Application Note 009
Version 001
05 February 2010

# Sensus Water & Gas Meters – Configuring The ICE™ Index For Maximum Flow & Total Resolution.

The purpose of this document is to provide assistance to the EtherMeter user who wishes to collect totalization and flow rate information from Sensus Gas or Water Meter Indices (Registers).


**Figure 1. A Sensus R-175 Gas Meter Equipped With An Encoder-Based "ICE" Index (Register). This particular meter, when programmed to transmit all eight (8) digits, provides 1 cubic foot resolution and totalizes up to 99,999,999 cubic feet.**

**Water Meters** Generally speaking the Sensus Water ICE Index is factory pre-programmed to customer specifications.

**Gas Meters** On the other hand, the Sensus Gas ICE Index is generally pre-programmed to transmit only four (4) totalization digits using the fixed-length reading string format.

When using any model Sensus flow meter, it is recommended that the meter be programmed to transmit all eight (8) totalization digits, as this maximized resolution improves the connected SCADA system's ability to monitor realtime flow-rate and totalization from both water and gas meters.

While it is preferable (and simpler) for the customer to request pre-programming by Sensus personnel, it is important to note that Sensus meters may also be field-programmed.

This document details the field-programming procedures and settings for Sensus water and gas meters.

Required Tools:

- **Meter Index (Register)**
- **Sensus Programmer (eg Model 3001, UniPro 100A, etc…)**
- **Touch-Pad (if not already molded into the meter index (register) cable)**
- **Medium Phillips Screwdriver & Small Flat-Head Screwdriver**
- **Hookup Wire & Wire Stripper/Cutter**

Two popular Sensus programmers are shown in Figure 2. In order to program a Sensus ICE Index, an Inductive Touch-Pad is also required, unless the pad is integrated into the ICE Index's cable (See Figure 3.)

The step-by-step programming procedures for a Sensus Model 3001 Programmer are illustrated in Figures 4 through 16.


**Figure 2. A new Sensus UniPro 100A Programmer (Left), and a legacy Sensus Model 3001 Programmer (Right).**

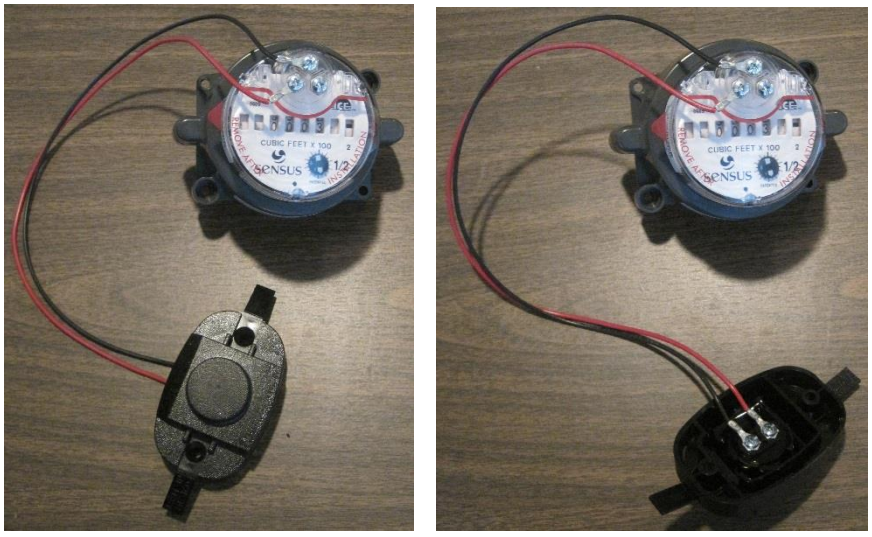


**Figure 3. Touch-Pad Connected To Sensus Gas Meter ICE Index (Required for Programming). Top View of Touch-Pad (Left). Bottom View of Touch-Pad (Right). Note that the RED and BLACK terminals of the ICE register are connected to the Touch-Pad.**


**Figure 4.**

Turn ON the Model 3001 Programmer by pressing the “LIGHT” key.


**Figure 5.**

Select “Programming Options” by pressing the “SHIFT-SENSUS” key.


**Figure 6.**

Select “Edit Defaults” by pressing the ‘1’ key.


**Figure 7.**

Programmable ID:  Disabled
Change it?

Press the “NO” key.


**Figure 8.**

Reading Wheels: 6 → 3 (4 Digits)
Change it?

Press the "YES" key.

Modify the left-most wheel to '8'.
Modify the right-most wheel to '1'.


**Figure 9.**

Programmable Text: <blank>
Change it?

Press the "NO" key.


**Figure 10.**

Reading Parameters:
Multiplier: Disabled
Unit: Disabled

Change it?

Press the "NO" key.


**Figure 11.**

Reading Mode:
2 – Fixed Reading String
Change it?

Press the "YES" key


**Figure 12.**

0 – Normal Reading String
1 – Extended Reading String
2 – Fixed Reading String

Enter Choice:

Press ‘0’ (Normal Reading String).


**Figure 13.**

Press the “SENSUS” key to initiate the programming sequence.


**Figure 14.**

Place the Touch-Gun (TG) on the Inductive Touch-Pad.

**Figure 15.**

Closeup of the Touch-Gun. Note the trigger button.

**Figure 16.**

Hold the Touch-Gun flush with the Touch-Pad, and press the Trigger.

The Model 3001 Programmer displays the programming progress on its LCD display.

Hold the Touch-Gun in place until the programming sequence is completed.

The Index is now ready for connection to an EtherMeter.

To summarize, the following programming parameters were used:

| | |
|---|---|
| **Programmable ID:** | **Disabled** |
| **Reading Wheels:** | **8 → 1** |
| **Programmable Text:** | **<blank>** |
| **Multiplier:** | **Disabled** |
| **Unit:** | **Disabled** |
| **Reading String:** | **Normal Reading String** |

If a different Sensus programmer is used (for example, the UniPro 100A), the procedure will vary, but the result will be equivalent if same programming parameters as listed above are employed.

Figure 17 illustrates an EtherMeter's "Diagnostic" Screen when a factory-default programmed Sensus Gas ICE Index is connected. Note the 4-digit totalization.

Figure 18 illustrates an EtherMeter's "Diagnostic" Screen when a re-programmed Sensus Gas ICE Index is connected (re-programmed according to the provided procedures). Note the 8-digit totalization.

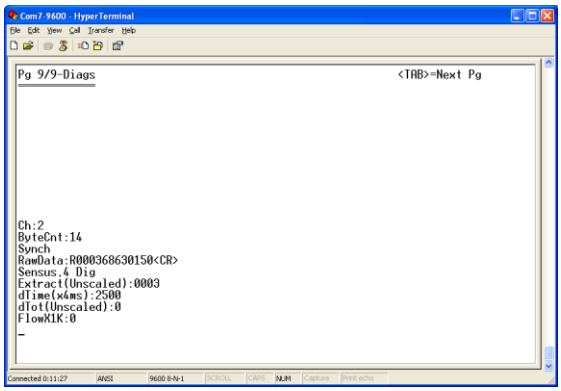


**Figure 17.** Gas ICE Index Reading Details
(Sensus Default Settings: 4-Digit Totalization)

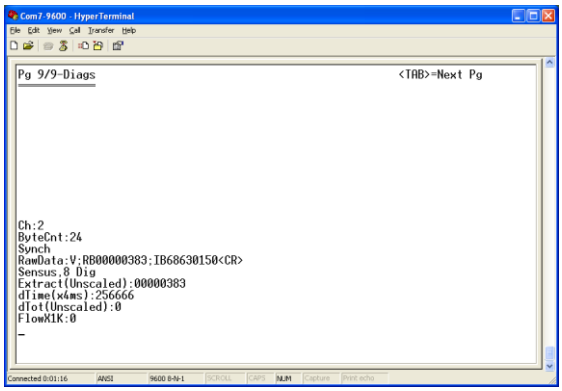


**Figure 18.** Gas ICE Index Reading Details.
(Modified Settings: 8-Digit Totalization)