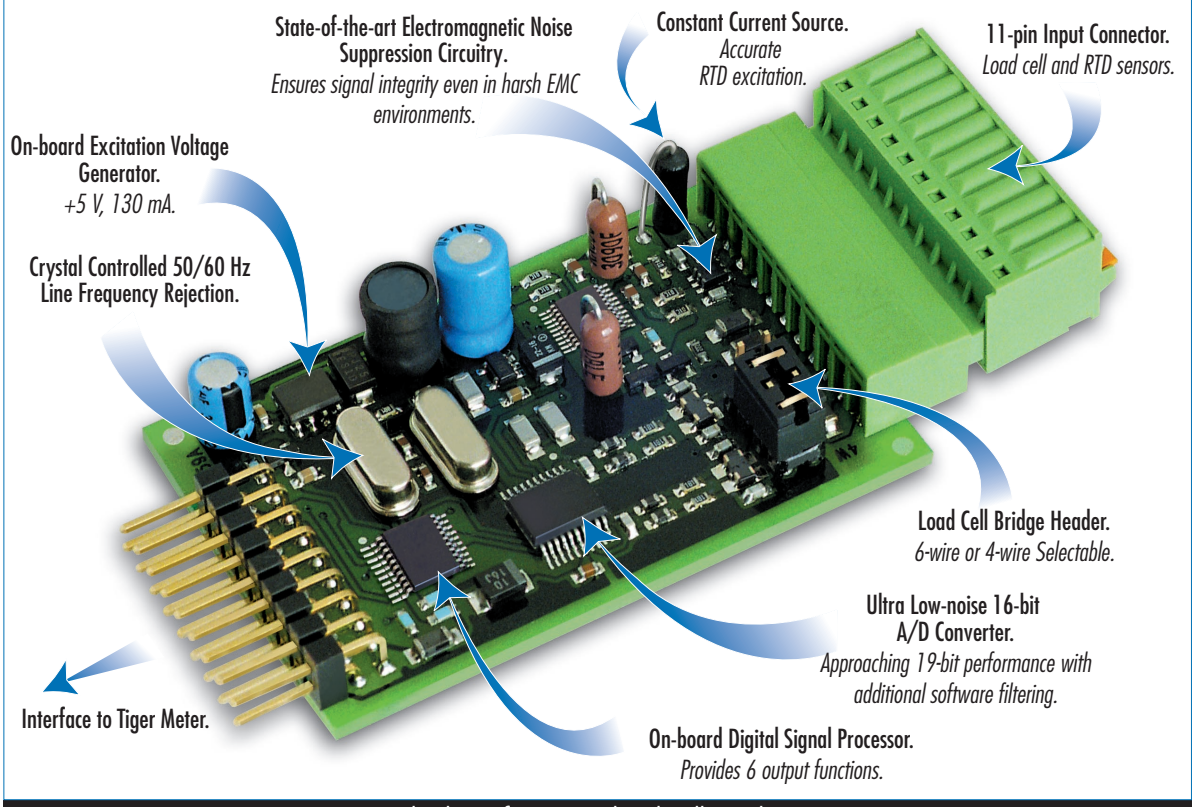
TEXMATE INC

Fits Tiger 320 Series

RTD & SMART 16-BIT LOAD CELL INPUT MODULE



RTD & high performance load cell combination.

A smart input module designed to monitor temperature using an RTD sensor and weight using a load cell. Ideal for applications that calculate fluid volume from weight and density measurements corrected for temperature changes.

Combined with the powerful Tiger 320 Series programmable meter controller, continuous monitoring and control of accurate volume versus cost calculations are a reality.

Input Module Order Code Suffix

ISSB (50/60 Hz)

Hardware Module Specifications	
RTD (CH1)	
Excitation	1.5 mA DC continuous.
Sensor Types	Pt (100 Ω) 385 & 395, Ni 120 & Cu 10.
Wiring	3-wire excitation & lead compensation.
Load Cell (CH2 / CH3 / CH4)	
Excitation	5 V DC, 130 mA maximum.
Input Range	Software selectable for sensors 1 mV/V to 20 mV/V.
Input Sensitivity	0.08 µV/ count maximum.
Zero Drift	± 40 nV/°C typical.
Span Drift	± 5 ppm/°C of full scale maximum.
Non-linearity	± 0.003% of full scale maximum.
Input noise	160 nV pp typical at 1 Hz output rate.
Signal Processing Rate	50 Hz maximum, 1 Hz minimum.
Wiring	4-wire & 6-wire selectable.
Guard	Shield 2.5 V common mode voltage.

Software Module Features	
Load Cell	
Dual Output Rates	Rapid and average response outputs.
Peak & Valley Outputs	Monitoring over and under-shoots.
Capture Output	Hardwire signal capture.
Rate of Change Output	Useful for fine tuning reaction times.
Line Frequency Rejection	50/60 Hz selectable.

Connector Pinouts

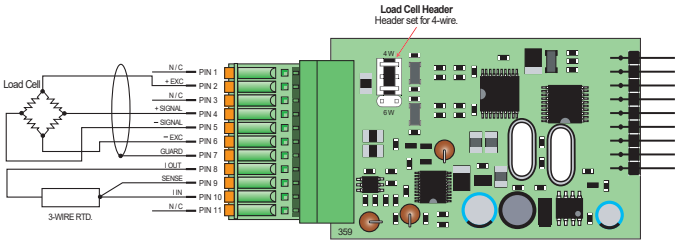


Figure 1 – ISSB Input Module Showing 4-wire Load Cell and 3-wire RTD Configuration

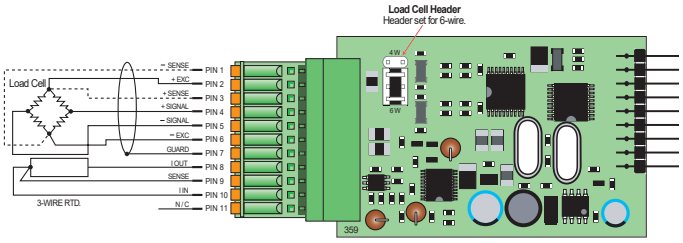


Figure 2 – ISSB Input Module Showing 6-wire Bridge and 3-wire RTD Configuration

Smart Setup Registers

The meter uses three smart setup registers to configure all smart input modules. The ISSB input module requires only **smart register 1** to be set up.

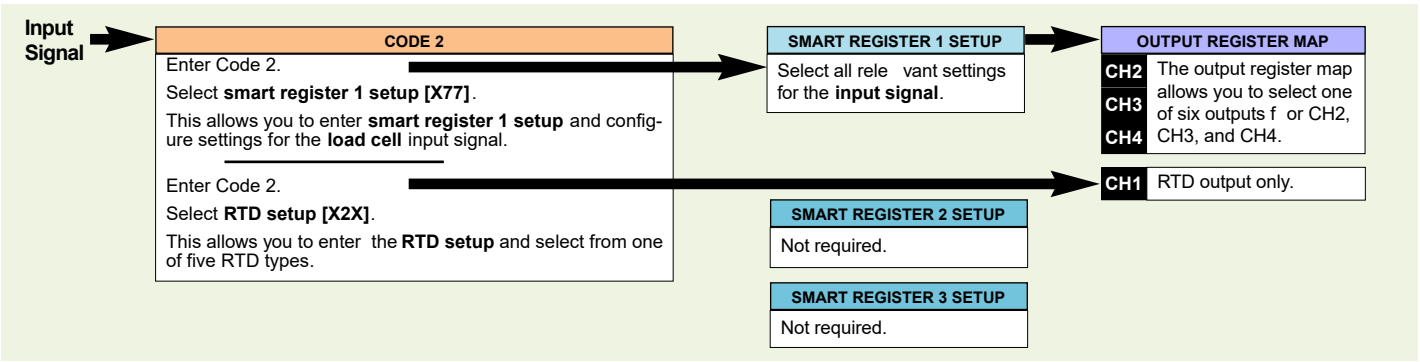


Figure 3 – ISSB Smart Setup Registers Operational Flow Diagram

Internally, the RTD input is automatically assigned to channel 1 (CH1) and must be set up through Code 2. The RTD input feeds directly through the input module multiplexer to the meter's 17-bit A/D converter, and then to the microprocessor for further processing.

The load cell input is processed in the input module's 16-bit A/D converter and digital signal processor. It is then fed to some or all of the three remaining channels, CH2, CH3, CH4, where one of six outputs can be selected for each channel from the output register map. Smart register 1 must be set up for the load cell to define the line frequency rejection, the sensor input in millivolts per volt, and the output rate.

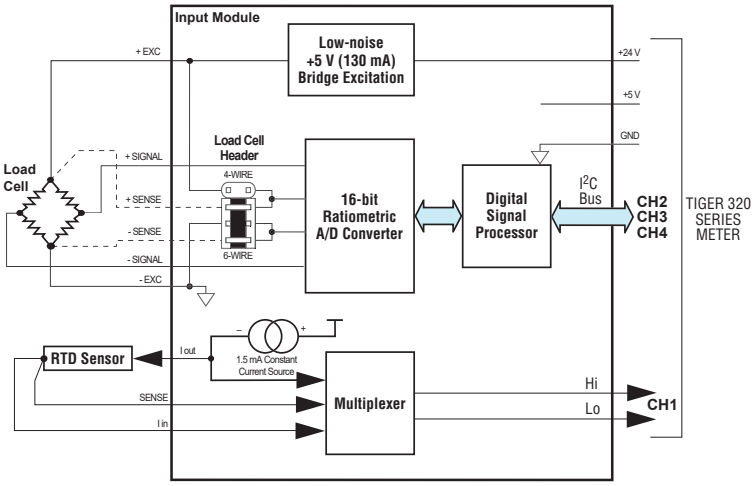


Figure 4 – ISSB Smart Setup Registers – Signal Flow Diagram

Programming Quick Start Guide

Load Cell Setup

1 Press the [P] and [↑] buttons at the same time to enter the main programming mode.

2 Press the [P] button three times to enter Code 2. Set Code 2 to [X77].

This setting enters the **smart register 1** code setup menu of the **load cell** input.

FIRST DIGIT
TIGER PROCESSING RATE
0 10 Hz
1 10 Hz
2 100 Hz
3 100 Hz

SECOND DIGIT
MEASUREMENT TASK
0 Voltage, Current
1 TC (3rd digit selects type of TC)
2 RTD 3-wire (3rd digit selects type of RTD)
3 RTD 2- or 4-wire (3rd digit selects type of RTD)
4 Frequency
5 Period
6 Counter
7 Smart Input Module

THIRD DIGIT
OUTPUT REGISTER MAP
0 Averaged signal
1 Rapid response signal*
2 Peak signal*
3 Valley signal*
4 Capture signal**
5 Rate of change signal
6 -
7 Smart input module register 1 code setup

* Signal output at A/D sampling rate.
** Hardwire initiated from meter capture pin.

Note the output register map is different for each smart input module.

3 Press the [P] button.

SMt 1 000

This menu provides settings unique to **smart register 1** of input module ISSB.

FIRST DIGIT
LINE FREQUENCY
0 60 Hz rejection
1 -
2 50 Hz rejection
3 -

SECOND DIGIT
LOAD CELL INPUT mV/V (5 V Exc.)
0 1 mV/V
1 2 mV/V
2 3 mV/V
3 20 mV/V
4 -
5 -
6 -
7 -

THIRD DIGIT
OUTPUT RATE
0 1 Hz averaged: 50/60 Hz rapid response
1 10 Hz: 50/60 Hz rapid response
2 -
3 50/60 Hz averaged: 800/900 Hz rapid response
4 -
5 -
6 -
7 -

4 Using the [↑][↓] buttons, select the relevant line frequency rejection, load cell input, and output rate settings.

5 Press the [P] button. The display returns to [Cod_2] [X77]. Cod_2 X77

RTD Setup

6 Using the [↑][↓] buttons, set Code 2 to [X2X] to select a 3-wire RTD sensor for the CH1 measurement task. In the 3rd digit, select the RTD type.

Cod_2 X2X

FIRST DIGIT
TIGER PROCESSING RATE
0 10 Hz
1 10 Hz
2 100 Hz
3 100 Hz

SECOND DIGIT
MEASUREMENT TASK
0 Voltage, Current
1 TC (3rd digit selects type of TC)
2 RTD 3-wire (3rd digit selects type of RTD)
3 RTD 2- or 4-wire (3rd digit selects type of RTD)
4 Frequency
5 Period
6 Counter
7 -

THIRD DIGIT
OUTPUT REGISTER MAP
0 Resistance
1 RTD Pt 100 Ω (385)
2 RTD Pt 100 Ω (392)
3 RTD Zn 100 Ω (120)
4 RTD Cu 10 10 Ω
5 -
6 -
7 -

7 Press the [P] button to save the settings.

Press the [P] and [↑] buttons at the same time to save the RTD Code 2 settings and return to the operational display.

Select a Load Cell Channel

Select the load cell output register for CH2, CH3, or CH4

8 Press the [P] and [↑] button at the same time again to re-enter the main prog ramming mode.

9 Press the [P] button five times to enter Code 4.

10 To select an output register for CH2, enter Code 4 and select the required register map settings for **CH2** in the 2nd digit.

Note, the 1st and 3rd digits must be set to 0.

CH2 Cod_4 0X0

FIRST DIGIT
MEASUREMENT TASK
0 Voltage, Current
1 TC (type as per 2nd digit)
2 RTD (type as per 2nd digit)
3 Second Digital Input Channel (type as per 2nd digit)

SECOND DIGIT	
FOR VOLTAGE & CURRENT	
0 Sensor 2 Input Disabled	
1 Direct (no post processing)	
2 Square Root of Sensor 2 Input	
3 Inverse of Sensor 3 Input	
4 Output Register 1 (smart module)*	
5 Output Register 2 (smart module)*	
6 Output Register 3 (smart module)*	
7 Output Register 4 (smart module)*	

Note:
*The logic for **CH2** is not the same as CH3, or CH4. The 1st and 3rd digits must both be set to 0. Selecting 040 to 070 in the 2nd digit of Code 4 directly selects one of the following settings in the output register map (3rd digit):*

2nd Digit	Output Register Map
4 selects	**0 Averaged signal**
5 selects	1 Rapid response signal
6 selects	2 Peak signal
7 selects	3 Valley signal

Note the capture **and** rate of change **registers can not be selected in Code 4 for CH2.**

11 If required enter Code 5 and select the required post processing setting for **CH3** in the 2nd digit and the required output register map setting in the 3rd digit.

CH3 Cod_5 X7X

FIRST DIGIT
CH3 INPUT POST PROCESSING
0 Direct Display of Input (no processing)
1 Square Root of Sensor 3 Input
2 Inverse of Sensor 3 Input
3 **Meters with 4 kB memory** NO Linearization **Meters with 32 kB memory** 32-point Linearization of Sensor 3 Input using Table 3

Note:
All linearization tables are set up in the Calibration Mode [24X].

THIRD DIGIT
OUTPUT REGISTER MAP
0 Averaged signal
1 Rapid response signal*
2 Peak signal*
3 Valley signal*
4 Capture signal**
5 Rate of change signal
6 -
7 Smart input module register 1 code setup

* Signal output at A/D sampling rate.
** Hardwire initiated from meter capture pin.

Note the register map is different for each smart input module type.

From Procedure 12, Page 4

12 If required enter Code 6 and select the required post processing setting f or **CH4** in the 1st digit and the required register map setting in the 3rd digit.

CH4 Cod_6 X7X

FIRST DIGIT
SENSOR 4 INPUT POST PROCESSING
0 Direct Display of Input (no processing)
1 Square Root of Sensor 4 Input
2 Inverse of Sensor 4 Input
3 **Meters with 4 kB memory**
NO Linearization
Meters with 32 kB memory
32-point Linearization of Sensor 4 Input using Table 4
Note:
All linearization tables are set up in the Calibration Mode [24X].

To Procedure 11, Page 3

13 Press the [P] button to save the settings.

14 Press the [P] and [↑] buttons at the same time to return to the operational display.

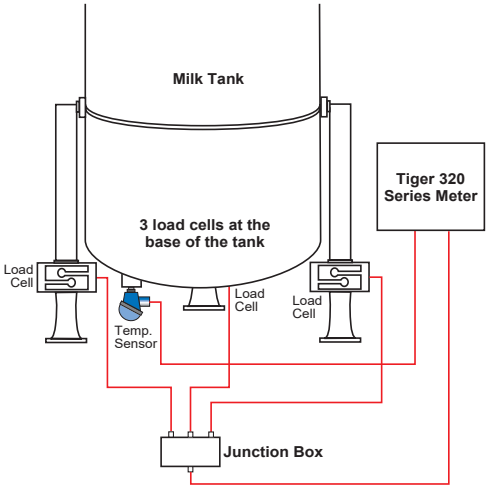


Figure 5 – Example Milk Dispensing Tank

Example Setup Procedure

The volume of milk in a dispensing tank must be known as payment to the dairy farmer is on a per volume basis (See Figure 5).

Each foot of the tank is mounted on a 20 mV/V load cell. Each load cell is connected in parallel at a junction bo x to supply an a veraged weight signal to the Tiger 320 Ser ies controller.

An RTD 385 Pt 100 Ω sensor monitors the liquid temperature. As volume changes slowly with temperature, an output rate of 1 Hz averaged is sufficient for the load cell signal.

1 **Select line frequency rejection as 50 Hz input f or a 20 mV/V load cell averaged signal input with a 1 Hz output rate in smar t register 1:**

In [CODE 2] select [X77] then press [P] button.

Display toggles between [SMt1] [000]

Set [SMt1] to [230]

2 **Select 3-wire RTD 385 probe for CH1:**

In [CODE 2] select [X21]

3 **Select the load cell average output weight for CH2:**

In [CODE 4] select [040]

Customer Configuration Settings:

RTD only

CH1 Cod_2

1st Digit	2nd Digit	3rd Digit
	2	

Load Cell only

Cod_2

1st Digit	2nd Digit	3rd Digit
	7	7

SMt 1

1st Digit	2nd Digit	3rd Digit

CH2 Cod_4

1st Digit	2nd Digit	3rd Digit
0		0

CH3 Cod_5

1st Digit	2nd Digit	3rd Digit
	7	

CH4 Cod_6

1st Digit	2nd Digit	3rd Digit
	7	

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