

OpenWay® Riva

500G ERT® Module Installation Guide, Direct Mount

TDC-1671-005

500G ERT® Module Installation Guide, Direct Mount

25 July 2019

TDC-1671-005

Copyright © 2019 Itron, Inc. All rights reserved.

Confidentiality Notice

Confidential Information of Itron®, Inc., provided under nondisclosure obligations. The information contained herein is proprietary and confidential and is being provided subject to the condition that (i) it be held in confidence except to the extent required otherwise by law and (ii) it will be used only for the purposes described herein. Any third party that is given access to this information shall be similarly bound in writing.

Trademark Notice

Itron is a registered trademark of Itron, Inc.

All other product names and logos in this documentation are used for identification purposes only and may be trademarks or registered trademarks of their respective companies.

For more information about Itron or Itron products, go to **www.itron.com**.

If you have questions or comments about a software or hardware product, contact Itron Technical Support Services.

Contact

Email: **support@itron.com**

Itron Access: **<https://support.itron.com>**

Telephone Itron Technical Support North America: 1-877-487-6602

For technical support contact information by region, go to **www.itron.com** and select your country and language.

Table of Contents

1	Important Safety and Compliance Information	6
	U.S. and Canadian Patent Numbers	6
	U.S. Patent Numbers	6
	Canadian Patent Numbers	6
	USA, FCC Part 15 Spectrum Compliance	6
	USA, FCC Class B-Part 15	6
	Modifications and Repairs	7
	Canada, ISED Spectrum Compliance	7
	RF Exposure (FCC/ISED)	8
	Australia, ACMA Spectrum Compliance	8
	Transportation Classification	8
	Modifications, Repairs, Installation, and Removal	8
	Lithium Battery Safety	8
	Equipment Repairs	9
	Intrinsic Safety	9
	Electrostatic Ignition Hazard	9
	Module Cleaning	9
	Do Not Drop	9
2	About the OpenWay® Riva 500G ERT® Module	10
	Transmission Modes	10
	Mobile High Power Mode	10
	Mobile and Handheld Mode	10
	(Optional) Hard to Read Mode	11
	Gas Day Take	11
	High Flow Event/Alarm	11
	Local Auditing	11
	Low Battery Event/Alarm	12
	OpenWay Riva 500G and Itron Security Manager	12
	Functional Specifications	13
	Operational Specifications	14
	Device Firmware Functionality	14

Related Documents	15
Installation Requirements	16
3 Programming	19
Standard Configuration	19
Programming the Direct Mount Module	20
Itron Programs and Software Variables	20
Field Deployment Manager (FDM)	20
Mercury X-Blank options	22
Check Endpoint functions	23
Field Collection System (FCS) (Mobile Mode only)	23
OpenWay Operation Center (OWOC)	23
Itron Enterprise Edition (IEE) Meter Data Management	23
4 Specific Meter Manufacturer Installation	24
Elster American Installation	24
Installation Overview	27
Mechanical Installation	28
Commercial Module Mechanical Installation	33
Programming and Requirements notes	37
GE Oil and Gas (Dresser) Installation	38
Installation Overview	41
Residential Module Installation	42
Commercial Module Mechanical Installation	43
Programming and Requirements Notes	45
Itron Meter Installation	46
Installation Overview	51
Itron Residential Meter Mechanical Installation	54
Itron Commercial Meter Mechanical Installation	63
Programming and Requirements Notes	70
National (Lancaster) Meter Installation	72
Installation Overview	73
Mechanical Installation	74
Programming and Requirements Notes	80
Romet Commercial Rotary Meter Installation	80
Installation Overview	81

Residential Module Mechanical Installation 82

Commercial Module Mechanical Installation 83

Programming and Requirements notes83

Sensus Meter Installation84

Installation Overview89

Residential Meter Mechanical Installation 90

Commercial Meter Mechanical Installation 95

Programming and Requirements Notes102

1

Important Safety and Compliance Information

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

U.S. and Canadian Patent Numbers

U.S. Patent Numbers

- 4,614,945
- 4,753,169
- 4,768,903
- 4,799,059
- 4,867,700

Canadian Patent Numbers

- 1,254,949
- 1,267,936
- 1,282,118

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. 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.	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. 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 doit 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.

Transportation Classification

The Federal Aviation Administration prohibits operating transmitters and receivers on all commercial aircraft. When powered, 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.

Modifications, Repairs, Installation, and Removal

To ensure system performance, this device and antenna shall not be changed or modified without the express approval of Itron. Any unauthorized modification will void the user's authority to operate the equipment.

In the event of malfunction, all repairs should be performed by Itron. It is the responsibility of users requiring service to report the need for service to Itron.

Lithium Battery Safety



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 100° Celsius (212° Fahrenheit), crush, expose to water, or incinerate the lithium battery.
- Keep the lithium battery away from children.
- Fire, explosion, and severe burn hazards

Equipment Repairs



Warning! Only authorized Itron personnel should attempt repairs on Itron equipment. Attempts to do so by others might void any maintenance contract with your company. Unauthorized service personnel might also be subject to shock hazard on some Itron equipment if removal of protective covers is attempted.

Intrinsic Safety



Warning! Substitution of components may impair intrinsic safety.

Electrostatic Ignition Hazard



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

Module Cleaning



Warning! Clean only with a damp cloth.

Do Not Drop



Warning! While Itron modules are designed to withstand a drop, dropping the module may damage the device and void the warranty.

2

About the OpenWay® Riva 500G ERT® Module

Itron direct mount 500G ERT modules are radio-frequency gas modules (RF) featuring IPv6 open standards. The 500G ERT modules are designed to be read under Itron's multi-purpose OpenWay Riva Network Mode or by legacy ChoiceConnect handheld, mobile and fixed network readers. In OpenWay Riva Network Mode, the 500G ERT module offers firmware download, sub-hourly interval data, and extended data storage. In Mobile Mode, the ERT module operates identical to the 100G DLS Dataglogging ERT module and can be read by legacy ChoiceConnect handheld readers, mobile collection, and Itron's new Mobile Radio network readers.

The 500G ERT module continues Itron's tradition of reliability, accuracy, and long battery life while supporting the industry's standards for security and intrinsic safety.

Note: The OpenWay Riva 500G ERT Module was formally known as the OpenWayRiva Gas Module. The UI associated with this device may reflect the former name.

Transmission Modes

In OpenWay Riva Network Mode, the module provides 3,840 buckets of configurable interval data. Interval options are 5, 15, or 30 minutes.

Note: Interval data options are dependent on the ERT module's firmware version. For more information, see [Device Firmware Functionality on page 14](#).

Output power in OpenWay Riva Network Mode is +27 dBm (500 milliwatts). The module is designed to transmit 3 times a day with a 20-year battery life.

In Mobile Mode, the module provides 960 buckets of hourly interval data and can be set to transmit in mobile and handheld, hard to read mobile and handheld. Mobile Mode transmission modes include the following transmission characteristics:

Mobile High Power Mode

The 500G ERT module transmits a high-powered RF message every 60 seconds. Output power in this mode is 250 milliwatts or +24dbm. In Mobile High Power Mode, the expected battery life is 20 years.

Mobile and Handheld Mode

The 500G ERT module transmits a medium-powered RF message every 15 seconds. Output power in this mode is 10 milliwatts or +10dBm. In Mobile and Handheld Mode, the expected battery life is 20 years.

(Optional) Hard to Read Mode

The 500G ERT module transmits a high-powered RF message every 30 seconds. Output power in this mode is 250 milliwatts or +24dBm. In Hard to Read Mode, the expected battery life decreases to 15 years in this mode. The *hard to read mobile mode* should only be used for exceptionally hard-to-read applications (such as meters installed on rooftops or in sub-basements).



Caution: If you perform a Switch to OpenWay Riva Network Mode or Switch to Mobile Mode operation, it results in a loss of interval data.

An FCC license is not required to read the 500G ERT modules.

Gas Day Take

Note: Gas Day Take functionality is dependent on the 500G ERT module firmware version. For more information, see [Device Firmware Functionality on page 14](#).

Gas Day Take (GDT) is critical to many natural gas utilities. GDT allows utilities to manage deregulated gas purchases. While daily GDT reads can be used for various operations within the utility, the primary time constrained business operation is to daily balance deregulated (transport) customers. GDT requires GDT data from a percentage (typically a maximum of 10%) of the utility's customers at 9:00 a.m. Central Clock Time.

All collected data must be prepared and presented to deregulated marketers and customers by 11:00 a.m. CCT to support the gas utility's deregulated tariff. If a deregulated marketer of customer under or over-burns what they nominated for a given day, they may pay a daily penalty. Customers require the previous day's GDT data to make adjustments to their next day nomination to avoid penalties.

High Flow Event/Alarm

Note: High Flow event functionality is dependent on the 500G ERT module firmware version. For more information, see [Device Firmware Functionality on page 14](#).

High Flow is a configurable event/alarm that can alert a utility of an excessive flow of gas to avoid potential hazardous events. The High Flow threshold can be configured using FDM Tools or the OWOC CM.

Local Auditing

Note: Local auditing functionality is dependent on the ERT module's firmware version. For more information, see [Device Firmware Functionality on page 14](#).

The 500G ERT module supports local data auditing of installation programming. Local auditing features the listed characteristics.

- Supports writing data (in both manufacturing and by FDM) to the module to support future installation programming auditing.
- Reading the auditing data is supported locally.
- Auditing parameters include FDM User ID, number of dials, meter drive rate, unit of measure, ERT count rate, rollover, and PComp.
- Timestamping of auditing parameters.
- Log access via COSEM only.

Low Battery Event/Alarm

Note: Low battery functionality is dependent on the module's firmware version. For more information, see [Device Firmware Functionality on page 14](#).

The OpenWay Riva module low battery event is flagged when the device reaches a 10% of battery life remaining state. The event triggers an alarm configurable for asynchronous delivery to the head end system.

OpenWay Riva 500G and Itron Security Manager

The OpenWay Riva 500G ERT module is a component of Itron's OpenWay Riva system. The OpenWay Riva system security, provided by Itron Security Manager (ISM), applies to the RF communications between the collection device and the ERT module.

There are two fundamental security processes used in the Itron Security Manager to ensure system communication confidentiality and validity.

- **Authentication.** Authentication is the process of confirming that an artifact is genuine or valid. Authentication in the ERT module is the process of verifying a request is from a valid source and in its original form.
- **Encryption.** Encryption is the process of transforming information to make it unreadable to anyone who does not have a valid security key. There are two types of encryption, symmetric and asymmetric. Symmetric encryption uses a shared key to decrypt or encrypt information. Asymmetric encryption uses a private key to encrypt and a public key to decrypt. Data transmissions over the network are protected using AES-256 encryption.

As a component of the Itron Openway Riva solution, the 500G ERT module supports the security model found in the OpenWay solution for both reading and programming. If the ERT modules are shipped without security enabled (ready to secure), the utility can—at a later date—configure the modules for ISM enhanced security.



Important! Modules ordered pre-programmed with security injected and specified as Zero Touch Deployment require that the installer rotates the wriggler five (5) times to activate the module to join the network, if the module is installed in a location with little or no gas flow.

Functional Specifications

Functional specifications	Description
Power source	Two "A" cell lithium batteries
Tamper detection	Tilt and cut cable
Regulatory and Standards	FCC compliance: Part 15.247, 15.249 (programming) FCC IDs: ■ EWQ500GA: American/Rockwell ■ EWQ500GB: Sprague/Itron ■ EWQ500GC: Commercial ■ EWQ500GR: Remote ISED compliance: RSS-247, RSS-210 (programming) IC: ■ 864D-500GA: American/Rockwell ■ 864D-500GB: Sprague/Itron ■ 864D-500GC: Commercial ■ 864D-500GR: Remote Measurement Canada: Pending
Intrinsically safe per	Telemetry Equipment for use in Hazardous Locations, for Cl I, Div 1, Gp D for Haz Loc, Temp Code T1, $-40^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$.
Operational	All 500G modules operate without the need for an FCC or ISED license. Frequency: 902 to 928 MHz ISM band Program frequency: 908 MHz
Australia	ACMA AS/NZS 4268 Frequency: 915 to 928 MHz ISM band Program frequency: 916 to 926.8 MHz

Functional specifications	Description
Product identification	Numeric and bar coded module type and serial number
Construction materials	Gray polycarbonate housing and back plate with encapsulated electronics

Operational Specifications

Operational specifications	Description
Operating temperatures	-40° to 158° F (-40° to +70° C)
Operating humidity	5 to 95 percent relative humidity
Data integrity	Verified in every data message

Device Firmware Functionality

This section lists the 500G ERT device firmware information and lists functionality by version.

Firmware part number	Global software release (GSR) version	FDM Check Endpoint firmware version	Over-the-air firmware part number	Firmware Functionality
Direct Mount: FMW-7004-005 Remote Mount: FMW-7014-005	5.0	4.13.15	N/A	■ GSR 4.1 functionality ■ 5, 15, 30-minute interval data ■ High flow alarm ■ Low battery alarm ■ Gas Day Take ■ Local auditing for dial and drive rate

Firmware part number	Global software release (GSR) version	FDM Check Endpoint firmware version	Over-the-air firmware part number	Firmware Functionality
Direct Mount: FMW-7002-012 Remote Mount: FMW-7012-012	4.5	2.2.6	N/A	■ GSR 4.1 functionality ■ 3,840 buckets of configurable interval data ■ Interval options are 5, 15, and 30-minute intervals ■ High flow alarm ■ Low battery alarm ■ Gas day take ■ Local auditing

Note: For more information about alarms and events, see the *OpenWay Riva Collection Manager Device Interface Guide* (TDC-1786-XXX).

Related Documents

Document title	Document part number
<i>OpenWay Riva 500G Gas ERT Module Installation Guide, Remote Mount</i>	TDC-1678-000
<i>Customer setup to order secured OpenWay Riva modules</i>	TDC-1748-XXX
<i>First article review form</i>	TDC-1749-XXX
<i>OpenWay Collection Manager Operational Guidelines</i>	
<i>OpenWay Riva Collection Manager Device Interface Guide</i>	TDC-1786-XXX
<i>Itron Mobile Radio User Guide</i>	TDC-1719-XXX
<i>Itron Mobile Radio Quick Reference Guide</i>	TDC-1720-XXX
<i>Gas and Telemetry Module Meter Compatibility List</i>	PUB-0117-002
<i>OpenWay Riva Gas Devices Ordering Guide</i>	PUB-0117-006

Document title	Document part number
<i>OpenWay Riva 500G Gas ERT Module Specification Sheet</i>	101510SP-0X
<i>Field Deployment Manager Tools Application Guide</i>	TDC-1713-XXX
<i>Field Deployment Manager Tools Configuration Guide</i>	TDC-1711-XXX
<i>Field Deployment Manager Field Representative's Guide</i>	TDC-1714-XXX

Note: The last three digits of the user and installation guides represent the document's revision level. The revision level is subject to change without notice.

Installation Requirements

Replacement screws for the residential direct mount 500G are listed in the following table.

Replacement screws				
Meter	To mount the 500G ERT module on the meter:	Itron part number	To mount the index on the 500G ERT module housing:	Itron part number
Elster American	1/4 - 20 x 5/8" slotted, Fillister head		8 - 32 x 3/16" slotted, Fillister head	
Sensus/Rockwell	10 - 24 x 5/8" slotted, Fillister head		6 - 32 x 5/8" slotted, Fillister head	
Itron/Sprague Sprague/Schlumberger 175 RM	10 - 24 x 5/8" slotted, Fillister head 10 - 24 x 1/2-inch, slotted Fillister head	SCR-0175-002	10 - 24 x 3/8" Fillister head	010040-002

Replacement screws				
Meter	To mount the 500G ERT module on the meter:	Itron part number	To mount the index on the 500G ERT module housing:	Itron part number
National/Lancaster	10 - 24 x 3/4" Phillips, flat-head, stainless steel	SCR-0014-004	10 - 24 x 3/8" thread-forming, Phillips pan-head to mount indexes with legs 6 - 19 x 3/8" thread-forming, Phillips, Fillister head to mount indexes with screw holes	SCR-0017-001 SCR-0037-001

Replacement screws for the commercial direct mount 500G are listed in the following table.

Commercial meter	To mount the 500G commercial ERT on the meter:	Itron part number	To mount the index (and index assembly, if applicable) on the 500G commercial ERT housing:	Itron part number
Elster American	2A x 3.35" length, slotted round-head drilled to accept utility-approved wire seals	SCR-0062-001	12 - 24 x 1/2" slotted, Fillister head machine screws, drilled to accept utility-approved wire seals	
Sensus	2A x 3.63" length, slotted round-head drilled to accept utility-approved wire seals	SCR-0062-002	2A x 2.94" length, slotted round-head	SCR-0062-003
Rockwell	For Aluminum Box Direct Reading (VDR) index only	SCR-0062-001		

Commercial meter	To mount the 500G commercial ERT on the meter:	Itron part number	To mount the index (and index assembly, if applicable) on the 500G commercial ERT housing:	Itron part number
Itron			Index mounting screws direct read index dial index	090071 010040-002

3 Programming



Caution: You must program the 500G ERT module before use.

Programming Itron ERT modules requires an understanding of:

- Your meter's drive rate and the number of dials
 - The drive rate and number of dials is important for programming the module to count correctly and roll over to zero at the correct time. For example, a four-dial, 2 cubic-foot meter configuration will count two cubic-feet for each rotation and roll over to zero after 9999.99 where the **ones place** is equivalent to 100 cubic-feet.
- How your system interprets the meter reading
 - Some systems modify the consumption reading with the collection software. Other times, the billing system is used to make modifications. If modifications are made in both systems, issues may cause consumption reading errors.

It is important to understand your system before the ERT modules are programmed.

Program the 500G ERT module in OpenWay Riva Network Mode using a compatible programming device loaded with FDM version 4.1 or higher.

Program the 500G ERT module in Mobile Mode using an approved programming device loaded with Field Deployment Manager (FDM) software version 4.0 or higher.

To enable enhanced security and for more complete programming information, see the *Field Deployment Manager Tools Mobile Application Guide* (TDC-1713).



Important! Modules ordered pre-programmed with security injected and specified as Zero Touch Deployment require the installer to rotate the wriggler five (5) times to activate the module to join the network if installing in a location with little or no gas flow.

Standard Configuration

The OpenWay Riva 500G ERT module is capable of configurations that reduce battery life. Standard battery life is based on the following configuration:

- Hourly interval data
- Interrogations of 3 times per day
- 60 second receiver wakeup

- Five firmware downloads over the life of the ERT module
- Network management and security overhead set to default timing
- RF at capacity (2,000 maximum per cell)
- Average of one two-way command/response per week

Programming the Direct Mount Module

Program the meter drive rate into the ERT module using a compatible programming device.

- | |
|---|
| 1. Verify that you have the correct programming mode (OpenWay Riva Network Mode, or Mobile High-Power Mode, Mobile/Handheld Mode, or Hard-to-read Mobile/Handheld Mode) for your application. |
| 2. For all programming and Check Endpoint operations using a handheld computer, hold the handheld as close to vertical as possible. For best success, keep the handheld within six feet of the target ERT module. |
| 3. Programming parameters are based on the configuration file loaded into the programming device. |
| 4. Read or Check the 500G ERT module using a compatible reading device. <ul style="list-style-type: none">■ If the read result is higher than the number programmed in step 1, the module is counting correctly.■ If the read result is not higher than the number programmed in step 1, replace the ERT module. |

Itron Programs and Software Variables

This section defines and clarifies possible system variables you may encounter in programming 500G ERT modules.

Field Deployment Manager (FDM)

The following tables illustrate various FDM programming configurations and the endpoint response to each setting.

	1,000,000,000,000 CF	100,000,000,000 CF	10,000,000,000 CF	1,000,000,000 CF	100,000,000 CF	10,000,000 CF	1,000,000 CF	100,000 CF	10,000 CF	1,000 CF	100 CF	10 CF	1 CF
3 Dial, 1 cubic foot													1
3 Dial, 2 cubic feet													2
4 Dial, 1 cubic foot													1
4 Dial, 2 cubic feet													2
4 Dial, 5 cubic feet													5
4 Dial, 10 cubic feet												1	
5 Dial, 1 cubic foot													1
5 Dial, 2 cubic feet													2
5 Dial, 5 cubic feet													5
5 Dial, 10 cubic feet												1	
5 Dial, 20 cubic feet												2	
5 Dial, 25 cubic feet												2	5
5 Dial, 40 cubic feet												4	
5 Dial, 50 cubic feet												5	
5 Dial, 100 cubic feet										1			
5 Dial, 500 cubic feet										5			
5 Dial, 1000 cubic feet									1				
6 Dial, 5 cubic feet													5
6 Dial, 10 cubic feet												1	
6 Dial, 20 cubic feet												2	
6 Dial, 50 cubic feet (CCF)												5	
6 Dial, 50 cubic feet (MCF)												5	
6 Dial, 100 cubic feet (CCF)										1			
6 Dial, 100 cubic feet (MCF)										1			
6 Dial, 500 cubic feet (CCF)										5			
6 Dial, 500 cubic feet (MCF)										5			
6 Dial, 1000 cubic feet (CCF)									1				
6 Dial, 1000 cubic feet (MCF)									1				
6 Dial, 10000 cubic feet								1					
7 Dial, 100 cubic feet (CCF)										1			
7 Dial, 100 cubic feet (MCF)										1			
7 Dial, 1000 cubic feet (CCF)									1				
7 Dial, 1000 cubic feet (MCF)									1				

Numbers represent the place and value that will increment per count/pulse

Entered in initial index read

Entered in initial index read but will not increment

Not entered in initial index read but passed on in reading

Not entered in initial index read and will not increment; will always read 0

Internal, incrementing digits not visible or transmitted

Not in SCM or SCM Plus but read out in NIM. Rolls over after 32 bits
4,294,967,295

				100,000,000 M ³	10,000,000 M ³	1,000,000 M ³	100,000 M ³	10,000 M ³	1,000 M ³	100 M ³	10 M ³	M ³	0.1 M ³	0.01 M ³
5 Dial, 0.05 cubic meter														5
6 Dial, 0.10 cubic meter													1	
6 Dial, 1 cubic meter												1		
6 Dial, 10 cubic meters											1			
6 Dial, 100 cubic meters										1				
7 Dial, 10 cubic meters											1			
7 Dial, 100 cubic meters										1				

Programming example

Endpoint programmed for 6 dial, 1000 cubic feet CCF.

1. Enter the initial index read. For this example, the initial read is 123456 where 6 = 600 cubic feet. After the initial programming, an endpoint read will result in a reading of 1234560 where the least significant digit is in 10's of cubic feet. Since counting is with a drive rate of 1000 cubic feet and the reading is transmitted in 10's of cubic feet, the last two digits of the reading will not change.
2. Program the endpoint to 123456.
3. Read the endpoint. The result should be 1234560 with the zero added to put the reading in 10's of cubic feet.
4. Add one count. The result should be 1234660. Notice that the last two digits of **60** do not change.

	1,000,000,000 CF	100,000,000 CF	10,000,000 CF	1,000,000 CF	100,000 CF	10,000 CF	1,000 CF	100 CF	10 CF
6 Dial, 1000 cubic feet (CCF)							1		

Mercury X-Blank options

Endpoints (ERT modules) can be programmed with one of the Mercury X-Blank options. There are 1, 2, 3, and 4 blank option available. Blank options are set up as a *what-you-see-is-what-you-get* (WYSIWYG) configuration. The values are not set in cubic feet or cubic meter standards. The Mercury X-Blank options are used in configurations where the system receives pulses from a corrector or instrument that can change pulse values and has configurable display digits. The Mercury-X Blank options allow users to program the endpoint to match the configuration of the corrector or instrument.

Check Endpoint functions

The FDM Check Endpoint function triggers users to input the number of dials and drive rate if a Check Endpoint is requested for an endpoint programmed for 5, 6, or 7-dial meter configurations. The request to input the dial and drive rate information happens only if the system has more than one option using the same count rate and rollover variable enabled in their FDM business unit.

Note: Itron recommends that users only enable the configurations used by your business unit. Having only one meter configuration option enabled (with the endpoint variable being checked in the FDM business unit) eliminates the need to enter the number of dials.

Field Collection System (FCS) (Mobile Mode only)

In FCS, a Read Type Code can be assigned to a meter session. The Read Type Code in conjunction with the Endpoint Type is used to determine how the endpoint reading is formatted using the Endpoint Translation table in FCS. The Endpoint Translation table is a configurable table that is used to determine the truncation factor and multiplier for each reading. A default Endpoint Translation is defined for each type of endpoint supported by FCS (ReadType of 00 for each EndpointType). If the default Endpoint Translation is not formatting the read correctly, an additional Endpoint Translation can be defined to properly format the read.

Since the Endpoint Translation Code is based on the Read Type Code and the Endpoint Type, changing from a 40-series endpoint to a 100-series endpoint can cause the reading to be truncated differently. If you are having issues with your reading after a change out, check your Read Type Codes and Endpoint Translation Codes.

OpenWay Operation Center (OWOC)

The OpenWay Operation Center (OWOC) collects the raw reading and passes it on without making any formatting changes.

Itron Enterprise Edition (IEE) Meter Data Management

The standard unit of measure (UOM) in IEE is cubic feet for gas endpoints. The reading passed on by the gas endpoint is not in cubic feet if endpoints with 6 and 7-dial meter configurations are programmed, so adjustments are required to set the correct unit of measure. If you are having issues with your readings in IEE but your endpoint and meter index match, check your unit of measure within IEE.

4 Specific Meter Manufacturer Installation

This chapter provides 500G ERT module installation instructions for the compatible meter types. See each section for a listing of those meters.



Important! Modules ordered pre-programmed with security injected and specified as Zero Touch Deployment require that the installer rotate the wriggler five (5) times to activate the module to join the network if installing in a location with little or no gas flow.

Elster American Installation



Residential direct-mount 500G ERT Module



Commercial direct-mount 500G ERT Module

This section provides instructions to install the residential and commercial 500G ERT modules on the following compatible Elster American meters. Some meter manufacturers provide mounting kits and installation procedures for their meters. If the Elster American meter to the 500G ERT module installation instructions are not available, follow the installation procedures in this section.

Meter model	Meter notes	Itron part number	Gas module notes
		ERG-7000-001	
W75AL Aluminum case			
AC-175 Aluminum case			
AL-175 Aluminum case			
ALC-175 Aluminum case			
AT-175 Aluminum case			
AT-210 Aluminum case			
AL-225, Canada only Aluminum case			
5B-225 Aluminum case			Must cut 1/16" off the end of the module wiggler drive post which will make the module incompatible with other 2-ft. drive meters.
AC-250 Aluminum case			
AL-250 Aluminum case			
AM-250 Aluminum case			

Meter model	Meter notes	Itron part number	Gas module notes
AR-250 Aluminum case		ERG-7000-001	
AT-250 Aluminum case			
AL-310 Aluminum case			
AL-350 Aluminum case			
AL-425 Aluminum case			
AC-630 Aluminum case			
AC-800 Aluminum case			
		ERG-7000-007	
AL800 Top mount index			
AL1000 Top mount index			
AL1400 Top mount index			
AL2300 Top mount index			
AL3000 Top mount index			
AL5000 Top mount index			
35B Iron case			
60B Iron case			
80B Iron case, must have front reading index			
250B Iron case			
500B Iron case			

Meter model	Meter notes	Itron part number	Gas module notes
 Rotary RPM series (no pulser, no instrument drive)	Use Elster American kit numbers 93179K002, 003, 004, or 005 to attach a residential 500G ERT module. Purchase the kit from Elster American.	ERG-7000-001	
Rotary RPM series (instrument drive)		ERG-7000-001	

Installation Overview

Installing the 500G direct mount ERT module to an Elster American meter involves four tasks.

1. Removing the index cover and preparing the meter for installation.
 - Preparing the meter requires:
 - A flat-head screwdriver
 - A scraping tool
2. Assembling the index and ERT module.
3. Programming the 500G ERT module. See [Programming on page 19](#) for programming instructions and items needed to program the ERT module.
4. Connecting the ERT module to the meter. Connecting the module to the meter may require the following materials:
 - A compatible index
 - Small and medium flat-blade or Phillips screwdrivers
 - Side-cutting pliers or wire snips
 - (Optional) meter seals, wire seal, and seal press
 - 11/32-inch nut driver or other blunt tool
 - Replacement screws (for replacement screw information, see [Installation Requirements on page 16](#)).

500G ERT module configuration with the meter is dependent on your system application. See the Elster American meter configuration information.

Mechanical Installation

1. Remove the four index cover screws and the index cover from the Elster American residential meter. Alternate screw removal following the numbered pattern in the photo.



2. Examine the mounting screws. If they are 5/8-inch long and not corroded, keep them to install the module assembly to the meter. If the screws are not the correct length or if the screws are corroded, discard.

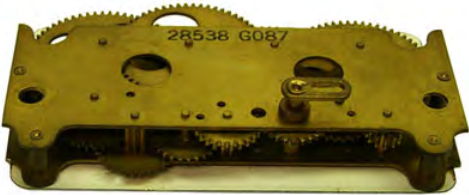
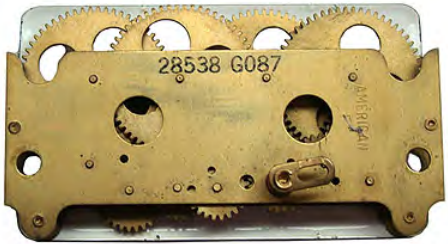
3. Unscrew one index mounting screw completely. Hold one hand under the index to catch the screw. While you remove the other mounting screw, pull the index away from the meter to keep the index backplate against the back of the screw. Remove the screw completely after the index is free of the meter. Set the index aside. You will mount the index to the module later in this procedure.



4. Verify that the index mounting screws are 3/16-inch long and not corroded. If the screws are the correct length and not corroded, retain for later use. If you discarded the original screws, use the correct replacement screws. For replacement screw information, see [Installation Requirements on page 16](#).

5. Remove the old gasket, gasket residue and dirt from the meter (if applicable). The meter face must be free of gasket residue and foreign materials before you install the module.



6. Separate the module housing from the cover by pulling the cover straight out from the housing.	
7. Set the module clear cover aside where it will not be damaged or fill with rain, dirt, or snow. You will use the cover later in this installation procedure. Note: Elster American Meter indexes are available in different models:	
	
Index wrigglers on one-foot meters with drive slots	Index with mounting screw holes
	
Index meters on two-foot meters with drive posts	Index with mounting slots
Note: If your index has mounting screw slots, skip steps 8 and 9. If your index has mounting screw holes, perform steps 8 and 9, and skip steps 10 and 11.	

8. Using the original index mounting screw or a replacement screw, if necessary, place one 8 - 32 3/16-inch screw into one of the index's mounting screw holes.	
9. Attach the screw to the module housing's index mounting post just enough to hold the screw and the end of the index in place.	
10. Screw one 8 - 32 x 3/16-inch screw into the other index mounting post loosely—one or two turns. Do not tighten the screw.	
11. For indexes with mounting slots, place the index mounting screw slot under the screw head. Do not tighten the screw.	
12. Slide the index drive post into the module shaft slot. Verify positive engagement. Caution: If the index wriggler has a drive slot, place the module shaft drive post into the index drive slot. Failure to mate the module shaft with the index drive post (or slot) can cause binding and lead to poor registration or meter failure.	
13. Install and tighten the other index mounting screw (for indexes with either mounting screw slots or holes). Tighten the previously installed index mounting screw. Install and tighten index mounting screws evenly.	

14. Slide the module cover over the index and housing. Verify the cover is installed correctly. The 500G ERT module label should be clearly visible and easily read.



15. Program the module. See [Programming on page 19](#). After successful programming, attach the 500G ERT module assembly to the Elster American meter.

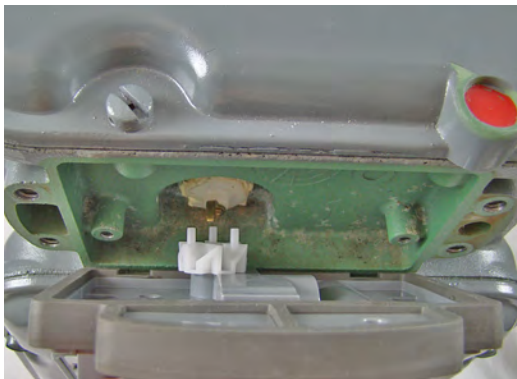
Warning: For 5B-225 aluminum meters only: cut 1/16-inch off each 500G ERT module's wiggler post to prevent the wiggler from rubbing on the face of the nut holding the meter drive dog in place. Trimming the drive post may make the module incompatible with other 2-ft. drive meters.



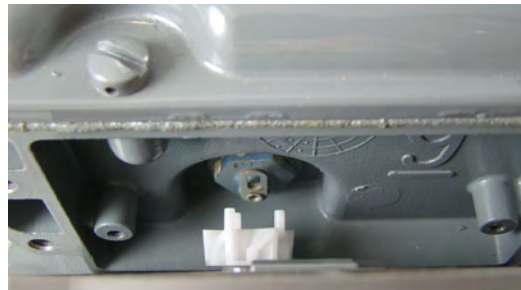
16. Align the 500G ERT module wiggler to connect with the drive post (or slot) of the meter.

Warning: Failure to correctly align the meter drive post and 500G ERT module drive slot can cause binding and lead to poor registration or meter failure. If there is a gap between the 500G ERT module gasket and the meter, it may be the drive slot of the 500G ERT module assembly's wiggler is not correctly aligned with the meter drive slot. Remove the 500G ERT module assembly and repeat the alignment procedure. You must engage the 500G ERT module wiggler with the meter drive dog.

For one-foot meters: Align the 500G ERT module assembly wiggler perpendicular to the meter drive post.



For two-foot meters: Align the 500G ERT module assembly wiggler perpendicular to the meter drive slot. The pin on the 500G ERT module wiggler may be installed inside or outside the meter drive slot. For easy assembly, Itron recommends installing the pin on the module's wiggler outside the meter drive slot.



17. Carefully align the 500G ERT module's four screw holes with the holes on the meter. Attach the assembly using the original mounting screws if they are the correct size and are not corroded (1/4 - 20 x 5/8-inch screws.) If you discarded the original screws, use the correct replacement screws. Tighten the screws in the order shown in the illustration in Step 1.

- Insert first screw and tighten 1/4 to 1/2 turn after the screw contacts the meter connection.
- Insert the second screw and tighten 1/4 to 1/2 turn after contact with the meter connection.
- Insert the third screw and tighten 1/4 to 1/2 turn after contact with the meter connection.
- Insert the last screw and tighten 1/4 to 1/2 turn after contact with the meter connection.

18. Return to the first screw and tighten. Continue with the second, third, and last screw until all screws are tight. Use equal screw tension to tighten each screw.

Important: Meter manufacturers: torque the mounting screws 15 to 20 inch-pounds.

19. Place new tamper seals over the two screws with tamper seal mounts. Press tamper seals into place using an 11/32-inch nut driver or similar blunt tool.



Complete necessary paperwork and verify that all excess materials are removed from the customer premises. 500G ERT module on the Elster American meter is complete.



Commercial Module Mechanical Installation

This section provides instructions to install the commercial 500G ERT Module Elster American/Itron module on Elster American commercial meters.



Warning: Handle the commercial 500G ERT module carefully so the metal passive radiator antenna is not damaged.



Mounting plate with tamper seal cups



Mounting plate without tamper seal cups

Indexes may be mounted on the commercial 500G ERT Module Elster American meter module without mounting plates. Index covers may (or may not) have tamper seal cups (on the back of the cover) for added security. Index removal assumes the installer removes any tamper seals or wires before continuing with these instructions.



Note: It may not be necessary to dismantle your commercial index assembly (index and cover). These instructions do not include index/cover assembly for those applications. Some diaphragm commercial meters do not require an index assembly mounting plate. Indexes can be mounted directly to the module.

Commercial modules mount on Elster American meters in various configurations. These instructions show metal mounting plates without tamper seal cups and plastic mounting plates with tamper seal cups to represent mounting plate options.

1. Remove any tamper seals (1) (or wire seals) from the index cover and mounting plate screws (2). Set the index and cover assembly aside. You will re-install it later in these instructions.



2. Remove the index cover screws from the meter. Verify that screws are 1/2-inch long and are not corroded. If the screws are the correct length and are not corroded, keep them to re-install the module assembly later in this procedure. If the screws are damaged or not the correct length, discard.



3. Remove any tamper seals from the mounting plate.

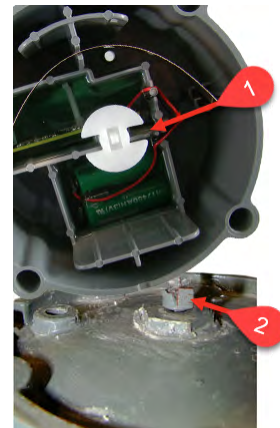
4. Remove the mounting plate screws and separate the mounting plate from the meter. Place the mounting plate where it will not be damaged. You may use it later in this installation.



5. Program the commercial 500G ERT module. For programming instructions, see [Programming the Direct Mount Module on page 20](#). After the commercial module is successfully programmed, attach it to the commercial meter.

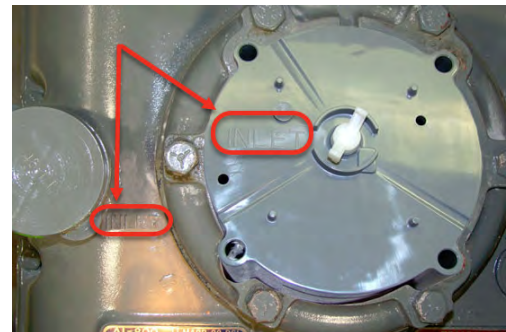
6. Tilt the commercial module at an angle and turn the wriggler until the wriggler's notches (1) line up with the meter's drive dog teeth (2).

Warning: Failure to properly align the 500G ERT module wriggler with the meter drive post can cause binding and lead to poor registration or meter failure.



7. Align the 500G ERT module so the screw holes line up with the meter's top screw holes. Carefully lower the module on the meter with the wriggler notches lining up with the meter's drive dog teeth.

Warning: The INLET label on the 500G ERT module must line up with the INLET label on the meter case.



8. Verify that the bottom of the 500G ERT module and the top of the meter meet. The 500G ERT module housing should rest on top of the meter without gaps.

Warning: Do not press down on the 500G ERT module if a gap exists between the 500G ERT module and the meter. A gap may be caused by misalignment of the 500G ERT module wriggler and meter's drive post. Pushing down on the 500G ERT module could damage the 500G ERT module wriggler or meter drive post. To eliminate a gap, slowly turn the 500G ERT module's drive shaft back and forth until the module aligns with the meter's drive teeth.



9. Place the index cover mounting plate on the commercial 500G ERT module so the printing "FLOW FRONT AL800 AL1000 AL1400 AL2300 AL5000 TURBINE ROTARY" stamped on the plate is toward the front of the meter. (A gap between the mounting plate and meter at the screw locations is normal.)



10. Install four mounting screws included with the 500G ERT module and tighten them in an alternating diagonal sequence. For metal mounting plates with a flat screw surface, use 500G ERT module mounting screws with internal tooth washers. For plastic mounting plates with tamper screw cups, use 500G ERT module mounting screws (use O-ring AS-568A-011, 5/16" ID x 7/16-inch OD for a maximum moisture seal). Turn each screw 1/4 to 1/2 turn after it contacts the mounting plate. If you have access to a torque driver, tighten mounting screws to 20-25 inch-pounds.



11. Place new tamper seals over screws (if the mounting plate has tamper seal cups). Press the tamper seals into place with an 11/32-inch nut driver or a similar blunt tool.

12. Place the mounting plate gasket (previously removed) on the index cover mounting plate. Align the gasket and index cover mounting plate screw holes.

13. Place the index and cover assembly on the index mounting plate. (The index must face the direction it faced before removal.) Attach the index/cover assembly on the mounting plate using original 1/2-inch index screws.

- a. Insert one screw and tighten two turns to hold it in place on the mounting plate.
- b. Insert the second mounting screw and tighten until secure.
- c. Completely tighten the first mounting screw.

Tighten each index cover mounting screw.



14. Install new tamper or wire seals. If tamper seals are installed, press into place with an 11/32-inch nut driver or similar blunt tool. Crimp the seal if utility-approved wire seals are installed.

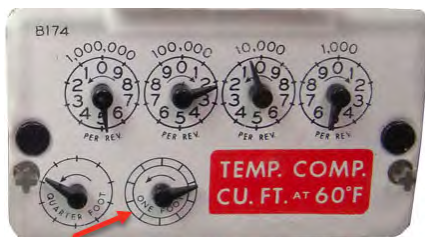
This completes installation of the commercial 500G ERT Module on an Elster American commercial meter.



Programming and Requirements notes

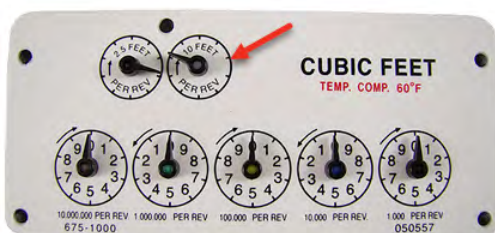
Residential Module Programming Notes

The 500G ERT module is programmed based on the meter's drive rate. Take note of the index drive rate shown on a lower dial on the index. Elster American meter index drive rates are either 1-cubic foot, 2-cubic feet or 0.05 cubic meters (not shown below).



Commercial Module Programming Notes

Take note of the index drive rate shown on the index. The 500G ERT module is programmed based on the drive rate. Elster American commercial meter index drive rates may be 5-, 10- or 100 cubic feet. The index shown has a 10-cubic foot drive rate.



GE Oil and Gas (Dresser) Installation

This section provides the instructions to mount 500G ERT modules (residential and commercial) on compatible GE Oil and Gas (Dresser) commercial rotary meters.

Meter model	Meter notes	Module type	Itron part number	ERT module notes
 Series B3 8C-56M CTR 8C-16M TC (No pulser, no instrument drive)	To attach an Elster American residential module, install GE Dresser's Elster American AMR adapter kit, p/n 059599-000. Purchase AMR adapter from GE Dresser.	500G	ERG-7000-001	
 Series A (LMMA) 1.5M-5M CTR (No pulser, no instrument drive)	To attach an Elster American residential module, install GE Dresser's Elster American AMR adapter kit, p/n 058530-610. Purchase AMR adapter from GE Dresser.			
Series A (LMMA) 7M-16M CTR (No pulser, no instrument drive)	To attach an Elster American residential module, install GE Dresser's Elster American AMR adapter kit, p/n 058531-610. Purchase AMR adapter from GE Dresser.			

Meter model	Meter notes	Module type	Itron part number	ERT module notes
Series A (LMMA) 1.5M-5M TC (No pulser, no instrument drive)	To attach an Elster American residential module, install GE Dresser's Elster American AMR adapter kit, p/n 058224-641. Purchase AMR adapter from GE Dresser.			
 Series Z 5C/8C15	To attach an Elster American residential module, install GE Dresser's Elster American AMR adapter kit, p/n 059847-000. Purchase AMR adapter from GE Dresser.			
 Instrument Drive B3: CTR or TC 8C-11M LMMA: CTR or TC 1.5M-11M	Instrument platform with mechanical drive	500G	ERG-7000-007 ERG-7000-008	Instrument drive determines if ERG-7000-007 (Elster American commercial module) or ERG-7000-008 (Sensus commercial module) is required.

Some commercial AMR applications require a GE Oil and Gas rotary meter with a residential 500G ERT module. Only Elster American version residential 500G ERT modules are compatible with GE Oil and Gas series rotary gas meters. This section provides the instructions to mount an Elster American residential 500G ERT module on GE Dresser AMR-ready rotary commercial meters. Installation requires an AMR adapter kit supplied by GE Oil and Gas.

Installation Overview

500G ERT module configuration with the meter is dependent on your system application. See the GE Oil and Gas meter configuration information.

Installing the 500G direct mount ERT module to a GE Oil and Gas product involves four tasks.

1. Removing the index cover and preparing the meter for installation.
 - Preparing the meter requires:
 - A flat-head screwdriver
 - A scraping tool
2. Assembling the index and ERT module.
3. Programming the 500G ERT module. See [Programming on page 19](#) for programming instructions and items needed to program the ERT module.
4. Connecting the ERT module to the meter.

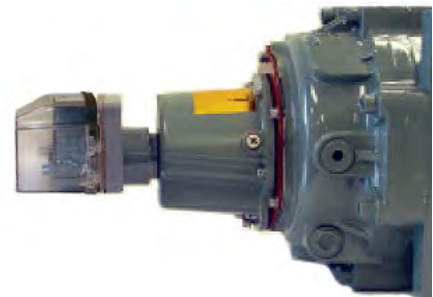
Connecting the residential module to the meter may require the following materials:

- A compatible index
- Small and medium flat-blade or Phillips screwdrivers
- Side-cutting pliers or wire snips
- (Optional) meter seals, wire seal, and seal press
- 11/32-inch nut driver or other blunt tool
- Replacement screws (for replacement screw information, see [Installation Requirements on page 16](#))

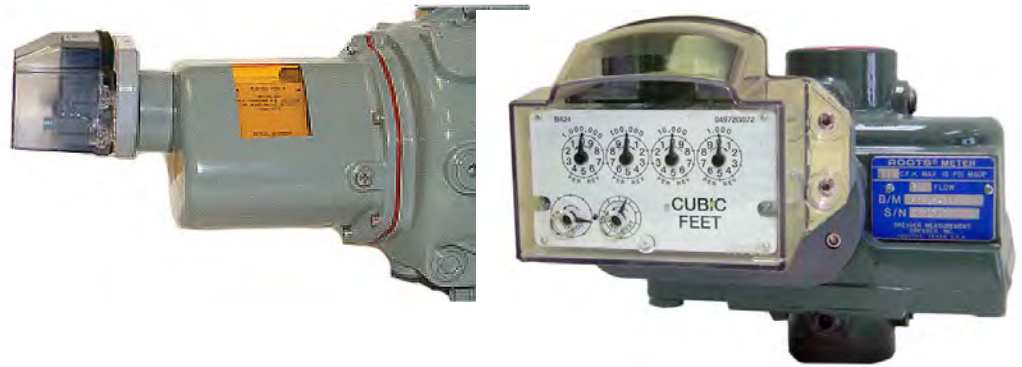
The following pictures show typical residential 500G ERT module installations.



GE Dresser B3 CTR/TC



GE Dresser LMMA CTR



GE Dresser LMMA TC

GE Dresser 8C15

Connecting the commercial module to the meter may require the following materials:

- One index mounting plate (if applicable)
- Gasket and drive cover kit (if applicable)
- An Elster American Meter or Sensus commercial ERT module
- A flat, slot-drive screwdriver

Note: A cover is installed on the commercial 500G ERT module mounted to a GE Dresser meter with S3A LMMA accessory units (or other GE Oil and Gas adapters with odometer gauges).

Residential Module Installation

After the 500G ERT module programming is complete, attach the ERT assembly to the GE Dresser rotary meter. This mounting procedure applies to B3 CTR or TC, LMMA CTR or TC, and 8C15 series GE Dresser meters.

1. The 500G ERT module must be mounted on the adapter plate in an upright position. Align the module wriggler with the opening between the tabs of the adapter's drive dog.

- Insert one module mounting screw and tighten enough to hold the module. Do not completely tighten the screw.
- Insert the second mounting screw and tighten it two turns.
- Insert the third mounting screw and tighten it two turns.
- Insert the last mounting screw and tighten it until snug. Tighten the remaining mounting screws in an alternating, diagonal pattern until snug. Tighten all mounting screws evenly.

Warning: A gap may be caused by misalignment of the ERT module wriggler and adapter's drive teeth. Pushing down on the ERT module could damage the ERT module wriggler or adapter's drive teeth. To eliminate a gap, remove the ERT module assembly and re-align the ERT wriggler with the adapter's drive teeth.

2. Complete necessary paperwork and verify all excess materials are removed from the customer's premises.

Residential Elster American 500G ERT module installation on the GE Dresser rotary meter is complete.

Commercial Module Mechanical Installation

The information in this section guides you through the installation of the commercial 500G ERT on GE Oil and Gas rotary meters.

Note: This installation procedure requires a GE Oil and Gas rotary gas meter with an instrument drive. These instructions show an Elster American commercial ERT module. The installation procedure is identical for the Sensus commercial ERT module.



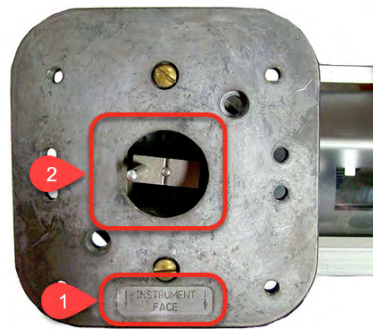
Elster American commercial 500G ERT module Sensus commercial 500G ERT module



Warning! Handle the commercial ERT module carefully so the metal passive radiator antenna is not damaged.

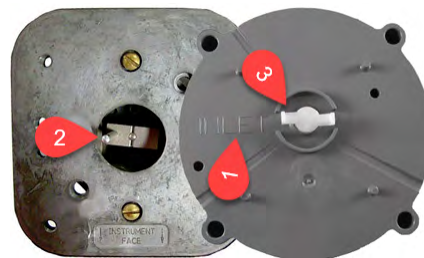


1. Locate the INSTRUMENT FACE stamp (1) and position the meter with the drive dog (2) centered (as shown).



2. Locate the INLET (1) stamp on the ERT and position the ERT as shown in the following illustration. Verify that the commercial 500G ERT module wriggler (3) and drive dog shaft (2) are aligned.

Warning: Failure to properly align the ERT module wriggler with the meter drive post can cause binding and lead to poor registration or meter failure.



3. Verify that the ERT wriggler and drive dog shaft are engaged by turning the commercial ERT module wriggler. When properly engaged, you will feel resistance.

4. Place the customer-supplied index mounting plate on the ERT and install the four mounting screws. Do not disturb the shaft alignment.



5. Install the four ERT module mounting screws (supplied with the commercial ERT). Tighten mounting screws in an alternating, diagonal pattern. Tighten each ERT module mounting screw evenly.

- Turn each screw 1/4 to 1/2 turn after it contacts the cover.
- Torque to 20 to 25 inch-pounds.

6. Insert new utility-approved wire seals and crimp (if required).

Note: To mount an index and index cover on a rotary meter without an accessory odometer unit, remove the domed cover.



Completed Installation Examples



Elster American commercial 500G ERT module mounted on a GE Dresser Meter with an instrument drive



Sensus commercial 500G ERT module mounted on a GE Oil and Gas meter with an instrument drive

Programming and Requirements Notes

Programming Notes for Residential Direct Mount ERT Modules

For 5C15 and 8C15 rotary meters, program as 4-dial, 2-cubic foot index. For all other residential 500G ERT module to GE Oil and Gas installations, refer to GE Oil and Gas register and drive rate information for your meter type.

Index style	8C-11M	16M	16M-56M	1.5-11M	16M-102M
	Meter size				
B3 CTR index	10		100		
B3 TC index (Meter built 1/1999 and beyond)	10	100			
B3 TC index (Meter built prior to 1/1999)	50	500			
LMMA CTR index				10	100
LMMA TC or Series 3 CTR/TC index		100		10	

Programming Notes for Commercial Direct Mount ERT Modules

The 500G ERT module is programmed based on the meter's drive rate. See GE Oil and Gas meter drive rates for commercial ERT modules.

Index style	Meter size				
	8C-11M	16M	16M-56M	1.5-11M	16M-102M
B3 CTR index	10		100		
B3 TC index (Meter built 1/1999 and beyond)	10	100			
B3 TC index (Meter built prior to 1/1999)	50	500			
LMMA CTR index				10	100
LMMA TC or Series 3 CTR/TC index		100		10	

Itron Meter Installation

This section describes installing the 500G ERT module on Itron residential and commercial meters. Itron meters are also known as Actaris, Schlumberger, or Sprague meters. For these instructions, all meters will be referred to as Itron meters.

**Residential Itron 500G ERT module****Commercial Elster American/Itron 500G ERT module**

Meter model	Meter notes	Module type	Itron module part number	ERT module notes
 175	3-hole index cover 2-hole index cover	500G	ERG-7000-005	
175 combination	3-hole index cover integrated regulator 2-hole index cover			
175WC	3-hole index cover			
210	Slant-face meter			
240	Slant-face meter			
240	2-hole index cover			
240 combination	Integrated regulator			
250	Slant-face			

Meter model	Meter notes	Module type	Itron module part number	ERT module notes
 I-250	Slant-face			
250WC	Integrated regulator			
305 combination	Integrated regulator			
400	Slant-face meter			
 400A	Slant-face meter			

Meter model	Meter notes	Module type	Itron module part number	ERT module notes
 METRIS 250	Slant-face	500G	ERG-7000-005	A longer mounting screw is required when retrofitting to METRIS meters. Longer mounting screw is Itron p/n 010626-002.
 METRIS RM	Slant-face meter, back inlet and outlet			
METRIS MB	Slant-face meter, back inlet and outlet without regulator			
1A	Flat-face meter includes 3-dial, 2cf indexes	500G	ERG-7000-005	Installation requires Itron 1A adapter kit part number CFG-0015-001. Purchase from Itron.
240	Flat-face meter 1-hole index cover			

Meter model	Meter notes	Module type	Itron module part number	ERT module notes
 675A 800A 1000A	Top-mount index	500G	ERG-7000-007	Requires Itron (Actaris) adapter part number 80005901-001. Purchase from Itron.
175RM	Flat-face meter regulator on back of meter	500G	ERG-7000-009	

Installation Overview

Installing the direct mount 500G ERT module on an Itron meter involves four tasks.

1. Removing the index cover and preparing the meter for installation.
 - Preparing the meter requires:
 - A flat-head screwdriver
 - A scraping tool
2. Assembling the index and 500G ERT module.
3. Programming the 500G ERT module. See [Programming and Requirements notes on page 37](#) for programming instructions and items needed to program the 500G ERT module.
4. Connecting the 500G ERT module to the meter. Connecting the module to the meter may require the following materials:
 - A compatible index
 - Small and medium flat-blade or Phillips screwdrivers
 - Side-cutting pliers or wire snips

- (Optional) meter seals, wire seal, and seal press
- 11/32-inch nut driver or other blunt tool
- Replacement screws (for replacement screw information, see [Installation Requirements on page 16](#))

Note: 500G ERT module installation on a flat-faced Sprague meter requires the Itron adapter plate kit (CFG-0015-001). The adapter plate kit includes:



- the adapter shim plate (1)
- index cover mounting screws (2)
- extended drive dog (3)
- adapter plate mounting screws (4)

Installation on Itron commercial meters may require the following optional materials, available from Itron.

Optional commercial module installation materials (available from Itron)		Itron part number
Index cover		80006001

Optional commercial module installation materials (available from Itron)		Itron part number
Commercial index		Various

Itron adapter kit materials (part number 80005901-001)		Itron part number (kit component)
Adapter plate		550418-001
500G ERT module mounting screws (4)		550416
Adapter plate mounting screws (2)		550622
Screw bushings (4)		550420
Tamper seals		017167

Itron adapter kit materials (part number 80005901-001)		Itron part number (kit component)
Extension driver		550417

500G ERT module configuration with the meter is dependent on your system application.

Itron Residential Meter Mechanical Installation

This section describes installation on Itron residential meters.

1. Remove the index cover screws and the index cover from the Itron meter. Examine the mounting screws. If they are 5/8-inch long and not corroded, keep them to re-attach the 500G ERT module assembly. If the screws are not the correct length or if the screws are corroded, discard them.



2. Loosen the index mounting screws 1/2 to one turn. Slide the index to the left and off the mounting screws. Remove the index and index screws from the meter and set aside for later use. If the screws are damaged or corroded, replace them with the proper replacement screws. For replacement screw information, see [Installation Requirements on page 16](#).



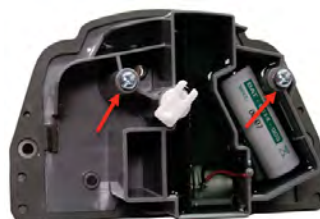
3. Remove the old gasket, gasket residue, and dirt from the meter (if applicable). The meter face must be free of gasket residue or dirt before you install the 500G ERT module.



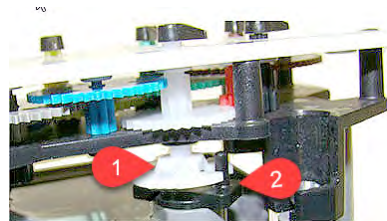
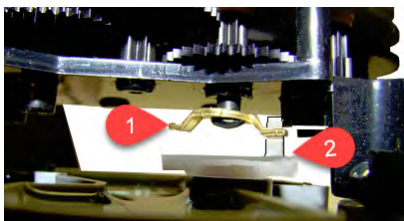
4. Separate the 500G ERT module housing from the cover by pulling the cover straight out from the housing. Set the 500G ERT module cover aside for use later in this installation procedure.



5. Insert the 10 - 24 x 1/4-inch screws (removed in Step 2) into the index mounting posts two turns. Do not tighten the screws.



6. Align the index wriggler (1) with the drive post of the 500G ERT module shaft (2). Carefully slide the index onto the mounting screws.



7. Verify that the module's shaft drive post makes positive engagement with the index wriggler.

Warning: Indexes have varying drive mechanism styles. Failure to align the 500G ERT module shaft with the index drive post can cause binding and lead to poor registration or meter failure. To verify proper engagement of the index to the 500G ERT module shaft, spin the wriggler one clockwise rotation, then one-counterclockwise rotation. Do not spin the wriggler more than one complete rotation. The wriggler should spin freely, with little or no resistance.

8. Hold the index in place and tighten the index mounting screws.

Warning: Verify that the index is correctly positioned all the way to the right on the index mounting screws before you tighten the index mounting screws. Failure to properly mount the index on the index mounting screws may cause binding and meter failure.



9. Slide the 500G ERT module cover over the index and housing. Verify the cover is installed correctly. The 500G ERT module label should be clearly visible and easily read.

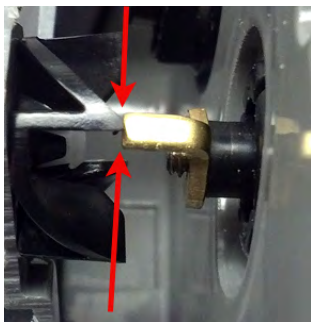


10. After you program the 500G ERT module, attach it to the Itron meter. For programming information, see [Programming the Direct Mount Module on page 20](#).

11. Align the 500G ERT module so one of its four drive *fins* (1) lines up with the meter drive dog (2).



Warning: Failure to correctly align the meter drive post and 500G ERT module wiggler can cause binding and lead to poor registration or meter failure. If there is a gap between the 500G ERT module gasket and the meter, it may be that the wiggler of the 500G ERT module is *dead-headed* against the meter drive dog as shown in the following illustration. Remove the 500G ERT module assembly and repeat the alignment procedure. You must engage the meter drive post with the 500G ERT module wiggler.



12. Place the 500G ERT module on the meter.

13. Insert the right module mounting screw and tighten the screw until the gasket is against the meter. Do not completely tighten the mounting screw.



14. Slightly raise the left side of the 500G ERT module (the module will rotate on the right screw) until the left 500G ERT module mounting hole is approximately 1/4-inch above the left meter mounting hole.



15. Rotate the 500G ERT module down until the module mounting hole is approximately 1/4-inch below the meter hole.



16. Rotate the 500G ERT module up to align the left mounting holes. Raising and lowering the 500G ERT module on the meter drive post facilitates the proper positioning and engagement of 500G ERT module wriggler with the meter drive post.



17. Insert the left mounting screw and tighten a few turns. Tighten the right and left 500G ERT module-to-meter mounting screws in an alternating pattern. Tighten each mounting screw evenly.



Important: The following conditions ensure proper engagement of the 500G ERT module to the meter. Meter manufacturers: torque the mounting screws 15 to 20 inch-pounds.

- The 500G ERT module fits flush against the meter body there are no gaps between the 500G ERT module gasket and the meter body.
- The 500G ERT module mounting holes align with the index cover mounting holes on the meter body.
- The meter test dial moves in relation to gas flowing through the meter.

18. Place a new tamper seal in the tamper seal cups surrounding the two mounting screws. Press the new tamper seals into place using an 11/32-inch nut driver or similar blunt tool. 500G ERT module installation on the Itron meter is complete.



19. Complete any necessary paperwork and properly dispose excess installation materials and scrap from the customer premises.

500G Mechanical Installation Using the Itron Adapter Plate Kit

1. 500G ERT module installation on a flat-faced Sprague meter requires the Itron Adapter Plate Kit (CFG-0015-001).

Warning: The adapter plate must fit flush against the meter face. Some older Sprague meters are not compatible with the adapter plate. The following examples illustrate the potential obstruction (problem) areas between the adapter plate and meter. Failure to mount the adapter plate flush on the front of a meter could result in a binding condition and lead to poor registration or meter failure.



2. Remove the drive dog from the flat-faced Sprague meter. Replace it with the extended drive dog included in the kit. Hand-tighten to snug.

Warning: A gasket surrounds the meter drive dog shaft. A gas leak could result if the gasket is damaged. Do not use a tool to install or tighten the new drive dog. Hand-tighten only.

3. Attach the adapter plate to the meter with the gasket against the meter face. Secure the plate to the meter with the two adapter plate mounting screws. Tighten the screws in an alternating pattern.

- Insert the right adapter plate screw and tighten the screw enough to hold it in place.
- Install the left mounting screw and tighten to a snug fit.
- Finish by tightening the right mounting screw to a snug fit.

Tighten each screw evenly.

Note: The ERT module and index assembly must be programmed and installed following the instructions in [Programming on page 19](#).

Mechanical Installation to Sprague 175RM Meters

This section provides the information to install the 500G ERT Module to a Sprague 175RM meter.



1. Remove the index cover mounting screws and the index cover from the Sprague 175RM meter. Discard the index cover and index cover mounting screws.



2. Loosen the index mounting screws 1/2 to one turn. Slide the index up and off the mounting screws and remove it from the meter. Set the index aside where it will not be damaged or fill with dirt, rain or snow. You will mount the index in the module later in this procedure. Remove the index mounting screws from the meter. Verify that the index mounting screws are 1/4-inch long and not corroded. If the screws are the correct length and not corroded, retain for later use. If the original screws are discarded, use the correct replacement screws.

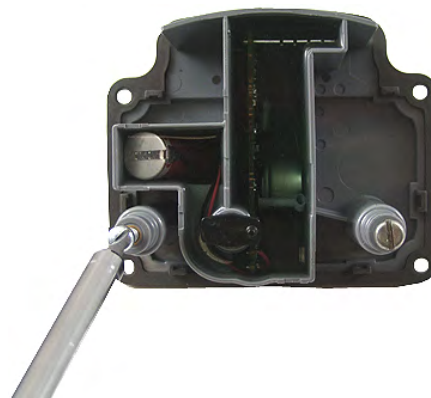
3. Remove the old gasket, gasket residue, and dirt from the meter (if applicable). The meter face must be free of gasket residue and dirt before you install the 500G ERT module.



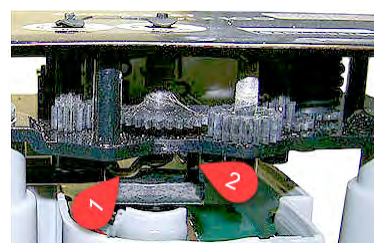
4. Separate the 500G ERT module housing from the cover by pulling the cover straight out from the housing. Set the module cover aside for use later in this installation procedure.



5. Screw the index mounting screws into the index mounting posts loosely (one to two turns). Do not tighten the screws.



6. Align the index wiggler (1) with the 500G ERT module drive post (shaft, 2).



7. Carefully slide the index onto the mounting screws. Verify that the module's drive post makes positive engagement with the index wiggler. Tighten the index mounting screws.



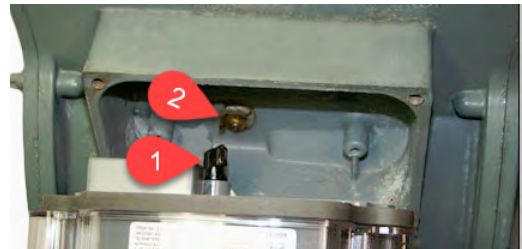
8. Program the Itron 175RM meter before you install the assembly to the meter.

9. Slide the 500G ERT module cover over the index and housing. Verify that the cover is installed correctly. The label should be clearly visible and easily read.



10. Align the module wiggler (1) with the meter's drive dog (2).

Warning: Failure to properly align the 500G ERT Module wiggler with the meter drive post can cause binding and lead to poor registration or meter failure.



11. Use the replacement mounting screws shipped with the 500G ERT Module. Install module-to-meter mounting screws in an alternating pattern. Tighten the mounting screws in the order numbered and in an alternating diagonal fashion as shown in the illustration. Tighten each mounting screw evenly.

Important: Meter manufacturers: torque the mounting screws 15 to 20 inch-pounds.



12. Place a new tamper seal over the two screws in the tamper seal cups. Press the new tamper seals into place using an 11/32-inch nut driver or similar blunt tool.



13. Complete any necessary paperwork and properly dispose excess installation materials and scrap from the customer premises.

500G ERT Module installation on the Sprague 175RM meter is complete.



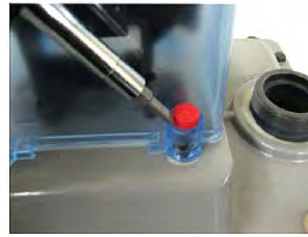
Itron Commercial Meter Mechanical Installation

This section provides instructions for installing the commercial module on the Itron, Sprague, Actaris, or Schlumberger 675A, 800A, and 1000A commercial meter. The installation requires an Itron adapter kit available from Itron.

Preparing the Commercial Meter

1. Place a slotted screwdriver over one of the red security seal covering the index cover mounting screws.
2. Push on the handle-end of the screwdriver to drive the slotted end into the security seal.

3. Pry the broken security seal out of the index screw mounting cup. Be careful not to damage the index cover. Remove the second security seal.



4. Remove the index cover mounting screws with the slotted screwdriver.

5. The index cover has either a room temperature vulcanizing (RTV) or cork gasket. Carefully remove the index cover and inspect the cover for wear or damage to the RTV (silicone) or cork gasket.

Caution: If the RTV silicone gasket is damaged during removal or shows signs of degradation, you must replace it with a new index cover from Itron.

6. Set the index cover aside. The index will be reinstalled later in the installation.

Removing a commercial index

7. Remove the two screws holding the index bracket to the meter.



8. To remove a dial index, loosen the two screws holding the index to the index bracket in an alternating pattern:

- Loosen the right index mounting screw two turns.
- Loosen the left index mounting screw two turns.
- Loosen the right and left index mounting screws until you can slide the index to the left and away from the index mounting screws and bracket.



9. To remove an odometer index, remove the two screws holding the index to the index bracket. Temporarily store the index and index mounting screws in a safe location.

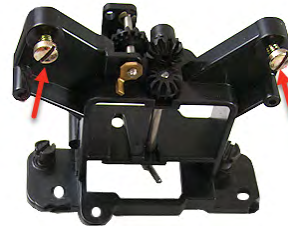


Completing the installation

Install the dial index on the index bracket

1. If the original dial index mounting screws cannot be reused, remove them from the index mounting bracket and recycle or discard.

2. Insert the dial index mounting screws (part number 010040) in the index mounting bracket. Tighten the index mounting screws just enough to secure them in the index mounting bracket.



3. Slide the index mounting legs (1) all the way to the right over the index screws. *The mounting bracket drive dog must engage with the index wriggler (2).*

Warning: Failure to properly engage the mounting bracket drive dog and index wriggler may cause binding and meter failure.



4. Tighten the index mounting screws in an alternating pattern.



Warning: Verify that the index is correctly positioned all the way to the right on the index mounting screws before you tighten the index mounting screws. Failure to properly mount the index on the index mounting screws may cause binding and meter failure.

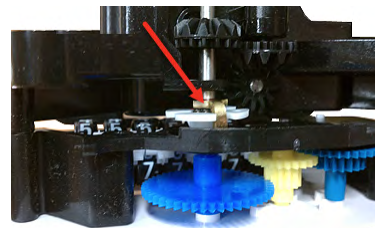
5. Torque the index mounting screws to 3 to 6 inch-pounds.

Install an odometer index on the index mounting bracket

6. If the original odometer index mounting screws cannot be reused, recycle or discard them. Use new odometer index mounting screws (part number 090071).

7. Align the mounting bracket drive dog with the index wriggler.

Warning: Failure to properly engage the mounting bracket drive dog and index wriggler may cause binding and meter failure.



8. Insert the odometer index mounting screws through the index mounting hole and into the mounting bracket.



9. Tighten the index mounting screws in an alternating pattern. Torque the index mounting screws to 3 to 6 inch-pounds.

Note: You must program the commercial module before installation on the Itron commercial meter. For programming information, see [Programming the Direct Mount Module on page 20](#).

10. Turn the commercial 500G ERT module over and place the four mounting screw bushings into the screw holes on the module.

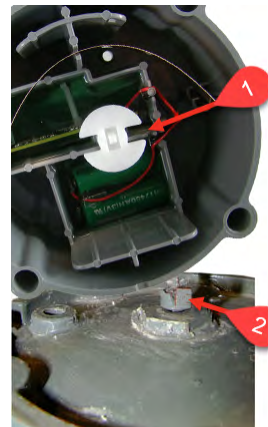
Warning: Handle the 500G ERT module carefully so the passive radiator antenna is not damaged.



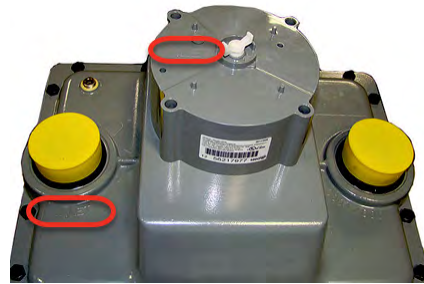
11. Push the screw bushings all the way into the mounting screw holes to secure the screw bushings in the mounting screw hole and prevent them from falling out when the module is turned to install it on the meter.

12. Turn the module on its side and align the module's wriggler with the meter's drive dog.

Warning: Failure to properly align the 500G ERT module wriggler with the meter drive post can cause binding and lead to poor registration or meter failure.



13. Align the INLET lettering on the commercial module with the INLET lettering on the meter.



14. Slowly lower the module onto the Itron commercial meter. Carefully align the meter drive dog and commercial 500G ERT module wriggler. The module housing should rest on the top of the meter without gaps.

Warning: Do not press down on the module if a gap exists between the module and the meter. A gap may be caused by misalignment of the 500G ERT module wriggler and meter wriggler's drive teeth. Pushing down on the 500G ERT module could damage the 500G ERT module wriggler or meter drive teeth. To eliminate a gap, remove the 500G ERT module and repeat steps 12 and 13.



15. Align the back outer index bracket screw holes with the adapter plate mounting holes.



16. Secure the index assembly to the adapter plate with the two 1/4-20 x 0.375 Fillister-head screws. Torque the index bracket mounting screws 3 to 6 inch-pounds.

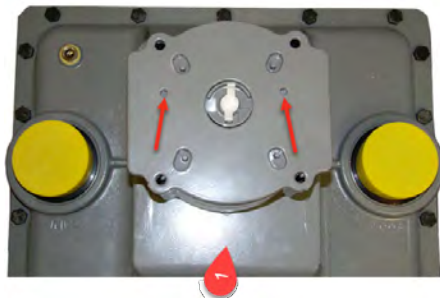
Note: After assembly, the index will be centered on the adapter plate.

17. Place the extension driver on the commercial module wriggler. Apply a little pressure to ensure that the extension driver seats securely on the commercial module wriggler.



18. Place the Itron adapter plate on the commercial 500G ERT module with the two small screw holes in the adapter plate to the back of the meter. The front of the adapter plate must align with the front of the meter (1).

Note: The illustration shows the adapter plate without the index mounting bracket assembly or the extension driver to illustrate the location of the small screw holes. Install the index mounting bracket assembly before you place the adapter plate on the commercial module.



19. Carefully place the adapter plate index assembly on the commercial module and extension driver assembly. The extension driver (1) must align with the index drive dog (2).



20. Place the index cover over the index with the clear side covering the index dials for easy reading. Align the holes in the index cover with the adapter plate mounting holes.

21. Secure with the four mounting screws from the adapter kit. Tighten the mounting screws in a diagonal alternating pattern. Tighten each index mounting screw evenly. If you have access to a torque-driver, tighten mounting screws 20 to 25-inch pounds



22. Insert tamper seals in the tamper seal cups on the index cover and press into place with an 11/32 nut driver or similar blunt tool.



This completes installation of the commercial 500G ERT module on the Itron meter.



Programming and Requirements Notes

The ERT module is programmed based on the meter's drive rate. Take note of the index drive rate shown on the drive dial on the index. The ERT module is programmed based on the drive rate.

Residential Meter Drive Rates

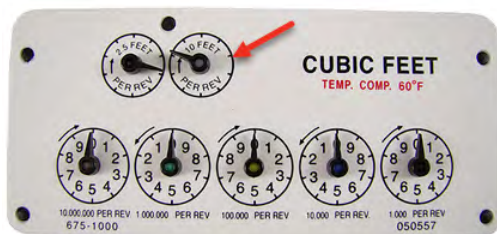
Itron residential meter index drive rates are typically 2-cubic feet.

Sprague 175-RM meter index drive rates are typically 2-cubic feet.



Commercial Meter Drive Rates

Take note of the index drive rate shown on the index. The ERT is programmed based on the drive rate. The index shown has a 10-cubic foot drive rate.



Attaching Brass Meter Tags to Flat-faced Meters

Some older Sprague meters have metal index covers with brass meter tags attached (by screws or rivets) to metal index covers.

1. Typically, brass meter tags have mounting (screw/rivet) holes on each end of the tag. Secure the brass meter tag using one of the three Itron-approved methods.

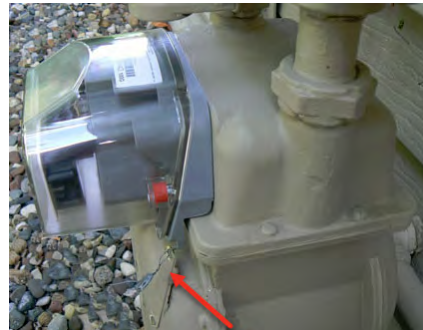


Methods 1 and 2

2. Carefully remove the brass meter tag from the meter index cover. Try not to damage the meter tag mounting holes.

3. Attach the 500G ERT module assembly to the meter. The Sprague adapter plate has tag mounting holes in the lower left and right corners. Secure the meter tag to one of the holes with a utility-approved and provided security seal.

Method 1: Attach the meter tag to the adapter plate tag mounting hole



Method 2: Attach the meter tag to the 500G ERT module mounting hole

4. Attach the meter tag to the meter mounting hole.

Note: If the brass meter tag will be secured to the meter using the meter index cover mounting hole, it must be attached during the installation procedure.



Caution: A protruding brass meter tag can present a safety concern, particularly if the tag is damaged with sharp edges protruding from the meter.

Method 3: Place the brass meter tag inside the 500G ERT module assembly.

5. Remove the 500G ERT module index cover and place the meter tag inside the 500G ERT module assembly for optimal meter tag security.



National (Lancaster) Meter Installation

This chapter provides instructions to install the 500G ERT module on 175 - 250 CFH National (Lancaster) meters.



Meter model	Meter notes	Module type	Itron module part number	Gas module notes
	National meter indexes with bow-tie shaped wigglers cannot be used.	500G	ERG-7000-006	Actaris/Schlumberger/Sprague direct read (odometer) indexes cannot be used.
175				
U175 and UL175				
250				

Installation Overview

Installing the 500G direct mount ERT module to a National (Lancaster) product involves four tasks.

1. Removing the index cover and preparing the meter for installation.
 - Preparing the meter requires:
 - A flat-head screwdriver
 - A scraping tool
2. Assembling the index and ERT module.
3. Programming the 500G ERT module. See [Programming on page 19](#) for programming instructions and items needed to program the ERT module.
4. Connecting the ERT module to the meter. Connecting the module to the meter may require the following materials:
 - A compatible index
 - Small and medium flat-blade or Phillips screwdrivers
 - Side-cutting pliers or wire snips
 - (Optional) meter seals, wire seal, and seal press

- 11/32-inch nut driver or other blunt tool
- Replacement screws (for replacement screw information, see [Installation Requirements on page 16](#)).

500G module configuration with the meter is dependent on your system application.

Mechanical Installation

This section describes the mechanical installation of the National meter and the 500G ERT module.

1. Remove any tamper seals from the index cover screws. Remove the index cover screws and the index cover from the meter. Discard the index cover mounting screws and index cover. The ERT module includes new, different-size ERT module mounting screws.



2. Remove one index mounting screw completely. Hold one hand under the index to catch the screw.

3. While you remove the other mounting screw, pull the index away from the meter to keep the index back-plate against the back of the screw. Remove the screw completely after the index is free of the meter.



4. Set the index aside—you will attach the index to the ERT module later in this procedure.

5. Discard the index mounting screws. The ERT module for National (Lancaster) meters includes new, different-sized index mounting screws.

6. Remove the old gasket, gasket residue, and dirt from the meter (if applicable). The meter face must be free of gasket residue or dirt before you install the ERT module assembly.

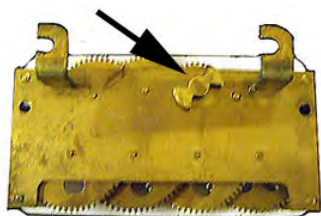


7. Separate the module housing from the cover by pulling the cover straight out from the housing.

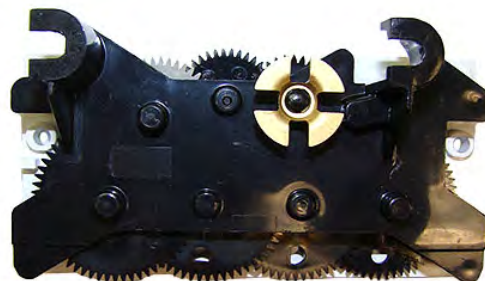


8. Set the ERT cover aside where it will not be damaged or fill with rain, dirt, or snow. You will use the cover later in this installation procedure.

Caution: Use only dial-type indexes from National, Actaris, Schlumberger, or Sprague meters with the ERT module. Indexes with bow-tie shaped wrigglers are not compatible with the ERT module. You must use a compatible index.



National (Lancaster) meter indexes are available in different models:





Some National meter indexes have index legs to mount the index on the meter or ERT. Some indexes have both legs and index mounting holes and some have just mounting holes. Mounting methods are dependent on the index. Index types require different mounting screws to attach the index to the ERT module housing. Indexes with legs must be mounted to the ERT housing mounting posts (1). Indexes with mounting holes must be attached to the ERT housing's bracket mounting posts (2).

If your index has legs with mounting screw slots, skip steps 9 and 10. If your index has mounting screw holes in the index back plate (no legs), perform steps 9 and 10, and skip steps 11 and 12.



9. For indexes with mounting screw holes in the index back plate (no legs), use the replacement index mounting screws (SCR-0037-001). Place one screw into the index's right-hand mounting screw hole.



10. Attach the screw to the ERT housing's right-index mounting post just enough to hold the screw and the right end of the index in place.

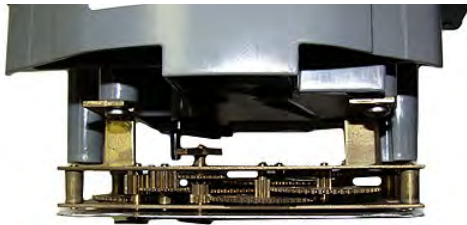
11. For indexes with legs (mounting slots), screw one 10 - 20 x 3/8-inch screw (SCR-0017-001) into the right index mounting post one or two turns. Do not completely tighten the screw.

12. Place the right index mounting screw slot under the screw head. Do not completely tighten the screw.

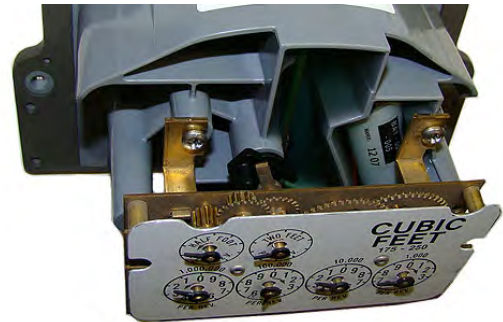
13. Carefully slide the index drive post into the ERT shaft slot. Verify positive engagement of the index wriggler to the ERT shaft. (The following illustrations show index to shaft placement with positive engagement.)



Warning: Verify that the index drive slot engages with the ERT module shaft. Failure to mate the ERT shaft with the index drive post (or slot) can cause binding and lead to poor registration or meter failure.



14. Install and tighten the left index mounting screw (for indexes with either mounting screw slots or holes). Tighten the right index mounting screw. Tighten each index mounting screw evenly.



Warning: Slide indexes with mounting screw slots all the way to the right. Verify that the ERT module shaft is aligned with the index drive post. Hold the index tightly in place while you secure the index mounting screws.

15. Slide the ERT module cover over the index and housing. Verify that the cover is installed correctly. The ERT module label should be clearly visible and easily read.



16. After you program the ERT module, complete the ERT module installation by installing the module on the meter. For programming information, see [Programming on page 19](#).

17. Align the black wriggler (1) so one of its four drive *pins* lines up with the meter's drive dog (2).



18. Carefully place the ERT module on the meter.

Warning: Failure to correctly align the meter drive post and ERT module wriggler can cause binding and lead to poor registration or meter failure. If there is a gap between the ERT module gasket and the meter, it may be that the wriggler of the ERT module is *dead-headed* against the meter drive dog as shown in the following illustration. If the wriggler and drive post are *dead-headed*, remove the ERT module assembly and repeat the alignment procedure. You must engage the meter drive dog in the ERT module wriggler.

19. Insert the right module mounting screw and tighten the screw until the gasket is against the meter. Do not completely tighten the mounting screw.

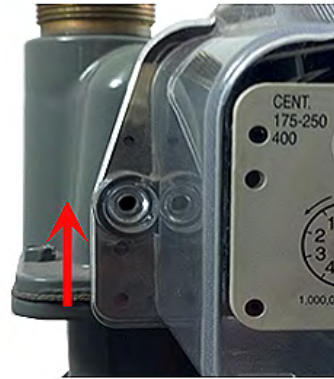
20. Slightly raise the left side of the ERT module (the module will rotate on the right screw) until the left ERT module mounting hole is approximately 1/4-inch above the left meter mounting hole.



21. Rotate the ERT module down until the ERT module mounting hole is approximately 1/4-inch below the meter index mounting hole.



22. Rotate the ERT up to align the left mounting holes. Raising and lowering the ERT module on the meter drive post facilitates the proper positioning and engagement of ERT module wriggler with the meter drive post.



23. Insert the left mounting screw and tighten a few turns.

24. Tighten the right and left ERT-to-meter mounting screws in an alternating pattern. Tighten each mounting screw evenly.

Important: The following conditions ensure proper engagement of the ERT module to the meter. Meter manufacturers: torque the mounting screws 15 to 20 inch-pounds.

- The ERT module fits flush against the meter body—there are no gaps between the ERT gasket and the meter body.
- The ERT module mounting holes align with the index cover mounting holes on the meter body.
- The meter test dial moves in relation to gas flowing through the meter.

25. Place a new tamper seal in the tamper seal cups surrounding the two mounting screws. Press the new tamper seals into place using an 11/32-inch nut driver or similar blunt tool.



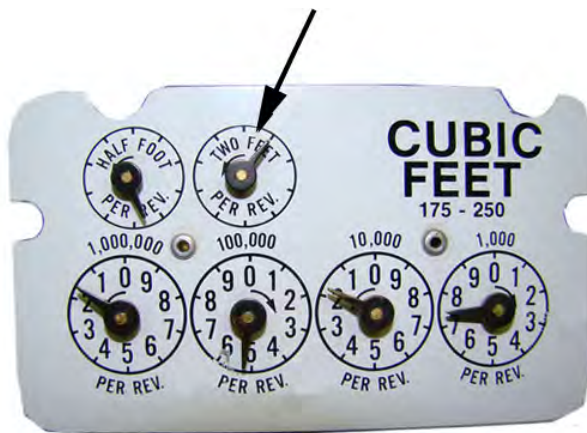
26. Complete any necessary paperwork and properly dispose excess installation materials and scrap from the customer premises.

This completes installation of the 500G ERT module on the National (Lancaster) meter.



Programming and Requirements Notes

Take note of the index drive rate shown on a top right dial on the index. The endpoint is programmed based on the drive rate. National/Lancaster meter index drive rates are typically 2-cubic feet.



Romet Commercial Rotary Meter Installation

This section provides the instructions to install the 500G ERT module on the listed compatible Romet RM commercial rotary meters.

Only Elster American version residential 500G ERT modules are compatible with Romet RM rotary gas meters.

Meter model	Meter notes	Module type	Itron part number	ERT module notes
 RM Series	Must purchase adapter kit from Romet No pulse/no instrument drive	500G	ERG-7000-001	
 RM Series instrument drive		500G	ERG-7000-005	

Installation Overview

Installing the 500G direct mount ERT module to a Romet meter involves four tasks.

1. Removing the index cover and preparing the meter for installation.
 - Preparing the meter requires:
 - A flat-head screwdriver
 - A scraping tool
2. Assembling the index and ERT module.
3. Programming the 500G ERT module. See [Programming on page 19](#) for programming instructions and items needed to program the ERT module.
4. Connecting the ERT module to the meter. Connecting the module to the meter may require the following materials:
 - A compatible index
 - Small and medium flat-blade or Phillips screwdrivers
 - Side-cutting pliers or wire snips
 - (Optional) meter seals, wire seal, and seal press
 - 11/32-inch nut driver or other blunt tool
 - Replacement screws (for replacement screw information, see [Installation Requirements on page 16](#)).

500G ERT module configuration with the meter is dependent on your system application. See the Romet meter documentation for more information.

Residential Module Mechanical Installation

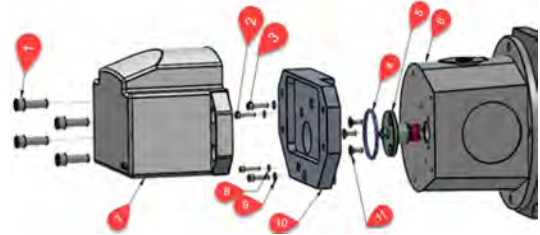
After the 500G ERT module is programmed, attach the module to the Romet rotary meter. For programming information, see [Programming on page 19](#).

Refer to the Rotary RM2000 installation example in the list of compatible meters. The ERT module must be mounted on the adapter plate in an upright position.

1. Assemble the O-Ring (4) on the meter drive dog.

2. Insert the drive dog (5) into the Romet rotary meter and secure it to the meter using the three flat head screws (11).

- a. Socket head cap screws (4) 1/4-20 x 3/4 lg
- b. Socket head cap screws (2) #4-40 x 1/2 lg
- c. Socket head cap screws (2) #6-32 x 1/2 lg
- d. O-Ring
- e. Drive dog assembly
- f. Romet STD CTR
- g. Itron 100G residential ERT module
- h. Lock washers (4)
- i. Lock washers (6)
- j. Adapter plate
- k. Flat head screws (3) #4-40 x 5/16



3. Mount the adapter plate (10) over the meter drive dog and to the Romet rotary meter using the lock washers (8, 9) and the socket head cap screws (2, 3).

4. Tighten the adapter plate mounting screws in an alternating pattern.

5. Align the ERT module wriggler with the meter drive dog (5). Ensure that the drive dog aligns with the space between the wriggler's teeth.

Warning: A gap may be caused by misalignment of the module wriggler and the meter wriggler's drive teeth. Pushing down on the module could damage the module's wriggler or meter drive teeth. To eliminate a gap, remove the module assembly and re-align the module's wriggler with the meter drive dog.

6. Secure the ERT module to the adapter plate using the four socket head cap screws (1).

7. Complete the necessary paperwork and verify that all excess materials are removed from the customer's premises.

Commercial Module Mechanical Installation

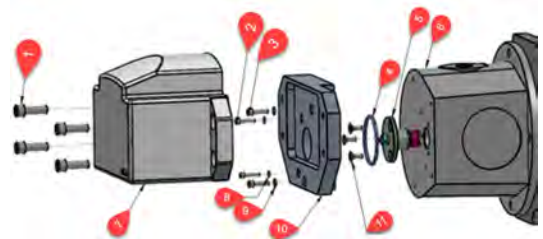
1. Mount the adapter plate over the meter drive dog and to the Romet rotary meter using the lock washers and the socket head cap screws.
2. Tighten the adapter plate mounting screws in an alternating pattern.
3. Align the ERT module wriggler with the meter drive dog. Verify that the drive dog aligns with the space between the wriggler's teeth.
Warning: A gap may be caused by misalignment of the module wriggler and the meter wriggler's drive teeth. Pushing down on the module could damage the module's wriggler or meter drive teeth. To eliminate a gap, remove the module assembly and re-align the module's wriggler with the meter drive dog.
4. Secure the ERT module to the adapter plate using the four mounting screws.
5. Complete the necessary paperwork and verify that all excess materials are removed from the customer's premises.

Programming and Requirements notes



Caution: You must program the 500G ERT module before use. For programming information, see [Programming on page 19](#).

1. Assemble the O-Ring (4) on the meter drive dog.
2. Insert the drive dog (5) into the Romet rotary meter and secure it to the meter using the three flat head screws (11).
 - a. Socket head cap screws (4) 1/4-20 x 3/4 lg
 - b. Socket head cap screws (2) #4-40 x 1/2 lg
 - c. Socket head cap screws (2) #6-32 x 1/2 lg
 - d. O-Ring
 - e. Drive dog assembly
 - f. Romet STD CTR
 - g. Itron 100G residential ERT module
 - h. Lock washers (4)
 - i. Lock washers (6)
 - j. Adapter plate
 - k. Flat head screws (3) #4-40 x 5/16



3. Mount the adapter plate (10) over the meter drive dog and to the Romet rotary meter using the lock washers (8, 9) and the socket head cap screws (2, 3).
4. Tighten the adapter plate mounting screws in an alternating pattern.
5. Align the ERT module wriggler with the meter drive dog (5). Ensure that the drive dog aligns with the space between the wriggler's teeth.
Warning: A gap may be caused by misalignment of the module wriggler and the meter wriggler's drive teeth. Pushing down on the module could damage the module's wriggler or meter drive teeth. To eliminate a gap, remove the module assembly and re-align the module's wriggler with the meter drive dog.
6. Secure the ERT module to the adapter plate using the four socket head cap screws (1).
7. Complete the necessary paperwork and verify that all excess materials are removed from the customer's premises.



Caution: .

Sensus Meter Installation

This section provides the information to install the 500G ERT module on a Sensus meter. These instructions apply to 11-tooth, 16-tooth, and 18-tooth residential and commercial Sensus gas modules.

Note: Sensus meters are also known as Invensys, Equimeter, or Rockwell. For these instructions, all meter types are referred to as Sensus meters.



Sensus residential 500G ERT Module

**Sensus 11-tooth****Sensus 16-tooth****Sensus 18-tooth**

The listed Sensus meters are compatible with the Gas Modules.

Meter model	Meter notes	Itron part number	Gas module notes
S-110	11-tooth	ERG-7000-002	24 and 30-tooth gears are not compatible

Meter model	Meter notes	Itron part number	Gas module notes
T-110			
S-120			
T-120			
R-175			
R-200			
RT-200			
S-200			
RC-225			
RT-225			
RC-230			
RT-230			
250			
Cubix250			
MR-7 (Cubix250 Metric)			
			
R-275			
RT-275			
S-275			
310			
R-315			

Meter model	Meter notes	Itron part number	Gas module notes
RCM-230 (RC-230 Metric)	16-tooth	ERG-7000-003	24 and 30-tooth gears are not compatible
MR-8 (R-275 Metric)			
MR-5 (S275 Metric)			
MR-9 (R-315 Metric)			
MR-12 (415 Metric)			
RT-100	18-tooth	ERG-7000-004	24 and 30-tooth gears are not compatible
S-175			
S-190			
RT-360			
	18-tooth. Older meters may have 500G ERT module to meter mounting hole variations that make them incompatible.	ERG-7000-004	24 and 30-tooth gears are not compatible
415			
750	Vertical index only	ERG-7000-008	
1000			
1600			
3000			
10000			

Meter model	Meter notes	Itron part number	Gas module notes
	Aluminum box direct reading (VDR) index	ERG-7000-008	Requires Itron mounting screws, part number SCR-0062-001. Must purchase separately.
750			
1000			
1600			
3000			
5000			
10000			
EMCO #2-1/2	Vertical index only	ERG-7000-008	
EMCO #3			
EMCO #4			
EMCO #4-1/2			
EMCO #5			

Installation Overview

Installing the 500G direct mount ERT module to a Sensus meter involves four tasks.

1. Removing the index cover and preparing the meter for installation.
 - Preparing the meter requires:
 - A flat-head screwdriver
 - A scraping tool
2. Assembling the index and ERT module.
3. Programming the 500G remote ERT module. See [Programming on page 19](#) for programming instructions and items needed to program the ERT module.

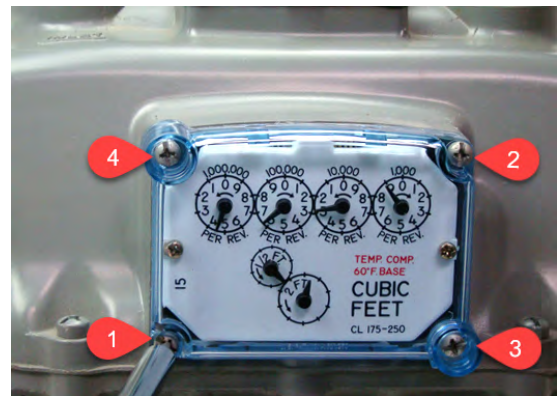
4. Connecting the ERT module to the meter. Connecting the module to the meter may require the following materials:
 - A compatible index
 - Small and medium flat-blade or Phillips screwdrivers
 - Side-cutting pliers or wire snips
 - (Optional) meter seals, wire seal, and seal press
 - 11/32-inch nut driver or other blunt tool
 - Replacement screws (for replacement screw information, see [Installation Requirements on page 16](#))

500G module configuration with the meter is dependent on your system application. See Sensus meter documentation for more information.

Residential Meter Mechanical Installation

This section describes the 500G ERT module mechanical installation on the residential Sensus meter.

1. Remove the four index cover screws and the index cover from the Sensus meter. Alternate screw removal following the numbered pattern as shown in the illustration.



2. Examine the index cover screws. If they are 5/8-inch long and not corroded, keep them to attach the module assembly. If the screws are not the correct length or if the screws are corroded, discard them.

3. Remove one index mounting screw completely. Hold one hand under the index to catch the screw. While removing the other mounting screw, pull the index away from the meter to keep the index back-plate against the back of the screw. Remove the screw completely after the index is free of the meter.



4. Set the index aside where it will not be damaged or fill with dirt, rain, or snow. You will mount the index on the 500G ERT module later in this procedure.

5. Verify that the index mounting screws not corroded. If the screws are the not corroded, retain for later use. If you discard the original screws, use the correct replacement screws. For screw replacement information, see [Installation Requirements on page 16](#).

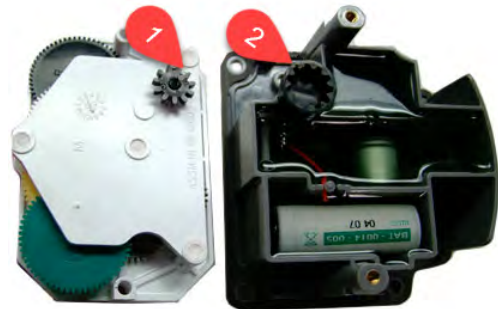
6. Remove the old gasket, gasket residue, and dirt from the meter (if applicable). The meter face must be free of gasket residue or dirt before you install the module.



7. Separate the 500G ERT module housing from the clear cover by pulling the cover straight out from the housing. Set the module cover aside where it will not be damaged or fill with rain, dirt, or snow. You will replace the cover later in this installation procedure.



8. Place the index drive gear (1) in the shaft gear cup (2) of the 500G ERT module. The example shows an 11-tooth drive gear. Your index may be a 16- or 18-tooth gear. Use the appropriate 500G ERT module for your specific meter.



Warning: Indexes have varying drive mechanism styles. Failure to align the 500G ERT module shaft with the index drive post can cause binding and lead to poor registration or meter failure. To verify proper engagement of the index to the 500G ERT module shaft, spin the wriggler one clockwise rotation, then one-counterclockwise rotation. Do not spin the shaft more than one complete rotation. The shaft should spin freely, with little or no resistance.

9. After the index drive gear is aligned and inserted into the shaft gear cup, the mounting holes will line up.



10. Using the original index mounting screw or a replacement screw (if necessary), place one 6 - 32 x 5/8-inch screw into the index right mounting screw hole.

11. Attach the screw to the 500G ERT module housing right-index mounting post just enough to hold the screw and the right end of the index in place.

12. Install and tighten the left index mounting screw.

13. Tighten the right index mounting screw completely. Install and tighten both index mounting screws evenly.

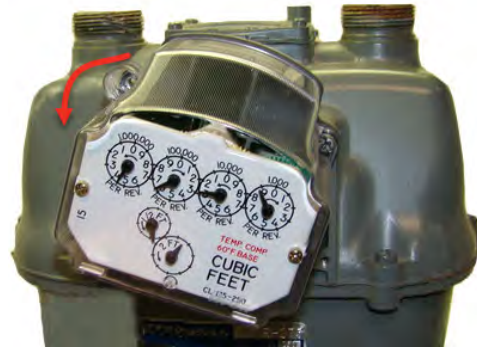


14. Slide the 500G ERT module cover over the index and housing. Verify that the cover is installed correctly. The 500G ERT module label should be clearly visible and easily read.



15. After the 500G ERT module programming is complete, attach the module assembly to the Sensus meter. For programming information, see [Programming the Direct Mount Module on page 20](#).

16. Place the 500G ERT module assembly against the front of the meter at angle.



Warning: Failure to correctly align the meter drive gears and 500G ERT module drive gears can cause binding and lead to poor registration or meter failure. If there is a gap between the 500G ERT module gasket and the meter, it may be that the drive gears of the 500G ERT module assembly's wiggler are not correctly aligned with the meter drive gears. Remove the 500G ERT module assembly and repeat the alignment procedure. You must engage the 500G ERT module wiggler with the meter drive gears.

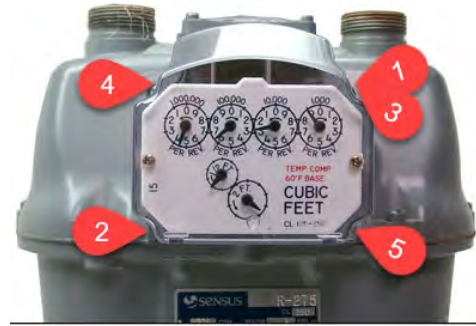
17. Install and tighten the 500G ERT module-to-meter mounting screws in an alternating pattern. Use the original mounting screws if they were the correct size and not corroded. If you discarded the original screws, use the correct replacement screws.

Caution: As the 500G ERT module assembly is secured into its final position on the meter, shifting may occur due to existing tolerances within the mounting screw holes. To ensure full 500G ERT module wiggler gear to meter gear engagement, push the 500G ERT module to the right while tightening the screws in the following pattern.

- Align the top right mounting screw hole on the meter with the top right screw hole on the 500G ERT module.
- Insert the top right cover mounting screw and tighten the screw enough to hold the 500G ERT module assembly in place. Do not completely tighten the screw.
- Rotate the 500G ERT module assembly counterclockwise until the remaining three 500G ERT module screw holes line up with the holes in the meter.

18. Install the remaining three mounting screws and tighten them as described here and shown in the illustration.

- Insert lower left mounting screw (2) and tighten to snug position.
- Tighten upper right mounting screw (1,3) to snug position.
- Insert upper left mounting screw (4) and tighten to snug position.
- Insert lower right mounting screw (5) and tighten to snug position.



Tighten each mounting screw evenly.

Important: Meter manufacturers: torque the mounting screws 15 to 20 inch-pounds.

19. Place a new tamper seal over the two screws with tamper seal cups. Press the new tamper seals into place using an 11/32-inch nut driver (or similar blunt tool).



20. Complete any necessary paperwork and properly dispose excess installation materials and scrap from the customer premises.

This completes installation of the 500G ERT module installation on the Sensus meter.



Commercial Meter Mechanical Installation

This section provides instructions to install the commercial 500G ERT module on a Sensus commercial meter.



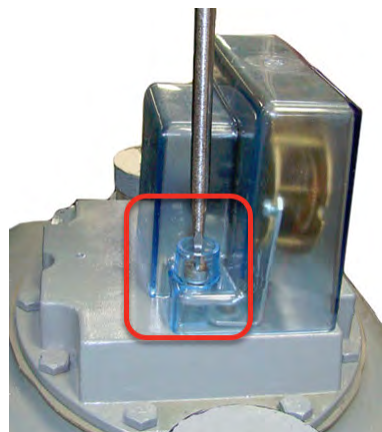
Note: Sensus meters are also known as Invensys or Rockwell meters. For these instructions, all meter types are referred to as Sensus meters. Sensus diaphragm commercial meters do not require an index assembly mounting plate. Indexes can be mounted directly to the module. Commercial gas modules can be mounted on Sensus commercial meters in various configurations. These instructions show the index assembly mounted without a mounting plate.



Warning! Handle the commercial module carefully so the metal passive radiator antenna is not damaged.



1. Remove any tamper seals (or wire seals) from the index cover and remove the index cover mounting screws. You will reinstall it later in these instructions.



2. Remove the index screws from the meter. Set the index cover aside where it will not be damaged or fill with dirt, rain or snow. You will re-install the index later in this procedure.

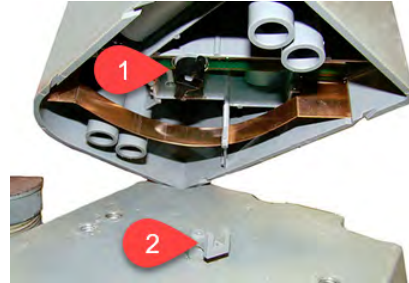
Note: Properly dispose all unused screws, old index covers, gaskets, tamper seals, and other leftover materials. Do not leave materials on customer premises.



3. Program the commercial module before you complete the 500G ERT module installation. For programming information, see [Programming the Direct Mount Module on page 20](#).

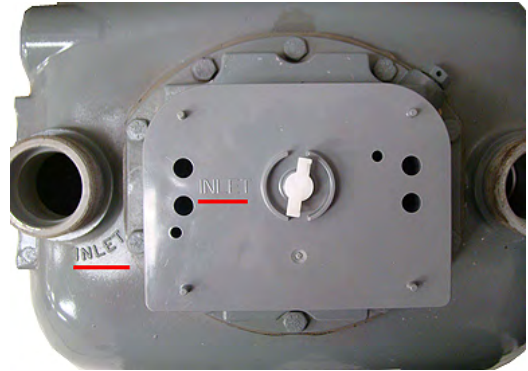
4. Tilt the commercial 500G ERT module at an angle and turn the wriggler until the drive notches line up with the meter wriggler's drive teeth.

Warning: Failure to properly align the 500G ERT module wriggler with the meter drive post can cause binding and lead to poor registration or meter failure.



5. Align the 500G ERT module so the screw holes line up with the meter's top screw holes. Carefully lower the 500G ERT module on the meter so the wriggler's bars line up with the meter drive dog. Itron recommends installation with one bar inserted into the meter drive dog's u-shaped gear.

Warning: The INLET label on the commercial 500G ERT module must line up with the INLET label on the Sensus meter case.



6. Verify that the bottom of the 500G ERT module and the top of the meter meet. The 500G ERT module housing should rest on top of the meter without gaps.



Warning: Do not press down on the commercial 500G ERT module if a gap exists between the 500G ERT module and the meter. A gap may be caused by misalignment of the 500G ERT module wriggler and meter's drive teeth. Pushing down on the 500G ERT module could damage the module's wriggler or meter drive teeth. To eliminate a gap, slowly turn the commercial 500G ERT module's shaft back and forth until the 500G ERT module wriggler aligns with the meter's drive teeth.

7. Align the 500G ERT module with the index mounting holes. Verify the index drive dog intersects with the 500G ERT module's wriggler.

8. Install the 500G ERT module mounting screws (SCR-0062-003). Turn each screw 1/4 to 1/2 turn after it contacts the index assembly.



9. Install the index cover.

- For index covers with flat-surface screw holes, use screws (SCR-0062-002), flat washers (WSH-0020-005), and cork washers (WSH-0032-001).
- For index covers with tamper seal cups, use screws, (AS-568A-011, 5/16" ID x 7/16 OD) O-rings, and tamper seals.

10. Place new tamper seals over screws (if mounting plate has tamper seal cups) and press into place with an 11/32-inch nut driver or similar blunt tool.



11. If your mounting assembly requires a utility-approved wire seal, pass wires through holes in the screw heads and crimp the approved wire seal.

This completes installation of the commercial 500G ERT module on the Sensus commercial diaphragm meter.



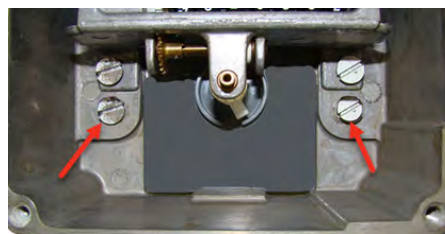
Mechanical Installation on a Rockwell Meter with a VDR Index

Installing the commercial Sensus on a Rockwell commercial meter with an aluminum box direct reading (VDR) index requires two Itron SCR-0062-001 mounting screws. The mounting screws must be purchased separately.

1. Remove tamper seals and screws from the top of the aluminum box direct reading index. Set the cover and screws aside. You will use them later in the installation



2. Remove the screws holding the aluminum box to the meter.



3. Carefully remove the aluminum box and set it aside. You will use it later in this installation.

Program the commercial module before you complete the installation on the Rockwell meter (for programming information, see [Programming the Direct Mount Module on page 20](#)).

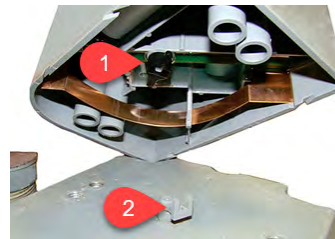
4. Using a side-cutter, remove the two rear housing pins from the Sensus commercial 500G ERT module.



Caution: Removing the rear housing pins may make the 500G ERT module incompatible with other commercial meters.

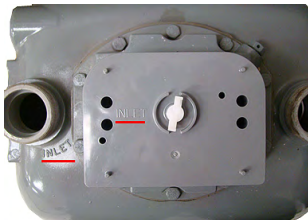
5. Tilt the 500G ERT module at an angle and turn the wriggler until the drive notches line up with the meter wriggler's drive teeth.

Warning: Failure to properly align the commercial Sensus 500G ERT Module wriggler with the meter drive post can cause binding and lead to poor registration or meter failure.



6. Align the 500G ERT module so the screw holes line up with the meter's top screw holes. Carefully lower the 500G ERT module on the meter so the wriggler's bars line up with the meter drive dog. Itron recommends installation with one bar inserted into the meter drive dog's u-shaped gear.

Warning: The INLET label on the commercial 500G ERT Module must line up with the INLET label on the Rockwell meter case.

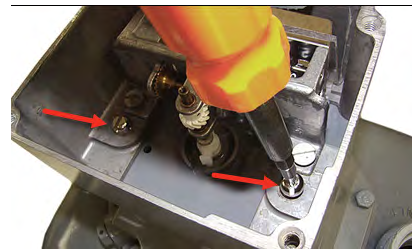


7. Verify that the bottom of the commercial module and the top of the meter meet. The 500G ERT module housing must rest on top of the meter without gaps.

Warning: Do not press down on the 500G ERT module if a gap exists between the 500G ERT module and the meter. A gap may be caused by misalignment of the module's wriggler and meter's drive teeth. Pushing down on the 500G ERT module could damage the module's wriggler or meter drive teeth. To eliminate a gap, slowly turn the module's shaft back and forth until the module's wriggler aligns with the meter's drive teeth.



8. Align the index drive wriggler with the 500G ERT module shaft and mounting holes. Attach the 500G ERT module to the meter using two SCR-0062-001 Itron mounting screws.



9. Attach the index cover with the original index cover screws.

10. Insert tamper seals in the tamper seal cups. Push tamper seals into place using an 11/32-inch nut driver or similar blunt tool.

This completes installation of the commercial 500G ERT Module with an aluminum box direct reading (VDR) index on a Rockwell commercial meter.



Programming and Requirements Notes



Caution: You must program the 500G ERT Module before use. For programming information, see [Programming the Direct Mount Module on page 20](#).

Sensus Residential 500G ERT module Programming

The 500G ERT module is programmed based on the meter's drive rate. Take note of the index drive rate shown on a lower dial on the index. Sensus meter index drive rates are typically 2-cubic feet.



Sensus Commercial 500G ERT module Programming

Take note of the index drive rate shown on the index. The 500G ERT module is programmed based on the drive rate. Sensus commercial meter index drive rates may be 5-, 10- or 100-cubic feet. The seven-dial index shown is a 100-cubic feet drive rate.

