

Operating Manual for Models



5012 / 5012-Q / 5012-C

Universal Dual Channel
Frequency, Speed, Period,
Count, Rate, Totaliser,
Quadrature, Event Timer,
Clock, Position 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 mains fuse with one of an equivalent type or rating.

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 5012 series (6 digit) are low-cost universal programmable indicators for use in all types of frequency and counting applications. The indicators have unipolar & bi-polar pulse / frequency inputs for counting, frequency (dual channel), speed (dual channel), period, flow, timing, totalising, clock & positioning applications. They can be used in conjunction with most standard pulse/frequency generating sensors. Sensor excitation is standard & is link selectable for encoders, proximity switches etc. All Models offer up & down counter (with reset/preset), dual channel frequency input, which can be added, subtracted, or ratioed. Period indication is also available as standard.

Options include analog output, alarm setpoints up to 4 alarms, BCD output, RS232 or RS485 communications & many more. The instrument meets the European Community EMC directive 89/336/EEC & Low Voltage Directive 73/23/EEC.

Selected options now feature 'Plug & Play' technology, allowing option boards to be ordered separately & field fitted when required.

Three variations of this instrument are available, depending on the required functionality :

Model 5012 6 digit, freq, counts, rate + total, event timer
 Model 5012-C 6 digit, real time clock + all 5012 features
 Model 5012-Q 6 digit, quadrature input + all 5012 features

Time tagging feature is available on the Model 5012-C as an option.

Electrical Specifications

Operating temperature range	: -10°C to +50°C
Storage temperature range	: -40°C to +80°C
Humidity	: <85% non-condensing
Warm up time	: None
Relays, electro-mechanical	: 250V AC, 30V DC, 2A, PF=1
Relays, solid state	: 400V AC/DC, 0.5A, PF=1
Analog output accuracy	: 0.1% of full scale
Temperature coefficient	: 20 ppm / °C typically
Current analog output load	: 500 Ω maximum
Voltage analog output load	: 1 kΩ minimum
Memory retention (excl clock)	: Non-volatile memory
Option 3006 isolation rating	: 1500V
Declaration of conformity	: See last page

Frequency / Speed Specifications

Internal oscillator	: 11.059 MHz precision
Accuracy	: 0.01% (scaling = 1), or 1 count
Measurement time	: 5 msecs or 1/freq, whichever is greater
Frequency range	: 0.15Hz - 15000Hz
Max. resolution	: 0.01Hz
Pulse amplitude	: 50mV up to 24V max, uni / bi-polar.
Filtering	: None, 0.5, 1.1 and 4.5 secs programmable.
Selectable for most standard sensors by jumper links and differing connections. Jumper links for hysteresis selection.	

Up / Down Counter Specifications

Maximum pulse rate of 10000 pulses per second.
 Pulse amplitude from 50mV up to 24V max, uni-polar or bi-polar.
 Reset via 'Enter' key (press 3 secs) or ext reset (instantaneous).
 Selectable for most standard sensors by jumper links and differing connections. Jumper links for hysteresis selection.

Real Time Clock (5012-C)

Clock display modes	: 12 hour or 24 hour
Drift	: < 0.5 seconds per day
Real time clock backup	: 30-days typically
External sync & preset	: Yes

Power Supply

Standard

115 / 230 VAC \pm 10%, link selectable, 50/60Hz, 5VA typical

Optional

8-30VDC isolated power supply option, 8VA typical (Option 3008)

95V-265V AC/DC power supply option, 8VA typical (Option 3010)

8-30VDC non isolated power supply option, 8VA typical (Option 3028)

Programmable Settings

Channel display	: Ch1, Ch2, Ch1+Ch2, Ch1-Ch2, Ch1/Ch2
Rate / total display	: Selectable via front keypad
Freq / counting factor	: 000.001 to 999.999
Freq / counting scaler	: 10.000, 1.000, 0.100, 0.010, 0.001
Decimal point	: Selectable on any digit
Filtering	: None, 0.5, 1.1, 4.5 seconds selectable
Frequency display	: Normal or inverse (period in microseconds)
Counter features	: Up or down counting with reset (count up) or preset (count down)
	: Counter rate & totaliser
Event timer	: HHHH.MM or HH.MM.SS or SSSSSS or SSSSS.S or SSSS.SS
Real time clock	: 12h or 24h mode; external sync preset

Sensor Excitation

24V DC:	(17-26V), current limited. For 2-wire transmitters, proximity switches or encoders. With option 3010, current capability increases to 100mA
12V DC:	(9-13V), maximum 50mA
5V DC:	\pm 1% maximum 50mA

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

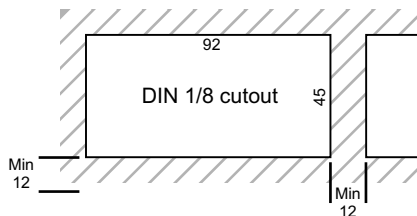
Front facia rating : IP65 (with o-ring seal supplied as standard)

Options :

Analog output zero & span	: -199999 to 999999
Alarm setpoint values	: -199999 to 999999 (default)
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
RS485 address	: 0 (default) to 99
RS232 / RS485 baud rate	: 2400, 4800, 9600, 19200
Protocol options	: DPM's DIGibus or ASCIIbus
Keypad lockout	: 3 levels to choose from

Installation

Panel Cutout

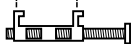


Installation

Fastening

147

O-ring sealing gasket supplied as standard



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.

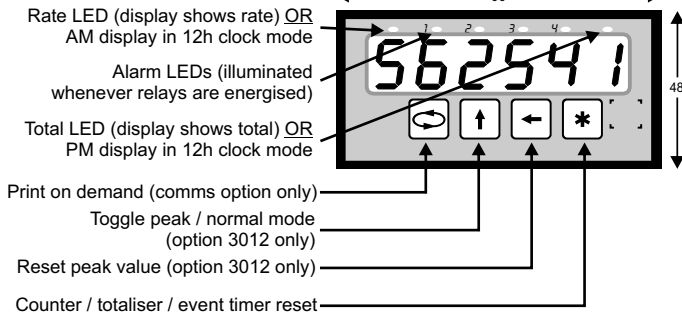
Caution : Do not overtighten the screws.

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.



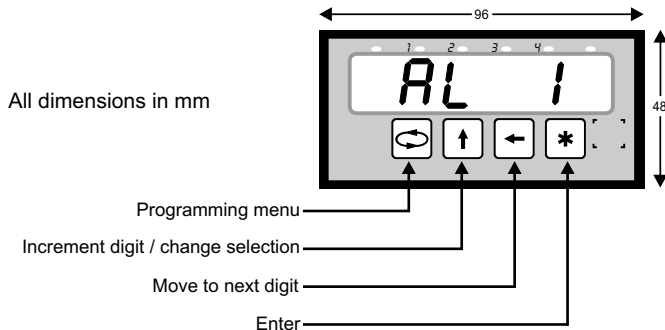
During normal display mode

Display & Keypad

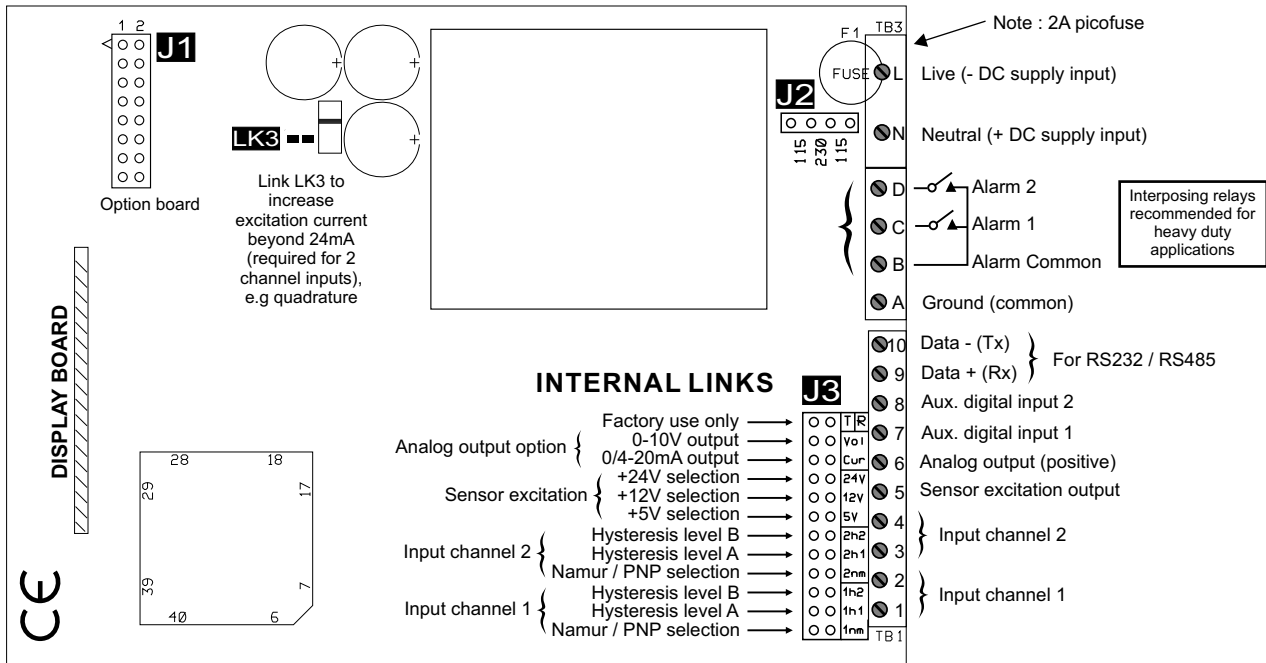


During programming mode

Display & Keypad



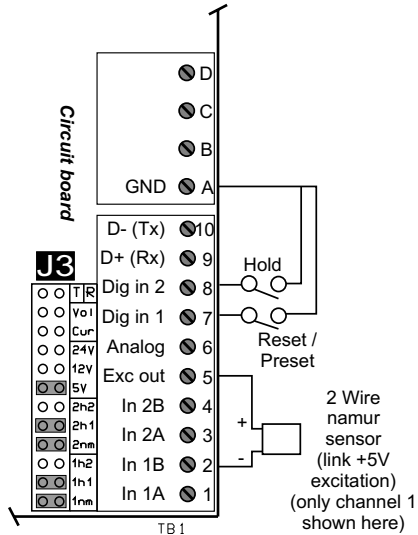
Hardware Links & General Layout



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 10 & 11.

2-Wire NAMUR Sensor

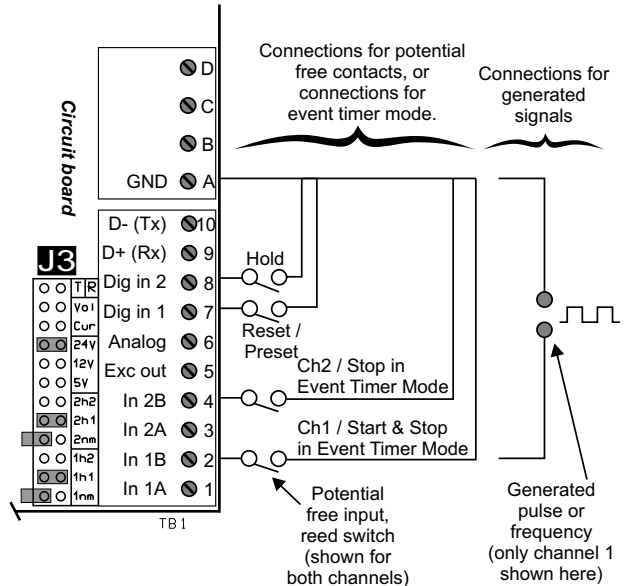


Place hardware links as shown in the diagrams.

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 10 & 11.

Contacts, Generated Signals, Event Timer

For event timer mode, if "ST 1" is selected in the menu, then use channel 1 only to start and stop the timer. If "ST 2" is selected, then use channel 1 to start the timer, and channel 2 to stop the timer.

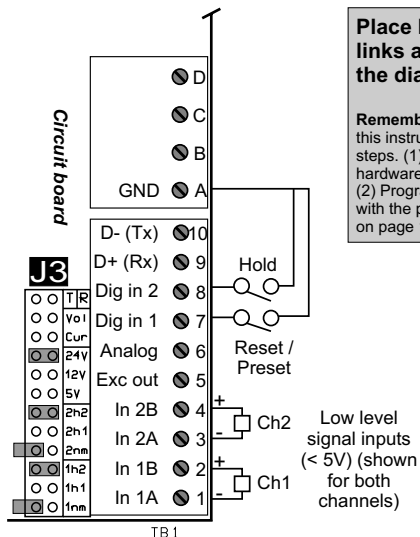


Note : Counter or totaliser reset may also be achieved by pressing the "star" key (press for 3 seconds). External reset is almost instantaneous.

Note : For two wire proximity switches (NAMUR type), they must be able to operate from 5V supply.

Low Level Signals

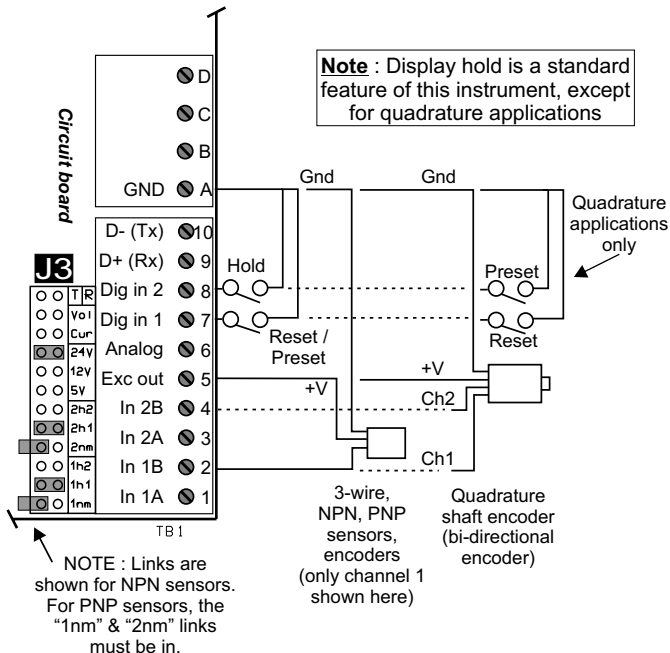
e.g. 2-wire magnetic pickups,
low level AC signals



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 10 & 11.

3-Wire Proximity Switches & Encoders

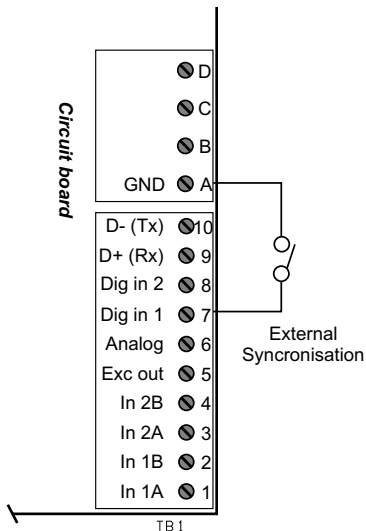


Note : Counter or totaliser reset may also be achieved by pressing the "star" key (press for 3 seconds). External reset is almost instantaneous.

Note : For two wire proximity switches (NAMUR type), they must be able to operate from 5V supply.

Real Time Clock Synchronisation

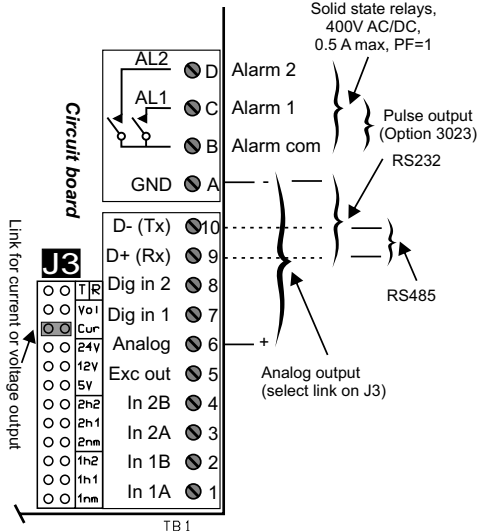
If the clock requires synchronisation to an external clock, then connect a potential free contact as shown.



Option Connections & Links

Note : Interposing relays recommended for heavy duty applications

Option 3001/4-P only.
Solid state relays,
400V AC/DC,
0.5 A max, PF=1

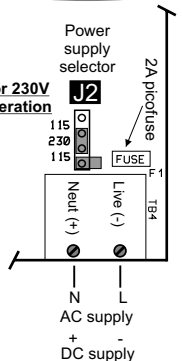


Place hardware links as shown in the diagrams.

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 10 & 11.

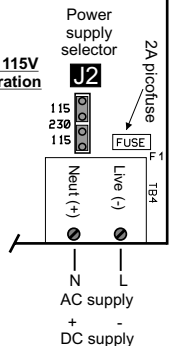
Power Supply

For 230V operation



J2 link positions do not matter for DC supply or for

For 115V operation

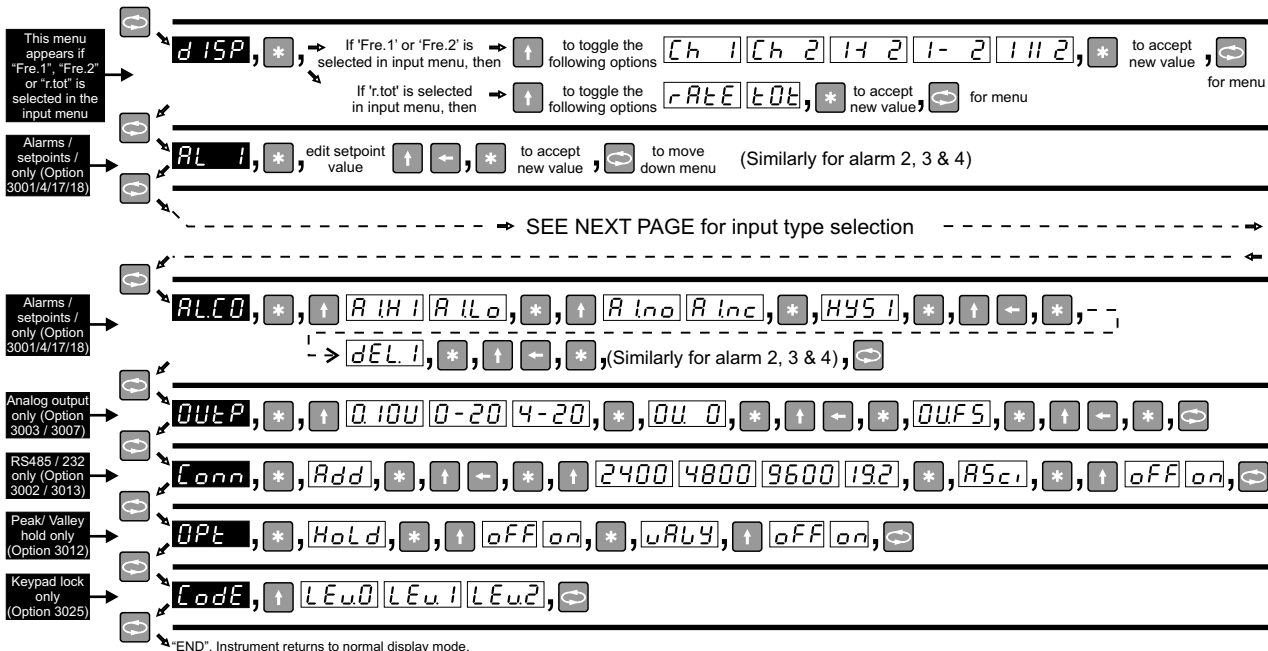


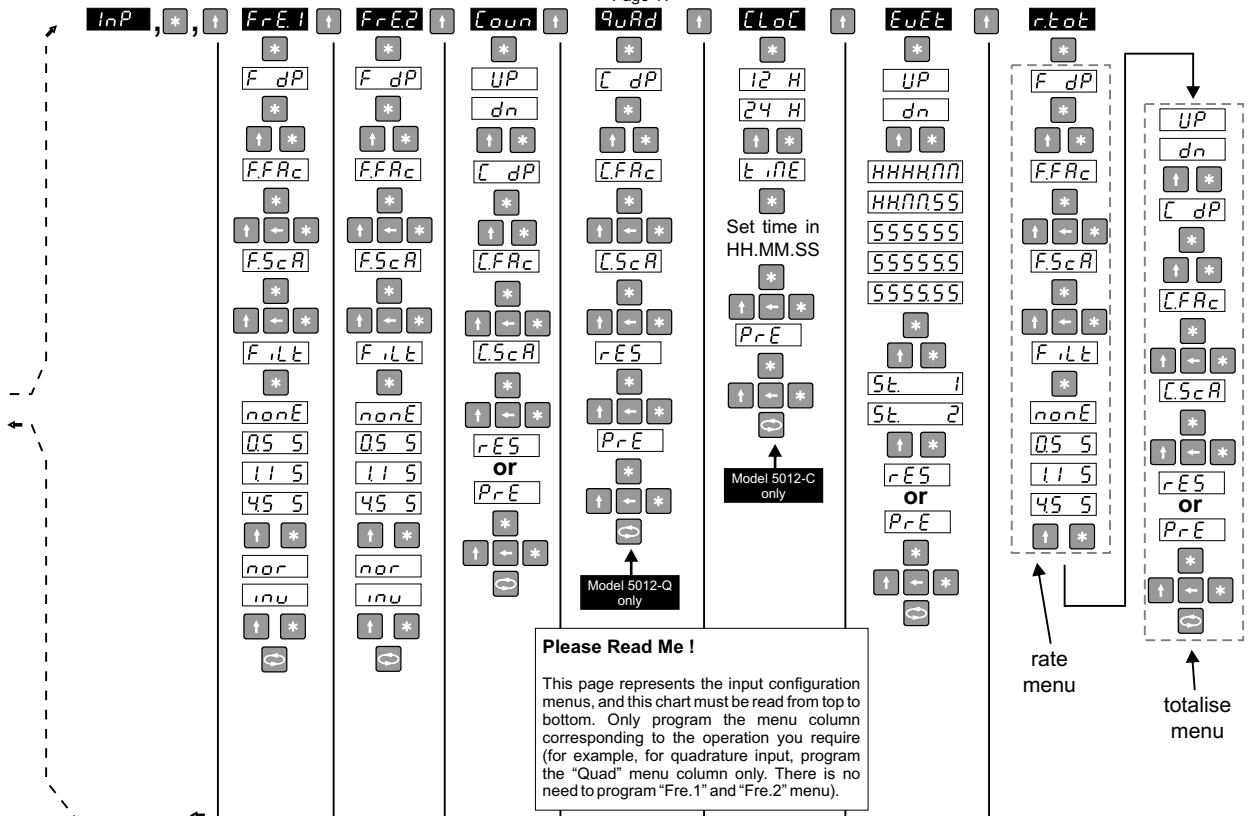
Programming Chart

READ ME FIRST !

- 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 & 8). (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

START HERE















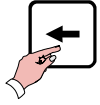

Display Codes Explained

d15P	Display value selection menu	InP	Input selection menu	QuAd	Quadrature encoder input (both channels)
Ch 1 Ch 2 14 2 1- 2 111 2	Channel 1, 2, 1+2, 1-2, 1/2	FRE.1	Frequency input - channel 1	CLoC	Real time clock
rAtE EOt	Rate or totaliser display	FRE.2	Frequency input - channel 2	EuEt	Event timer
AL 1 AL 2 AL 3 AL 4	1st, 2nd, 3rd, 4th setpoint value	COun	Count input (channel 1 only)	r.tot	Rate & totaliser (channel 1 only)
ALCO	Alarm configuration menu (shown for 1st alarm only)	FdP	Frequency / rate decimal point	Please Note : PASS If the front keypad has been locked, then the word "PASS" will appear. See option 3025 for more information.	
AlH1 AlLo	1st alarm setpoint select HIGH / LOW alarm	FFAc	Frequency factor selection		
Alno Alnc	1st alarm setpoint normally OPEN / CLOSED contact	F.ScA	Freq. scaler select (10.000, 1.000, 0.100, 0.010, 0.001)	Please Note : In clock mode, the alarm delay is the time for the alarm output to remain on. Also, hysteresis and Hi/Lo settings have no meaning in clock mode.	
HYS1	1st alarm hysteresis	Filt nonE 0.5 S 1.1 S 4.5 S	Filtering (none, 0.5, 1.1, 4.5 seconds)		
dEL.1	1st alarm delay (secs)	nor inu	Normal display mode (freq display) or inverse display mode (period display in microseconds (best resolution - 10 microseconds) if "F.Fac" & "F.Sca" is set to 1, and no decimal point).	Please Note : Display screens shown in black are to indicate the beginning of sub-menus.	
OUTP	Analog output menu	CdP	Counter / quadrature / totaliser decimal point		
0.10V 0-20 4-20	Output selection (0-10V, 0-20mA, 4-20mA)	UP dn	Up / down counter selection	Please Note : Display screens shown in black are to indicate the beginning of sub-menus.	
OU 0	Output zero selection	C.FAc	Counter / quadrature / totaliser factor selection		
OUFS	Output full scale selection	C.ScA	Counter / quadrature / totaliser scaler selection (10.000, 1.000, 0.100, 0.010, 0.001)	Please Note : Display screens shown in black are to indicate the beginning of sub-menus.	
COun	Communications menu (RS232 / RS485)	rES PRE	Counter / quadrature / totaliser reset / preset value		
Add	Unit address (default 0)	In event timer display resolution can be configured as follows: In clock mode, the following can be configured:			
2400 4800 9600 192	Available baud rate values	HHHHnn	Hours & minutes (1 minute resolution)	12 H	12 hour display
ASc1 oFF on	Protocol selection. On = AsciiBus. Off = DigiBus.	HHnnSS	Hours, minutes & secs. (1 sec. resolution)	24 H	24 hour display
OPt	Option sub-menu	SSSSSS	Seconds only (1 second resolution)	t.nE	Set the time in hrs.mins.secs
HoLd	Peak / valley hold option (min / max hold)	SSSSSS	Seconds only (0.1 second resolution)	PRE	External synchronisation preset time
oFF on	Turn the peak / valley hold feature on or off	SSSSSS	Seconds only (0.01 second resolution)		
uALY oFF on	Peak / valley hold selector. "Off" is peak hold mode. "On" is valley hold mode.	St. 1	Timer start & stop on the same digital input (digital input 1)		
Code	Keypad lock. Select on or off. See Option 3025.	St. 2	Timer start & stop on separate inputs (start digital input 1, stop digital input 2)		
LEu0 LEu1 LEu2	Keypad lock security level. Level 0 = none, Level 1 = alarm value changes, Level 2 = full	0000 8888	Process overscale. Input has exceeded full scale value. / Display test mode.		
		- - - -	Hardware overrange. Reduce input signal to reduce saturation.		

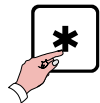



Programming Example

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.

PLEASE READ ME!**Operating notes on “Factor” and “Scaler”**

This instrument caters for a wide range of applications and display scaling. This is achieved in this unit by having a factor “Fac” and a scaler “Sca”. In the frequency menu, this is shown as “F.Fac” (frequency factor) and “F.Sca” (frequency scaler). In the count menu, this is shown as “C.Fac” (count factor) and “C.Sca” (count scaler). The factor and scaler parameters work together. The effective formula to understand these parameters is Display = Input x Factor x Scaler

The factor “Fac” multiplies the display by a user selectable number ranging from “0.001” to “999.999”.
The scaler “Sca” multiplies the display by the user selectable factors “10.000”, “1.000”, “0.100”, “0.010” and “0.001”.

As an example, if it is calculated that the display must be multiplied by a value of 0.005286 to obtain a correct reading on the display, then the factor should be entered as “5.286”, and the scaler would be entered as “0.001” (shifts the decimal point 3 places to the left). It can be seen that $5.286 \times 0.001 = 0.005286$, which is the desired factor / scaler.

Operating Notes**Period (1 / freq) measurement**

Period measurement is the inverse of frequency measurement, i.e. the time between pulses, not the pulses per second (Hz). Period measurement is invoked by selecting “Inv” (inverse) in the “Fre.1” menu. If no decimal point is selected, and the factor and scaler is set to “1.000”, then the period is shown in microseconds. By adjusting the decimal point, factor and scaler, the desired reading can be obtained.

E.g. A bakery wants to translate the speed of a conveyer in an oven to a time value. At the correct speed, the indicator should display “27.0” minutes (desired result). If the belt is moving too fast, then the display will show a lower reading (baking time is too short) and vice versa. The information available is that the encoder give 600 pulses per rev, and that at the correct speed, the pulley turns at 2.2 revs per minute.
Step 1 : Calculate the pulses per second. $600 \text{ p/rev} \times 2.2 \text{ rev/min} = 1320 \text{ p/min}$. $1320 \text{ p/min} \div 60 = \underline{22 \text{ pulses per second}}$.
Step 2 : Convert to period and calculate factors. $1 \text{ divided by } 22 \text{ p/sec} = 0.045455 \text{ seconds or } 45455 \text{ microseconds}$. But the desired reading is “27.0”. Therefore $270 \text{ divided by } 45455 = \underline{0.00594}$. (Note that the calculation is done without decimal points).
Now program instrument with 1 decimal point, factor of “5.940”, scaler of “0.001” and set to period “Inv”.

Operating Notes**Special note about quadrature encoder inputs**

Due to the nature of quadrature encoders, the instrument will display a resolution 4 times higher than the rating of the encoder. In other words if the quadrature encoder gives 500 pulses per revolution, then the instrument will display 2000 pulses per revolution. This increased display resolution is advantageous in most applications. However, it may be necessary to correct for this increased resolution by using an additional factor of “0.25” (i.e. divide by 4).

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 "ASCII" 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 'AA' 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
 : AA = 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.

Option 3001-P**Two Setpoint Alarms (Solid State Relays)**

See page 8 for connection details. Wire for AL1 & AL2 only.

Option 3001-M**Two Setpoint Alarms (Electro-Mechanical Relays)**

This option provides two alarm setpoints 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 Communications Option**

See page 8 for connection details. Select DIGIbus or ASCIIbus protocol from the program menu. See additional protocol documents.

Option 3003**0 - 20mA / 4 - 20mA / 0 - 10V Analog Output Option**

See page 9 for connection details. Remember to select the correct link on motherboard.

Option 3004-P**One Setpoint Alarm (Solid State Relay)**

This option is similar to Option 3001-P but with a single alarm only. See page 8 for connection details. Wire for AL1 only.

Option 3004-M**One Setpoint Alarm (Electro-Mechanical Relay)**

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

Option 3006**Isolated Options (Analog Output / RS232 / RS485)**

This is ordered with option 3002, 3003 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 3008**Galvanic Isolation (8 30VDC Supply) Option**

This power supply option provides 8 - 30VDC supply isolation. See page 8 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 and DC power supplies. See page 8 for supply connections.

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 7 or 8 for connection details). If analog output option is fitted, the output will hold as well.

Option 3013**RS232 Communications Option**

See the additional pages supplied for protocol details & page 8 for connection details. Ensure that maximum cable length from instrument to PC is less than 15 metres.

Option 3017-P**Three Alarm Setpoints (Solid State Relays)**

This option provides three alarm setpoints 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 Alarm Setpoints (Electro-Mechanical Relays)**

This option provides three alarm setpoints 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 Alarm Setpoints (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 Alarm Setpoints (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 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 11 for more information on setting up the totalising parameters.

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 10.

Three levels of keypad lockout are available:

Level 0 - Full access to programming menu.

Level 1 - User only has access to alarm setpoint 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 3028**Non Isolation (8 - 30V Supply) Option**

This option an 8 - 30 VDC non-isolated power supply. See page 7 for connection details.

Option 3029

Time and Date Stamp

This option allows the user to time and date stamp the display value either by momentarily pressing the 'menu' key, or by transmitting a byte (any ASCII character) to the unit. This option is very useful to interface to serial printers.

DISPLAY CODES EXPLAINED

CLoC	Clock
oN	On
oFF	Off
t,ME	Time
hhmmSS	Hour, Minute, Second (24 hr mode)
dAtE	Date
ddmmYY	Day, Month, Year

Data Protocol Format

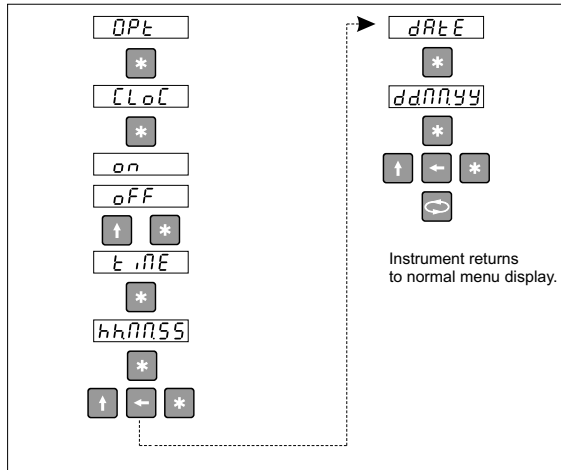
Protocol format is: #_HH:MM:SS_DD/MM/YY_S_ _DDDDDD_CR/LF
 - Decimal point is in the same position as the display decimal point.
 - See option 3002/3013 for more information on the Ascibus Protocol.

Protocol format is : _ = Space
 : S = Sign
 : # = indicates start of message
 : D = data for 6 numerals.
 : CR = ASCII carriage return.
 : LF = ASCII line feed

NOTE:

- The time is only available in 24hr mode.
- This option comes standard with options 3013 (RS232 Communications Option).

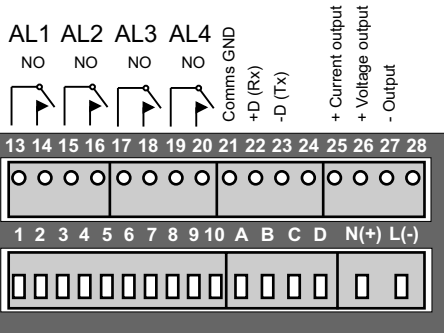
PROGRAMMING CHART





Declaration of Conformity

Diagram "P"



Universal process / counter / frequency
/ integrator / totaliser indicator

Manufacturer : DPM

Type : 5012, 5012-C, 5012-Q

Options : 3000 to 3029

Corresponds to the requirements of the following EC directives:

EMC directive : 89/336/EEC

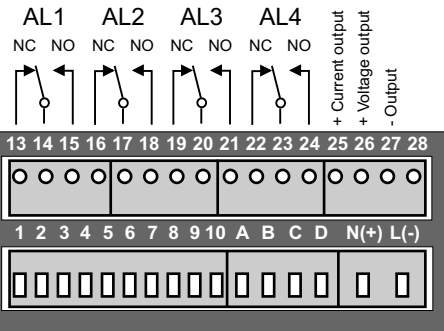
Low voltage directive : 73/23/EEC

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 (two) 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.