Cellular 500G Module Direct Mount Installation Guide

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Contents

New in This Document

Revision	Date	Description
REV 003	September 26, 2022	Added updated images in Introduction on page 6, Itron/Sprague Meter Installation on page 25,Sensus/Rockwell Meter Installation on page 36, Elster American Installation on page 44 and Sensus/Rockwell Installation on page 49.
REV 002	September 19, 2022	Reorganized Specific Meter Manufacturer Installation on page 17 to list meter installation based on Residential Meters on page 18 and Commercial Meters on page 44. Added Itron/Sprague Meter Installation on page 25, Meter Installation on page 46 in Elster American Installation on page 44, and Meter Installation on page 51 in Sensus/Rockwell Installation on page 49
REV 001	April 7, 2022	Updated installation images for improved accuracy. Added Residential Meter Mechanical Installation on page 1 and Programming and Requirements Notes on page 49.
REV 000	January 5, 2022	First date of publication.

1 Introduction

Itron's Cellular 500G Module Direct Mount (hereafter referred to as Cellular 500G Module) is a Cellular IoT (CIoT) gas module. It features cellular and RF communication capabilities, delivering flexibility in reading options. It is designed to be read under Itron IoT networks or by legacy ChoiceConnect™ handheld and mobile readers.

With new features for Network operation – including firmware download, high flow alarm, sub hourly interval data and the ability to hop to a neighboring module for hard-to-read applications and extended data storage – Itron's Cellular 500G Module offers additional value while continuing to offer the highest in reliability, accuracy, battery life, security standards and intrinsic safety that you have come to expect from the industry leader in gas modules.

This guide describes the steps for direct-mount installing the Cellular 500G Module.

Figure 1 Cellular 500G Module (Residential): American Elster, Itron/Sprague, and Sensus/Rockwell

Figure 2 Cellular 500G Module (Commercial): Elster/American and Sensus/Rockwell

Related Documents

The following documents may also be useful to readers. These documents and others can be accessed and viewed on https://products.itron.com.

- *Cellular 500G Module Technical Reference Guide*
- *Cellular 500G Spec Sheet*
- *Field Deployment Manager (FDM) Field Representative Guide*
- *Field Deployment Manager (FDM) Tools Configuration Guide*
- *Field Deployment Manager (FDM) Tools Mobile Application Guide*
- *Gas Devices Ordering Guide*
- *OpenWay® Collection Manager Device Interface Guide*

Security

System security, provided by Itron Security Manager (ISM), applies to the RF communications between the collection device and the Cellular 500G 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 Cellular 500G 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.

The Cellular 500G Module supports the security model found in the GenX solution for both reading and programming. If the Cellular 500G Modules are shipped without security enabled (ready to secure), the utility can—at a later date—configure the Cellular 500G 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 Cellular 500G Module if the Cellular 500G Module is installed in a location with little or no gas flow.

Transmission Modes

This section describes the various modes available for the Cellular 500G modules.

Note: Neither an ISED nor an FCC license is required to read the Cellular 500G Modules.

The module supports 5, 15, 30, or 60-minute intervals and provides storage and reporting for up to 62 days of 15-minute interval data and associated event data, or 8 months of hourly interval data.

> **Note:** Interval data options are dependent on the Cellular 500G Module's firmware version.

The module is designed to transmit 3 times a day with a 20-year battery life.

Mobile High Power Mode

The module transmits a high-powered RF message every 60 seconds. In Mobile High-Power Mode, the expected battery life is 20 years.

Mobile and Handheld Mode

The module transmits a medium-powered RF message every 15 seconds. In Mobile and Handheld Mode, the expected battery life is 20 years.

(Optional) Hard-to-Read Mode

The module transmits a high-powered RF message every 30 seconds. 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).

Highlighted Features

The following sections describe highlighted features in the Itron gas modules (these features vary by module type and installed firmware).

Gas Day Take

> **Note:** Gas Day Take functionality is dependent on the module firmware version. For more information, see Firmware Functionality on page 10.

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 AM Central Clock Time (CCT).

All collected data must be prepared and presented to deregulated marketers and customers by 11:00 AM CCT to support the gas utility’s deregulated tariff. If a deregulated marketer or 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.

Local Auditing

> **Note:** Local auditing functionality is dependent on the Cellular 500G Module's firmware version. For more information, see Firmware Functionality on page 10.

The 500G 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 Cellular 500G 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, module count rate, rollover, and PComp.
- Time stamping of auditing parameters.
- Log access via COSEM only.

Low Battery Event/Alarm

> **Note:** For Cellular 500G Modules, low-battery functionality is dependent on the firmware version. For more information, see Firmware Functionality on page 10.

The Cellular 500G Module's low-battery events are 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.

Module High Flow Event

> **Note:** High Flow event functionality is dependent on the Cellular 500G Module firmware version.

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.

Functional Specifications

Functional specification	Description
Power source	Single "D" cell lithium batteries
Tamper detection	Tilt and cut cable
Regulatory and Standards	FCC compliance: Part 15.247, 15.249 (programming), 15.109 FCC ID: EWQ500GAC: for American/Rockwell Gas meters ■ The Cellular modem is a Sierra Wireless HL7800 module. – FCC ID: NLNHL78 ISED compliance: RSS-247, RSS-210 (programming), ICES 003

Functional specification	Description
	IC: 864D-500GAC: American/Rockwell ■ The Cellular modem is a Sierra Wireless HL7800 module. – IC: 2417C-HL78 Measurement Canada: Pending
Intrinsically safe per	Telemetering Equipment for use in Hazardous Locations, for Cl I, Div 1, Gp D for Haz Loc, Temp Code T1, -40°C ≤ Ta ≤ +70°C.
Operational	All Cellular 500G modules operate pursuant to FCC, ISED cellular licensing, and 3GPP defined, regulated cellular standards and networks. **Frequency:** 3GPP Band 4 (744-787 MHz) / Band 13 (1710-2155 MHz) for cellular operation; 902 to 928 MHz and 2400-2483.5 MHz ISM bands for RF operation **Program frequency**: 908 MHz
Product identification	Numeric and bar coded type and serial number
Construction materials	Gray polycarbonate housing and back plate with encapsulated electronics

Operational Specifications

Operational specifications	Description
Operating temperatures	-22° to 158° F (-30° to +70° C)
Operating humidity	5 to 95% relative humidity
Data integrity	Verified in every data message

Firmware Functionality

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

Part number	OpenWay Collection Manager (OWCM) firmware number	FDM check endpoint firmware version	Over-the-Air Firmware part number	Firmware functionality
FMW-7200-001	5.4 or later	4.4	DFW-7200-001	■ Support for American/Elster Residential meters ■ Support for Rockwell/Sensus Residential meters ■ GSR 5.4 functionality ■ Network/Mobile topology ■ 5, 15, 30-minute interval data ■ High flow alarm ■ Low battery alarm ■ Gas Day Take ■ Local auditing for dial and drive rate

2 Programming

Caution: You must program the Cellular 500G Module before use.

Programming Itron 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 Cellular 500G Module to count correctly and roll over to zero at the correct time. For example, a four-dial, 2 cubic-feet meter configuration will count two cubic-feet for each rotation and roll over to zero after 999**9**.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.

Program the 500G cellular module using an approved programming device loaded with Field Deployment Manager (FDM) software version 4.4 or later.

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

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 Cellular 500G Module if installing in a location with little or no gas flow.

Standard Configuration

Cellular 500G Modules are capable of configurations that reduce battery life. Standard battery life is based on the following configuration:

- Hourly interval data
- Interrogations of three times per day
- 60-second receiver wake up
- Five firmware downloads over the life of the Cellular 500G 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

Program the meter drive rate into the Cellular 500G Module using a compatible programming device.

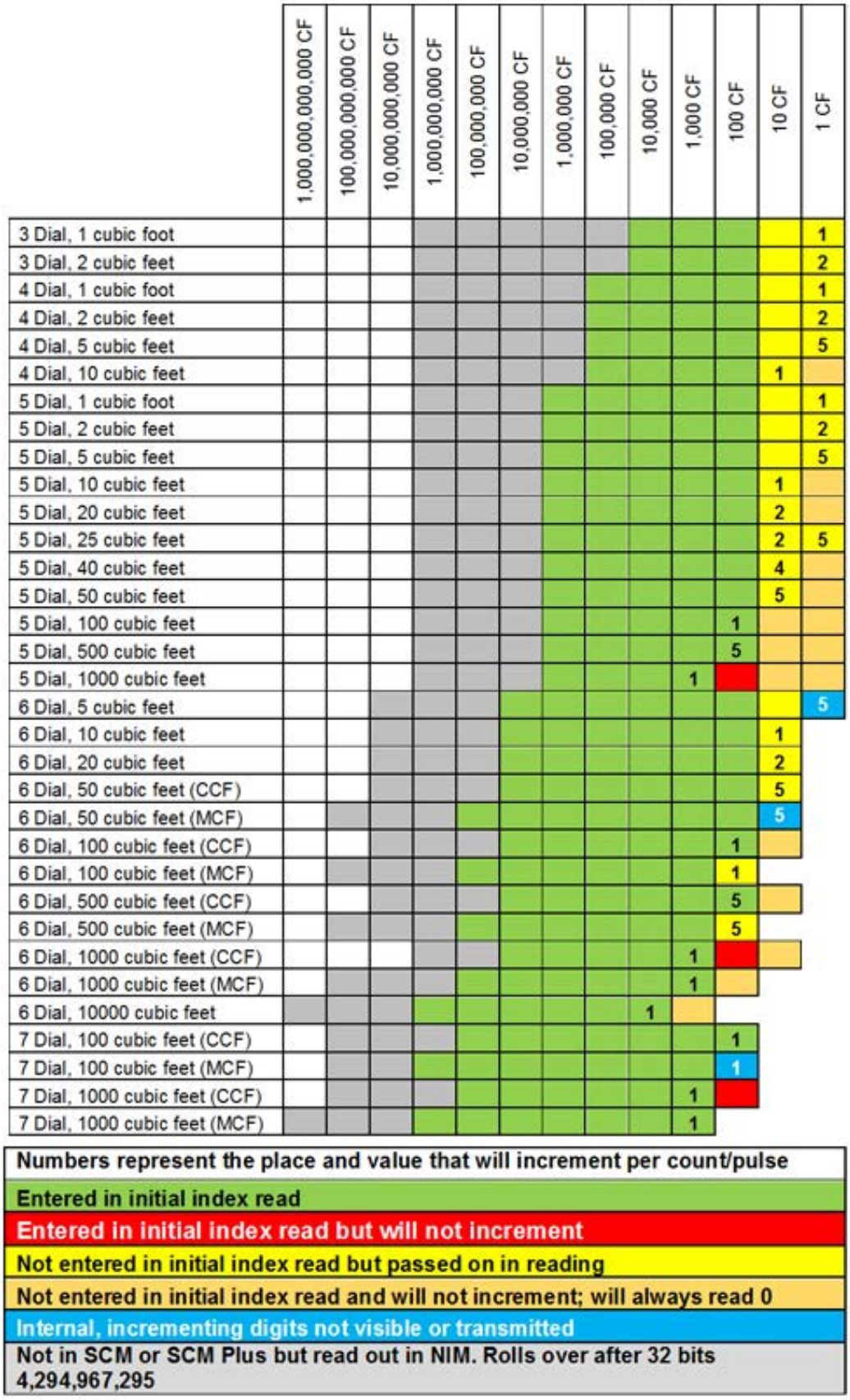
1. Verify that you have the correct programming for your application: Mobile High-Power Mode, Mobile/Handheld Mode, or Hard-to-read Mobile/Handheld Mode.
2. For all programming and **Check Endpoint** operations using a handheld computer, hold the handheld as close to vertical as possible. For best success, keep the handheld within six feet of the target module.
3. Programming parameters are based on the configuration file loaded into the programming device.
4. **Read** or **Check** the Cellular 500G Module using a compatible reading device.
   - If the read result is higher than the number programmed in step 2, the Cellular 500G Module is counting correctly.
   - If the read result is not higher than the number programmed in step 2, replace the Cellular 500G Module.

Itron Programs and Software Variables

This section defines and clarifies possible system variables you may encounter in programming 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
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1,000 CF
100 CF
10 CF
1 CF
3 Dial, 1 cubic foot
3 Dial, 2 cubic feet
4 Dial, 1 cubic foot
4 Dial, 2 cubic feet
4 Dial, 5 cubic feet
4 Dial, 10 cubic feet
5 Dial, 1 cubic foot
5 Dial, 2 cubic feet
5 Dial, 5 cubic feet
5 Dial, 10 cubic feet
5 Dial, 20 cubic feet
5 Dial, 25 cubic feet
5 Dial, 40 cubic feet
5 Dial, 50 cubic feet
5 Dial, 100 cubic feet
5 Dial, 500 cubic feet
5 Dial, 1000 cubic feet
6 Dial, 5 cubic feet
6 Dial, 10 cubic feet
6 Dial, 20 cubic feet
6 Dial, 50 cubic feet (CCF)
6 Dial, 50 cubic feet (MCF)
6 Dial, 100 cubic feet (CCF)
6 Dial, 100 cubic feet (MCF)
6 Dial, 500 cubic feet (CCF)
6 Dial, 500 cubic feet (MCF)
6 Dial, 1000 cubic feet (CCF)
6 Dial, 1000 cubic feet (MCF)
6 Dial, 10000 cubic feet
7 Dial, 100 cubic feet (CCF)
7 Dial, 100 cubic feet (MCF)
7 Dial, 1000 cubic feet (CCF)
7 Dial, 1000 cubic feet (MCF)
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 M³	10,000,000 M³	1,000,000 M³	100,000 M³	10,000 M³	1,000 M³	100 M³	10 M³	M³	0.1 M³	0.01 M³
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 12346**60**. 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 (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)

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® Collection Manager (OWCM)

The OpenWay Collection Manager (OWCM) collects the raw reading and passes it on without making any formatting changes.

3 Specific Meter Manufacturer Installation

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

Installation Requirements and Replacement Parts

Residential Cellular 500G Module

Replacement screws for the residential Cellular 500G Module are listed in the following table.

Meter	To mount the Cellular 500G Module on the meter:	Itron part number	To mount the index on the Cellular 500G Module (and index assembly, if applicable), on the Cellular 500G Module housing:	Itron part number
Elster American	1/4-20 by 0.625 (5/8) inch slotted, Fillister head	N/A	8-32 by 0.19 (3/16) inch slotted, Fillister head	N/A
Sensus/Rockwell	10-24 by 0.625 (5/8) inch slotted, Fillister head	N/A	6-32 by 0.625 (5/8) inch slotted, Fillister head	N/A

Commercial Cellular 500G Module

Replacement screws for the commercial Cellular 500G Module are listed in the following table.

Meter	To mount the Cellular 500G Module on the meter:	Itron part number	To mount the index on the Cellular 500G Module (and index assembly, if applicable), on the Cellular 500G Module housing:	Itron part number
Elster American	2A by 3.35 inch length, slotted round-head drilled to accept utility-approved wire seals	SCR-0062-001	12 - 24 by 1/2 inch slotted, Fillister head machine screws, drilled to accept utility-approved wire seals	N/A
Sensus	2A by 3.63 inch length, slotted round-head drilled to accept utility-approved wire seals	SCR-0062-002	2A by 2.94 inch length, slotted round-head	SCR-0062-003

Meter	To mount the Cellular 500G Module on the meter:	Itron part number	To mount the index on the Cellular 500G Module (and index assembly, if applicable), on the Cellular 500G Module housing:	Itron part number
Rockwell	For Aluminum Boby Direct Reading (VDR) index only	SCR-0062-001		N/A

Residential Meters

Elster American Installation

Figure 3 Elster American Cellular 500G Module (Residential)

This section provides instructions to install the residential 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 Cellular 500G Module installation instructions are not available, follow the installation procedures in this section.

Important! Modules ordered pre-programmed with security injected and specified as Zero Touch Deployment require that the installer rotate the wriggler five times to activate the Cellular 500G Module if installing in a location with little or no gas flow.

Meter model	Itron part number	Gas module notes
W75AL Aluminum case	ECG-7200-001	
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 inch off the end of the Cellular 500G Module wriggler drive post which will make the Cellular 500G Module incompatible with other 2 feet drive meters.
AC-250 Aluminum case		
AL-250 Aluminum case		
AM-250 Aluminum case		
AR-250 Aluminum case	ECG-7200-001	
AT-250 Aluminum case		
AL-310 Aluminum case		
AL-350 Aluminum case		
AL-425 Aluminum case		
AC-630 Aluminum case		
AC-800 Aluminum case		

Installation Overview

Installing the Cellular 500G 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 module.

3. Programming the Cellular 500G Module. See Programming on page 12 for programming instructions and items needed to program the Cellular 500G Module.
4. Connecting the Cellular 500G Module to the meter. Connecting the Cellular 500G 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
   - 0.34 (11/32) inch nut driver or other blunt tool
   - Replacement screws (for replacement screw information, see Installation Requirements and Replacement Parts on page 17.

Module configuration with the meter is dependent on your system application. See the Elster American meter configuration documentation.

Meter 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.

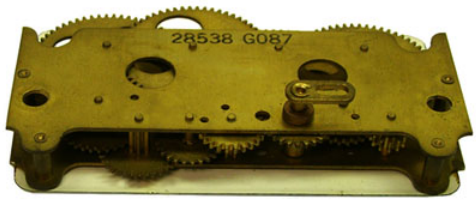
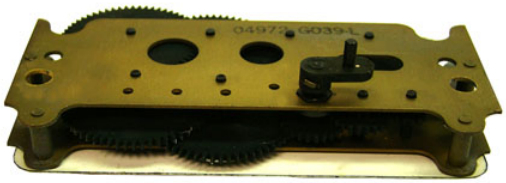
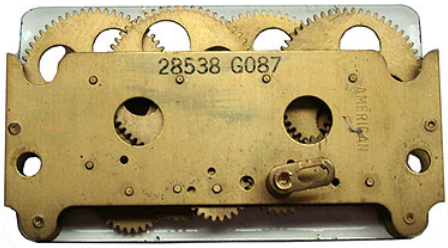
2. Examine the mounting screws. If they are 5/8 inch long and not corroded, keep them to install the module assembly to the meter. If the screws are not the correct length or if the screws are corroded, discard.
3. Unscrew one index mounting screw completely.

   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.
4. Set the index aside. You will mount the index to the module later in this procedure.
5. 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 and Replacement Parts on page 17.

6. 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.
7. Separate the module housing from the cover by pulling the cover straight out from the housing.

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.

	
Index wrigglers on one foot meters with drive slots	**Index with mounting screw holes**
	

8. 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:

9. 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.

10. 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.

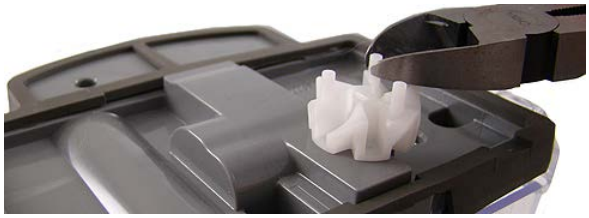
11. Screw one 8-32 by 3/16 inch screw into the other index mounting post loosely—one or two turns. Do not tighten the screw.
12. For indexes with mounting slots, place the index mounting screw slot under the screw head. Do not tighten the screw.
13. Slide the index drive post into the module shaft slot. 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.

14. 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.
15. Slide the module cover over the index and housing. Verify the cover is installed correctly. The module's label should be clearly visible and easily read.

16. Program the module. See Programming on page 12. After successful programming, attach the Cellular 500G Module assembly to the Elster American meter.

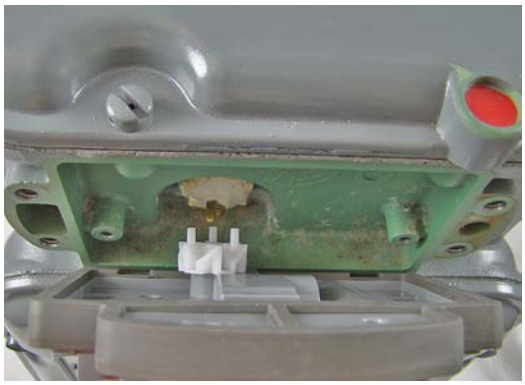
> **Warning!** For 5B-225 aluminum meters only: cut 1/16 inch off each Cellular 500G Module's wriggler post to prevent the wriggler from rubbing on the face of the nut holding the meter drive dog in place. Trimming the drive post may make the module incompatible with other 2 feet drive meters.



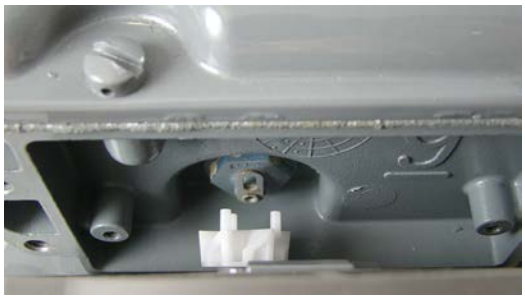
17. Align the Cellular 500G Module wriggler to connect with the drive post (or slot) of the meter.

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

18. For one foot meters: Align the Cellular 500G Module assembly wriggler perpendicular to the meter drive post.



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



20. Carefully align the Cellular 500G 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 by 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.
21. 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.
22. Meter manufacturers: torque the mounting screws 15 to 20 inch-pounds.

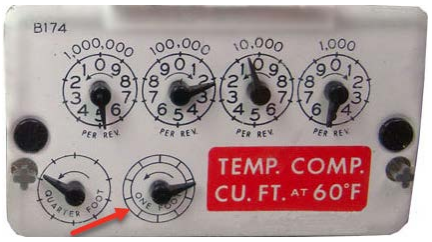
    Place new tamper seals over the two screws with tamper seal mounts. Press tamper seals into place using an 11/32 inch nut driver or similar blunt tool.

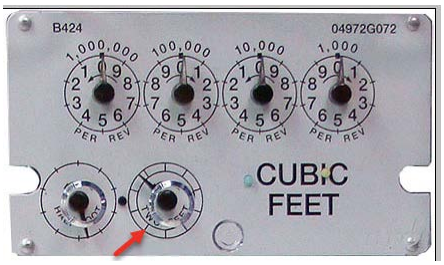
Complete necessary paperwork and verify that all excess materials are removed from the customer premises.

Installation of the Cellular 500G Module on the Elster American meter is complete.

Programming and Requirements Notes

The Cellular 500G 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 cubic foot, 2 cubic feet or 0.05 cubic meters (not shown below).





Itron/Sprague Meter Installation

This section describes installing the Cellular 500G 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.

Figure 4 Itron/Sprague - right side (Residential)

Meter model	Meter notes	Itron module part number	Cellular 500G Module notes
 175	3-hole index cover 2-hole index cover	ECG-7200-005	
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		
 I-250	Slant-face		
250WC	Integrated regulator		
305 combination	Integrated regulator		
400	Slant-face meter		
	Slant-face meter		

Meter model	Meter notes	Itron module part number	Cellular 500G Module notes
400A			
 METRIS 250	Slant-face	ECG-7200-005	A longer mounting screw is required when retrofitting to METRIS meters. The longer mounting screw is Itron part number 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	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		

Overview

Installing the Cellular 500G 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 Cellular 500G Module.
3. Programming the Cellular 500G Module. See Programming Fundamentals on page 1 for programming instructions and items needed to program the Cellular 500G Module.
4. Connecting the Cellular 500G 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 and Replacement Parts on page 1)

Installation on Itron commercial meters may require additional optional materials, available from Itron. For more information about these materials, see the *Gas Module Ordering Guide*.

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

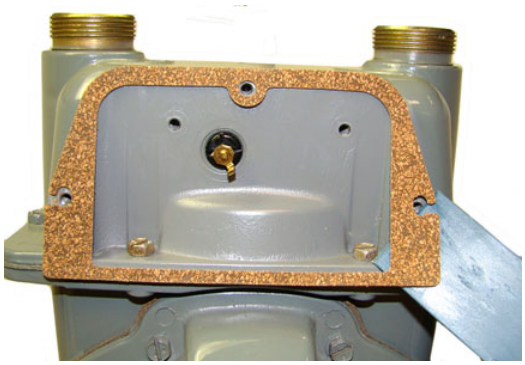
Meter Installation

This section describes installation on Itron residential meters.

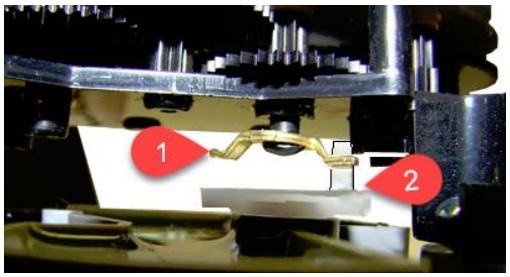
> **Note:** The module depicted below may vary slightly in appearance from the Cellular 500G Module you are installing.

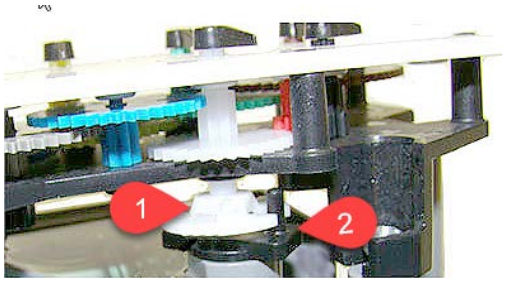
1. Remove the index cover screws and the index cover from the Itron meter. Examine the mounting screws. If they are 5/8 inch long and not corroded, keep them to re-attach the Cellular 500G Module assembly. If the screws are not the correct length or if the screws are corroded, discard them.
2. Loosen 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 and Replacement Parts on page 1.

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 Cellular 500G Module.



4. Separate the Cellular 500G Module housing from the cover by pulling the cover straight out from the housing. Set the Cellular 500G Module cover aside for use later in this installation procedure.
5. Insert the 10-24 x 3/8 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 Cellular 500G 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.

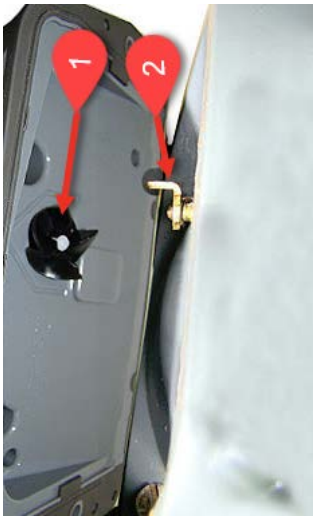
Warning! Indexes have varying drive mechanism styles. Failure to align the Cellular 500G Module shaft with the index drive post can cause binding and lead to poor registration or meter failure. To verify proper engagement of the index to the Cellular 500G Module shaft, spin the wriggler one clockwise 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.

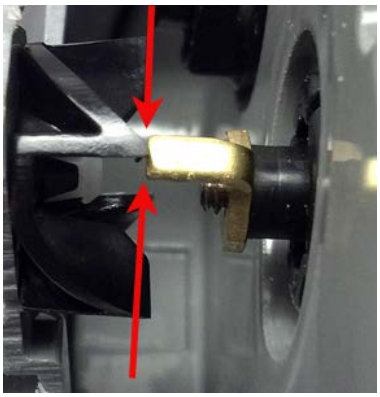
8. Hold the index in place and tighten the index mounting screws.

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 Cellular 500G Module cover over the index and housing. Verify the cover is installed correctly. The Cellular 500G Module label should be clearly visible and easily read.
10. After you program the Cellular 500G Module, attach it to the Itron meter. For programming information, see Programming on page 12.
11. Align the Cellular 500G 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 Cellular 500G Module wriggler can cause binding and lead to poor registration or meter failure. If there is a gap between the Cellular 500G Module gasket and the meter, it may be that the wriggler of the Cellular 500G Module is *dead-headed* against the meter drive dog as shown in the following illustration. Remove the Cellular 500G Module assembly and repeat the alignment procedure. You must engage the meter drive post with the Cellular 500G Module wriggler.

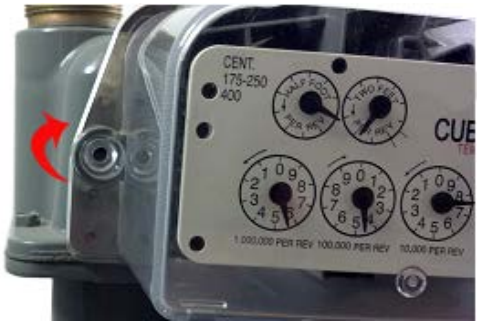




12. Place the Cellular 500G Module on the meter.

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 Cellular 500G Module (the module will rotate on the right screw) until the left Cellular 500G Module mounting hole is approximately 1/4 inch above the left meter mounting hole.



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

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

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

> **Important!** The following conditions ensure proper engagement of the Cellular 500G Module to the meter. Meter manufacturers: torque the mounting screws 15 to 20 inch-pounds.
>
> - The Cellular 500G Module fits flush against the meter body so there are no gaps between the Cellular 500G Module gasket and the meter body.
> - The Cellular 500G 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. Cellular 500G 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.

Installation Using the Itron Adapter Plate Kit

1. Cellular 500G 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 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.
   a. Insert the right adapter plate screw and tighten the screw enough to hold it in place.
   b. Install the left mounting screw and tighten to a snug fit.
   c. Tighten the right mounting screw to a snug fit.
   d. Make sure each screw is tightened evenly.
4. The Cellular 500G Module and index assembly must be programmed and installed following the instructions in Programming Fundamentals on page 1.

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.

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.

Note: The module depicted in the instructions below may vary slightly in appearance from the Cellular 500G Module you are installing.

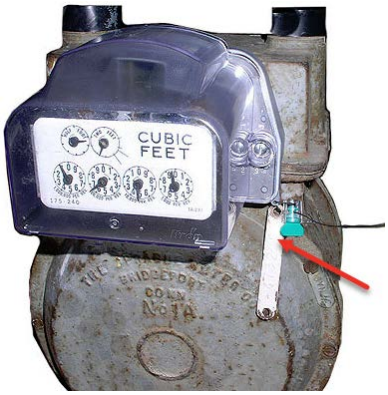
Method 1: Attach the meter tag to the adapter plate tag mounting hole

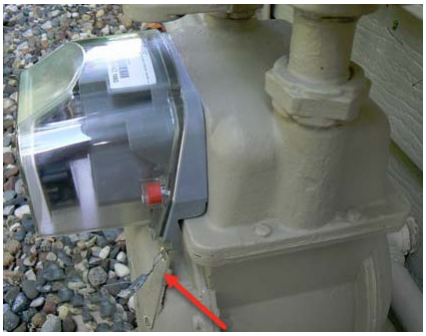
1. Carefully remove the brass meter tag from the meter index cover. Try not to damage the meter tag mounting holes.
2. Attach the Cellular 500G Module assembly to the meter. The Sprague adapter plate has tag mounting holes in the lower left and right corners. Secure the meter tag to one of the holes with a utility-approved and provided security seal.
3. Attach the meter tag to the adapter plate tag mounting hole
4. Attach the meter tag to the meter mounting hole.

   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 2: Attach the meter tag to the Cellular 500G Module mounting hole

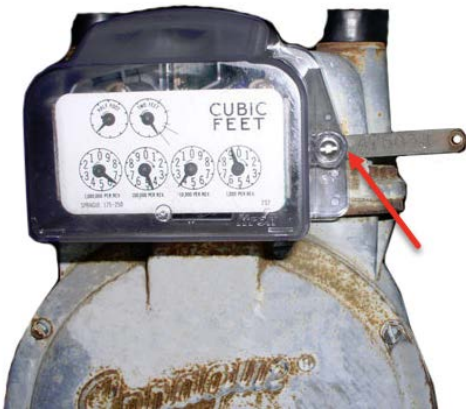




1. Carefully remove the brass meter tag from the meter index cover. Try not to damage the meter tag mounting holes.

2. Attach the Cellular 500G 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.
3. Attach the meter tag to the Cellular 500G Module mounting hole.
4. Attach the meter tag to the meter mounting hole.

   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 Cellular 500G Module assembly

1. Carefully remove the brass meter tag from the meter index cover. Try not to damage the meter tag mounting holes.
2. Attach the Cellular 500G 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.
3. Remove the Cellular 500G Module index cover and place the meter tag inside the Cellular 500G Module assembly for optimal meter tag security.

Programming and Requirements Notes

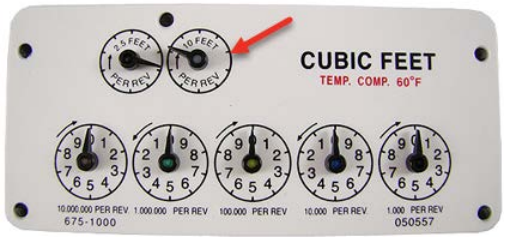
The Cellular 500G Module is programmed based on the meter's drive rate. Take note of the index drive rate shown on the drive dial on the index. The Cellular 500G Module is programmed based on the drive rate.

Residential Meter Drive Rates

Itron residential 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 Cellular 500G Module is programmed based on the drive rate. The index shown has a 10 cubic foot drive rate.



Sensus/Rockwell Meter Installation

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

Important! Modules ordered pre-programmed with security injected and specified as Zero Touch Deployment require that the installer rotate the wriggler five times to activate the Cellular 500G Module if installing in a location with little or no gas flow.

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

Figure 5 Sensus/Rockwell Cellular 500G Module - right side (Residential)

The listed Sensus meters are compatible with the gas modules.

Meter model			Gas module notes
S-110	11-tooth	ECG-7200-002	24 and 30-tooth gears are not compatible
T-110			
S-120			
T-120			
R-175			
R-200			
RT-200			
S-200			
RC-225			
RT-225			
RC-230	11-tooth	ECG-7200-002	24 and 30-tooth gears are not compatible
RT-230			
250			
Cubix250			
MR-7 (Cubix250 Metric)			
R-275			
RT-275			
S-275			
310			
R-315			

Installation Overview

Installing the Cellular 500G 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 module.

3. Programming the Cellular 500G Module. See Programming on page 12 for programming instructions and items needed to program the Cellular 500G Module.
4. Connecting the Cellular 500G Module to the meter. Connecting the Cellular 500G 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
   - 0.34 (11/32) inch nut driver or other blunt tool
   - Replacement screws (for replacement screw information, seeInstallation Requirements and Replacement Parts on page 17)

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

Meter Installation

This section describes the Cellular 500G Module mechanical installation on the residential Sensus meter.

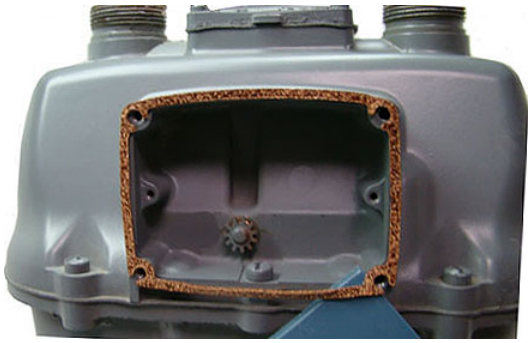
> **Note:** The module depicted below may vary slightly in appearance from the Cellular 500G Module you are installing.

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 0.625 (5/8) inch long and not corroded, keep them to attach the Cellular 500G 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

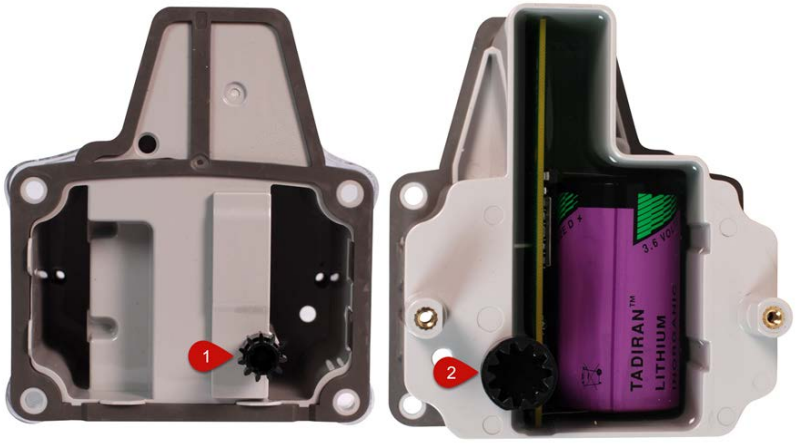
to keep the index backplate against the back of the screw. Remove the screw completely after the index is free of the meter.

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 Cellular 500G 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 and Replacement Parts on page 17.
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 Cellular 500G Module.



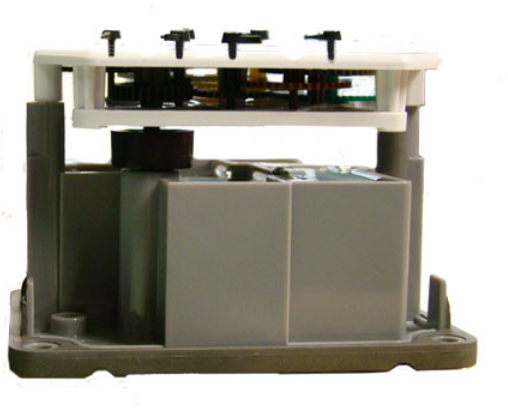
7. Separate the Cellular 500G Module housing from the clear cover by pulling the cover straight out from the housing. Set the Cellular 500G Module cover aside where it will not be damaged or fill with rain, dirt, or snow. You will replace the cover later in this installation procedure.

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



Warning! Indexes have varying drive mechanism styles. Failure to align the Cellular 500G 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 Cellular 500G 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 by 0.625 (5/8) inch screw into the index right mounting screw hole.
11. Attach the screw to the Cellular 500G 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 Cellular 500G Module cover over the index and housing. Verify that the cover is installed correctly. The Cellular 500G Module label should be clearly visible and easily read.

15. After the Cellular 500G Module programming is complete, attach the Cellular 500G Module assembly to the Sensus meter. For programming information, see Programming on page 13.
16. Place the Cellular 500G Module assembly against the front of the meter at angle.

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

17. Install and tighten the Cellular 500G 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 Cellular 500G 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 module wriggler gear to meter gear engagement, push the Cellular 500G Module to the right while tightening the screws in the following pattern.

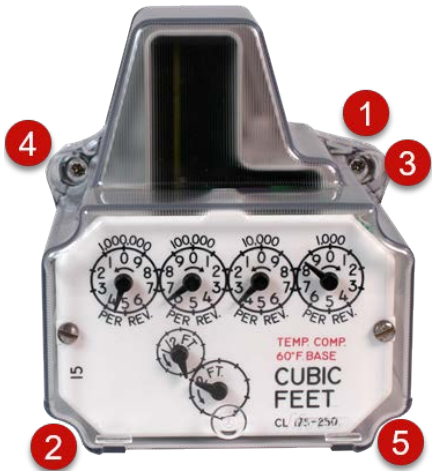
    a. Align the top right mounting screw hole on the meter with the top right screw hole on the Cellular 500G Module.
    b. Insert the top right cover mounting screw and tighten the screw enough to hold the Cellular 500G Module assembly in place. Do not completely tighten the screw.
    c. Rotate the Cellular 500G Module assembly counterclockwise until the remaining three 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.

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

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

5. Tighten each mounting screw evenly.



19. Place a new tamper seal over the two screws with tamper seal cups. Press the new tamper seals into place using an 0.34 (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 Cellular 500G Module installation on the Sensus meter.

Programming and Requirements Notes

Caution: You must program the Cellular 500G Module before use. For programming information, see Programming on page 13.

The Cellular 500G 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.

Commercial Meters

Elster American Installation

This section provides instructions to install the commercial Cellular 500G Module Elster American/Itron module on Elster American commercial meters. Some meter manufacturers provide mounting kits and installation procedures for their meters. If the Elster American meter to the Cellular 500G Module installation instructions are not available, follow the installation procedures in this section.

Important! Modules ordered pre-programmed with security injected and specified as Zero Touch Deployment require that the installer rotate the wriggler five times to activate the Cellular 500G Module if installing in a location with little or no gas flow.

Figure 6 Elster/American Cellular 500G Module (Commercial)

Indexes may be mounted on the commercial Cellular 500G 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 assume you are installing metal mounting plates without tamper seal cups and plastic mounting plates with tamper seal cups that represent mounting plate options.

This section provides instructions to install the residential modules on the following compatible Elster American meters.

Meter model	Itron part number
	ECG-7200-007
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	

Installation Overview

Installing the Cellular 500G 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 module.
3. Programming the Cellular 500G Module. See Programming on page 12 for programming instructions and items needed to program the Cellular 500G Module.

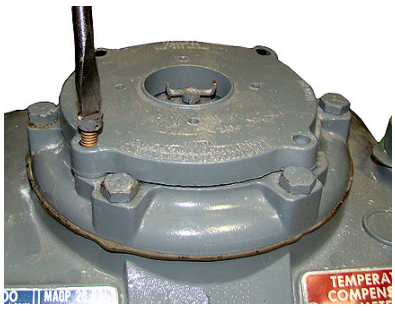
4. Connecting the Cellular 500G Module to the meter. Connecting the Cellular 500G Module to the meter may require the following materials:
   - A compatible index
   - Small and medium flat-blade or Phillips screwdrivers
   - Side-cutting pliers or wire snips
   - *(Optional)* meter seals, wire seal, and seal press
   - 0.34 (11/32) inch nut driver or other blunt tool
   - Replacement screws (for replacement screw information, see Installation Requirements and Replacement Parts on page 17.

Module configuration with the meter is dependent on your system application. See the Elster American meter configuration documentation.

Meter Installation

> **Note:** The module depicted below may vary slightly in appearance from the Cellular 500G Module you are installing.

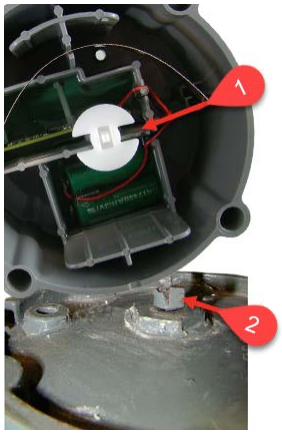
1. Remove any tamper seals (or wire seals) from the index cover and mounting plate screws. Set the index and cover assembly aside. You will re-install it later in these instructions.
2. Remove the index cover screws from the meter. Verify that screws are 0.5 inch long and are not corroded. If the screws 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 Cellular 500G Module. For programming instructions, see Programming on page 12. After the commercial module is successfully programmed, attach it to the commercial meter.

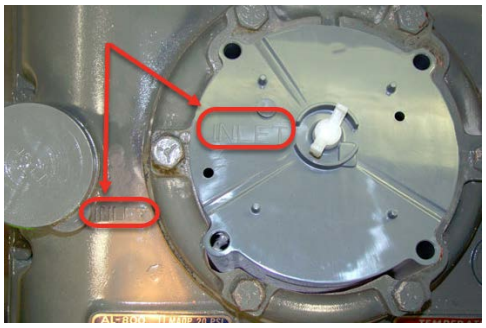
6. Tilt the commercial module at an angle and turn the wriggler until the wriggler's notches line up with the meter's drive dog teeth.

   Failure to properly align the Cellular 500G Module wriggler with the meter drive post can cause binding and lead to poor registration or meter failure.



7. Align the Cellular 500G 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 Cellular 500G Module must line up with the INLET label on the meter case.



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

   Do not press down on the Cellular 500G Module if a gap exists between the Cellular 500G Module and the meter. A gap may be caused by misalignment of the Cellular 500G Module wriggler and meter's drive post. Pushing down on the Cellular 500G Module could damage the Cellular 500G Module wriggler or meter drive post. To eliminate a gap, slowly turn the Cellular 500G 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 Cellular 500G 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.)

   Note: The module depicted below may vary slightly in appearance from the Cellular 500G Module you are installing.

10. Install four mounting screws included with the Cellular 500G Module and tighten them in an alternating diagonal sequence. For metal mounting plates with a flat screw surface, use Cellular 500G Module mounting screws with internal tooth washers. For plastic mounting plates with tamper screw cups, use Cellular 500G Module mounting screws (use O-ring AS-568A-011, 5/16 inch ID x 7/16 inch OD for a maximum moisture seal). Turn each screw a quarter to half a 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.
    d. 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 Cellular 500G Module on an Elster American commercial meter.

Programming and Requirements Notes

The Cellular 500G 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 cubic foot, 2 cubic feet or 0.05 cubic meters (not shown below).

Sensus/Rockwell Installation

This section provides instructions to install the commercial Cellular 500G 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.

Figure 7 Sensus/Rockwell Cellular 500G Module (Commercial)

The listed Sensus meters are compatible with the commercial Cellular 500G Module.

Meter model	Meter notes	Itron part number	Gas module notes
750	Vertical index only	ECG-7200-008	
1000			
1600			
3000			
10000			
 750	Aluminum box direct reading (VDR) index	ECG-7200-008	Requires Itron mounting screws, part number SCR-0062-001. Must purchase separately.
1000			
1600			
3000			
5000			
10000			
EMCO #2-1/2	Vertical index only	ECG-7200-008	
EMCO #3			
EMCO #4			
EMCO #4-1/2			
EMCO #5			

Installation Overview

Installing the Cellular 500G 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 module.

3. Programming the Cellular 500G Module. See Programming on page 12 for programming instructions and items needed to program the Cellular 500G Module.
4. Connecting the Cellular 500G Module to the meter. Connecting the Cellular 500G 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
   - 0.34 (11/32) inch nut driver or other blunt tool
   - Replacement screws (for replacement screw information, seeInstallation Requirements and Replacement Parts on page 17)

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

Meter Installation

> **Note:** The module depicted below may vary slightly in appearance from the Cellular 500G Module you are installing.

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 Cellular 500G Module installation. For programming information, see Programming on page 12.

4. Tilt the commercial Cellular 500G 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 Cellular 500G Module wriggler with the meter drive post can cause binding and lead to poor registration or meter failure.

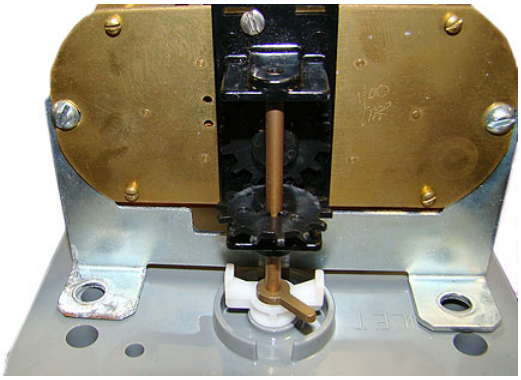
5. Align the Cellular 500G Module so the screw holes line up with the meter's top screw holes. Carefully lower the Cellular 500G Module on the meter so the wriggler's bars line up with the meter drive dog. Itron recommends installation with one bar inserted into the meter drive dog's u-shaped gear.

   Important! The INLET label on the commercial Cellular 500G Module must line up with the INLET label on the Sensus meter case.

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

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

7. Align the Cellular 500G Module with the index mounting holes. Verify the index drive dog intersects with the Cellular 500G Module's wriggler.
8. Verify the index drive dog intersects with the Cellular 500G Module's mounting screws (SCR-0062-003). Turn each screw a quarter to half a 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 inch ID by 7/16 inch OD), O-rings, and tamper seals.

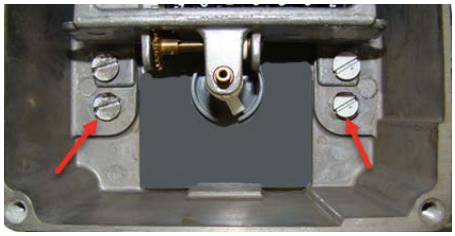
- Place new tamper seals over screws (if mounting plate has tamper seal cups) and press into place with an 11/32 inch nut driver or similar blunt tool.
- If your mounting assembly requires a utility-approved wire seal, pass wires through holes in the screw heads and crimp the approved wire seal.

  This completes installation of the commercial Cellular 500G Module on the Sensus commercial diaphragm meter.

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.

> **Note:** Program the commercial module before you complete the installation on the Rockwell meter (for programming information, see Programming Fundamentals on page 1).

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

> **Caution:** Removing the rear housing pins may make the Cellular 500G Module incompatible with other commercial meters.

5. Tilt the Cellular 500G 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 Cellular 500G Module wriggler with the meter drive post can cause binding and lead to poor registration or meter failure.

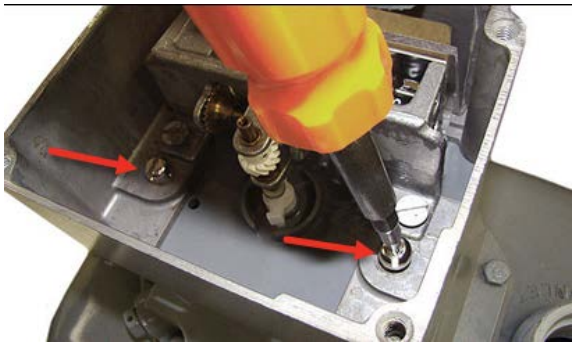
6. Align the Cellular 500G Module so the screw holes line up with the meter's top screw holes. Carefully lower the Cellular 500G Module on the meter so the wriggler's bars line up with the meter drive dog. Itron recommends installation with one bar inserted into the meter drive dog's u-shaped gear.

Warning! The INLET label on the commercial Cellular 500G 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 Cellular 500G Module housing must rest on top of the meter without gaps.

   Warning! Do not press down on the Cellular 500G Module if a gap exists between the Cellular 500G 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 Cellular 500G 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 Cellular 500G Module shaft and mounting holes. Attach the Cellular 500G 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 Cellular 500G Module with an aluminum box direct reading (VDR) index on a Rockwell commercial meter.

Programming and Requirements Notes

Caution: You must program the Cellular 500G Module before use. For programming information, see Programming on page 13.

The Cellular 500G 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.


1,000,000
100,000
10,000
1,000
PER REV.
TEMP. COMP.
60°F. BASE
CUBIC
FEET
CL 175-250
15

A 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. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

This 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 and ISED rules, unapproved modifications or operation beyond or in conflict with these instructions for use could void the user's authority to operate the equipment.

Canada, ISED Spectrum Compliance

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

RF Exposure (FCC/ISED)

This equipment complies with radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Cet équipement est conforme aux limites d'exposition aux radiations dans un environnement non contrôlé. Cet équipement do it être installé et utilisé à distance minimum de 20 cm entre le radiateur et votre corps. Cet émetteur ne doit pas être co-localisées ou opérant en conjonction avec tout autre antenne ou transmetteur.

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 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 Cellular 500G Module may damage the device and void the warranty.