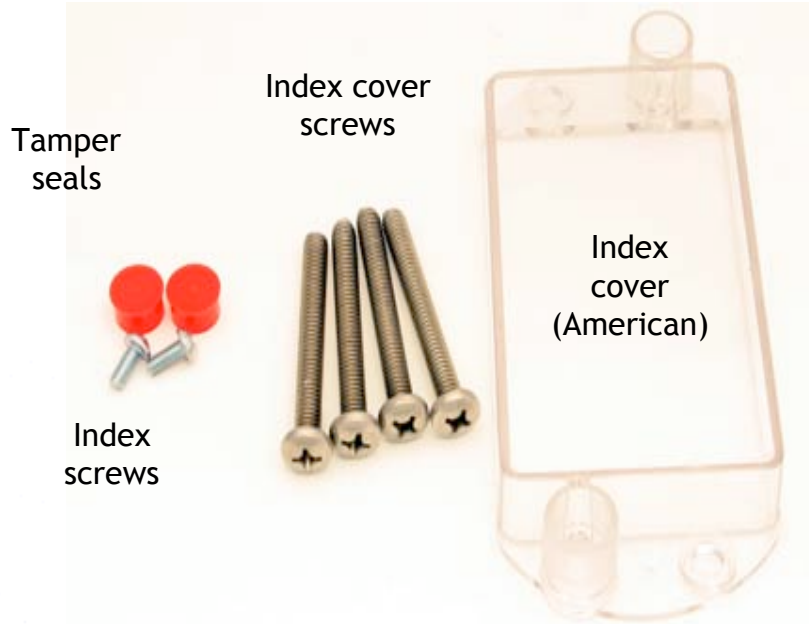
| Component | Qty. | Size | Part Numbers |
|--|------|----------------------------------|------------------------------------|
| SSN IMU (top level, includes hardware) | 1 | n/a | 221-010001 (Am) 222-010001 (RW) |
| Index cover | 1 | n/a | 976-000195 (Am) 976-000196 (RW) |
| Index cover screws | 4 | 1/4-20" x 21/8" 10-24 x 21/4" | 901-000067 (Am) 901-000053 (RW) |
| Index screws | 2 | 8-32 x 3/16" 6-32 x 3/4" | 901-000054 (Am) 901-000057 (RW) |
| Red tamper seals | 2 | n/a | 976-000204 |
| Tamper magnet holder & magnet | 1 | n/a | 976-000212 (Am) 976-000213 (RW) |

- Tools:

- Flathead screw driver (capable of torque setting)
- Phillips screw driver (capable of torque setting)
- Nut driver
- Awl, scraper, wire brush
- Service magnet
- Guide pins



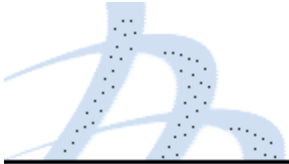
Components



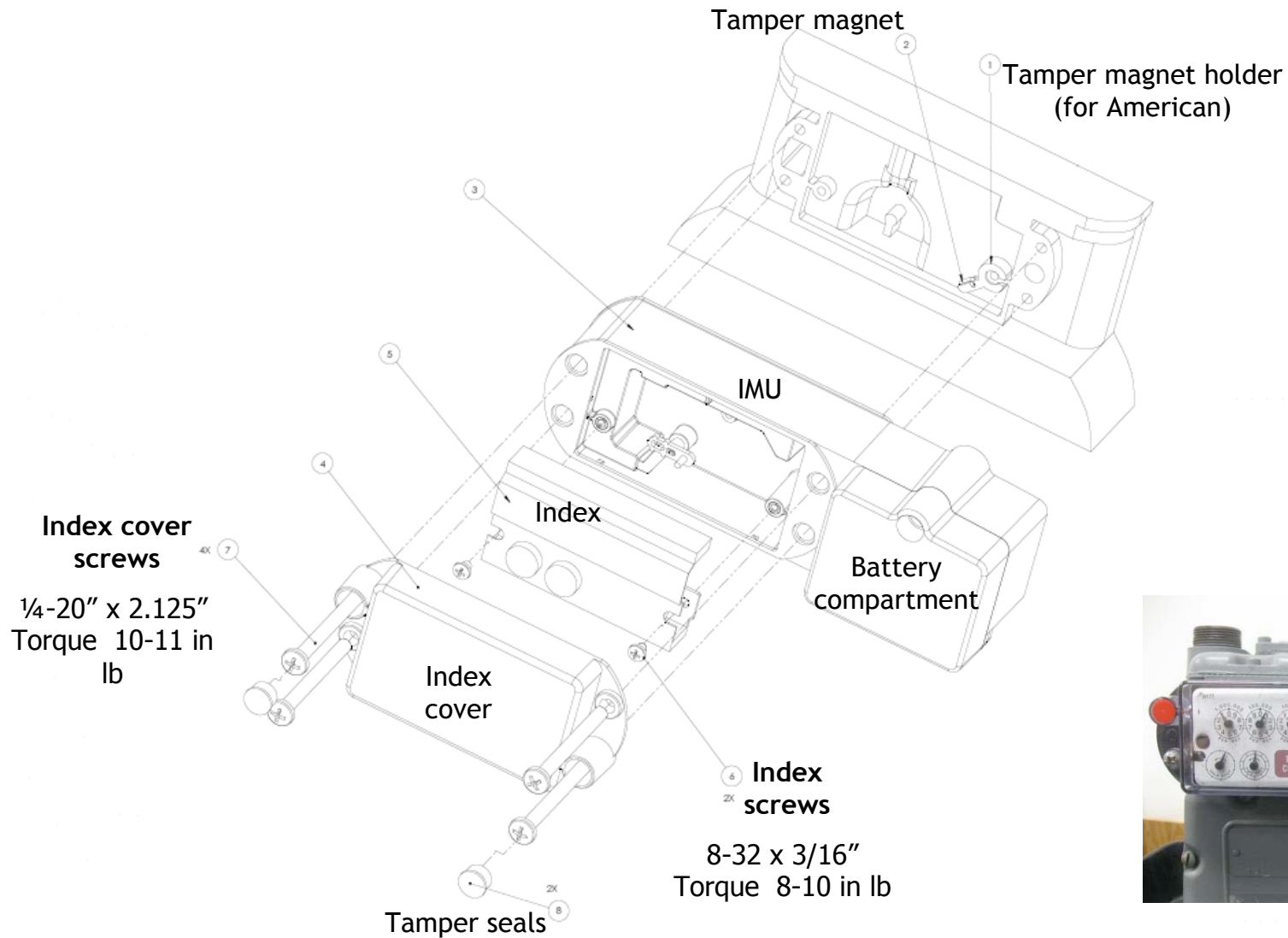
Tamper magnet holder with magnet for American

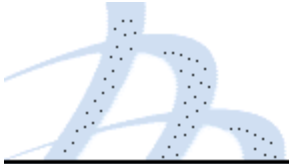


Tamper magnet holder and magnet for Rockwell



Assembly Drawing (American)



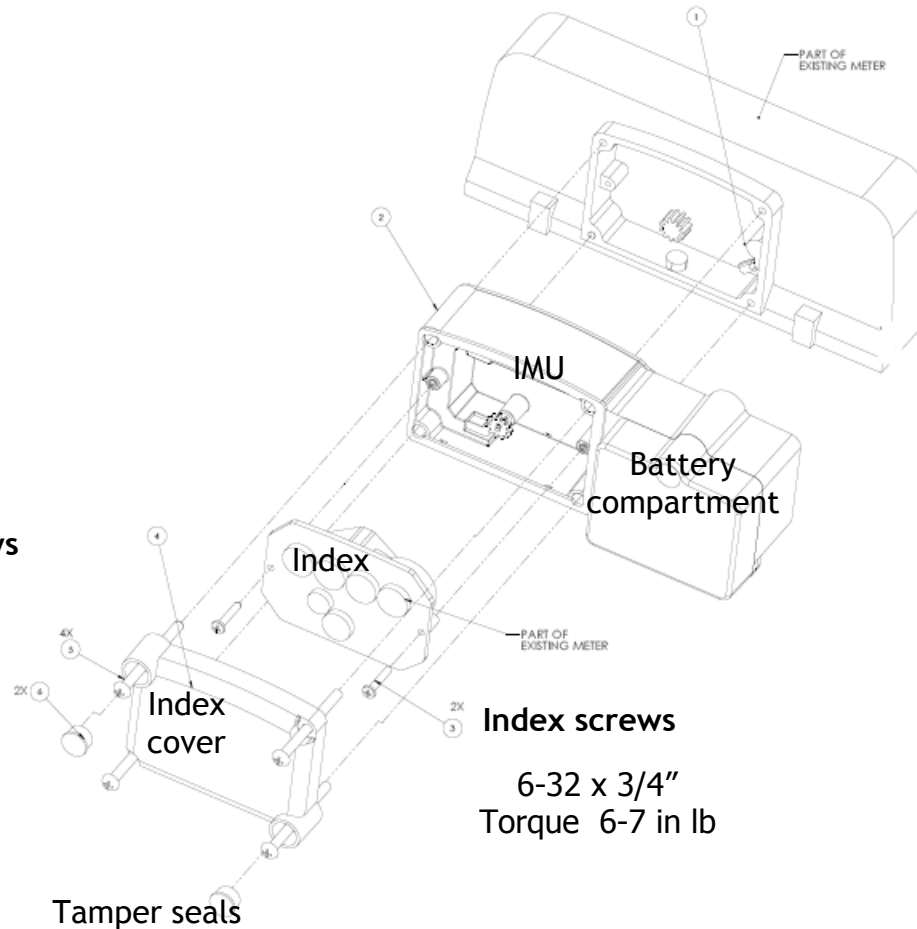


Assembly Drawing (Rockwell)

Tamper magnet holder
and magnet (for Rockwell)

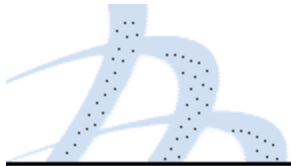
Index cover screws

10-24 x 2.25"
Torque 6-8 in lb



Index screws
6-32 x 3/4"
Torque 6-7 in lb





Remove Existing Cover & Prep Meter

- Remove the existing index cover and index from the meter.



- Clean the meter index area and make sure to remove any remaining parts of the old gasket.



Attach the Tamper Magnet Holder

- On an American meter, attach the magnet so that the protrusion holding the magnet points down and to the left and the gap in the circle fits around the notch on the meter.

American



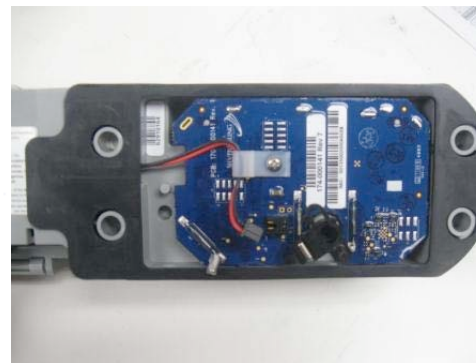
- On a Rockwell meter, attach the magnet holder so that the protrusion holding the magnet points down and to the left and the inner pin is inserted into the index screw hole.

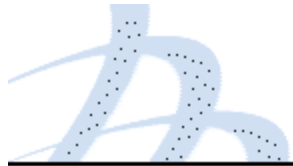
Rockwell



Inspect IMU

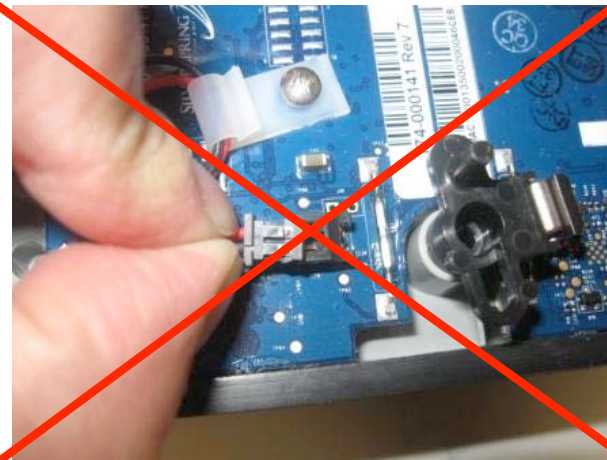
- Inspect the IMU, ensuring that there is no visible damage.
- Check the front and rear gaskets. Make minor placement corrections as needed.
 - The front gasket should adhere to the enclosure and keep the screw holes clear.
 - The rear gasket should be attached to the enclosure on the left and right, and remain straight in the middle such that the gasket will seal between the enclosure and meter. The gasket must keep the screw holes clear.





Connect Battery Cable Connector

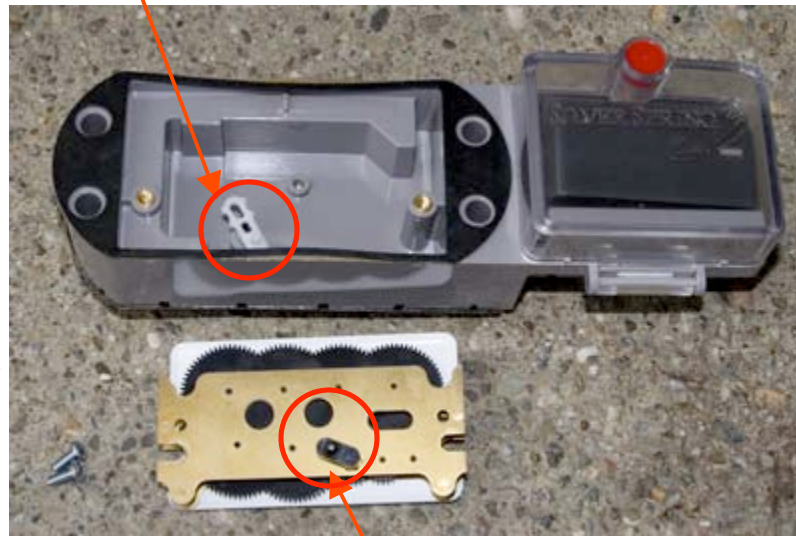
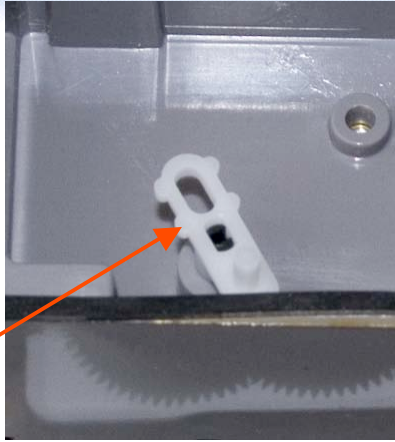
- Gently plug in the battery cable connector to the PCB, if it is not already connected.
 - The connectors are keyed. The top side of the male connector has a feature that fits into a slot on the top side of the female connector on the PCB.
 - Orient the connectors before attempting to connect.
 - Carefully insert the male connector while holding the opposite end of the female connector. Do not push the male connector without holding the opposite end of the female connector.



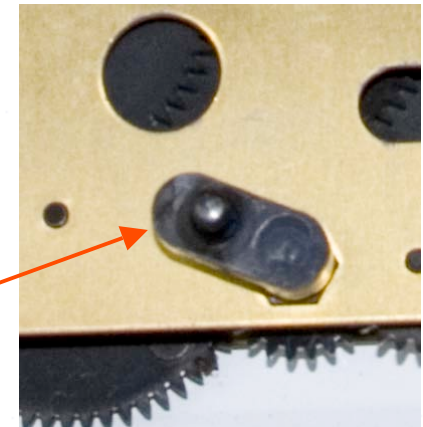
Attach the Meter Index to the IMU

- Align the IMU drive train with the index wiggler.

IMU Drive Train



Index Wiggler



Attach Meter Index to IMU

- Use the two index screws to firmly attach the index to the IMU.
- Index screw torque:
 - Rockwell: 6-7 inch pounds
 - American: 8-10 inch pounds



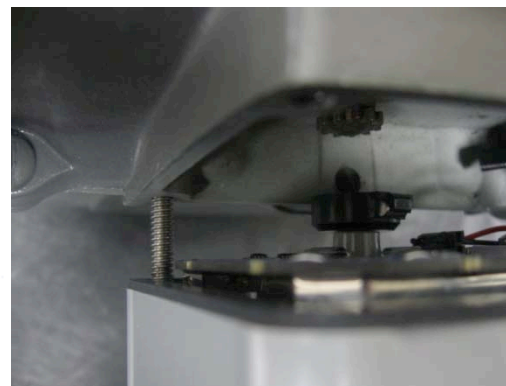
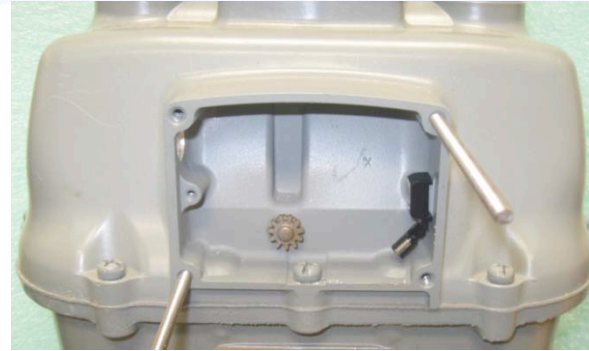
- Rotate the drive shaft two turns from the rear, clockwise or counter-clockwise, and observe that the 2 foot test hand also moves 2 turns. The test hand should spin freely. If not, correct by fixing or replacing the index or IMU.

Two rotations of the IMU drive shaft will rotate the 2 ft drive hand two rotations.



Attach IMU Assembly to Meter

- Temporarily fasten the guide pins to the meter (3-4 threads into the meter). You will remove these in a later step.
- Using the guide pins, align the IMU to the meter and match the meter wriggler to the IMU drive by adjusting the index test hand.
 - On the Rockwell meter, rotate the magnet to 12 o'clock to avoid the screw in the index well.
 - Watch (from the side or top) the IMU drive link to the meter wriggler.
 - On the American meter, the pin goes into the slot.
 - On the Rockwell meter, the cup fits over the wriggler (meter gear).



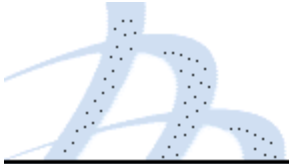
Attach IMU Assembly to Meter

- Hold the enclosure against the meter to maintain proper alignment to perform the following checks:
 - If no gas is flowing through the meter, verify that the half cubic ft test hand rotates approximately 180 degrees when turned gently by hand
 - If gas is flowing through the meter, you should see the test hands rotating. You do not need to manually rotate the test hand.
- Verify that:
 - There are no clicking or snapping sounds
 - There is no gap between the meter and IMU
 - The rear gasket seals the meter to the IMU



Half foot test hand

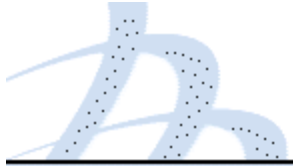
Two foot test hand



Attach IMU Assembly to Meter

- If you hear clicking or snapping, or if there is a gap or a poor gasket seal, remove the IMU and reinstall. Repeat the verification checks.
- Attach the index cover and 2 screws to the meter and IMU as shown. On a Rockwell meter, the curved side of the index cover goes on top. The red tamper plugs will fit to the upper left and lower right corners.
- Tighten the 2 screws.
 - Torque:
 - Rockwell: 6-8 inch pounds
 - American: 10-11 inch pounds

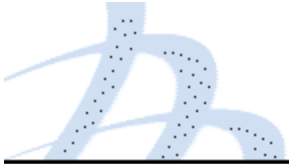




Inspect Gaskets

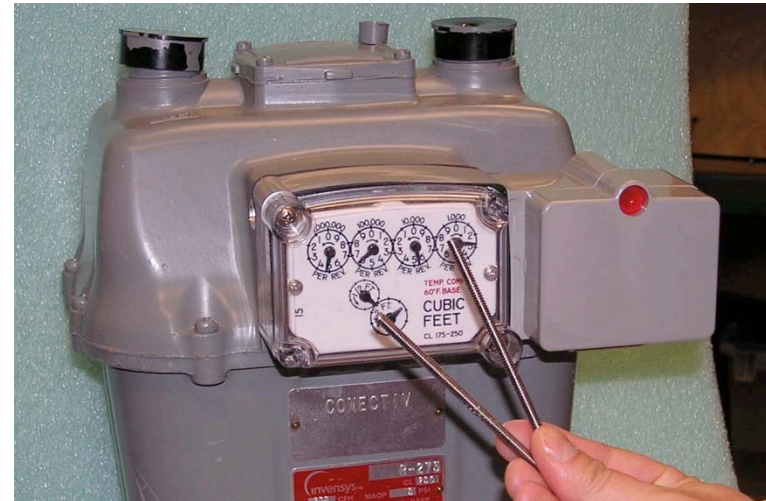
- Verify that the front and rear gaskets seal the mating surfaces all the way around the IMU and index cover.
- If the gaskets have not seated correctly, remove all the cover screws, adjust the gasket position, and reinstall the IMU.





Attach IMU Assembly to Meter

- Remove the guide pins



- Install the remaining 2 screws

Install the remaining 2 screws
and tighten

Torque:

- Rockwell: 6-8 inch pounds
- American: 10-11 inch pounds



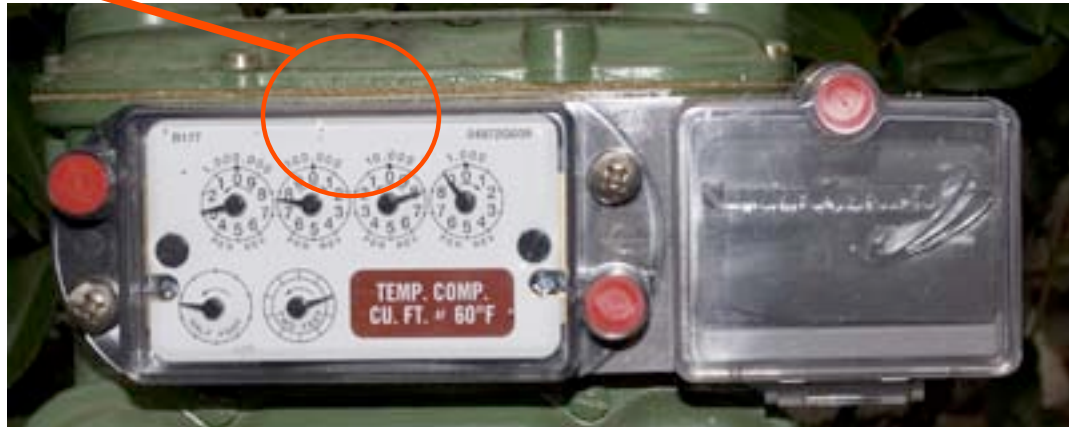
Inspect the gaskets and install the tamper seals

- Re-inspect the front and rear gaskets to ensure that they form a seal between the index cover, enclosure, and meter.
- Use a nut driver to push the three tamper seals into the openings on the IMU (2 in the index cover and 1 in the battery door).



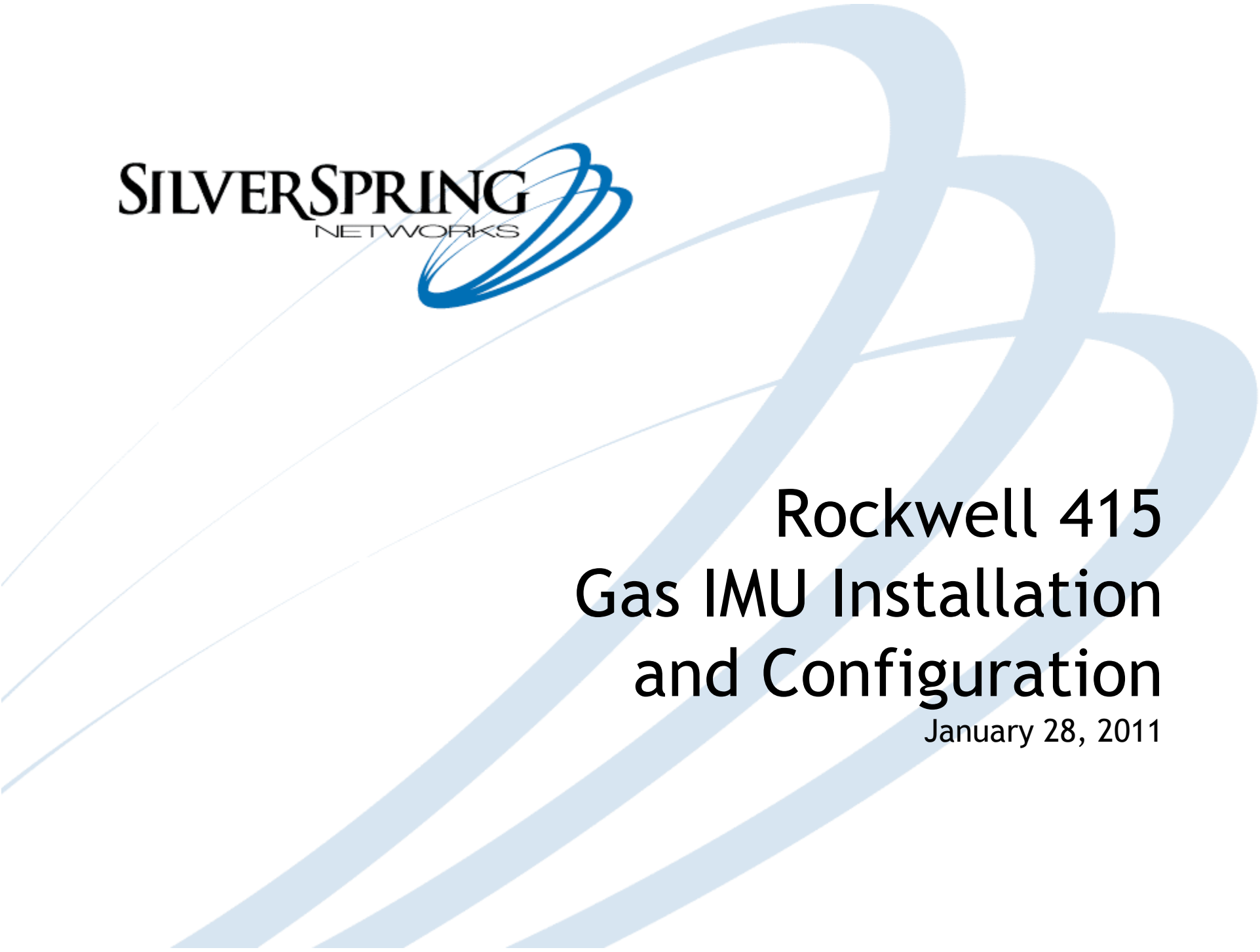
Prepare the IMU for Programming

- Slowly pass the service magnet once (for 2 to 5 seconds) over the top of the IMU.
- Doing so wakes up the IMU, enabling you to program it.



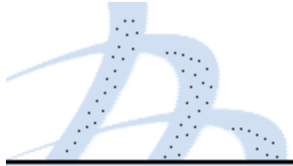


SILVERSPRING
NETWORKS



Rockwell 415 Gas IMU Installation and Configuration

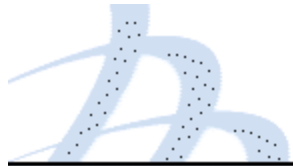
January 28, 2011



Rockwell 415 IMU Retrofit

Overview

- Check the components and tools list.
- Remove the index cover and index.
- Fasten the adapter plate to the meter.
- Fasten the meter index to the IMU.
- Fasten the IMU to the meter.
- Fasten the index lens cover and the tamper seals.
- Inspect
- Prepare the IMU for programming.



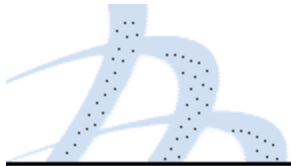
Check the Components and Tools List

- Components:

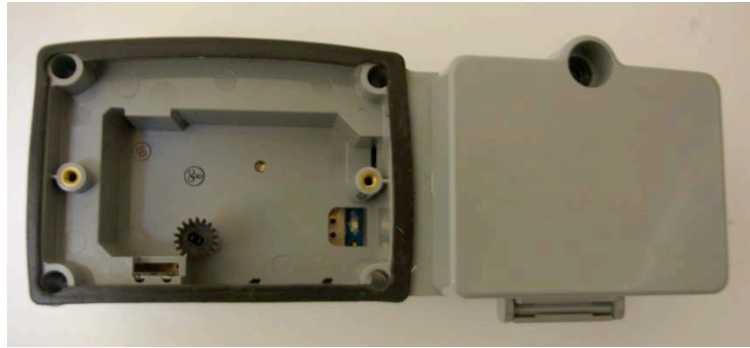
| Component | Qty. | Size | Part Numbers |
|----------------------------|-------------|-----------------|---------------------|
| Silver Spring Networks IMU | 1 | n/a | 178-000101 rev 06 |
| Adapter system | 1 | n/a | 178-000098 rev 02 |
| Index cover | 1 | n/a | 976-000196 rev 1 |
| Index cover screws | 4 | 10-24 X 2.75" L | 901-000061 rev 01 |
| Index screws | 3 | 6-32 X ¾" L | 901-000063 rev 01 |
| Red tamper seals | 3 | n/a | 976-000203 rev 1 |

- Tools:

- Flathead screw driver (capable of torque setting)
- Phillips screw driver (capable of torque setting)
- Nut driver
- Awl, scraper, wire brush
- Service magnet
- Guide pins



Components

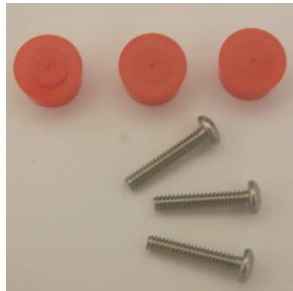


IMU



Index cover

Tamper seals



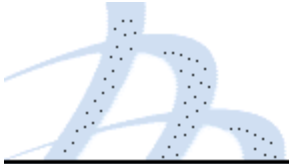
Index screws



Index cover screws

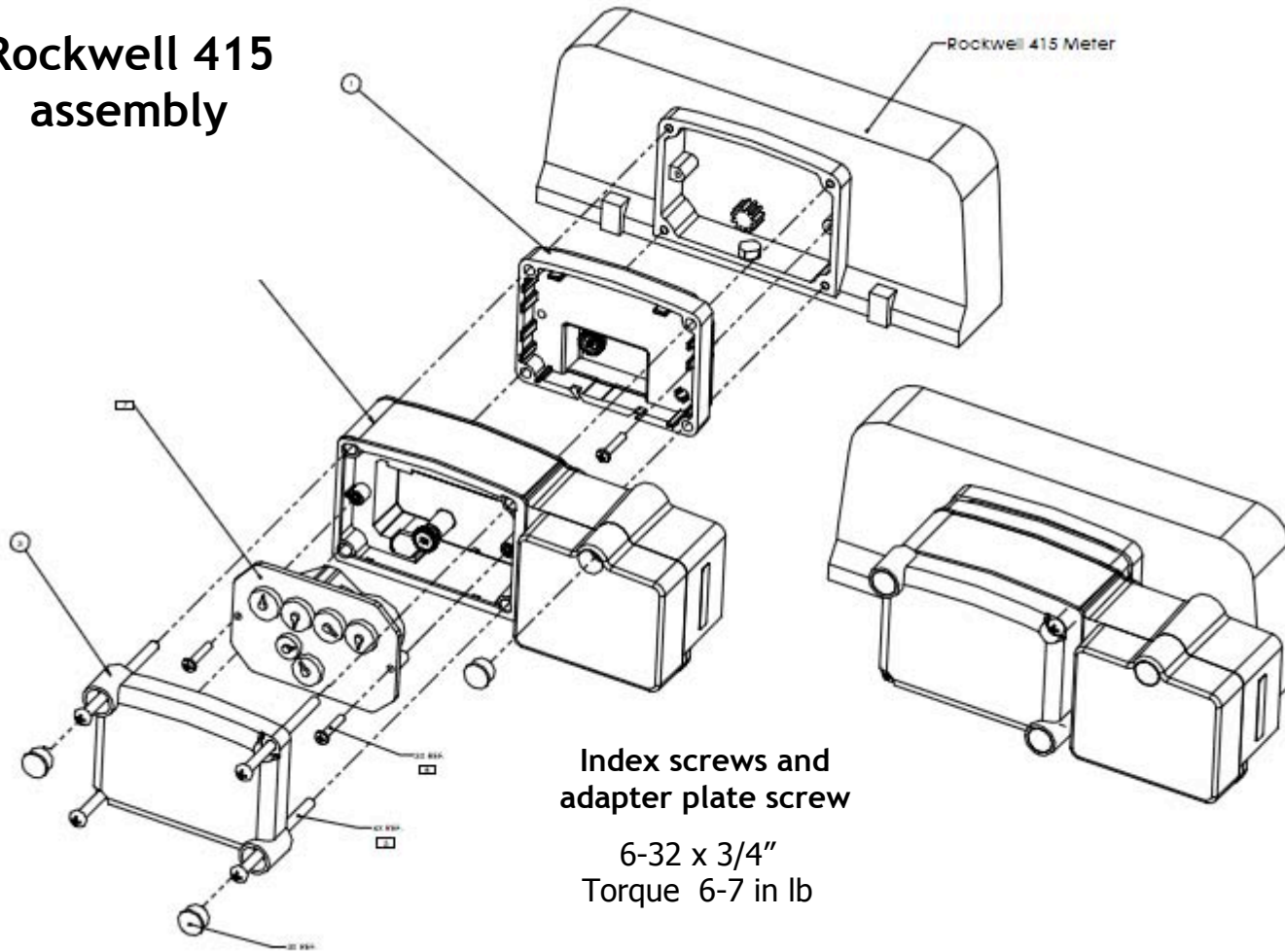


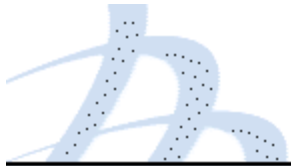
Adapter plate



Assembly Drawing (Rockwell 415)

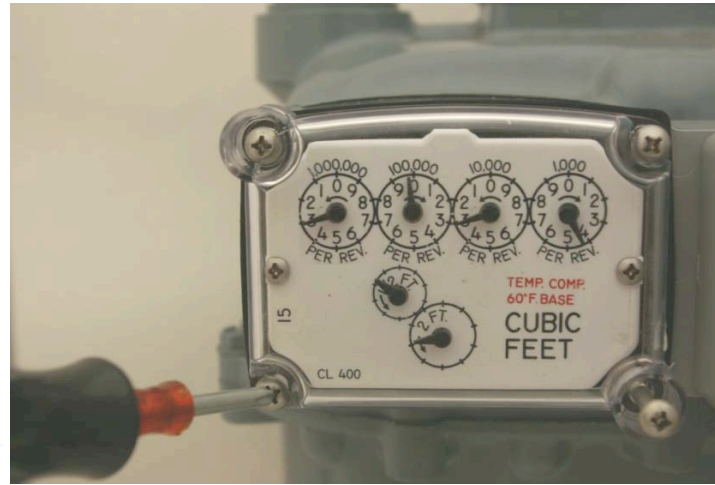
Rockwell 415 assembly





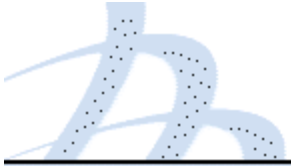
Remove the Index Cover and Index

- Remove the existing index cover and index from the meter.



- Clean the meter index area and make sure to remove any remaining parts of the old gasket.

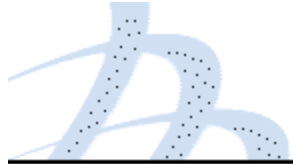




Install the Guide Pins

- Temporarily fasten the guide pins to the meter (3-4 threads into the meter). You will remove these in a later step.





Fasten the Adapter Plate to the Meter

- Position the adapter plate pin into the center left hole on the meter and seat the adapter plate onto the meter.
- Verify proper engagement of the gears. The gear should rotate at least 120 degrees.
- Position an index screw in the center right hole and fasten the adapter using 6-7 in-lbs of torque.



Fasten the Adapter Plate to the Meter (continued)

- If gas is not passing through the meter, rotate the gear on the plate clockwise until you feel it engage with the meter wriggler. The gear should rotate at least 120 degrees.
- If gas is passing through the meter, the gear should rotate in conjunction with the meter.
- You should not hear any clicking or snapping sounds.



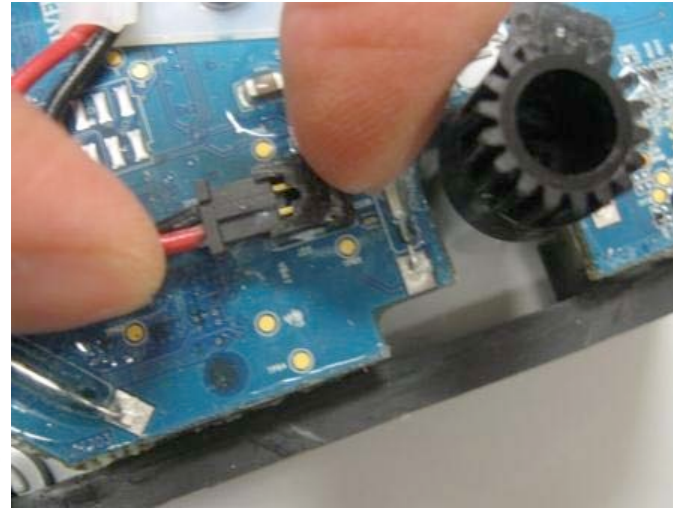
Inspect IMU

- Inspect the IMU, ensuring that there is no visible damage.
- Check the front and rear gaskets. Make minor placement corrections as needed.
 - The front gasket should adhere to the enclosure and keep the screw holes clear.
 - The rear gasket should be attached to the enclosure on the left and right, and remain straight in the middle such that the gasket will seal between the enclosure and meter. The gasket must keep the screw holes clear.



Connect Battery Cable Connector

- Gently plug in the battery cable connector to the PCB, if it is not already connected.
 - The connectors are keyed. The top side of the male connector has a feature that fits into a slot on the top side of the female connector on the PCB.
 - Orient the connectors before attempting to connect.
 - Carefully insert the male connector while holding the opposite end of the female connector. Do not push the male connector without holding the opposite end of the female connector.

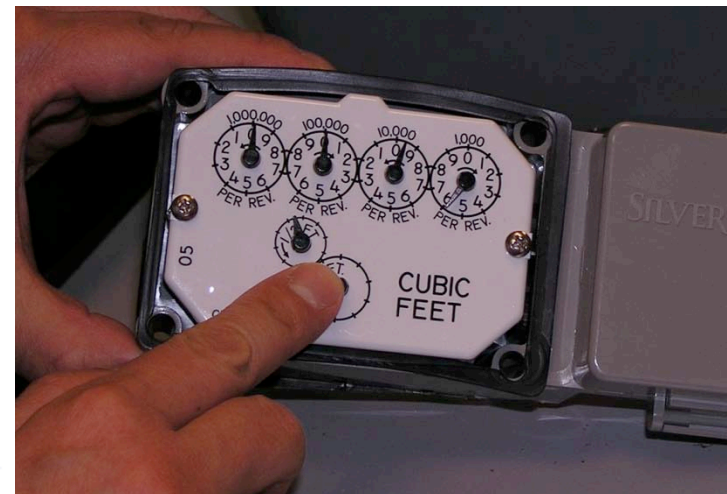


Fasten the Meter Index to the IMU

- Attach the meter index to the IMU with two index screws using 6-7 in-lbs of torque.



- Make sure that the gears are engaged and not bound up. The test hands should move freely, and in conjunction with the IMU drive.



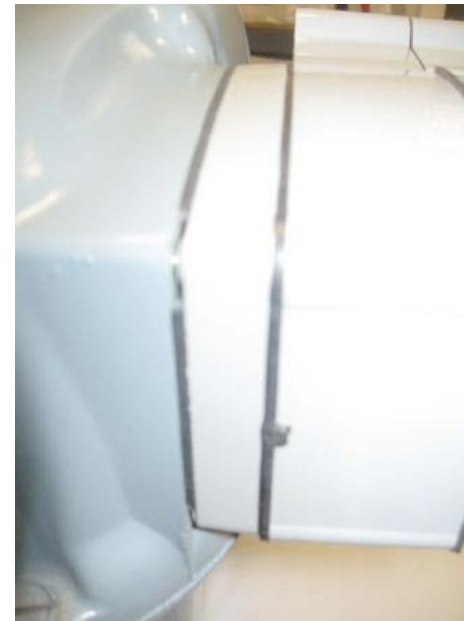
Fasten the IMU to the meter

- Make sure the gears are engaged and not bound by rotating the test hand.
- Attach the index cover and 2 screws to the meter and IMU as shown.
- Tighten the 2 screws.
Torque: 6-8 inch pounds



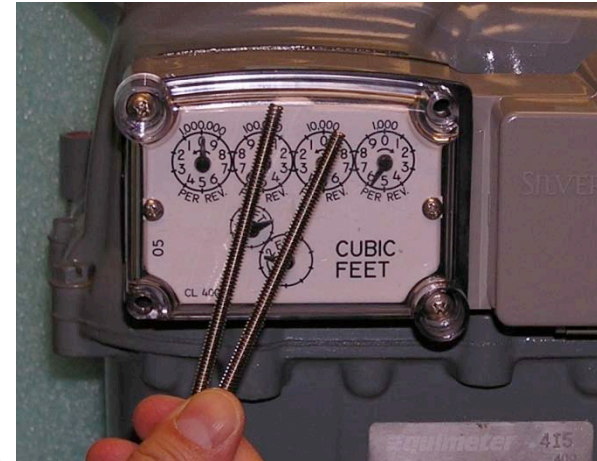
Attach IMU Assembly to Meter

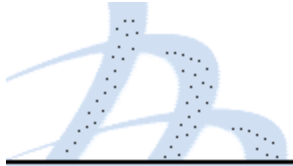
- Hold the enclosure against the meter to maintain proper alignment to perform the following checks:
 - If no gas is flowing through the meter, verify that the half cubic ft test hand rotates approximately 120 degrees when turned gently by hand
 - If gas is flowing through the meter, you should see the test hands rotating. You do not need to manually rotate the test hand.
- Verify that:
 - There are no clicking or snapping sounds
 - The gaskets are sealed and there is no gap between the meter, IMU, adapter plate, and cover.



Fasten the IMU to the meter

- Remove the guide pins
- Install the remaining 2 screws
Torque: 6-8 inch pounds





Inspect the Gaskets

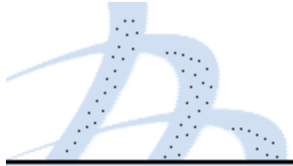
- Verify that the front and rear gaskets are properly seated all the way around the IMU. If not, remove and reinstall the IMU.



Install the tamper seals

- Use a nut driver to push the three tamper seals into the openings on the IMU.





Prepare the IMU for Programming

Slowly pass the service magnet once (for 2 to 5 seconds) over the top of the IMU.

This activates the IMU so you can program it. (tamper seals not shown)

