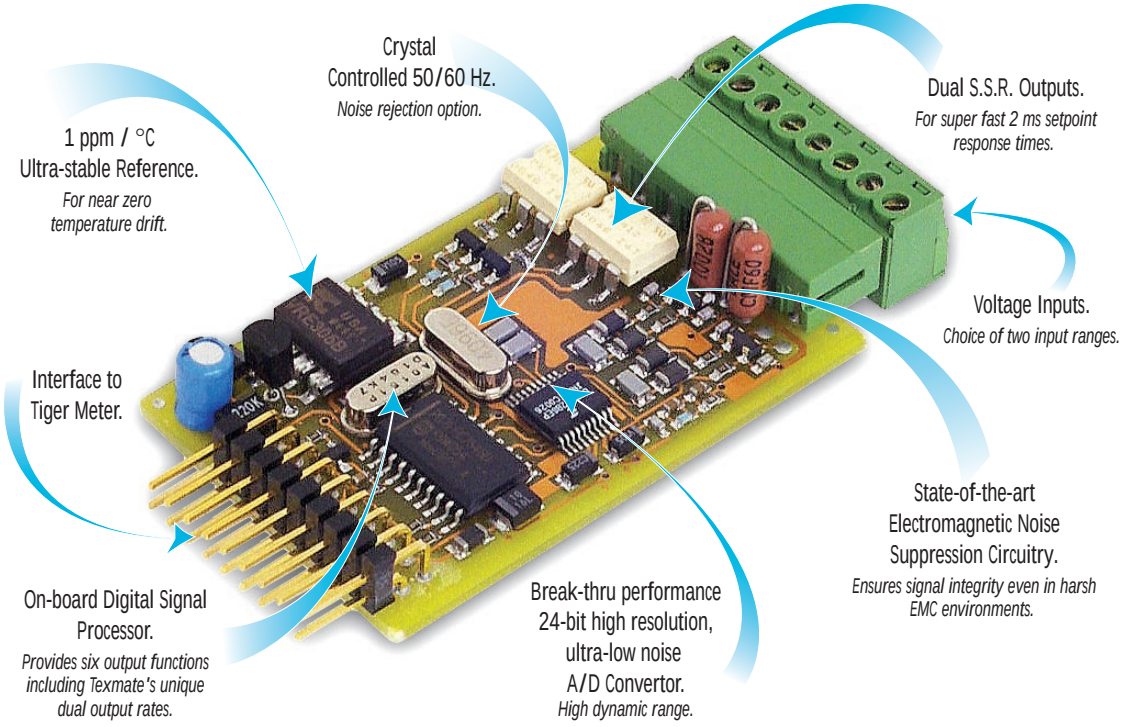
TEXMATE INC

Fits Tiger 320 Series

24-BIT SMART DC VOLTS INPUT MODULE



For the first time, an exceptionally high performance mV/V controller is available at a panel meter price

This input module outperforms many laboratory benchtop meters and calibrators. Where absolute accuracy is a must, this is the module to use.

Input Module Order Code Suffix

ISD5 (50 Hz Rejection)
ISD6 (60 Hz Rejection)
ISD7 (50 Hz w/SSRs)
ISD8 (60 Hz w/SSRs)

Hardware Module Specifications	
Input Range	Software selectable from 30 mV to 60 V.
Input Sensitivity	5 nV/ count maximum.
Zero Drift	± 40 nV/ °C typical.
Span Drift	± 3 ppm/ °C of F.S. (typical) for 30 mV to 2 V ranges.
	± 30 ppm/°C of F.S. (typical) for 60 V range.
Non-linearity	± 0.002% of full scale maximum.
Input Noise	40 nV p-p typical at 1 Hz output rate (30 mV range).
SSR Processing Rate	960 Hz maximum 1 Hz minimum.
Tiger 320 Processing Rate	10 or 100 Hz.
Solid State Relay (SSR)	17 Ω, 140 mA (± 400 V Breakdown).

Software Module Features	
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.

Some Relevant Tiger 320 Series Operating System Features
Smart Averaging.
Setpoints.
Linearization.
Macro Compiler for complex math Functions.

24-BIT SMART DC VOLTS

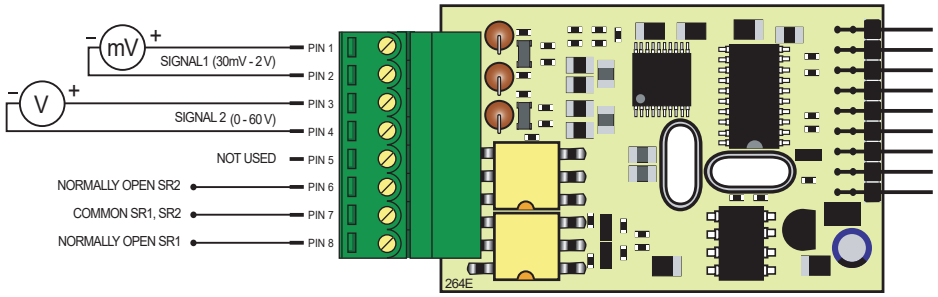
INPUTS

High Resolution
High Accuracy
High-speed S.S.R.
Output

Volts DC
Millivolts DC

Amps DC
with Ext. Shunt

Connector Pinouts



Smart Setup Registers

The meter can be connected to tw o input ranges, but perform signal conditioning on only one . The required input r ange is selected through software configuration.

ISD5 is a crystal controlled 50 Hz frequency r ange input module and **ISD6** is a crystal controlled 60 Hz frequency r ange input module.

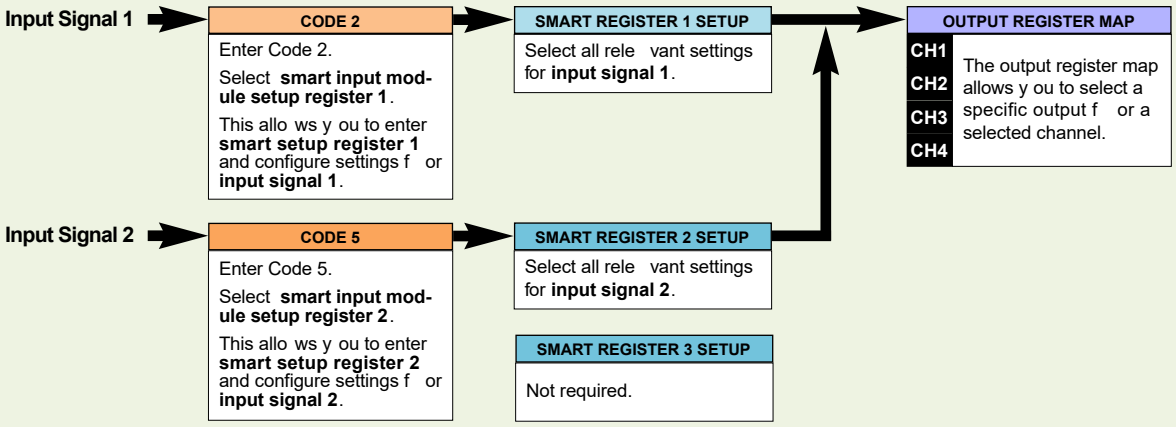
ISD7 is a crystal controlled 50 Hz frequency r ange input module with two solid state relay (SSR) outputs. **ISD8** is a crystal controlled 60 Hz frequency range input module with tw o SSR outputs.

The SSR outputs are known as smart relay 1 (SR1) and smart relay 2 (SR2) and are controlled through meter setpoints SP5 and SP6 respectively. In their unenergized state, the SSRs can be configured in softw are to be either a normally open (NO) or normally closed (NC) contact and can be switched at the selected averaged input signal or r apid response rate.

The meter uses three smart setup registers to configure all smart input modules. ISD5 and ISD6 require only **smart register 1** to be set up, while ISD7 and ISD8 require **smart register 1** and **smart register 2** to be set up.

This module produces **six output registers**. One of these registers can be transferred to Channel 1 via Code 2, the same or another register to Channel 2 via Code 4, the same or another register to Channel 3 via Code 5, and the same or another register to Channel 4 via Code 6.

Smart Setup Register – Operational Flo w Diagram



Programming Procedures

The following programming procedures cover all the steps required to configure ISD7. Similar procedures can be followed to configure ISD5, ISD6, and ISD8. Remember, ISD5 and ISD6 do not ha ve SSRs, so Steps 6 to 10 can be skipped dur ing configuration.

Steps 1 to 5 describe how to select the signal (1 or 2), v oltage, and output r ate through **smart register 1**.

Steps 6 to 9 describe how to select the SR1 and SR2 output mode and the source of data f or SP5 and SP6 through **smart register 2**.

Steps 10 to 16 describe how to select the output register f or channels 1, 2, 3, and 4 as required.

1 Press the [P] and [⬆] buttons at the same time to enter the main prog ramming 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.

Note:
The 1st digit setting is not rele vant to this step. 0 is the default setting.

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

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

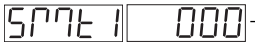
THIRD DIGIT
OUTPUT REGISTER MAP
0 Averaged signal 1 or 2
1 Rapid response signal 1 or 2*
2 Peak signal 1 or 2*
3 Valley signal 1 or 2*
4 Capture signal 1 or 2**
5 Rate of change of signal 1 or 2
6 -
7 Smart input module **register 1** code setup

* *Signal output at the A/D sampling r ate.*

** *Hardwire initiated from meter Capture pin.*

3 Press the [P] button.

This enters **smart register 1** code setup menu.



FIRST DIGIT
Not relevant

SECOND DIGIT
FULL SCALE SIGNAL
0 ± 2.0 V – Signal 1
1 ± 1.25 V – Signal 1
2 ± 600 mV – Signal 1
3 ± 300 mV – Signal 1
4 ± 150 mV – Signal 1
5 ± 70 mV – Signal 1
6 ± 30 mV – Signal 1
7 ± 60 V – Signal 2

THIRD DIGIT
OUTPUT RATE
0 1 Hz averaged: 50/60 Hz rapid response
1 10 Hz averaged: 50/60 Hz rapid response
2 10 Hz averaged: 800/960 Hz rapid response
3 50/60 Hz averaged: 800/960 Hz rapid response
4 50/60 Hz averaged: 400/480 Hz rapid response
5 50/60 Hz averaged: 200/240 Hz rapid response
6 -
7 -

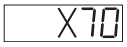
2nd digit settings 0 to 6 allo ws you to select input signal 1 with a range of full scale voltage settings from –30 mV to –2 V. Setting 7 allows you to select input signal 2 with a full scale voltage setting of a veraged 60 V. The 3rd digit allo ws you to select the output rate.

4 Using the [↑][↓] buttons, select the relevant **input signal, voltage**, and **output rate** settings.

5 Press the [P] button.

This takes you back to the Code 2 menu.

6 Using the [↓] button, reset the 3rd digit to z ero [X70] to leave the smart register 1 menu.



Note, leaving the 3rd digit as 7 means the displa y constantly cycles between [Cod_2] and [SMt1].

7 Press the [P] button three times to enter Code 5. Set Code 5 to [X77].

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

SECOND DIGIT
MEASUREMENT TASK
0 No function
1 Voltage, current
2 TC
3 RTD
4 Real time clock & timer
5 -
6 -
7 Smart input module

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

8 Press the [P] button.

This setting enters the **smart register 2** code setup menu.

This men u pro vides smar t rela y settings unique to input module ISD7 or ISD8.

Select the required smar t relay output mode and source of data for setpoints SP5 and SP6.

FIRST DIGIT
SMART RELAY OUTPUT MODE
0 SR1 & SR2 NC
1 SR1 NO, SR2 NC
2 SR1 NC, SR2 NO
3 SR1 & SR2 NO

Note:
SP5 controls SR1.
SP6 controls SR2.

SECOND DIGIT
SP6 SOURCE
0 Averaged signal 1 or 2
1 Rapid response signal 1 or 2*
2 Peak signal 1 or 2*
3 Valley signal 1 or 2*
4 Capture signal 1 or 2**
5 Rate of change of signal 1 or 2
6 -
7 -

THIRD DIGIT
SP5 SOURCE
0 Averaged signal 1 or 2
1 Rapid response signal 1 or 2*
2 Peak signal 1 or 2*
3 Valley signal 1 or 2*
4 Capture signal 1 or 2**
5 Rate of change of signal 1 or 2
6 -
7 -

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

The display toggles between [Cod_5] and [X77].

10 Using the [↑][↓] buttons, reset the 3rd digit to 0 to leave the **smart register 2** menu.

11 Press the [P] and [↑] buttons at the same time to retur n to the operational display.

12 Press the [P] and [↑] buttons at the same time again to re-enter the main programming mode.

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

Note:

Reset of Peak, Valley, and Capture Signals

Reset of peak/valley/capture signals options are:

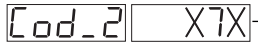
1. *If peak/v alley/capture signals are stored in CH1, CH2, CH3, or CH4, a macro can reset CH1 b y resetting register 253, CH2 b y resetting register 252, CH3 b y resetting register 251, and CH4 b y resetting register 250.*
2. *As for Step 1, but using the LOCK pin to reset.*
3. *As for Step 1, b ut only applying to CH1 using the HOLD pin to reset.*
4. *As for Step 1, but using SPC1 to reset CH1, SPC3 to reset CH3, and SPC4 to reset CH4.*

Select a Channel

Select the output register for the required channels

14 To select **channel 1**, set Code 2 to [X7X]. Select the required processing r ate for **CH1** in the 1st digit and the required output register map settings in the 3rd digit.

CH1



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

* *Signal output at the A/D sampling r ate.*

** *Hardwire initiated from meter Capture pin.*

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

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

15 To select **channel 2**, set Code 4 to [0X0]. Select the required output register map settings for **CH2** in the 2nd digit.

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	**Note:* *The logic for CH2 is not the same as CH1, 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):*
0 Channel 2 Disabled	
1 Direct (no post processing)	
2 Square Root of Channel 2	
3 Inverse of Channel 2	
4 Output Register 1 (smart module)*	
5 Output Register 2 (smart module)*	
6 Output Register 3 (smart module)*	
7 Output Register 4 (smart module)*	

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

16 To select **channel 3**, enter Code 5 and select the required output register map settings for **CH3** in the 3rd digit.

CH3 Cod_5 X7X

FIRST DIGIT
CH3 POST PROCESSING
0 Direct Display of Input (no processing)
1 Square Root of Channel 3
2 Inverse of Channel 3
3 **Meters with 4 kB memory** NO Linearization **Meters with 32 kB memory** 32-point Linear ization of CH3 using Table 3
Note: *All linear ization tab les are set up in the Calibration Mode [24X].*

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

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

* *Signal output at the A/D sampling rate.*

** *Hardwire initiated from meter Capture pin.*

17 To select **channel 4**, enter Code 6 and select the required output register map settings f or **CH4** in the 3rd digit.

CH4 Cod_6 X7X

FIRST DIGIT
CH4 POST PROCESSING
0 Direct Display of Input (no processing)
1 Square Root of Channel 4
2 Inverse of Channel 4
3 **Meters with 4 kB memory** NO Linearization **Meters with 32 kB memory** 32-point Linearization of CH4 using Table 4
Note: *All linearization tables are set up in the Calibration Mode [24X].*

Press the P button to save the settings.

18 Press the P and ↑ buttons at the same time to return to the operational display.

Customer Configuration Settings:

SMt 1

1st Digit	2nd Digit	3rd Digit

SMt2

1st Digit	2nd Digit	3rd Digit

CH1 Cod_2

1st Digit	2nd Digit	3rd Digit
	7	

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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