

# Operating Manual for Models :

**4001 / 4011 / 5001 / 5011 / 5600 /  
8001 / 5001-T / 8001-T**

Universal Process /  
Counter / Frequency /  
Integrator / Totaliser  
Indicator



## Safety

***This equipment is supplied by a mains voltage which can cause an electric shock injury. Before removing the circuit board from its housing, switch the instrument off, isolate it from the mains power supply and make sure that it cannot be connected inadvertently by other persons.***

***If the circuit board is removed from its housing, do not apply power to the instrument unless specifically instructed to do so in these instructions. When working on live equipment, exercise great care, use insulated tools and test equipment, and do not work alone.***

***When fitting option boards, always put the circuit boards back in the housing with the back-plate securely fastened before powering up the instrument.***

***When handling circuit boards, ensure that full anti-static precautions are observed.***

***Replace external mains fuse with one of an equivalent type.***

## Cleaning

***Do not clean the instrument while the instrument is on. Harsh abrasives, solvents, scouring cleaners and alkaline cleaning solutions, such as washing soda, should not be used especially on the display window. The outside of the instrument may be wiped down with a slightly damp clean cloth (lightly moistened with water only).***

***Under no circumstances should you attempt to wipe the inside of the instrument.***

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## Introduction

The Models 4001, 4011, 5001, 5011, 5600, 8001, 5001-T, 8001-T indicators are universal LED process indicators that can be applied to most process variables with analog & digital inputs. These high accuracy panel meters are designed for accurate measurement & display of pressure, level, flow, freq, up & down counting, DC voltages or currents & revolutions / min. Selected models offer integration / totalisation of the input signal. The built-in sensor excitation supply is link selectable for 2-wire / 3-wire transmitters, encoders & potentiometer input.

Model 4001 is a 4 digit (-1999 to 9999) indicator offering process inputs of type mA, mV, V, pot and frequency.

Model 5001 is a 5 ½ digit (-199999 to 199999) indicator offering all the features of Model 4001 but with process x frequency functions as well as count rate & totaliser.

Model 5600 is a 6 digit (-199999 to 999999) indicator offering all the features of Model 5001. Set points and other options are however limits to 5 ½ digits.

Model 5001-T is a 5 ½ digit (-199999 to 199999) indicator offering all the features of Model 5001 but with process integration / totalisation included.

Model 8001 is a 5 ½ digit rate display indicator with an 8 digit count display, while the Model 8001-T has process integration / totalisation included.

Model 4011 & Model 5011 offer Ascibus serial input for remote display of serial information.

## Electrical Specifications

Accuracy & linearity	: 0.05% of F.S., or 1 count
Option 3011/15/27 accuracy	: 0.5% of F.S., or 1 count
Internal resolution	: 20000 counts (bi-polar)
Temperature coefficient	: 20 ppm / °C typical
Settling time for process inputs	: 0.5 seconds
Settling time for frequency input	: 5 milliseconds (with no filter)
Operating temperature range	: -10 to +50°C
Storage temperature range	: -40 to +80°C
Humidity	: < 85% non-condensing
Warm-up time	: None required
Electro-mechanical relays	: 250V AC, 30V DC, 2A, PF=1
Solid state relays	: 400 V AC/DC, 0.5A, PF=1
Analogue output accuracy	: 0.1% of full scale, 12 bits
Current analogue output load	: 500 Ω maximum
Voltage analogue output load	: 1 kΩ minimum
Memory retention	: Full non-volatile operation
Option 3006 isolation rating	: 1500 V
Declaration of conformity	: See last page

## Input Ranges

0 - 20 mA, 4 - 20 mA, 0 - 200mV, 0 - 2 V, 0 - 10 V, 0 - 20 V, Special (pot input), 0.2Hz - 40kHz (24V max, up to 0.01 Hz resolution).

## Sensor Excitation

24V DC:	(17-26V), current limited. For 2-wire transmitters, proximity switches or encoders. With option 3010, current capability increases to 100mA
5V DC:	± 1%, maximum 25mA
2.5V DC:	Precision reference, 2mA max for pot (2 kΩ min)

## Power Supply

### Standard

115 / 230 VAC  $\pm$  10%, link selectable, 50/60Hz, 5VA typ  
or on request : 12VDC or 24VDC non-isolated, 5VA typ

### Optional

12VDC isolated power supply (Option 3008-12), 5VA typ  
24VDC isolated power supply (Option 3008-24), 5VA typ  
95V-265V AC/DC isolated power supply (Option 3010), 5VA typ

## Programmable Specifications

### 4 Digit Models

Zero & full scale setting : -1999 to 9999  
Decimal point : Adjustable on all digits  
Freq / counter scaler : 00.01 to 99.99  
Frequency units : Selectable Hz or RPM  
Frequency filtering : None, 0.5, 1.1 or 4.5 seconds  
Counter features : Reset (count up) / Preset (count down)

### Options :

Analog output zero & span : -1999 to 9999  
Alarm setpoint values : -1999 to 9999  
Alarm hysteresis : 0 to 255 (default 1)  
Alarm delay : 0 to 255 seconds (default 0)  
Alarm relay settings : Selectable HIGH or LOW alarm  
Alarm relay state : Selectable NO or NC  
Unit address : 0 to 99  
Baud rate : 2400, 4800, 9600, 19200

## Other Specifications

DIN 48 x 96 housing, 147mm depth  
Industrial strength single piece housing

Housing is flame retardant ABS plastic that meets UL94 V-0  
Circuit board is flame retardant material that meets UL94 V-0

Front facia rating : IP65 (with o-ring seal supplied as standard)

### 5½ / 6 / 8 Digit Models

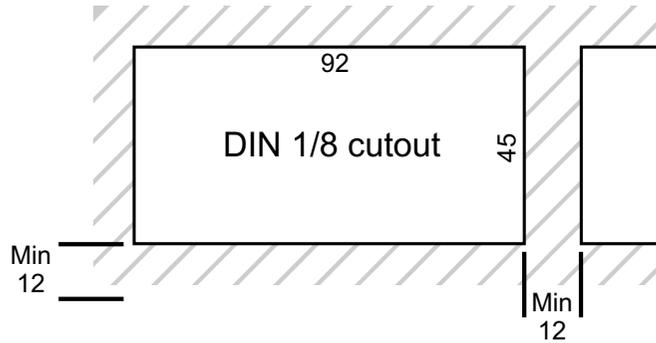
Zero & full scale setting : -199999 to 199999  
Decimal point : Adjustable on all digits  
Process filtering : 0.0 to 10.0 seconds  
Freq / counter scaler : 0.05 to 1999.99  
Frequency units : Selectable Hz or RPM  
Frequency filtering : None, 0.5, 1.1 or 4.5 seconds  
Counter features : Reset (count up) / Preset (count down),  
: Counter rate & totaliser

### Options :

Analog output zero & span : -199999 to 199999  
Alarm setpoint values : -199999 to 199999  
Alarm hysteresis : 0 to 255 (default 1)  
Alarm delay : 0 to 255 seconds (default 0)  
Alarm relay settings : Selectable HIGH or LOW alarm  
Alarm relay state : Selectable NO or NC  
Unit address : 0 to 99  
Baud rate : 2400, 4800, 9600, 19200

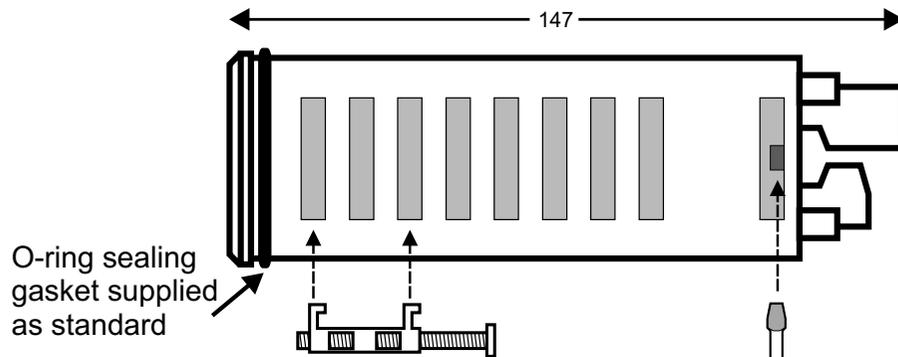
**Installation**

**Panel Cutout**



**Installation**

**Fastening**



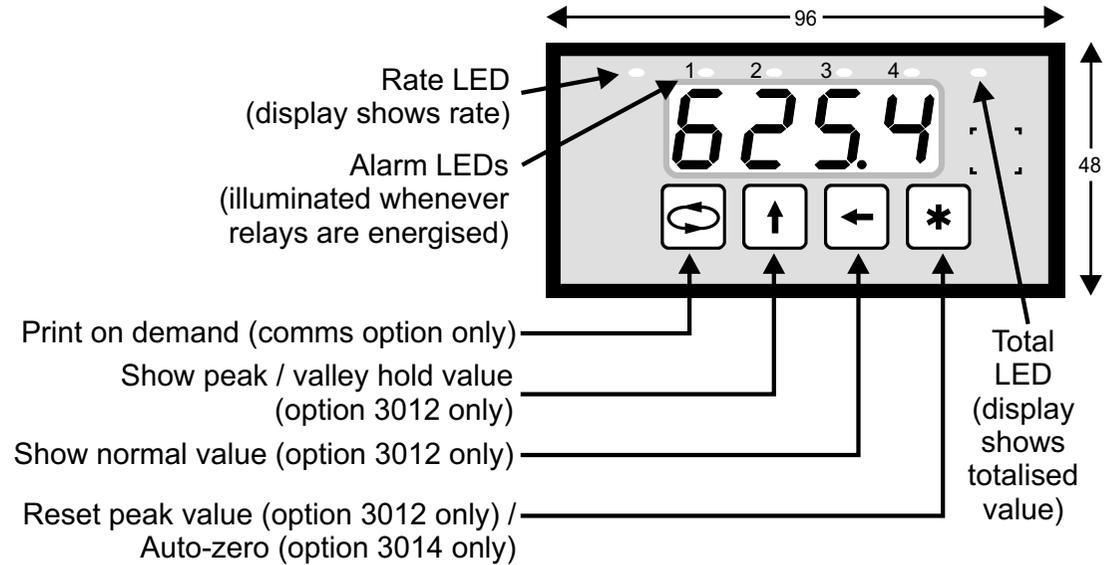
The supplied fastening clips may be fitted on **the side** or the **top / bottom** of the housing. Ensure that the clip & screw is mounted as shown here.

To gain access to the circuit boards, switch power off and remove terminals from the back of the housing. Observe safety precautions. Use a screwdriver to clip the back-plate off.

Caution : Do not overtighten the screws.

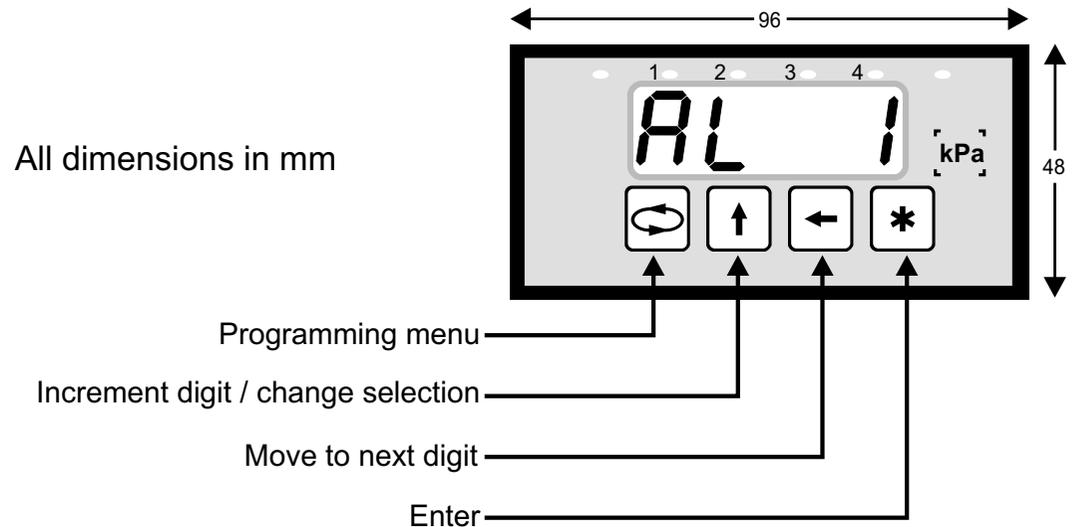
**During normal display mode**

**Display & Keypad**



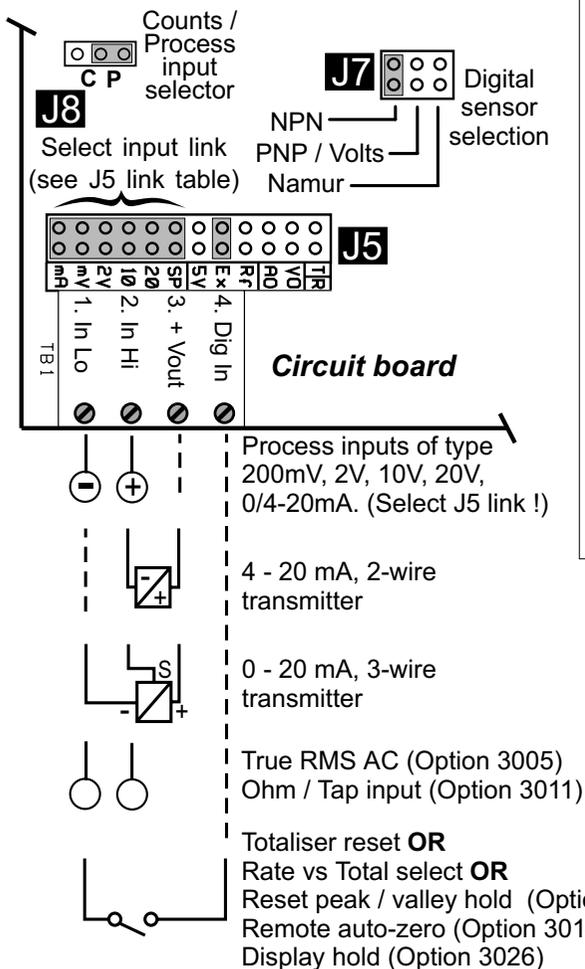
**During programming mode**

**Display & Keypad**

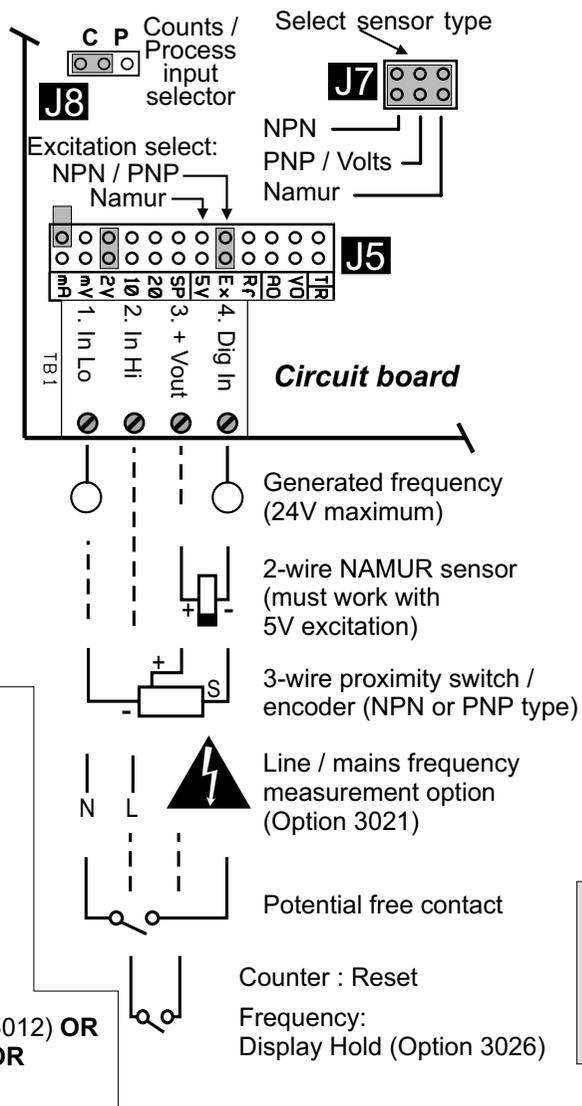


## Connections & Links

### Process Inputs



### Freq / Count Inputs



### Hardware Link Selection For J5

	J5															
<b>Input</b>																
mA			X		X											
200 mV				X	X											
2 V					X											
10 V						X										
20 V							X									
Special*								X								
<b>Terminal 3 Voltage Output</b>																
+5VDC								X								
+24VDC, current limited									X							
+2.5V Vref										X						
<b>Analog Output</b>																
0 - 20 / 4 - 20mA (option)												X				
0 - 10V (option)													X			

**Place hardware links as shown in the diagrams.**

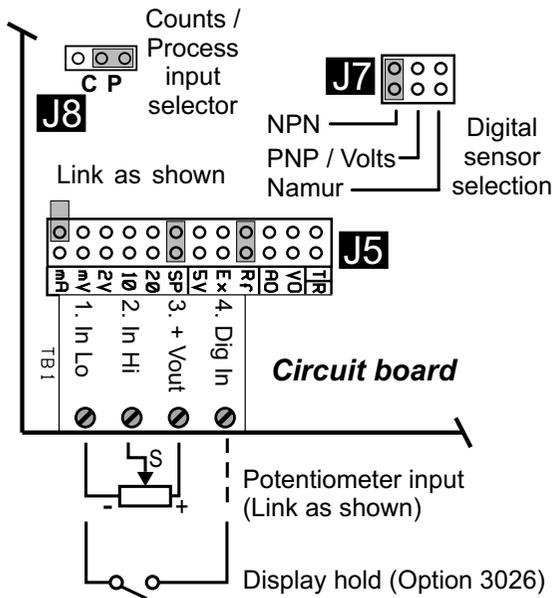
**Remember :** Configuring this instrument requires two steps. (1) Select the correct hardware links as shown. (2) Program the instrument with the programming chart on page 8 & 9.

**Note :** Counter or totaliser reset may also be achieved by pressing the 'Enter' key (press for 3 seconds). External reset is almost instantaneous.

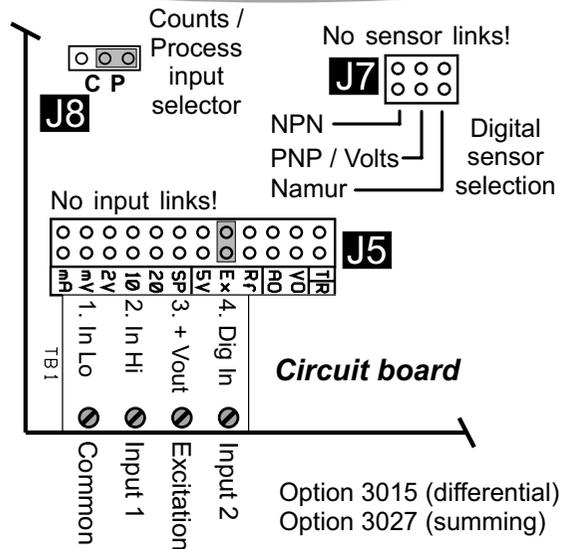
**Note :** The "special" (SP) input is normally configured for potentiometer input. It can however be configured to order as per customer's requirements.

**Note :** For 2- wire NAMUR sensors, the proximity switch must be able to operate from 5V supply.

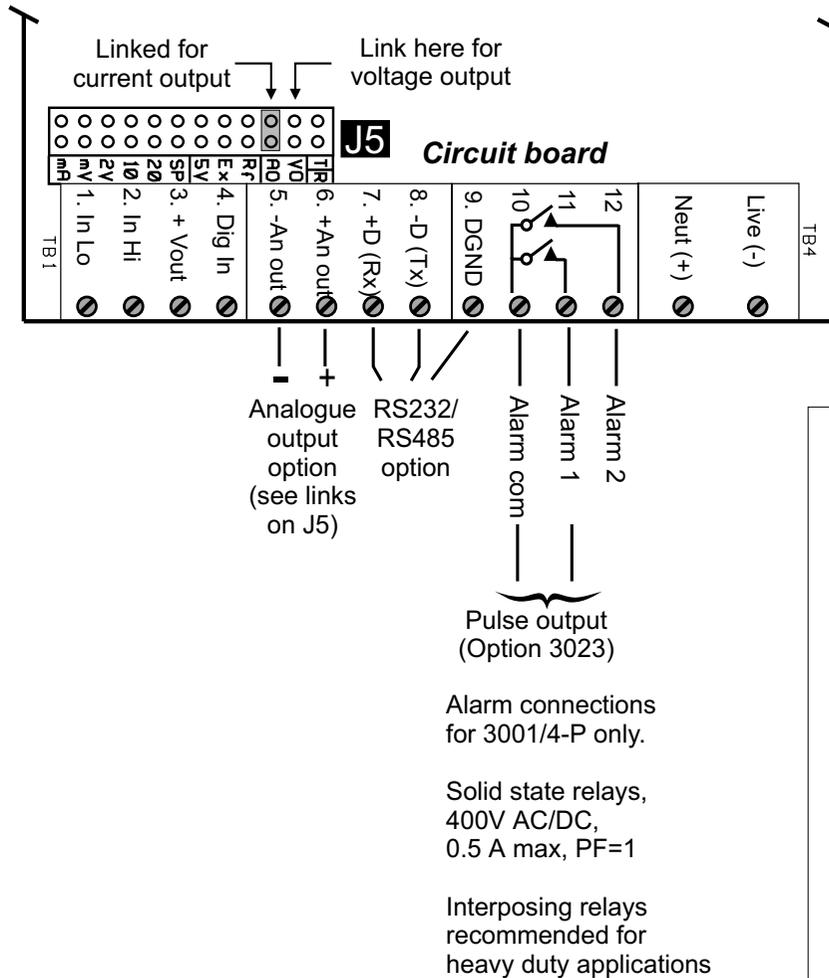
### Potentiometer Input



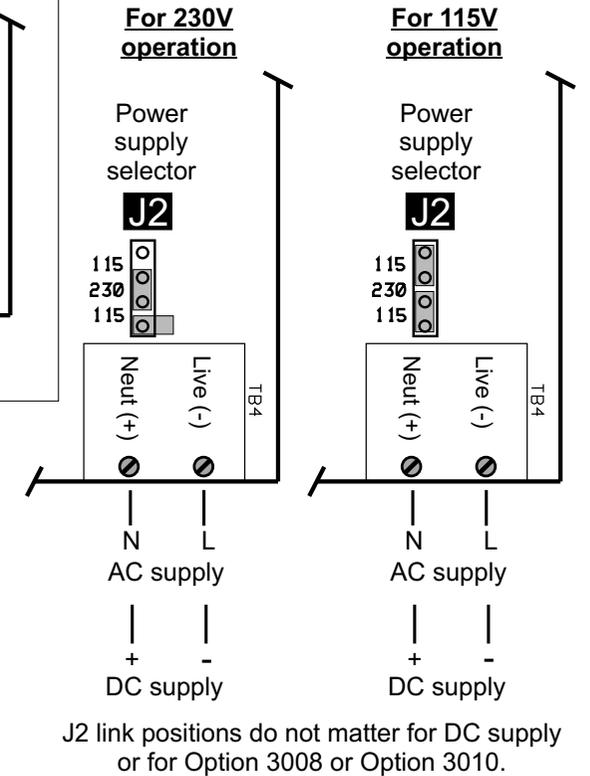
### Option 3015/3027 Wiring



### Option Connections & Links



### Power Supply Links



\*\*\* External 0.5A fuse recommended \*\*\*

**Place hardware links as shown in the diagrams.**

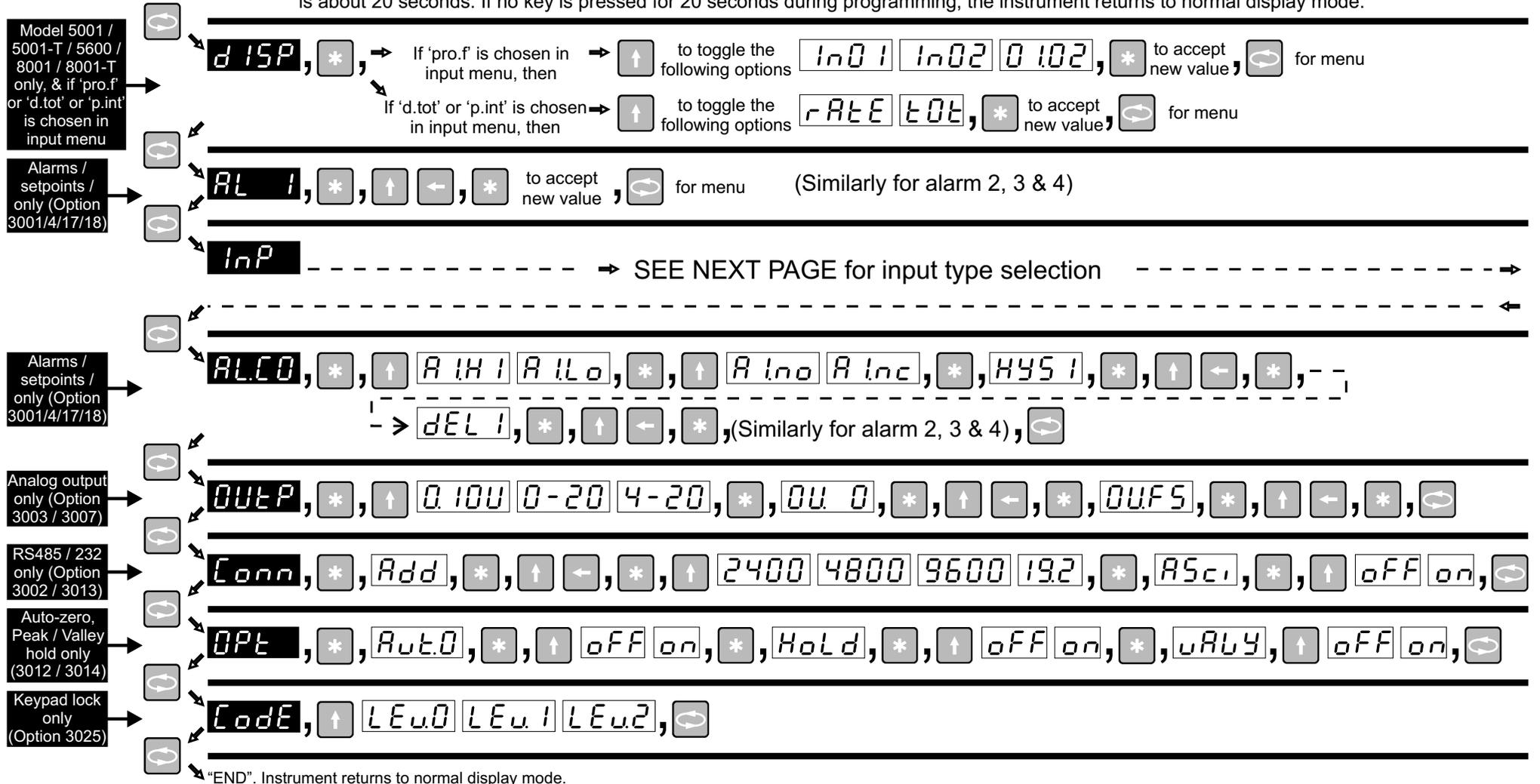
**Remember :** Configuring this instrument requires two steps. (1) Select the correct hardware links as shown. (2) Program the instrument with the programming chart on page 8 & 9.

# Programming Chart

# READ ME FIRST !

**START  
HERE**

- Note 1 : This programming chart is a simplified flowchart for users that have previous experience with this instrument. A programming example is available in the next few pages to assist new users in understanding this programming chart.
- Note 2 : Because this instrument has many options, all possible option menus are shown. Options that are not ordered will not appear in the programming sequence.
- Note 3 : Configuring this instrument requires two steps. (A) Select the correct hardware links (page 6 & 7). (B) Program the instrument with this chart.
- Note 4 : To enter programming mode, press the menu key for a few seconds (unless the optional keypad lock has been set). Programming mode timeout is about 20 seconds. If no key is pressed for 20 seconds during programming, the instrument returns to normal display mode.



**InP** , \* , ↑    **Pro** ↑    **Freq** ↑    **ProF** ↑    **C UP** ↑    **C dn** ↑    **dtot** ↑    **P.Int** ↑    **USER** ↑

**Special Note :**  
If Model 4011/5011 is ordered, then refer to the supplemental page supplied with this manual.

0.2V, 2V, 10V, 20V, Pot (SP),  
0 / 4 - 20mA input selection

\*  
0.2 U  
4-20  
↑ \*  
P dP  
\*  
↑ \*  
2Ero  
\*  
↑ ← \*  
P FS  
\*  
↑ ← \*  
P.Filt  
\*  
↑ ← \*  
incr  
\*  
↑ ← \*  
L in  
\*  
on  
off  
↑ \*↻

Model 5001 / 5001-T / 5600 / 8001 / 8001-T only.  
**See Note On 'incr' Feature**

Lineariser only (Option 3000).

\*  
F dP  
\*  
↑ \*  
F.SCA  
\*  
↑ ← \*  
HE  
rP  
↑ \*  
F.Filt  
\*  
nonE  
0.5 S  
1.1 S  
4.5 S  
↑ \*  
↻

Menu identical to 'Pro' menu, followed by 'Freq' menu.

Model 5001 / 5001-T / 5600 / 8001 / 8001-T only

**Please Read Me !**

This page represents the input configuration menus, and this chart must be read from top to bottom. Only program the menu corresponding to the operation you require (for example, for process integration, program the "P.Int" menu column only. There is no need to program the "Pro" menu as well.)

**Incr Feature**

"incr" is for display increment, and specifies the display increment steps. e.g. an increment of 10 will cause the least significant digit to function as a 'dummy' zero.

\*  
C dP  
\*  
↑ \*  
C.SCA  
\*  
↑ ← \*  
rES  
\*  
↑ ← \*  
↻

\*  
C dP  
\*  
↑ \*  
C.SCA  
\*  
↑ ← \*  
PrE  
\*  
↑ ← \*  
↻

\*  
F dP  
\*  
↑ \*  
F.SCA  
\*  
↑ ← \*  
HE  
rP  
↑ \*  
F.Filt  
\*  
nonE  
0.5 S  
1.1 S  
4.5 S  
↑ \*  
C dP  
\*  
↑ \*  
C.SCA  
\*  
↑ ← \*  
PrE  
\*  
↑ ← \*  
↻

Model 5001 / 5001-T / 5600 / 8001 / 8001-T only

Menu identical to 'Pro' menu, followed by :

\*  
C dP  
\*  
↑ \*  
I.FSH  
\*  
↑ ← \*  
ErSt  
rAtD  
↑ \*  
↻

Model 5001-T / 8001-T only

\*  
P dP  
\*  
↑ \*  
↻

Manual setpoint station only (Option 3024)

## Display Codes Explained

<b>dISP</b> Display value selection menu	<b>InP</b> Input selection menu	<b>Cdn</b> Down counter input
<b>In01</b> <b>In02</b> <b>0.102</b> Process, freq, or process x freq input	<b>Pro</b> Process input	<b>dtot</b> Digital input rate & totaliser
<b>rAtE</b> <b>tOt</b> Rate or totaliser display	<b>Freq</b> Frequency input	<b>P.Int</b> Process input integration / totaliser
<b>AL 1</b> <b>AL 2</b> <b>AL 3</b> <b>AL 4</b> 1st, 2nd, 3rd, 4th setpoint value	<b>ProF</b> Process x frequency input	<b>USER</b> User input for Option 3024 manual setpoint station
<b>ALCO</b> Alarm configuration menu (shown for 1st alarm only)	<b>CUP</b> Up counter input	
<b>ALH1</b> <b>ALL0</b> 1st alarm setpoint select HIGH / LOW alarm	<b>02 U</b> <b>2 U</b> <b>10 U</b> <b>20 U</b> <b>SP</b> Process input selection (200mV, 2V, 10V, 20V, Special (potentiometer input))	
<b>ALno</b> <b>ALnc</b> 1st alarm setpoint normally OPEN / CLOSED contact	<b>4-20</b> <b>0-20</b> Process input selection (0-20mA, 4-20mA)	
<b>HYS 1</b> 1st alarm setpoint hysteresis	<b>P.dP</b> Process decimal point selection (non-floating point)	
<b>dEL 1</b> 1st alarm setpoint delay	<b>ZEro</b> Process zero display configuration	
<b>OUtP</b> Analogue output menu	<b>P.FS</b> Process full scale display configuration	
<b>0.10V</b> <b>0-20</b> <b>4-20</b> Output selection (0-10V, 0-20mA, 4-20mA)	<b>P.Filt</b> Process filter - analog inputs (factor 0.0 to 9.9 secs)	
<b>OU 0</b> Output zero selection	<b>incr</b> Display increment. e.g. '10' would give dummy zero.	
<b>OUFS</b> Output full scale selection	<b>Lin</b> Linearisation menu (on/off) select (optional)	
<b>Conn</b> Communications menu (RS232 / RS485)	<b>IFSH</b> Process integration full scale rate hour setting	
<b>Add</b> Unit address (default 0)	<b>ErSt</b> Configure digital input as external totaliser reset	
<b>2400</b> <b>4800</b> <b>9600</b> <b>192</b> Available baud rate values	<b>rAtO</b> Configure digital input as external display rate / total selector	
<b>ASc 1</b> <b>oFF</b> <b>oN</b> Protocol selection. On = AsciiBus. Off = DigiBus.	<b>F.dP</b> <b>C.dP</b> Frequency / counter decimal point selection	
<b>OPt</b> Option menu for Auto-zero feature and Peak / Valley Hold feature	<b>F.SCA</b> <b>C.SCA</b> Frequency / counter scaler (multiplier)	
<b>Aut0</b> <b>oFF</b> <b>oN</b> Auto-zero option turned off or on	<b>rES</b> <b>P.rE</b> Counter reset / preset	
<b>Hold</b> <b>oFF</b> <b>oN</b> Peak / valley hold option turned off or on	<b>rP</b> <b>HE</b> RPM or Hz selection	
<b>VALY</b> <b>oFF</b> <b>oN</b> Peak OR valley hold. "off" = peak. "on" = valley	<b>F.Filt</b> <b>nonE</b> <b>0.5 S</b> <b>1.1 S</b> <b>4.5 S</b> Filter for frequency input (none, 0.5, 1.1, 4.5 seconds)	
<b>Code</b> Keypad lock security menu. See Option 3025 for more information.	<b>oooo</b> <b>8888</b> Process overscale. Input has exceeded full scale value. / Display test mode.	
<b>LEv0</b> <b>LEv1</b> <b>LEv2</b> Keypad lock security level. Level 0 = none, Level 1 = alarm value changes, Level 2 = full	<b>- - - -</b> Hardware overrange. Reduce input signal to reduce saturation.	

**Please Note :**

Display screens shown in black are to indicate the beginning of sub-menus.

**Please Note :**

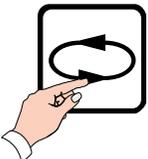
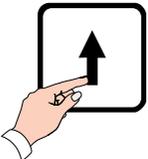
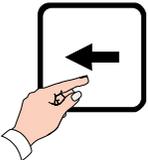
**PASS**

If the front keypad has been locked, then the word "PASS" will appear. See option 3025 for more information.

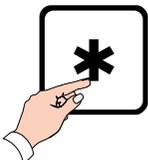
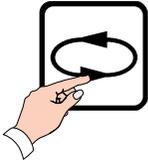
**Programming Example**

**Setting Up Alarm Values (Option)**

Remember, the symbols on the keypad have the following definitions during programming.

			
Next Menu Item	Increment digit	Next Digit	Enter / Accept value
	Press "Menu" for 3 seconds		
	Press "Enter" to see Alarm / Trip 1 value.		
	Press "Increment digit" to increase value		
	Press "Next digit" to amend the next digit		

Amend the other digits in the same way until the desired trip value is entered.

	Press "Enter" to accept Alarm 1 value.	
	Press "Menu" to proceed to next trip value.	

Use the same menu steps above to change trip levels for trip 2, 3 and 4.

The entire programming menu operates in a manner similar to the example described above.

IGNORE THIS PAGE unless communications option has been ordered. When the RS232 (option 3013) or RS485 (option 3002) is ordered, two protocols are made available, namely ASCIIbus & DIGIbus protocols. DIGIbus is the default protocol which is used for the calibration and configuration of the instruments, and whenever the instrument is connected to master-slave systems. DIGIbus protocol is therefore used in complex bus systems, and is NOT described here. Please contact factory for the DIGIbus protocol.

ASCIIbus, which is described here, is much easier to use as it can easily interface to third party systems with very little engineering work required. It is a purely ASCII based (7 bit) protocol. The protocol is essentially designed for one way communications (instrument to PC). Under the "Conn" (connection) programming menu, ASCIIbus is enabled by selecting "ASCI" to "ON". If "OFF" is selected, the DIGIbus protocol will be active. Although designed for one way communications only, the ASCIIbus protocol contains an address. The address range is "00" to "99".

Using address "00" : If this address is selected, the instrument will only transmit data on demand by either momentarily pressing the 'menu' key, or by transmitting a byte (any ASCII character) to the DPM. This mode is useful for interfacing to printers. In addition, field ' A A ' will contain the ASCII character "blank/space". Field ' P ' will also contain the ASCII character "blank/space".

Using address "01" to "99". If any of these addresses are used, the meter continuously transmits information at approximately 5 times a second.

The data format string output from the indicator is (7 bit ASCII code is used):

Line Settings : 7 Data Bits, 1 Parity bit, Odd Parity, 1 Stop Bit.  
 Baud Rate : Selectable 2400, 4800, 9600, 19200.  
 Data Bits : Numerical ASCII characters : 0, 1, 2, 3, 4, 5, 6, 7, 8, 9  
                   Other ASCII characters : #, blank/space, +, -, CR, LF  
 Protocol format is : # A A S D D D D D D D P CR LF  
 where : # = indicates start of message  
       : A A = Instrument address. ASCII 00 to 99. 00 is default.  
       : S = sign (polarity) ( ASCII "+" or "-" ).  
       : D = data bits (data for 8 numerals). See Note (1).  
       : P = decimal point position. ASCII 0 to 8.  
       : CR = ASCII carriage return.  
       : LF = ASCII line feed.

The output will follow the display reading. This means that if the peak-hold option has been ordered and activated, the communications output will peak-hold as well.

Note 1 : This protocol allows for future expansion. Therefore if Model 4001 is used for example, the first four digit data will contain the ASCII character "blank/space" and the last four digits will contain the display reading. Similarly, if the Model 5001 is used for example, the first 2 digit data will contain the ASCII character "blank/space" and the last six digits will contain the display reading.

**Model 5001-T**
**How to calculate the I.FS.H (integrated full scale hour) value for Model 5001-T**

Example 1:

Formula: I.FS.H value without decimal points = (Desired value on display after 1 hour \* 14062.5)

-----  
(Total value accumulated after 1 hour/256)

Example: A 4-20mA input signal must correspond to a 0-2500 rate display. This input must also be integrated (totalised) over an hour. The totaliser must show 1250 after 1 hour if the input is 12mA for that hour. For calculation purposes, calculate the totalised value at 20mA, which in this case will be 2500.

According to the above formula,

A = Desired value on display after 1 hour

B = I.FS.H Value without decimal points

C = Total value accumulated after 1 hour (i.e. max value on rate (2500) \* 3600 seconds = 9 000 000 )

$$B = (A * 14062.5)$$

$$\frac{\quad}{\quad}$$

(C/256)

$$\text{Therefore } B = (2500 * 14062.5)$$

$$\frac{\quad}{\quad}$$

(9000000/256)

$$\text{I.FS.H} = 1.000$$

After 1 hour at 12mA the display should show 1250. After 1 hour at 20mA, the display should show 2500.

Under the P.Int sub-menu in the instrument, set the following: select 4-20; P dP = 000000; ZEr0 = 000000; P FS = 002500; P.Filt = 00.5; incr = 000; C dP = 000000; I.FS.H = 1.000

**Model 5001-T (cont.)****How to calculate the I.FS.H (integrated full scale hour) value for Model 5001-T**

Example 2:

Formula: I.FS.H value without decimal points = (Desired value on display after 1 hour \* 14062.5)

-----  
(Total value accumulated after 1 hour/256)

Example: A 4-20mA input signal must corresponds to a 0-100 displayed rate value. The input signal must be totalised over an hour. The reading at 20mA must be 360 after an hour.

According to the formula:

A = Desired value on display after 1 hour

B = I.FS.H Value without decimal points

C = Total value accumulated after 1 hour (i.e Max value on rate (100) \* 3600 seconds = 360 000 )

$$B = (A * 14062.5 )$$

-----  
(C/256)

$$\text{Therefore } B = ( 360 * 14062.5 )$$

-----  
(360 000/256)

$$\text{I.FS.H} = 3.600$$

After 1 hour at 20mA, the display should show 360.

Under the P.Int sub-menu in the instrument, set as follows: select: 4-20; P dP = 000000; ZEr0 = 000000; P FS = 000100; P.Filt = 00.5; incr = 000; C dP = 000000; I.FS.H = 3.600

**Option 3000**

**Lineariser (Square Root / Cylinder / Sphere etc)**

---

If fitted, this option will accurately linearise signals for flow applications (square root extraction), s-curve (cylinder applications) and other non-linear signals. The type of linearisation required is specified at time of order and cannot be user selectable. However, the user has the option of toggling the lineariser feature 'ON' or 'OFF' in the process ('PRo') menu. See page 9 for programming details.

**Option 3001-P**

**Two Set Point (Solid-State Relays)**

---

See page 7 for connection details. Wire for AL1 & AL2 only.

**Option 3001-M**

**Two Set Point (Electro-Mechanical Relays)**

---

This option provides two alarm set points with electro-mechanical relays. This option board slots into the upper slot of the panel meter box. The upper terminals are clearly numbered 13-28 to differentiate them from the lower terminals. Both normally open and normally closed contacts are provided with each relay. The relays are rated at 250VAC / 30VDC @ 2A. Visual LED alarm indication is provided on the panel meter front. For connection wiring details, see diagram "M" on page 20. Connect wires for AL1 & AL2 only.

**Option 3002**

**RS485 Serial Interface Option**

---

See page 7 for connection details. Select DIGIbus or ASCIIbus protocol from the program menu. See additional protocol documents.

**Option 3003**

**0 - 20mA / 4 - 20mA Analogue Output Option**

---

See page 7 for connection details.

**Option 3004-P**

**One Set Point (Solid-State Relay)**

---

This option is similar to Option 3001-P but with a single alarm only. See page 7 for connection details. Wire for AL1 only.

**Option 3004-M**

**One Set Point (Electro-Mechanical Relay)**

---

This option is similar to Option 3001-M but with a one alarm set point only. See diagram "M" on page 20 for connections. Wire for AL1 only.

**Option 3005**

**True RMS AC Input Option**

---

For AC input applications. See “Process Inputs” diagram on page 6 for connection details.

**Option 3006**

**Isolated Options (Analogue Output / RS232 / RS485)**

---

This is ordered with option 3002, 3003, 3007 or 3013. It provides a minimum of 1500V isolation between input and output signal. Wiring connections are different for these isolated options. Use diagram “P” or diagram “M” on page 20 for wiring connections.

**Option 3007**

**0 - 10V Analogue Output Option**

---

See page 7 for connection details.

**Option 3008**

**Galvanic Isolation (12V / 24V Supply) Option**

---

This power supply option provides 12 or 24VDC supply isolation. See page 7 for connection details.

**Option 3009**

**Parallel BCD Output Option**

---

This option is supplied as an additional slot in card in the top part of the instrument housing. See additional documentation.

**Option 3010**

**95V-265V AC / DC Power Supply Option**

---

This options allows the instrument to operate from a wide range of AC & DC power supplies. The supply connections are on page 7.

**Option 3011**

**Ohms / Tap Input Option**

---

This option measures resistance & tap positions on transformers. See “Process Inputs” diagram on page 6 for connection details.

**Option 3012**

**Peak Or Valley (Max or Min) Hold Option**

---

This option displays and holds the max or min value (not both) of an input signal. This option is activated in the programming menu “Opt” by selecting whether “Hold” should be “On” or “Off”, and selecting valley (“valy” = “On”) or peak (“valy” = “Off”) mode.

To show peak / valley value, press the “up” arrow for 3 seconds. To show normal display value, press the “side” arrow key for 3 seconds. To reset the peak / valley hold value, press the “star” key for 3 seconds, or use an external potential free contact (see page 6 for connection details). If analog output option is fitted, the output will hold as well. This option cannot be used with option 3014.

**Option 3013**

**RS232 Serial Interface Option**

---

See the additional pages supplied for protocol details & page 7 for connection details. Ensure that maximum cable length from instrument to PC is less than 15 metres.

**Option 3014**

**Auto-zero Option**

---

This option allows the operator to zero the display at any time and continue the measurement from that zero point. This option is activated "ON" or "OFF" in the "Opt" menu during programming (see page 8).

During normal operations, pressing the "star key" for 3 seconds will zero the display. The display can also be zeroed via an external potential free contact (see page 6 for connection details). The display can be zeroed at any time over and over again. If the analog output option is fitted, the output will follow the display. Note that this option cannot be used in conjunction with option 3012, nor will this option be available if 'd.tot' or 'p.int' is selected in the input menu.

**Option 3015 / 3027**

**True Differential Input Option / Summing Input Option**

---

Option 3015 measures the difference between two input signals. Option 3027 sums two input signals. The second input signal is connected to Pin 4 of the DPM. No digital input functions are available if any of these options are ordered. See page 7 for wiring.

**Option 3017-P**

**Three Set Points (Solid-State Relays)**

---

This option provides three alarm set points with solid state relays. This option board slots into the upper slot of the panel meter box. The upper terminals are clearly numbered 13-28 to differentiate them from the lower terminals. Only normally open contacts are provided, which means that should the contacts be closed and the power fails, they will revert to a normally open condition. The relays are rated at 400V AC /DC @ 0.5A. Visual LED alarm indication is provided on the panel meter front. For connection wiring details, see diagram "P" on page 20. Connect wires for AL1, AL2 & AL3 only.

**Option 3017-M**

**Three Set Points (Electro-Mechanical Relays)**

---

This option provides three alarm set points with electro-mechanical relays. This option board slots into the upper slot of the panel meter box. The upper terminals are clearly numbered 13-28 to differentiate them from the lower terminals. Both normally open and normally closed contacts are provided with each relay. The relays are rated at 250VAC / 30VDC @ 2A. Visual LED alarm indication is provided on the panel meter front. For connection wiring details, see diagram "M" on page 20. Connect wires for AL1, AL2 & AL3 only.

**Option 3018-P**

**Four Set Points (Solid-State Relays)**

---

This option is similar to option 3017-P, but contains four relays (see option 3017-P). For connection wiring details, see diagram “P” on page 20. Connect wires for AL1, AL2, AL3 & AL4.

**Option 3018-M**

**Four Set Points (Electro-Mechanical Relays)**

---

This option is similar to option 3017-M, but contains four relays (see option 3017-M). For connection wiring details, see diagram “M” on page 20. Connect wires for AL1, AL2, AL3 & AL4.

**Option 3021**

**Line / Mains Frequency Measurement Option**

---

This option is for applications where the main power supply frequency needs to be accurately measured (0.00 to 99.99 Hz). Note that the input terminal are pins 1 and 2, NOT 1 and 4 in this application. See page 6 for wiring information.

**Option 3022**

**Vertical Bar Graph Display Option**

---

The vertical bar-graph display option provides a graphic linear representation of the process variable being measured. The bar graph’s zero and full scale setting is programmed by the ‘Outp’ sub-menu of the programming menu, which also controls the analog output option. The ‘Out.O’ controls the zero point of the graph, and the ‘Ou.Fs’ controls the full scale value of the graph. See the programming menu page 8 for more information. The instrument must be mounted vertically.

**Option 3023**

**Pulse Output Option**

---

This option is used with the optional totalising features of selected meters. With this option, the relay of alarm #1 pulses whenever the totalising display changes by one count (alarm #1 relay will no longer function as an alarm setpoint). The maximum pulse rate is two pulses per second, and it is therefore critical that the totalising display is configured not to change by more than two counts per second. See the programming menu page 9 for more information on setting up the totalising parameters.

**Option 3024****Manual Set Point Station Option**

When this option is ordered, a new sub-menu appears in the 'Input' menu. See the diagram on the right. This option is used to simulate an input value. No physical analog input is required. The display value is edited on the display with the front keys. If the analog output option is also ordered, the analog output will follow the display. e.g. If a value of 50% is entered on the display, the output will give a value of 50% (12 mA for 4-20 mA output).

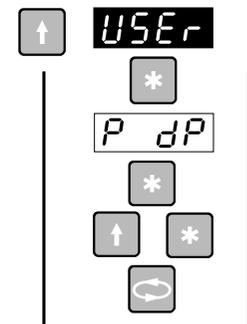
**CONFIGURATION**

In the main input menu, select the last option "User". Select the decimal place required. Press the menu button to proceed to the output menu. Select the output type required : 0 - 20 mA, 4 - 20 mA, 0 - 10 V. Note that the PCB link must be set to the same output. Enter the display value for zero output. Enter the display value for full scale output. Press the menu button to save and exit.

**APPLICATION**

The display will continually show the present value. To change the value, press the enter key. The first digit on the display will flash. Use the left and up keys to change to a new value. Press enter to accept or leave for 10 seconds to exit without saving. The new value will now be displayed continuously.

Input type for  
manual  
setpoint  
station

**Option 3025****Keypad Lock Option**

The keypad lock option is used to prevent un-authorized access to the programming menu. When this option is ordered, a new sub-menu called "CODE" appears at the end of the programming sequence. See programming page 8. Three levels of keypad lockout are available: Level 0 - Full access to programming menu. Level 1 - User only has access to alarm set point values. Level 2 - Total programming menu lockout.

If this option is ordered, the factory default is "Lev 0". If the keypad has been locked with either level 1 or 2, then the word "PASS" will appear on the display if the user attempts to enter programming mode. Pressing the menu key will return the instrument to normal display mode. However, if the user wishes to enter the programming menu, then when the word "PASS" appears, press in succession, 1 second apart, all four keys from right to left.

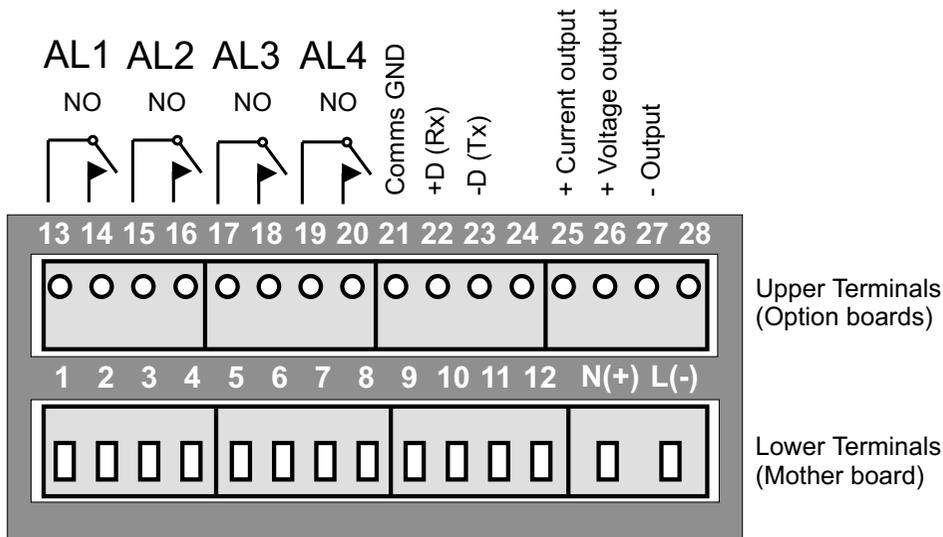
**Option 3026****Display Hold Option**

The option is at no-extra charge and allows the user to freeze the display via an external potential-free contact. Closing the switch will freeze the display. This option is NOT available for 5001-T & 8001-T. The connections to the instrument for the external potential free contact vary depending on input type. See page 6 for wiring connections.



**Declaration of Conformity**

**Diagram "P"**



**Universal process / counter / frequency / integrator / totaliser indicator**

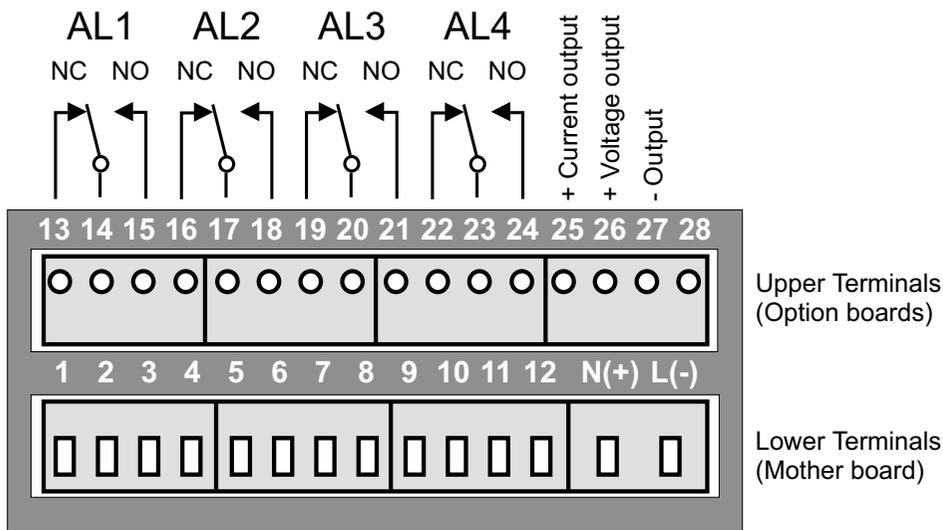
Manufacturer : DPM

Type : 4001,4011,5001,5011,5600,8001,5001-T,8001-T  
Options : 3000 to 3026

Corresponds to the requirements of the following EC directives:

- EMC directive : 89/336/EEC
- Low voltage directive : 73/23/EEC
- The applicable harmonised standards are : EN 50081-1
- : EN 50082-1
- : EN 61010

**Diagram "M"**



**Guarantee**

This product is guaranteed against faulty workmanship or defective material, for a period of 3 (three) years from date of delivery.

The manufacturer undertakes to replace without charge all defective equipment which is returned to it (transportation costs prepaid) during the period of guarantee, provided there is no evidence that the equipment has been abused or mishandled in any way.

The manufacturer reserves the right to alter any specification without notice.