

**PM4-BC**  
Binary/BCD/Gray Code  
Process Monitor/Controller  
Operation and Instruction Manual



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# 1 Introduction

This manual contains information for the installation and operation of the PM4-BC Monitor. The PM4 is a general purpose instrument which may be configured to accept inputs of BCD, binary, Gray code or special modes allowing either scaled or weighted displays. The inputs may be presented in parallel, strobed or addressed form. Twenty input lines are available. For BCD inputs, addressed, strobed or up to 4 digit parallel four of these input lines can be allocated for use as remote decimal point or display hold.

Optional relays, serial communications, analog or digital retransmission may also be provided.

Special modes are provided to allow scaling & weighting of the inputs if required.

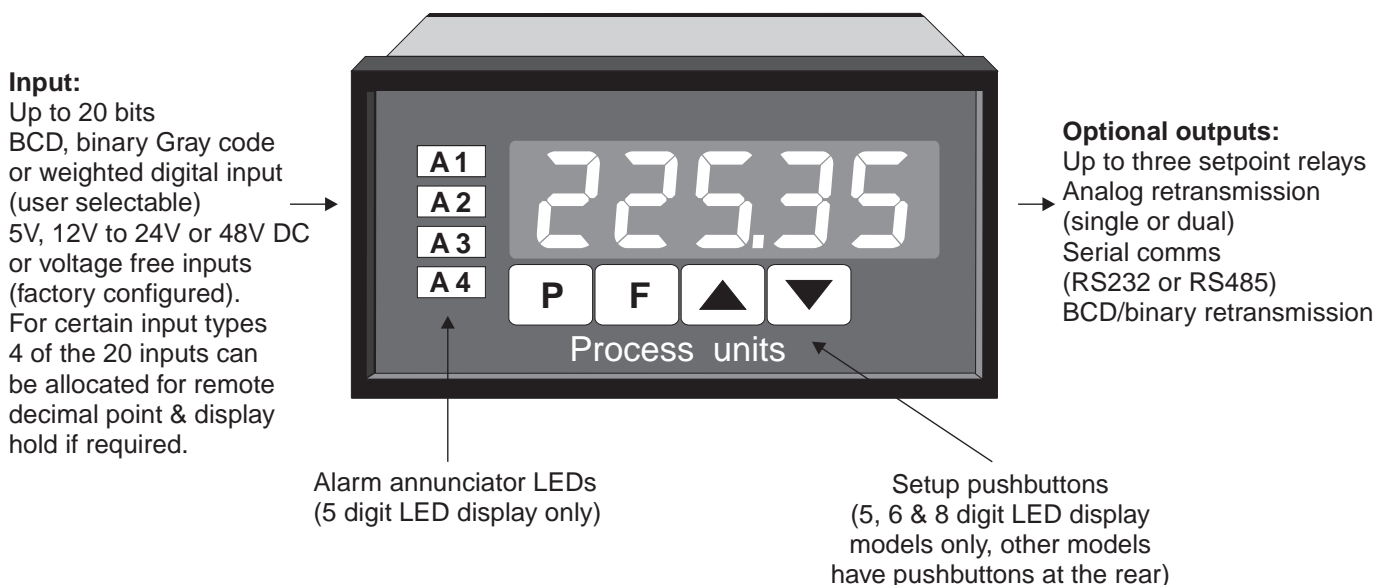
Unless otherwise specified at the time of order, your PM4 has been factory set to a standard configuration. Like all other PM4 series instruments the configuration and calibration is easily changed by the user. Initial changes may require dismantling the instrument to alter PCB links, other changes are made by push button functions.

Full electrical isolation between power supply, input voltage or current and retransmission output is provided by the PM4, thereby eliminating grounding and common voltage problems. This isolation feature makes the PM4 ideal for interfacing to computers, PLCs and other data acquisition devices.

The versatile PM4 has various front panel layout options, in some cases the pushbuttons may be located on the front panel as well as the standard rear panel configuration. The PM4-BC is available in 4, 5, 6 or 4 digit plus bargraph LED display form or with 4 or 6 digit LCD.

The PM4 series of Panel Mount Monitors are designed for high reliability in industrial applications. The high brightness LED display provides good visibility, even in areas with high ambient light levels. The high contrast LCD displays provide good visibility and are ideal for battery powered applications.

## 1.1 PM4-BC inputs & outputs

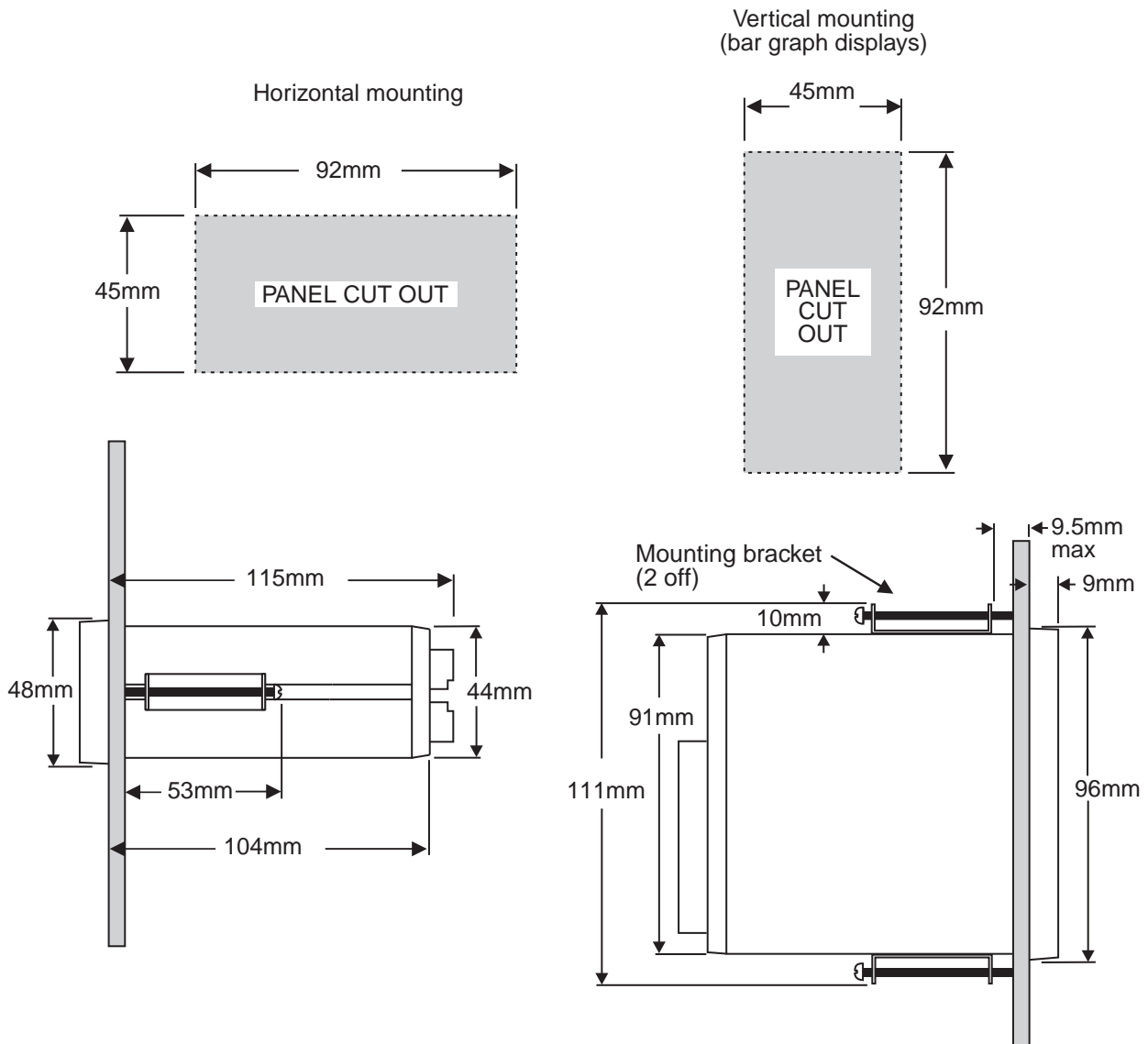


## 2 Mechanical installation

If a choice of mounting sites is available then choose a site as far away as possible from sources of electrical noise such as motors, generators, fluorescent lights, high voltage cables/bus bars etc. An IP65 access cover which may be installed on the panel and surrounds is available as an option to be used when mounting the instrument in damp/dusty positions. A wall mount case is available, as an option, for situations in which panel mounting is either not available or not appropriate. A portable carry case is also available, as an option, for panel mount instruments.

Prepare a panel cut out of 45mm x 92mm +1 mm / -0 mm (see diagram below). Insert the instrument into the cut out from the front of the panel. Then, from the rear of the instrument, fit the two mounting brackets into the recess provided (see diagram below). Whilst holding the bracket in place, tighten the securing screws being careful not to over-tighten, as this may damage the instrument.

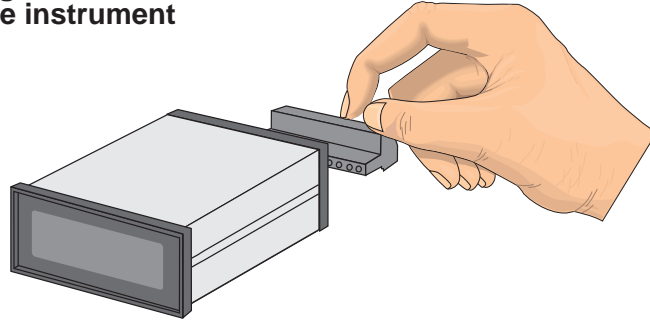
Hint: use the elastic band provided to hold the mounting bracket in place whilst tightening securing screws.



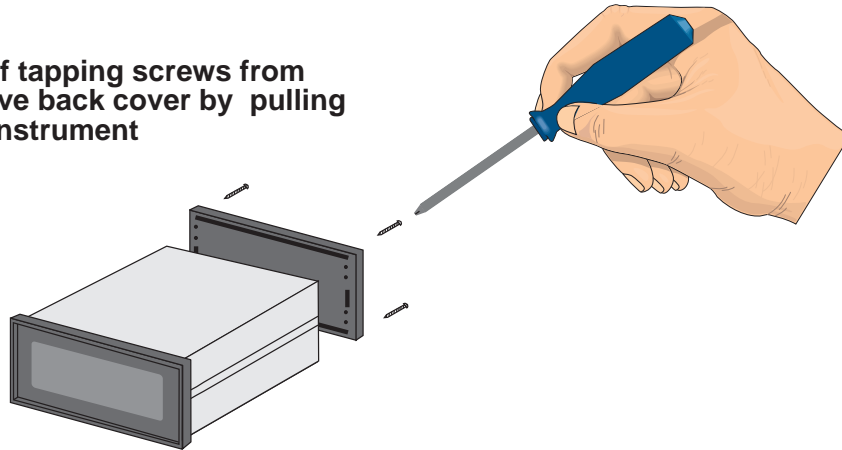
## 3 Input/output configuration

If you need to alter the input or output configuration proceed as follows:

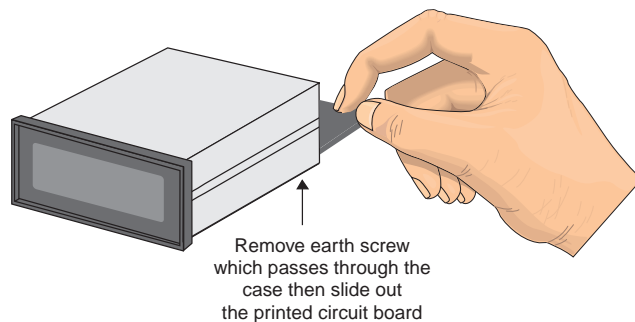
**1. Remove the plug in terminals from the rear of the instrument**



**2. Remove 4 x self tapping screws from back cover, remove back cover by pulling it away from the instrument**



**3. Using a screwdriver, remove the earth screw which passes through the case then slide out the board or boards**



**4. Configure the PCB links as required, see “Electrical installation” chapter**

**5. Slide PCB back into the case**

**6. Replace the earth screw which passes through the case**

**7. Refit back cover and fix with the self tapping screws**

**8. Plug the terminal strips back into the rear of the instrument**

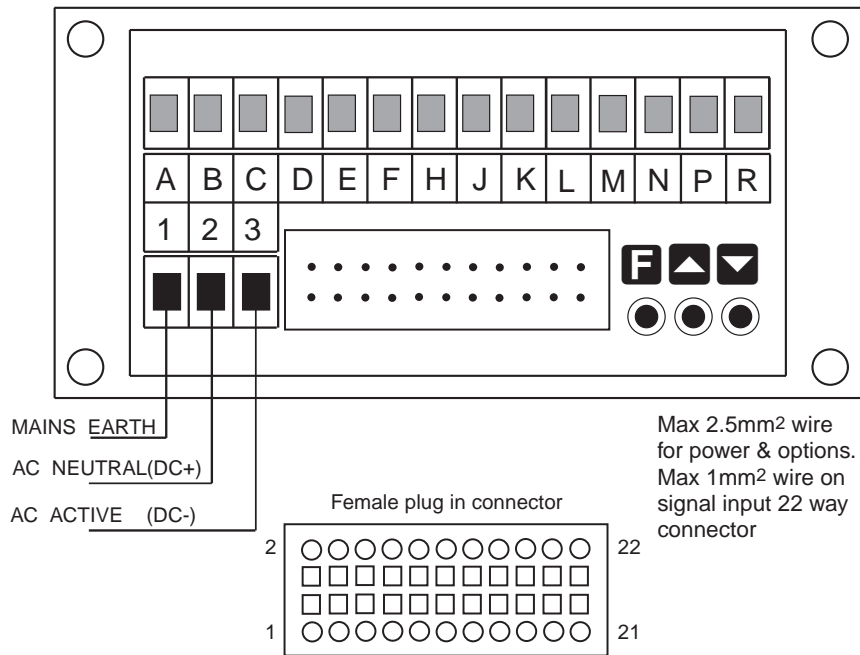
# 4 Electrical installation

The PM4 Panel Meter is designed for continuous operation and no power switch is fitted to the unit. It is recommended that an external switch and fuse be provided to allow the unit to be removed for servicing.

The plug in, screw type, terminal blocks allow for power supply wires of up to 2.5mm<sup>2</sup> to be fitted. Connect the wires to the appropriate terminals as indicated below. A 22 terminal plug in data connector is provided which will accept up to 1mm<sup>2</sup> wires. To insert wires to this data connector insert a screwdriver blade (max 2.5mm wide) into the square socket adjacent to the terminal required, push the wire into the terminal and remove the screwdriver blade. The wire will lock in place. See the "Weighted digital input operation & electrical connections" chapter for weighted digital input connections.

For wiring details for optional outputs refer to the separate "PM4 Panel Meter Optional Output Addendum" booklet supplied when options are fitted.

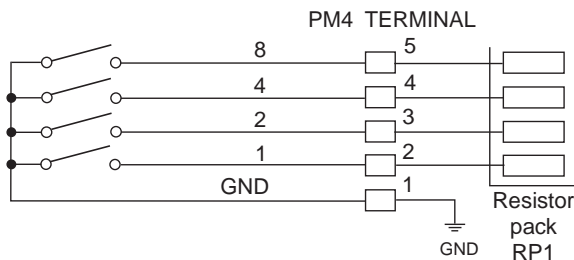
## 4.1 Instrument rear panel



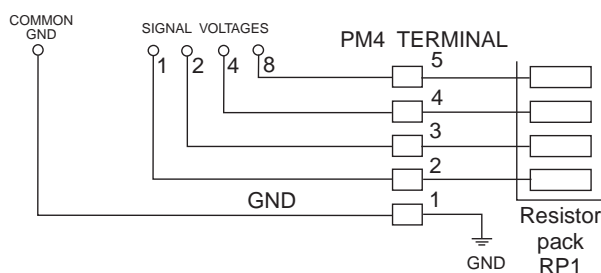
## 4.2 Wiring examples

Refer also to drawings for each input code and mode which follow in this chapter.

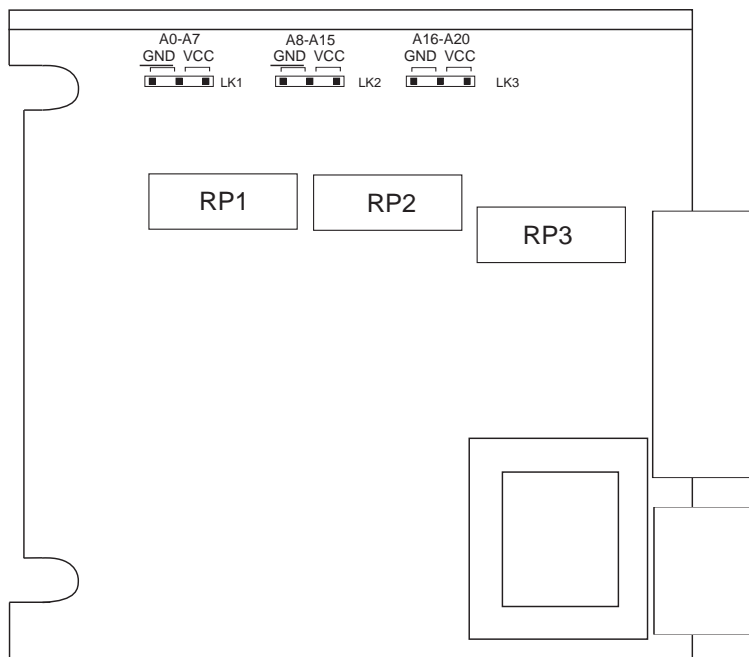
WIRING EXAMPLE - VOLTAGE FREE CONTACT



WIRING EXAMPLE - SIGNAL VOLTAGE



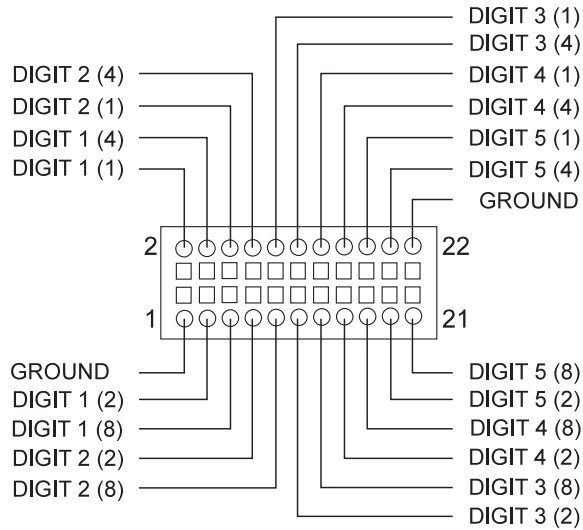
## 4.4 Resistor pack & link locations



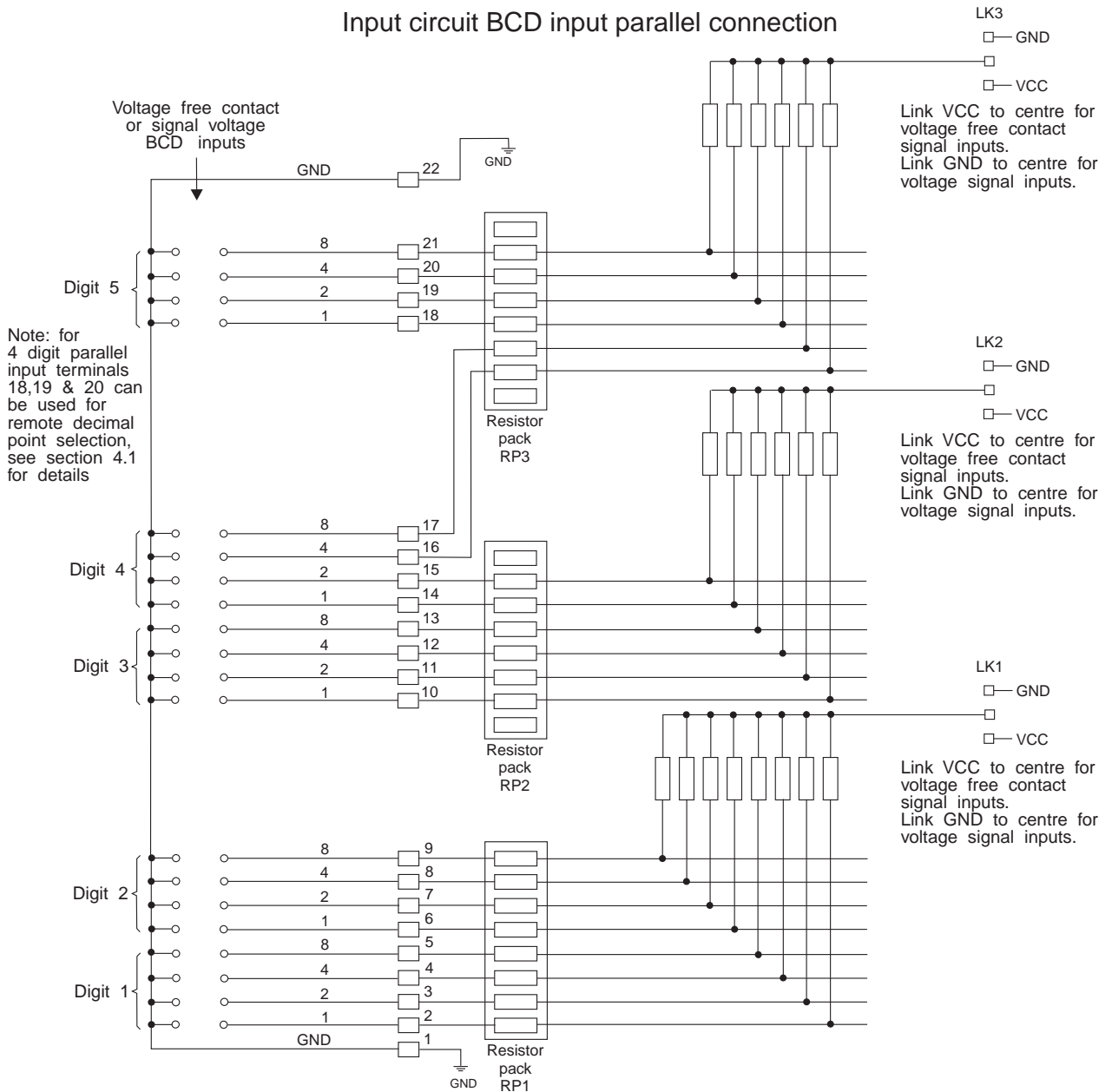
Resistor packs & link settings

Input	RP1, 2 & 3	LK1, 2 & 3
Voltage free	100 Ohms	VCC
5V	100 Ohms	GND
12V to 24V	10k Ohms	GND
48V	22k Ohms	GND

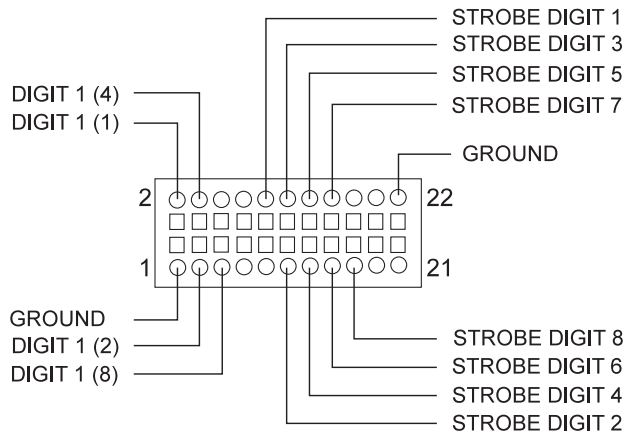
# PARALLEL BCD INPUT



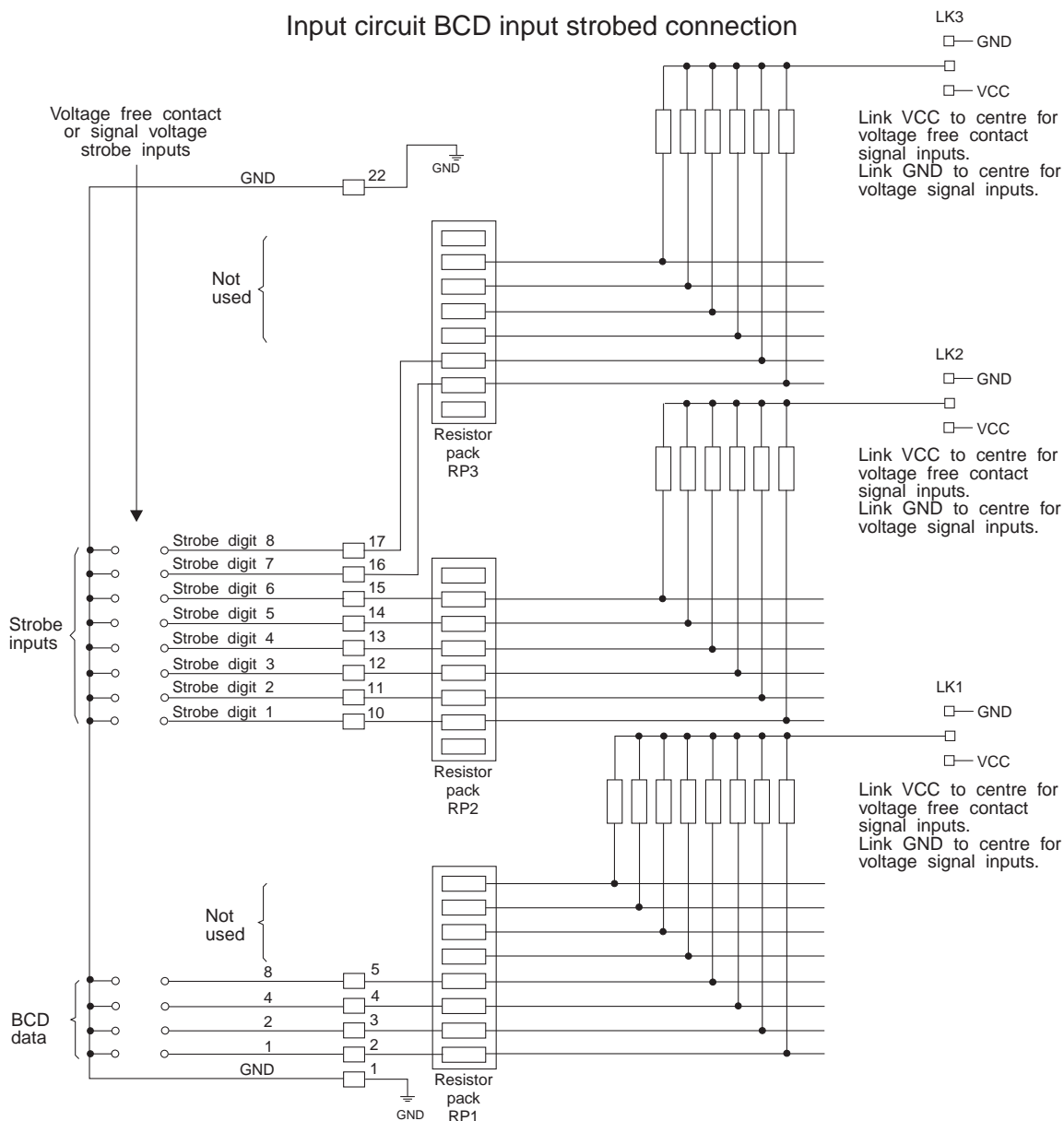
## Input circuit BCD input parallel connection



# STROBED BCD INPUT



Input circuit BCD input strobed connection



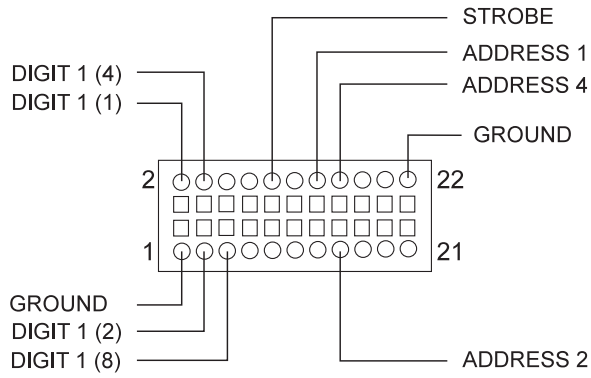
## Strobe mode operation

1. Set data value
2. Activate required strobe input when ready

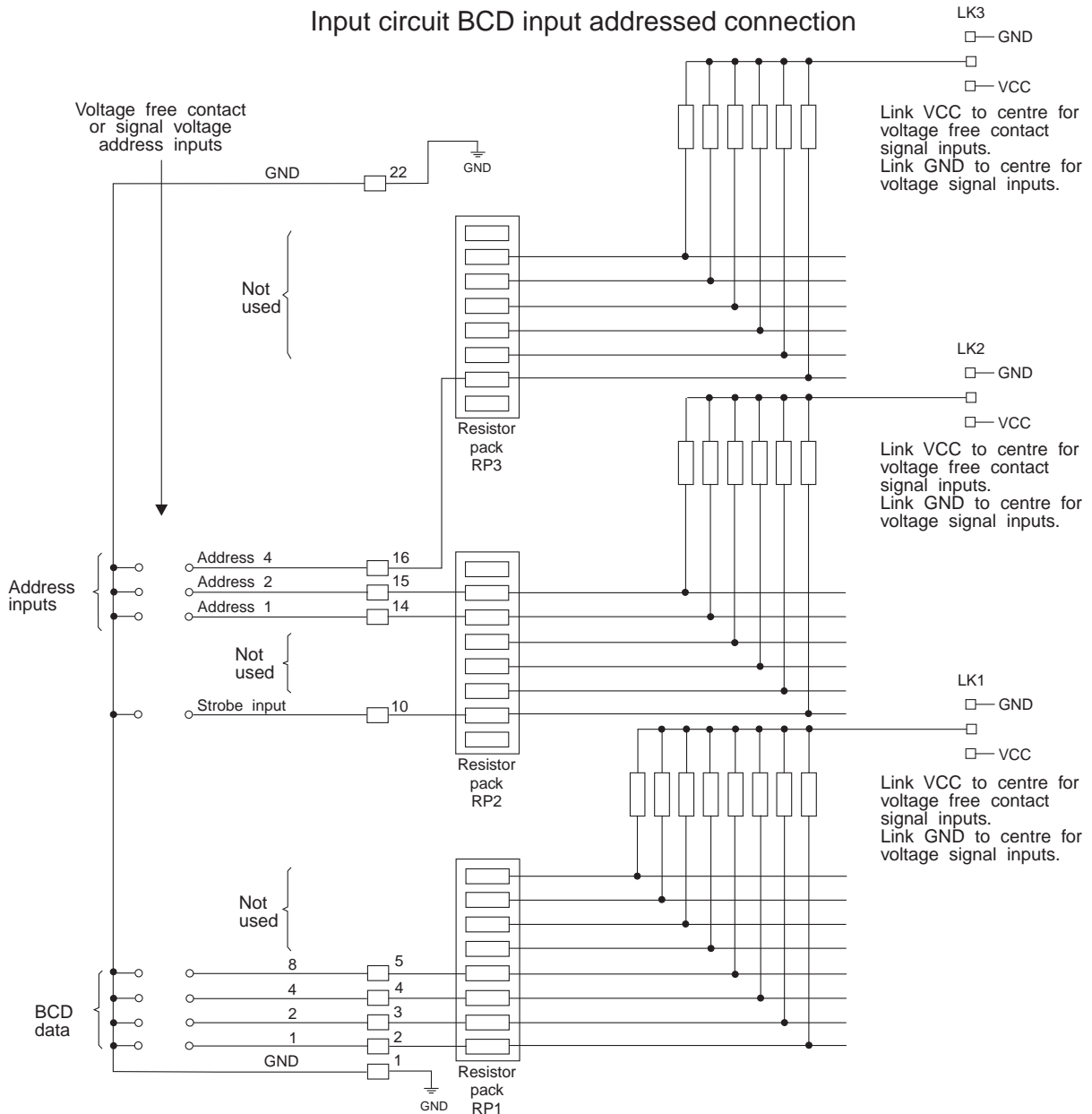
## Example

If BCD data 1001 is placed on the input and the strobe input for digit 2 is activated a value of 9 will be sent to digit 2

# ADDRESSED BCD INPUT



## Input circuit BCD input addressed connection

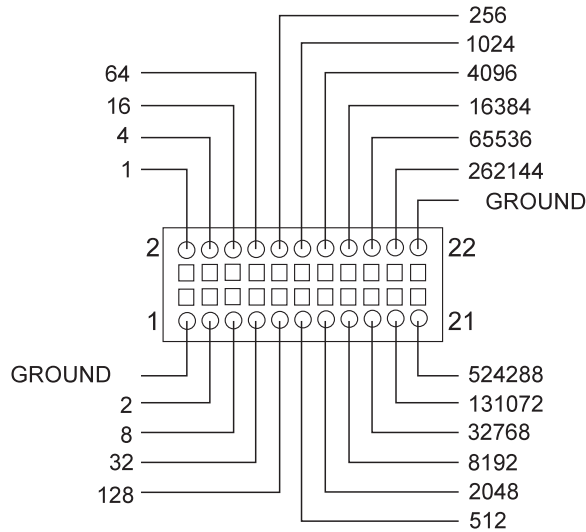


### Addressed mode operation

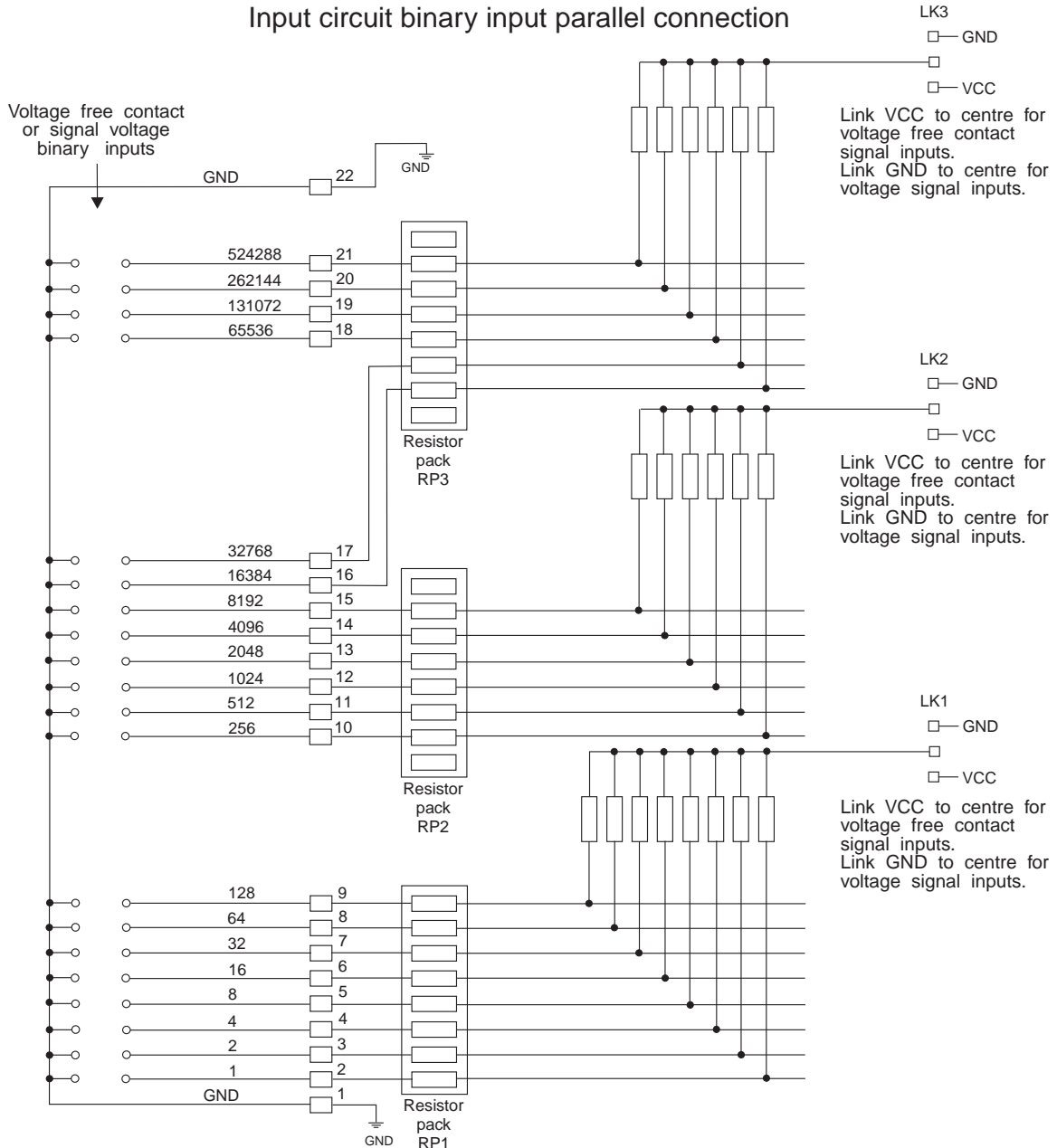
1. Set data value
  2. Set address
  3. Activate strobe input when ready
- See section 4.1 for details of remote decimal point selection

Address input	4	2	1	Digit addressed
Status	Inactive	Inactive	Inactive	1
	Inactive	Inactive	<b>Active</b>	2
	Inactive	<b>Active</b>	Inactive	3
	Inactive	<b>Active</b>	<b>Active</b>	4
	<b>Active</b>	Inactive	Inactive	5
	<b>Active</b>	Inactive	<b>Active</b>	6
	<b>Active</b>	<b>Active</b>	Inactive	7
	<b>Active</b>	<b>Active</b>	<b>Active</b>	8

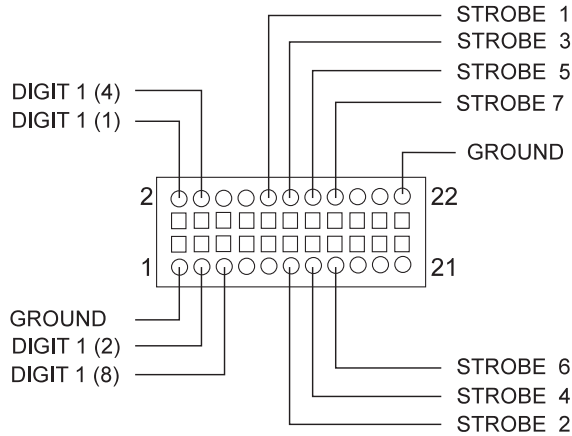
# PARALLEL BINARY INPUT (ALSO USED FOR GRAY CODE)



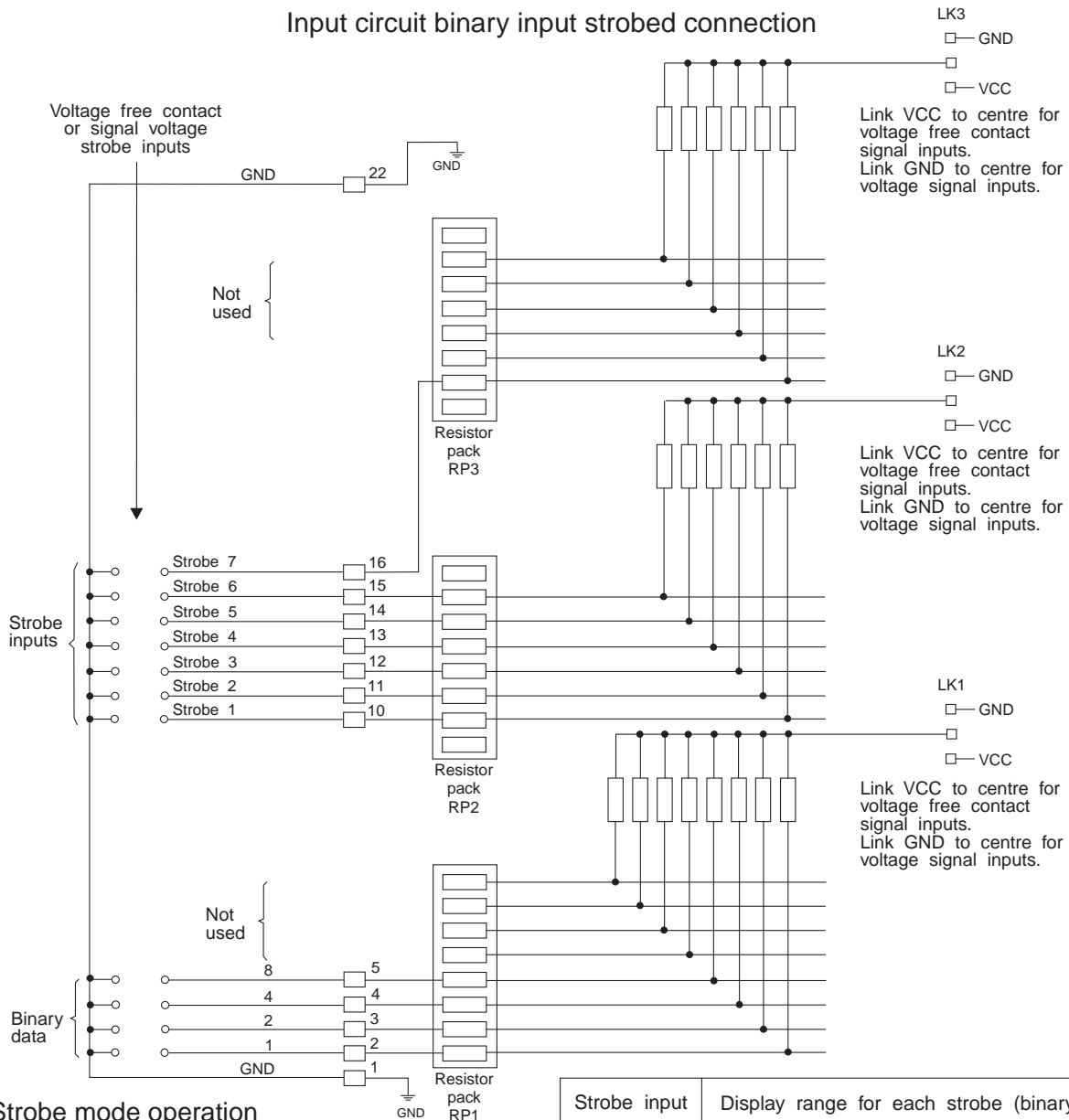
Input circuit binary input parallel connection



# STROBED BINARY INPUT (ALSO USED FOR GRAY CODE)



Input circuit binary input strobed connection



### Strobe mode operation

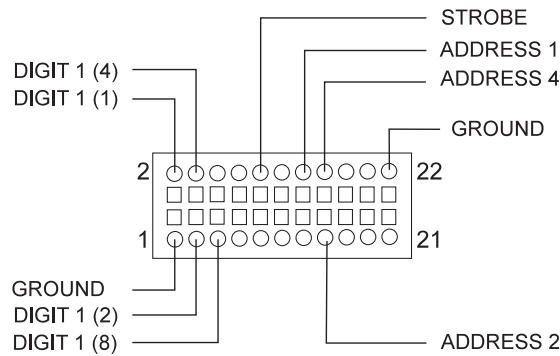
1. Set data value
2. Activate required strobe input when ready

### Example

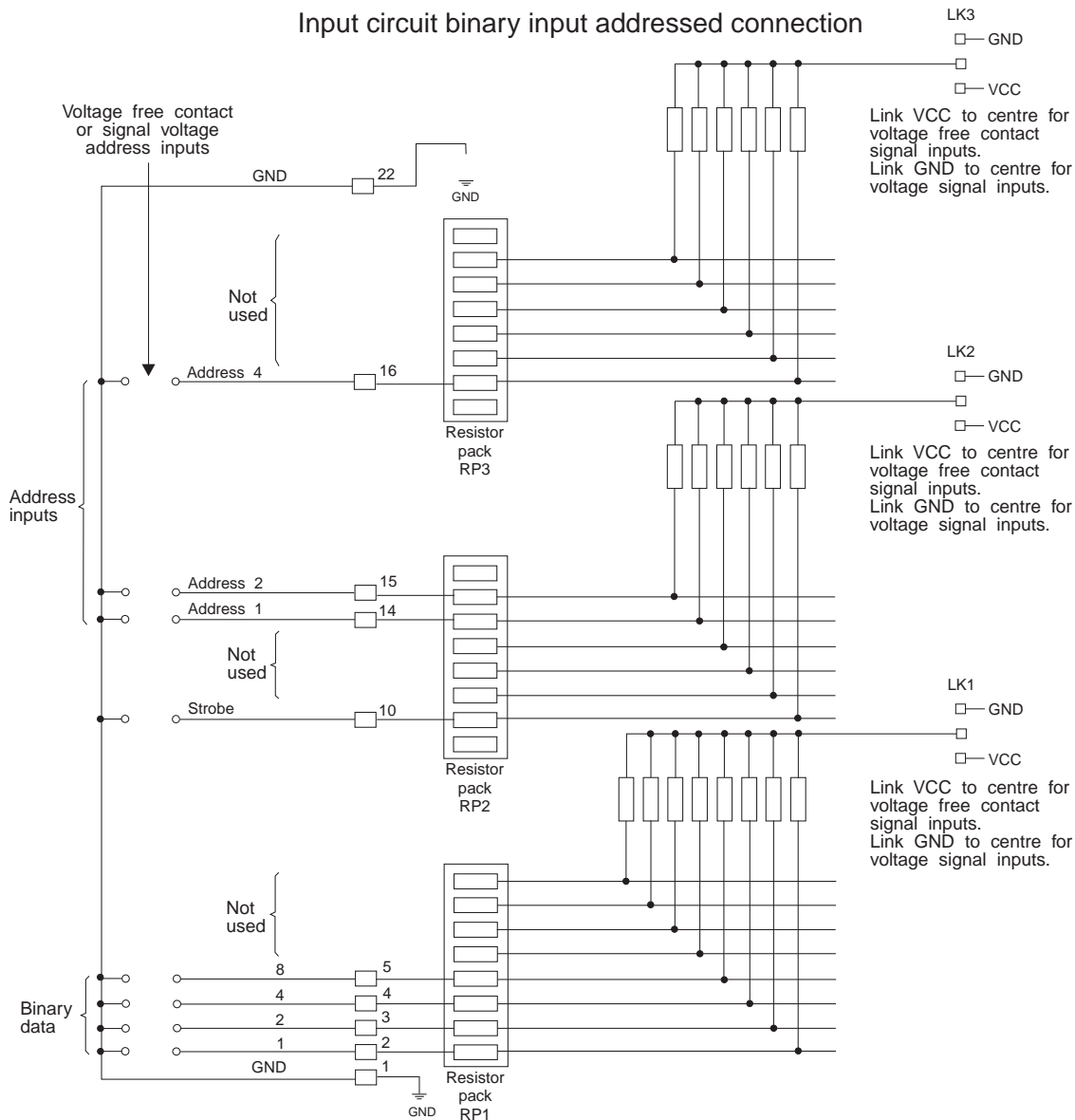
1. Data value set to 0100
2. Strobe 2 activated - a value of 64 (0100 0000 in binary) is added to the display.

Strobe input	Display range for each strobe (binary input)
1	0000 to 1111 adds 0 to 15
2	0001 to 1111 adds 16 to 240
3	0001 to 1111 adds 256 to 3840
4	0001 to 1111 adds 4096 to 61440
5	0001 to 1111 adds 65536 to 983040
6	0001 to 1111 adds 1048576 to 15728640
7	0001 to 1111 adds 16777216 to 251658240
Note 99999999 is the largest number which can be displayed on a 8 digit display	

# ADDRESSED BINARY INPUT (ALSO USED FOR GRAY CODE)



Input circuit binary input addressed connection



## Addressed binary mode operation

1. Set data value
2. Set address
3. Activate strobe

## Example

1. Data value set to 0100
2. Address set to 001 (digit 2)
3. Strobe activated - a value of 64 (0100 0000 in binary) is added to the display.

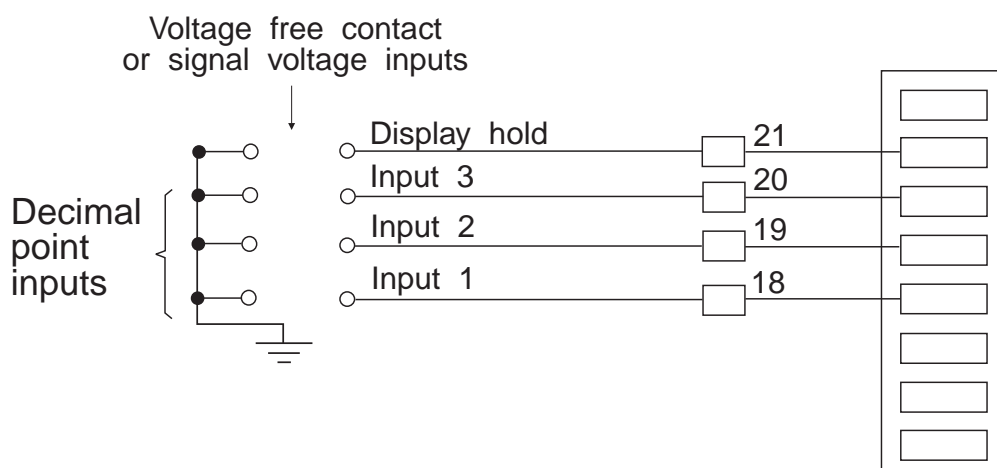
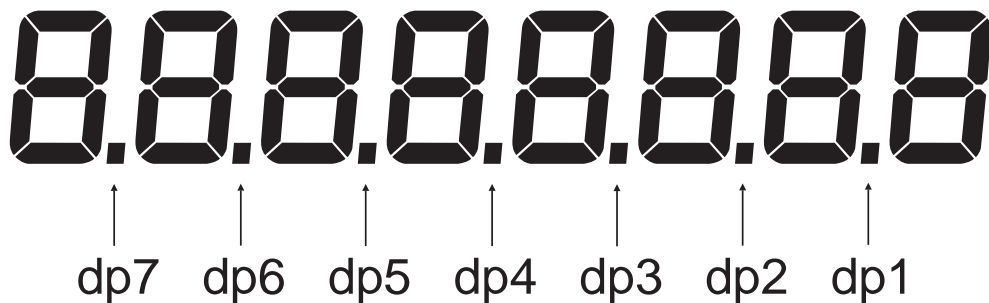
	Address input			Display range for each address (binary input)
	4	2	1	
Status	Inactive	Inactive	Inactive	0000 to 1111 adds 0 to 15
	Inactive	Inactive	<b>Active</b>	0001 to 1111 adds 16 to 240
	Inactive	<b>Active</b>	Inactive	0001 to 1111 adds 256 to 3840
	Inactive	<b>Active</b>	<b>Active</b>	0001 to 1111 adds 4096 to 61440
	<b>Active</b>	Inactive	Inactive	0001 to 1111 adds 65536 to 983040
	<b>Active</b>	Inactive	<b>Active</b>	0001 to 1111 adds 1048576 to 15728640
	<b>Active</b>	<b>Active</b>	Inactive	0001 to 1111 adds 16777216 to 251658240
				Note 99999999 is the largest number which can be displayed on a 8 digit display

### 4.3 Remote decimal point selection and display hold

For up to 4 digit parallel BCD or addressed BCD or strobed BCD inputs terminals 18, 19 & 20 may be used to select the decimal point position. To allow these inputs to be used in this manner the **dp ! npt** function must be set to **on**. When the **dp ! npt** function is set to **on** the software decimal point selection set at the **dcpt** function will be ignored. The table below shows the input requirements for remote decimal point selection.

The display hold input will hold the current display value when activated. The **! npt hold** function must be set to **on** to enable the display hold input. The **hold pol** function may be set to **H** or **L**, this sets the input logic level at terminal 21 for display hold. The display hold input is available for use with up to 4 digit parallel BCD or addressed BCD or strobed BCD.

Decimal point positions 8 digit display example.



Decimal point selection table

	No decimal points	dp1 on	dp2 on	dp3 on	dp4 on	dp5 on	dp6 on	dp7 on
Input 1	Inactive	Active	Inactive	Active	Inactive	Active	Inactive	Active
Input 2	Inactive	Inactive	Active	Active	Inactive	Inactive	Active	Active
Input 3	Inactive	Inactive	Inactive	Inactive	Active	Active	Active	Active

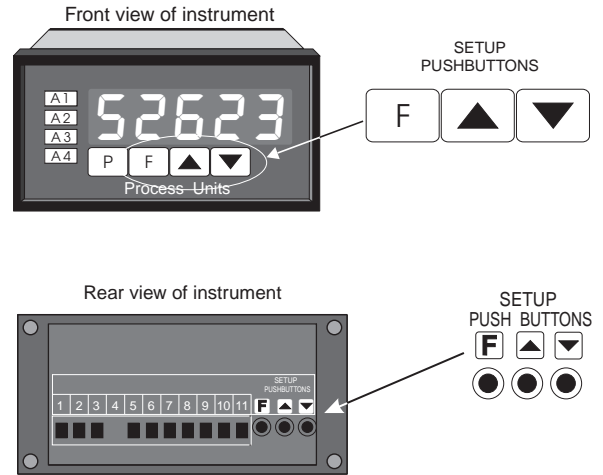
## 5 Explanation of functions

The PM4 setup and calibration functions are configured through a push button sequence. Two levels of access are provided for setting up and calibrating:-

**FUNC** mode (simple push button sequence) allows access to commonly set up functions such as alarm setpoints.

**CAL** mode (power up sequence plus push button sequence) allows access to all functions including calibration parameters.

The three push buttons located at the rear of the instrument (also at the front on some display options) are used to alter settings. Once **CAL** or **FUNC** mode has been entered you can step through the functions, by pressing and releasing the **F** push button, until the required function is reached. Changes to functions are made by pressing the **▲** or **▼** push button (in some cases both simultaneously) when the required function is reached.



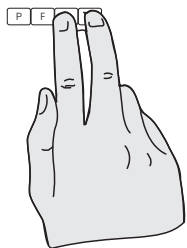
### Entering **CAL** Mode



1. Remove power from the instrument. Hold in the **F** button and reapply power. The display will briefly indicate **CAL** as part of the "wake up messages" when the **CAL** message is seen you can release the button. Move to step 2 below.



2. When the "wake up" messages have finished and the display has settled down to its normal reading press, then release the **F** button. Move to step 3 below.



3. Within 2 seconds of releasing the **F** button press, then release the **▲** and **▼** buttons together. The display will now indicate **FUNC** followed by the first function.

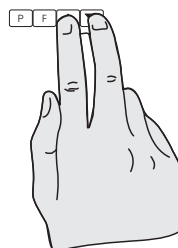
Note: If step 1 above has been completed then the instrument will remain in this **CAL** mode state until power is removed. i.e. there is no need to repeat step 1 when accessing function unless power has been removed.

### Entering **FUNC** Mode









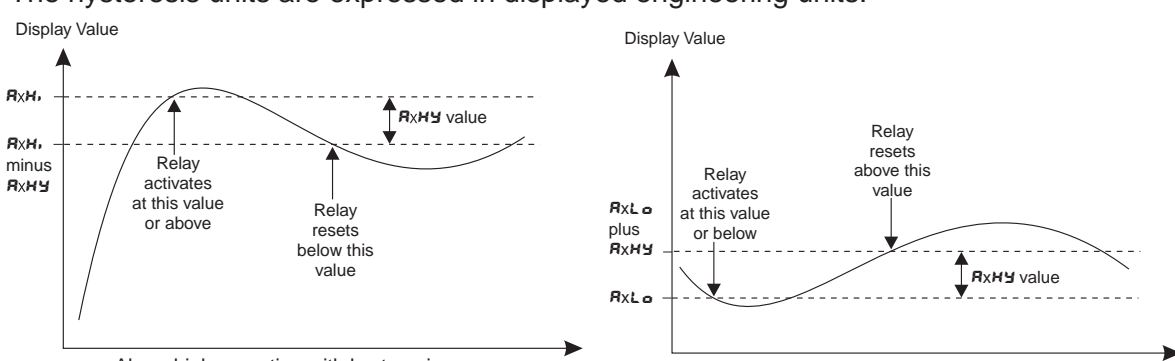
No special power up procedure is required to enter **FUNC** mode.







1. When the "wake up" messages have finished and the display has settled down to its normal reading press, then release the **F** button.



2. Within 2 seconds of releasing the **F** button press, then release the **▲** and **▼** buttons together. The display will now indicate **FUNC** followed by the first function.

Function	Description
<b>R2Lo</b>	First optional relay low setpoint (binary, Gray code, whole number BCD ( <b>bc d C0dE = 0</b> ) and weighted digital inputs only) - note there is no relay 1 therefore relay numbering starts from 2. Relay 2 front panel annunciator LED A2 (5 digit displays only) will operate from first optional relay. The <b>R2Lo</b> function displays and sets the low setpoint value for the alarm relay. The low alarm setpoint may be disabled by pressing the  and  pushbuttons simultaneously. When the alarm is disabled the display will indicate <b>OFF</b> . Use  or  to adjust the setpoint value if required. The alarm will activate when the displayed value is lower than the setpoint value. Each relay may be configured with both a low and high setpoint if required. When both a low and high setpoint is used the relay will be activated when the display reading moves outside the band set between low and high setpoints.
<b>R3Lo &amp; R4Lo</b>	Additional optional relay low setpoint (binary, Gray code, whole number BCD ( <b>bc d C0dE = 0</b> ) and weighted digital inputs only). See <b>R2Lo</b> above for description.
<b>R2H.</b>	Alarm high setpoint (binary, Gray code, whole number BCD ( <b>bc d C0dE = 0</b> ) and weighted digital inputs only) - note relay numbering starts from 2, relay 2 front panel annunciator LED A2 (5 digit displays only) will operate from first optional relay. Displays and sets the high setpoint value for the alarm relay. The high alarm setpoint may be disabled by pressing the  and  pushbuttons simultaneously. When the alarm is disabled the display will indicate <b>OFF</b> . Use  or  to adjust the setpoint value if required. The alarm will activate when the displayed value is higher than the setpoint value. Each relay may be configured with both a low and high setpoint if required, if so the relay will be activated when the display reading moves outside the band set between low and high setpoints.
<b>R3H. &amp; R4H.</b>	Additional optional relay high setpoint (binary, Gray code, whole number BCD ( <b>bc d C0dE = 0</b> ) and weighted digital inputs only). See <b>R2H.</b> above for description.
<b>R2HY R3HY &amp; R4HY</b>	<p>Alarm hysteresis [deadband] for optional relay (binary, Gray code, whole number BCD (<b>bc d C0dE = 0</b>) and weighted digital inputs only) - displays and sets the alarm hysteresis limit and is common for both high and low setpoint values. The hysteresis value may be used to prevent too frequent operation of the setpoint relay when the measured value stays close to the setpoint. Without a hysteresis setting (e.g. <b>R2HY</b> set to zero) the alarm will activate when the display value goes above the alarm setpoint (for high alarm) and will reset when the display value falls below the setpoint, this can result in repeated on/off switching of the relay at around the setpoint value. The hysteresis setting operates as follows:</p> <p>In the high alarm mode, once the alarm is activated the input must fall below the setpoint value minus the hysteresis value to reset the alarm.</p> <p>e.g. if <b>R2H.</b> is to <b>50.0</b> and <b>R2HY</b> is set to <b>3.0</b> then the setpoint output relay will activate once the display value goes above <b>50.0</b> and will reset when the display value goes below <b>47.0</b> (50.0 minus 3.0).</p> <p>In the low alarm mode, once the alarm is activated the input must rise above the setpoint value plus the hysteresis value to reset the alarm.</p> <p>e.g. if <b>R2Lo</b> is to <b>20.0</b> and <b>R2HY</b> is set to <b>10.0</b> then the alarm output relay will activate when the display value falls below <b>20.0</b> and will reset when the display value goes above <b>30.0</b> (20.0 plus 10.0).</p> <p>The hysteresis units are expressed in displayed engineering units.</p>
	

<b>A2tE</b> <b>A3tE</b> & <b>A4tE</b>	Alarm trip time for optional relay (binary, Gray code, whole number BCD ( <b>bc d C0dE = 0</b> ) and weighted digital inputs only) - displays and sets the alarm trip time and is common for both alarm high and low setpoint values. The trip time is the delay time before the alarm relay will activate, or trip, when an alarm condition is present. The alarm condition must be present continuously for the trip time period before the alarm will trip. This function is useful for preventing an alarm trip due to short non critical deviations from setpoint. The trip time is selectable over <b>0</b> to <b>60</b> seconds.
<b>A2rE</b> <b>A3rE</b> & <b>A4rE</b>	Alarm reset time for optional relay (binary, Gray code, whole number BCD ( <b>bc d C0dE = 0</b> ) and weighted digital inputs only) - displays and sets the alarm relay reset time. With the alarm condition is removed the alarm relay will stay in its alarm condition for the time selected as the reset time. The reset time is selectable over <b>0</b> to <b>60</b> seconds.
<b>A2n.o.</b> <b>A2n.c/</b> <b>A3n.o.</b> <b>A3n.c/</b> <b>A4n.o.</b> <b>A4n.c/</b>	Alarm normally open or normally closed for optional relay (binary, Gray code, whole number BCD ( <b>bc d C0dE = 0</b> ) and weighted digital inputs only) - displays and sets the setpoint alarm relay action to normally open (de-energised) or normally closed (energised), when no alarm condition is present. A normally closed alarm is often used to provide a power failure alarm indication.
<b>A3.SP,</b> <b>A3.t2</b> etc.	Relay operation independent setpoint or trailing setpoint for optional relay (binary, Gray code, whole number BCD ( <b>bc d C0dE = 0</b> ) and weighted digital inputs only) - each relay may be programmed to operate with an independent setpoint setting or may be linked (or trailing) to operate at a fixed difference to another relay setpoint. The operation is as follows:  Alarm relay 2 ( <b>A2</b> ) is always independent and must be set to <b>A2.SP</b> (ignore the <b>A2tE 1</b> setting as this does not apply to this instrument). Alarm relay 3 ( <b>A3</b> ) may be independent or may be linked to Alarm 2. Alarm relay 4 ( <b>A4</b> ) may be independent or may be linked to Alarm 2 or Alarm 3. The operation of each alarm is selectable within the Function Setup Mode by selecting, for example, (Alarm 4) <b>A4.SP</b> = Alarm 4 normal setpoint or <b>A4.t2</b> = Alarm 4 trailing Alarm 2 or <b>A4.t3</b> = Alarm 4 trailing Alarm 3. For trailing set points the setpoint value is entered as the difference from the setpoint being trailed. If the trailing setpoint is to operate ahead of the prime setpoint then the value is entered as a positive number and if operating behind the prime setpoint then the value is entered as a negative number. For example, with Alarm 3 set to trail alarm 2, if <b>A2H</b> is set to 1000 and <b>A3H</b> is set to 50 then Alarm relay 2 will activate at 1000 and Alarm relay 3 will activate at 1050 (i.e. 1000 + 50). If Alarm 3 had been set at -50 then Alarm relay 3 would activate at 950 (i.e. 1000 - 50).
<b>br9E</b>	Display brightness - displays and sets the digital display brightness. The display brightness is selectable from <b>1</b> to <b>15</b> where <b>1</b> = lowest intensity and <b>15</b> = highest intensity. This function is useful for improving the display readability in dark areas or to reduce the power consumption of the instrument.
<b>rEC-</b>	Recorder/retransmission output low value (binary, Gray code, whole number BCD ( <b>bc d C0dE = 0</b> ) and weighted digital inputs only) - seen only when analog retransmission option fitted. Refer to the separate "PM4 Panel Meter Optional Output Addendum" booklet supplied when this option is fitted.  Displays and sets the analog retransmission (4-20mA, 0-1V or 0-10V, link selectable) output low value (4mA or 0V) in displayed engineering units. e.g. if it is required to retransmit 4mA when the display indicates <b>0</b> then select <b>0</b> in this function via the  or  button.
<b>rEC+</b>	Recorder/retransmission output high value (binary, Gray code, whole number BCD ( <b>bc d C0dE = 0</b> ) and weighted digital inputs only) - seen only when analog retransmission option fitted. Refer to the separate "PM4 Panel Meter Optional Output Addendum" booklet supplied when this option is fitted.  Displays and sets the analog retransmission (4-20mA, 0-1V or 0-10V, link selectable) output high value (20mA, 1V or 10V) in displayed engineering units. e.g. if it is required to retransmit 20mA when the display indicates <b>500</b> then select <b>500</b> in this function via the  or  button.

<p><b>bAr<sub>l</sub></b></p>	<p>Bar graph display low value - seen only in bargraph display instruments. Displays and sets the graph low value i.e. the value on the 7 segment display at which the bargraph will start to rise. This may be independently set anywhere within the display range of the instrument.</p> <p>Note: The <b>bAr<sub>h</sub></b> and <b>bAr<sub>l</sub></b> settings are referenced from the 7 segment display readings, not the bargraph scale values. The bargraph scale may scaled differently to the 7 segment display, as shown on the right where bargraph scale is 0 to 100 yet the display is showing <b>675.3</b>. In this example the bargraph scale may be indicating percentage fill of a tank whilst the 7 segment display is indicating actual process units.</p>	
<p><b>bAr<sub>h</sub></b></p>	<p>Bargraph display high value - seen only in bargraph display instruments. Displays and sets the bar graph high value i.e. the value on the 7 segment display at which the bargraph will reach its maximum indication (all LED's illuminated). May be independently set anywhere within the display range of the instrument.</p>	
<p><b>bAr<sub>TYPE</sub></b></p>	<p>Bar graph display operation mode - seen only in bargraph display instruments.</p> <p>Allows selection of bargraph operation mode choices are:</p> <p><b>bAr</b> - conventional solid bargraph display i.e. all LED's illuminated when at full scale. When scaling the display use the <b>bAr<sub>l</sub></b> and <b>bAr<sub>h</sub></b> functions e.g. <b>bAr<sub>l</sub> = 0</b> and <b>bAr<sub>h</sub> = 100</b> will give a bargraph with no segments lit at a 7 segment display reading of <b>0</b> and all segments lit with a 7 segment display reading of <b>100</b>.</p> <p><b>S.dot</b> - single dot display. A single segment will be lit to indicate the input readings position on the scale. When scaling the display use the <b>bAr<sub>l</sub></b> and <b>bAr<sub>h</sub></b> functions e.g. <b>bAr<sub>l</sub> = 0</b> and <b>bAr<sub>h</sub> = 100</b> will give a bargraph with the bottom segment lit at a 7 segment display reading of <b>0</b> and the top segment lit with a 7 segment display reading of <b>100</b>.</p> <p>Note: this could also be set up as a centre zero single dot display by entering a negative value and positive value. e.g. <b>bAr<sub>l</sub> = -100</b>, <b>bAr<sub>h</sub> = 100</b>.</p> <p><b>d.dot</b> - double dot display. Two segments will be lit to indicate the input reading position on the scale. The reading should be taken from the middle of the two segments. When scaling the display use the <b>bAr<sub>l</sub></b> and <b>bAr<sub>h</sub></b> functions e.g. <b>bAr<sub>l</sub> = 0</b> and <b>bAr<sub>h</sub> = 100</b> will give a bargraph with the bottom two segments lit at a 7 segment display reading of <b>0</b> and the top two segments lit with a 7 segment display reading of <b>100</b>.</p> <p>Note: this could also be set up as a centre zero single dot display by entering a negative value and positive value. e.g. <b>bAr<sub>l</sub> = -100</b>, <b>bAr<sub>h</sub> = 100</b>.</p> <p><b>C.bAr</b> - centre bar display. The display will be a solid bargraph but will have its zero point in the middle of the display. If the seven segment display value is positive the bargraph will rise. If the seven segment display value is negative then the bargraph will fall. When scaling the display use the <b>bAr<sub>l</sub></b> and <b>bAr<sub>h</sub></b> functions e.g. <b>bAr<sub>l</sub> = 0</b> and <b>bAr<sub>h</sub> = 100</b> will give a bargraph with all the bottom half segments lit at a 7 segment display reading of <b>-100</b> and all the top segments lit with a 7 segment display reading of <b>100</b>.</p>	
<p>Functions below are accessible only via <b>CAL</b> mode or if <b>ACCS</b> is set to <b>ALL</b></p>		
<p><b>dCPt</b></p>	<p>Decimal point selection - displays and sets the decimal point. By pressing the <b>▲</b> or <b>▼</b> pushbuttons the decimal point position may be set. The display will indicate as follows: <b>0</b> (no decimal point), <b>0.1</b> (1 decimal place), <b>0.02</b> (2 decimal places), <b>0.003</b> (3 decimal places) etc.</p> <p>For addressed, strobed and 4 digit parallel BCD inputs the decimal points can be selected remotely via the signal levels on the rear input terminals 18, 19 &amp; 20. See section 4.1 and <b>dP</b>, <b>nPt</b> function for details. When remote decimal point selection is used the <b>dCPt</b> function settings are ignored.</p>	

<b>d9.OP</b>	Digital output mode (binary, Gray code, whole number BCD ( <b>bcdCODE = 0</b> ) and weighted digital inputs only) - seen only with digital output option. Refer to the separate "PM4 Panel Meter Optional Output Addendum" booklet supplied when this option is fitted. Selections available are: <b>b, n2</b> (signed binary), <b>b, n</b> (unsigned binary), <b>b.SCL</b> (scaled binary), <b>bcd</b> (binary coded decimal).
<b>d9.OP</b>	Digital output polarity (binary, Gray code, whole number BCD ( <b>bcdCODE = 0</b> ) and weighted digital inputs only) - seen only with digital output option. Refer to the separate "PM4 Panel Meter Optional Output Addendum" booklet supplied when this option is fitted. Select either <b>ALo</b> - active low output or <b>AH,</b> - active high output.
<b>bcd Start</b>	BCD - start display position (binary, Gray code, whole number BCD ( <b>bcdCODE = 0</b> ) and weighted digital inputs only) - seen only with digital output option. Refer to the separate "PM4 Panel Meter Optional Output Addendum" booklet supplied when this option is fitted. This function affects BCD mode only and determines the number of digits to skip when outputting from the display. Select from 0 to number of display digits minus 4. e.g. for a 6 digit display you may select 0 to 2, if 2 is selected then the four left most digits will be output.
<b>d, 9-</b>	Scaled digital output low reading (binary, Gray code, whole number BCD ( <b>bcdCODE = 0</b> ) and weighted digital inputs only) - seen only with digital output option. Refer to the separate "PM4 Panel Meter Optional Output Addendum" booklet supplied when this option is fitted. Accepts any valid display value. Determines the low scaling point for the <b>b.SCL</b> mode and has no effect on other modes.
<b>d, 9+</b>	Scaled digital output high reading (binary, Gray code, whole number BCD ( <b>bcdCODE = 0</b> ) and weighted digital inputs only) - seen only with digital output option. Refer to the separate "PM4 Panel Meter Optional Output Addendum" booklet supplied when this option is fitted. Accepts any valid display value. Determines the high scaling point for the <b>b.SCL</b> mode and has no effect on other modes. For example if <b>d, 9-</b> is set to <b>0</b> and <b>d, 9+</b> is set to <b>55535</b> ( $2^{16}$ ) then the retransmission will not be scaled i.e. a display of <b>2</b> will cause a retransmission of 2. If <b>d, 9+</b> is now changed to <b>32767</b> ( $2^{15}$ ) then a display of <b>2</b> will cause a retransmission of 4.
<b>P.but</b>	<b>P</b> button function - a only in models with front panel <b>P</b> buttons. The <b>P</b> button may be set to operate one selected function. The <b>P</b> button is located at the front of 5 or 6 digit LED models. Note the P button functions do not operate in BCD mode. Functions available are: <b>NONE, H, ,Lo, H, Lo</b> <b>NONE</b> - no function required. <b>H,</b> - peak memory. The peak value stored in memory will be displayed when the <b>P</b> button is pressed, if the button is pressed momentary then the display will return to normal measurement after 20 seconds. If the button is held for 1 to 2 seconds or the power is removed from the instrument then the memory will be reset. <b>Lo</b> - valley memory. The minimum value stored in memory will be displayed. Otherwise operates in the same manner as the <b>H,</b> function. <b>H, Lo</b> - toggle between <b>H,</b> and <b>Lo</b> displays. This function allows the remote input to be used to toggle between peak and valley memory displays. The first operation of the <b>P</b> button will cause the peak memory value to be displayed, the next operation will give a valley memory display. <b>PH,</b> or <b>PLo</b> will flash before each display to give an indication of display type.
<b>ACCESS</b>	Access mode - the access mode function <b>ACCESS</b> has four possible settings namely <b>OFF,</b> <b>EASY, NONE</b> and <b>ALL.</b> If set to <b>OFF</b> the mode function has no effect on alarm relay operation. If set to <b>EASY</b> the easy alarm access mode will be activated (requires optional alarm relay to be fitted). If set to <b>NONE</b> there will be no access to any functions via <b>FUNC</b> mode, entry via <b>CAL</b> mode must be made to gain access to alarm and calibration functions. If set to <b>ALL</b> then access to all functions, including calibration functions, can be gained via <b>FUNC</b> mode.
<b>input bits</b>	Input bits - allows selection of the number of input bits from 1 to 20 for parallel inputs or 1 to 31 for strobed or addressed inputs.

<b>SI 9N</b>	Sign bit <b>on</b> or <b>OFF</b> (parallel binary input only) - Example: if set to <b>on</b> then, with 16 bit binary selected, the most significant digit will be used as the sign bit with 0 on the most significant digit being positive and 1 on the most significant digit being negative. e.g. 0111 1111 1111 1001 will show as <b>32767</b> and 1111 1111 1111 1001 will show as <b>-7</b> (-7 being the two's complement of 111 1111 1111 1001). Thus the display with 15 bits plus a sign bit can display any number from <b>-32768</b> to <b>32767</b> . If set to <b>OFF</b> none of the data bits will be treated as a sign bit and all values will be positive.
<b>d1 SP FRate</b>	Display rate - allows selection of display update rate from 1, 2, 4, 8, 16 or 32 updates per second.
<b>d1 nP</b>	Weighted digital input bits - seen only when <b>SEt : nP</b> is set to <b>d1 nP</b> . Allows the number of weighted digital inputs used to be set from 1 to 8. See "Weighted digital input operation & electrical connections" chapter for a description of the <b>d1 nP</b> mode.
<b>d1 1, d1 2 etc.</b>	Weighting for digital input 1, 2 etc. - seen only when <b>SEt : nP</b> is set to <b>d1 nP</b> . Allows weighted values to be set for each of the digital inputs used. May be set to any value in the display range. See "Weighted digital input operation & electrical connections" chapter for a description of the <b>d1 nP</b> mode.
<b>SEt : nP</b>	Set input - allows selection of binary ( <b>b1 n</b> ), BCD ( <b>bcd</b> ), Gray ( <b>GRAY</b> ) code input or a special weighted digital input ( <b>d1 nP</b> ). See "Weighted digital input operation" chapter for a description of the <b>d1 nP</b> mode.
<b>: nP</b>	Input type - Allows selection of parallel ( <b>PARL</b> ), strobed ( <b>Strob</b> ) or addressed ( <b>Addr</b> ) input.
<b>dAR POL</b>	Data polarity - Allows selection of active low ( <b>Lo</b> ) or active high ( <b>Hi</b> ) data inputs.
<b>Strob POL</b>	Strobe polarity - Allows selection of active low ( <b>Lo</b> ) or active high ( <b>Hi</b> ) strobe inputs.
<b>bcd CODE</b>	BCD code - BCD inputs only i.e. <b>bcd</b> selected at <b>SEt : nP</b> function - allows selection of special code characters as shown below. Select the format for non BCD digits, A to F: <b>0</b> - A to F (1010 to 1111) displays blanks <b>1</b> - A to F (1010 to 1111) displays <b>A, b, C, d, E, F</b> <b>2</b> - A to F (1010 to 1111) displays <b>-, C, I, O, o, blank</b> <b>3</b> - A to F (1010 to 1111) displays <b>A, L, H, I, o, blank</b> <b>4</b> - A to F (1010 to 1111) displays <b>O, C, F, -, -, -</b> <b>5</b> - A to F (1010 to 1111) displays <b>-, E, H, L, P, blank</b>
<b>bcd d1 9t</b>	Number of BCD digits (1 to 5 or 1 to 4 for 4 digit display) - BCD inputs only i.e. <b>bcd</b> selected at <b>SEt : nP</b> function - allows selection of the number of BCD digits to be displayed.
<b>dP : nP</b>	Remote decimal point selection - for addressed, strobed or 4 digit parallel BCD inputs only there is a choice of setting the decimal point place either in software or remotely via rear terminals 18, 19 & 20. If selection is to be made via software the <b>dP : nP</b> function must be set to <b>OFF</b> . If remote selection is required the <b>dP : nP</b> function must be set to <b>on</b> . When the <b>dP : nP</b> function is set to <b>on</b> the <b>dCP</b> function setting is ignored. See section 4.1 for details.
<b>: nP HOLD</b>	Remote display hold - for addressed, strobed or 4 digit parallel BCD inputs only there is a choice of assigning terminal 21 as a display hold input. If the <b>: nP HOLD</b> function is set to <b>on</b> terminal 21 can be used to hold the display value (a latching switch or input level is normally required). If set to <b>OFF</b> terminal 21 cannot be used to hold the display. See <b>HOLD POL</b> function below.

<b>HOLD POL</b>	<p>Polarity for display hold input - for addressed, strobed or 4 digit parallel BCD inputs only. This function can be set to <b>H</b>, or <b>Lo</b> to select the logic level required for the display hold input on input terminal 21. The table below shows the effect of the <b>HOLD POL</b> function setting. The voltage levels at the hold input must be the same as the data voltage levels.</p> <table border="1" data-bbox="296 264 1461 555"> <thead> <tr> <th data-bbox="296 264 587 338"><b>HOLD POL</b> setting</th> <th data-bbox="587 264 979 338">LK1, 2 &amp; 3 set to GND</th> <th data-bbox="979 264 1461 338">LK1, 2 &amp; 3 set to VCC (voltage free inputs only)</th> </tr> </thead> <tbody> <tr> <td data-bbox="296 338 587 450"><b>Lo</b></td> <td data-bbox="587 338 979 450">Low voltage or open circuit holds display. High voltage frees display.</td> <td data-bbox="979 338 1461 450">Low voltage holds display. High voltage or open circuit frees display.</td> </tr> <tr> <td data-bbox="296 450 587 555"><b>H</b></td> <td data-bbox="587 450 979 555">Low voltage or open circuit frees display. High voltage holds display.</td> <td data-bbox="979 450 1461 555">Low voltage frees display. High voltage or open circuit holds display.</td> </tr> </tbody> </table>	<b>HOLD POL</b> setting	LK1, 2 & 3 set to GND	LK1, 2 & 3 set to VCC (voltage free inputs only)	<b>Lo</b>	Low voltage or open circuit holds display. High voltage frees display.	Low voltage holds display. High voltage or open circuit frees display.	<b>H</b>	Low voltage or open circuit frees display. High voltage holds display.	Low voltage frees display. High voltage or open circuit holds display.
<b>HOLD POL</b> setting	LK1, 2 & 3 set to GND	LK1, 2 & 3 set to VCC (voltage free inputs only)								
<b>Lo</b>	Low voltage or open circuit holds display. High voltage frees display.	Low voltage holds display. High voltage or open circuit frees display.								
<b>H</b>	Low voltage or open circuit frees display. High voltage holds display.	Low voltage frees display. High voltage or open circuit holds display.								
<b>USER SCALE</b>	<p>User scale - allows binary, Gray or BCD (<b>bc dCODE</b> function = 0 only) code inputs to be scaled to non standard display values - see "Scaled inputs" chapter for description.</p>									
<b>CAL 1</b>	<p>First scaling point - see "Scaled inputs" chapter for description.</p>									
<b>CAL 2</b>	<p>Second scaling point - see "Scaled inputs" chapter for description.</p>									
<b>CAL OFFSET</b>	<p>Scaling offset - see "Scaled inputs" chapter for description.</p>									
<b>baud</b>	<p>Set baud rate (binary, Gray code, whole number BCD (<b>bc dCODE</b> = 0) and weighted digital inputs only) - seen only with serial output option. Refer to the separate "PM4 Panel Meter Optional Output Addendum" booklet supplied when optional outputs are fitted. Select from <b>300 . 600 . 1200 . 2400 . 4800 . 9600 . 19.2</b> or <b>38.4</b>.</p>									
<b>Prty</b>	<p>Set parity (binary, Gray code, whole number BCD (<b>bc dCODE</b> = 0) and weighted digital inputs only) - seen only with serial output option. Refer to the separate "PM4 Panel Meter Optional Output Addendum" booklet supplied when optional outputs are fitted. Select parity check to either <b>NONE</b>, <b>EVEN</b> or <b>odd</b>.</p>									
<b>OPut</b>	<p>Set serial interface mode (binary, Gray code, whole number BCD (<b>bc dCODE</b> = 0) and weighted digital inputs only) - seen only with serial output option. Refer to the separate "PM4 Panel Meter Optional Output Addendum" booklet supplied when optional outputs are fitted.</p> <p>Select <b>NONE</b>, <b>d</b>, <b>SP</b>, <b>Cont</b> or <b>POLL</b></p> <p>Allows user to select the serial interface operation as follows:-</p> <p><b>NONE</b> No serial communications required.</p> <p><b>d</b>, <b>SP</b> Sends image data from the display without conversion to ASCII. This mode is used only when the instrument is communicating with a slave display of the same manufacture.</p> <p><b>Cont</b> Sends ASCII form of display data every time display is updated.</p> <p><b>POLL</b> Controlled by computer or PLC as host. Host sends command via RS232/485 and instrument responds as requested.</p>									
<b>Addr</b>	<p>Set unit address for polled (<b>POLL</b>) mode (0 to 31)) (binary, Gray code, whole number BCD (<b>bc dCODE</b> = 0) and weighted digital inputs only) - seen only with serial output option. Refer to the separate "PM4 Panel Meter Optional Output Addendum" booklet supplied when optional outputs are fitted.</p> <p>Allows several units to operate on the same RS485 interface reporting on different areas etc. The host computer or PLC may poll each unit in turn supplying the appropriate address.</p> <p>The unit address ranges from 0 to 31 (DEC) but is offset by 32 (DEC) to avoid clashing with ASCII special function characters (such as &lt;STX&gt; and &lt;CR&gt;). Therefore 32 (DEC) or 20 (HEX) is address 0, 42 (DEC) or 2A (HEX) addresses unit 10.</p>									

### Returning to normal measure mode

When the calibration has been completed it is advisable to return the instrument to the normal mode (where calibration functions cannot be tampered with). To return to normal mode, turn off power to the instrument, wait a few seconds and then restore power.

## 6 Function table

Initial display	Meaning of display	Next display	Default Setting	Record Your Settings
<i>RxLo</i>	Alarm relay low setpoint value	Setpoint value or <b>OFF</b>	<b>OFF</b>	See following table
<i>RxHi</i>	Alarm relay high setpoint value	Setpoint value or <b>OFF</b>	<b>OFF</b>	See following table
<i>RxHY</i>	Alarm relay hysteresis	Hysteresis value in measured units	<b>1</b>	See following table
<i>RxTt</i>	Alarm relay trip time	No of seconds before relay trips	<b>0</b>	See following table
<i>Rxrt</i>	Alarm relay reset time	Reset time in seconds	<b>0</b>	See following table
<i>Rxn.o</i> or <i>Rxn.c</i>	Alarm relay action N/O or N/C	<i>Rxn.o</i> or <i>Rxn.c</i>	<i>Rxn.o</i>	See following table
<i>Rx.SP</i> or <i>Rx.t!</i>	Setpoint or trailing alarm	<i>Rx.SP</i> or <i>Rx.t!</i>	<i>Rx.SP</i>	See following table
<i>brgt</i>	Display brightness	<b>1</b> to <b>15</b>	<b>15</b>	
<i>rEC-</i>	Recorder output low limit	Value in memory	<b>0</b>	
<i>rEC+</i>	Recorder output high limit	Value in memory	<b>1000</b>	
<i>bAr-</i>	Bargraph low reading	Value in memory	<b>0</b>	
<i>bAr+</i>	Bargraph high reading	Value in memory	<b>1000</b>	
Functions below are accessible only via <b>CAL</b> mode or if the <b>ACCESS</b> function is set to <b>ALL</b> .				
<i>bAr TYPE</i>	Bargraph operation mode	<i>bAr .S.dot .d.dot</i> or <i>C.bAr</i>	<i>bAr</i>	
<i>d9OP</i>	Digital output mode	<i>bcd.b.SCL.b, n</i> or <i>b, n2</i>	<i>b, n2</i>	
<i>d9.OP</i>	Digital retransmission output polarity	<i>ALo</i> or <i>AHi</i>	<i>ALo</i>	
<i>bcd Start</i>	BCD retransmission start value	Value in memory	<b>0</b>	
<i>d! 9-</i>	Scaled digital output low reading	Value in memory	<b>0</b>	
<i>d! 9+</i>	Scaled digital output high reading	Value in memory	<b>1000</b>	
<i>dCPE</i>	Decimal point position	<b>0, 0.1, 0.02</b> etc	<b>0</b>	
<i>P.but</i>	<b>P</b> button function	<b>NONE, Hi, Lo</b> or <b>Hi, Lo</b>	<b>NONE</b>	
<i>ACCESS</i>	Access mode	<b>OFF, EASY, NONE</b> or <b>ALL</b>	<b>OFF</b>	
<i>INPUT bits</i>	Number of input bits	<b>1</b> to <b>20</b> or <b>1</b> to <b>31</b>	<b>20</b>	
<i>SIGN</i>	Sign bit on or off	<b>on</b> or <b>OFF</b>	<b>OFF</b>	
<i>DISP RATE</i>	Display update rate	<b>1, 2, 4, 8, 16</b> or <b>32</b>	<b>4</b>	
<i>dnP</i>	Number of weighted digital inputs	<b>1</b> to <b>8</b>	<b>4</b>	
<i>d, 1, d, 2</i> etc	Value for each weighted digital input	Value in memory	<b>0</b>	
<i>SET INPUT</i>	Set input type	<i>b, n, bcd.9FAY</i> or <i>d, nP</i>	<i>b, n</i>	
<i>INPUT</i>	Input mode	<b>PARL, Strb</b> or <b>Addr</b>	<b>PARL</b>	
<i>DATA POL</i>	Input data polarity	<b>Lo</b> or <b>Hi</b>	<b>Hi</b>	
<i>Strb POL</i>	Strobe input polarity	<b>Lo</b> or <b>Hi</b>	<b>Hi</b>	
<i>bcd CODE</i>	BCD code	<b>0, 1, 2, 3, 4</b> or <b>5</b>	<b>0</b>	
<i>bcd d! 9t</i>	Number of BCD digits	<b>1</b> to <b>5</b> or <b>1</b> to <b>4</b>	<b>4</b>	
<i>dPI NPE</i>	Remote decimal point	<b>on</b> or <b>OFF</b>	<b>OFF</b>	
<i>INPUT HOLD</i>	Remote input hold	<b>on</b> or <b>OFF</b>	<b>OFF</b>	
<i>HOLD POL</i>	Input hold polarity	<b>Hi</b> or <b>Lo</b>	<b>Lo</b>	
<i>USER SCALE</i>	User scaling	n/a	n/a	
<i>CAL 1</i>	First scaling point	n/a	n/a	
<i>CAL 2</i>	Second scaling point	n/a	n/a	
<i>CAL OFFSET</i>	Scaling offset	n/a	n/a	
<i>BAUD</i>	Baud rate	<b>300, 600, 1200, 2400, 4800, 9600, 192</b> or <b>38.4</b>	<b>9600</b>	
<i>Parity</i>	Parity	<b>NONE, EVEN</b> or <b>odd</b>	<b>NONE</b>	
<i>COMM</i>	Communication mode	<b>NONE, d, SP, Cont</b> or <b>POLL</b>	<b>Cont</b>	
<i>Addr</i>	Unit address	<b>0</b> to <b>31</b>	<b>0</b>	

Note: Functions shown shaded on the above table will be displayed, only when those particular options are fitted. Refer to the separate “PM4 Panel Meter Optional Output Addendum” booklet supplied when these options are fitted.

<b>Settings for relays - record settings here</b>						
	A2	A3	A4	A5	A6	A7
<b>RxLo</b>						
<b>RxHi</b>						
<b>RxHY</b>						
<b>RxLt</b>						
<b>Rxrt</b>						
<b>Rxn.o</b> or <b>Rxn.c</b>						
<b>Rx.SP</b> or <b>Rx.t f</b>	n/a					

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## 7 Scaled inputs

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This chapter covers the scaled binary/Gray/BCD code facility of the PM4-BC display (note for BCD inputs the **bcdCode** function must be set to 0 if scaling is required). This facility allows the display value for an input to be scaled by a two point scaling i.e. the display does not need to follow normal binary or Gray code values. For example, using the scaling functions it is possible to display half the normal binary value for the inputs present. The functions which allow the scaling facility are:

**USEF SCL E** - this function allows the selection of **on** or **OFF**. If scaled inputs are required then this function must be set to **on**. The display can be reset to normal display values for each input type by setting the function back to **OFF**.

**CAL 1/SCL 1** - first scaling point, see examples which follow.

**CAL 2/SCL 2** - second scaling point, see examples which follow.

**CAL OFSt** - calibration scaling offset value. This function allows an offset value to be added or subtracted from the scaled value. For example if a value of 10 is to be added to all values on the display at the **CAL OFSt** function press the **▲** and **▼** buttons together, the scaled display value for the input will be seen e.g. 150, press the **F** button then use the **▲** button to make the scale value the display value plus 10 e.g. 160. Press the **F** button to accept the change.

The display scaling will operate in parallel, strobed or addressed modes, scaling cannot be used with BCD inputs. The electrical inputs for scaled binary are identical to non scaled binary.

To access any of the scaling function and to follow the examples below it is necessary to enter **CAL** mode, see page 14 for method.

The basic scaling procedure for any input is as follows:

1. Select the input type required e.g. parallel binary
2. Set the **USEF SCL E** function to **on**
3. Place a known input value into the PM4 and with this input present use **CAL 1/SCL 1** functions to change the scaling for this input as required
4. Change the input to a second known value then use **CAL 2/SCL 2** functions to change the scaling for this input as required

### Example 1 - halving the reading of a Gray code input.

Using inputs of 0 and 6000 decimal arrange the display to show half the normal value.

The Gray code for 6000 decimal is 1110011001000.

The Gray code for 0 is 0.

1. With the Gray code input set at 0 go to the **CAL 1** function and press **▲** & **▼** simultaneously. A display value will be seen.
2. Press the **F** button, the message **SCL 1** will be seen followed by a value. Use the **▲** or **▼** button if required to make this value read 0.
3. Press the **F** button the message **CAL End** followed by **CAL 2** should be seen. Change the input to 1110011001000 (6000 decimal.)
4. Press the **▲** and **▼** buttons together. A display value will be seen.
5. Press the **F** button, the message **SCL 2** will be seen followed by a value. Use the **▲** or **▼** button if required to make this value read 3000.
6. Press the **F** button the message **CAL End** followed by the next function will be seen. Press and release the **F** button until the message **FUNC End** is seen and the display moves back to normal display mode. The readings viewed should now be half the normal Gray code values.

### Example 2 - altering both the zero and span of a Gray code input.

Set the display to read 0 for an input of 3000 and to read 3000 for an input of 6000. Note alternatively the **CAL OFSt** function could be used to achieve the same result.

The Gray code for 6000 decimal is 1110011001000.

The Gray code for 4000 decimal is 100001110000.

The Gray code for 3000 decimal is 111001100100.

1. Set the input to 111001100100 (3000 decimal) then go to the **CAL 1** function and press **▲** & **▼** simultaneously. A display value will be seen.

2. Press the **F** button, the message **SCL 1** will be seen followed by a value. Use the **▲** or **▼** button if required to make this value read 0.
3. Press the **F** button the message **CAL End** followed by **CAL 2** should be seen. Change the input to 1110011001000 (6000 decimal.)
4. Press the **▲** and **▼** buttons together. A display value will be seen.
5. Press the **F** button, the message **SCL 2** will be seen followed by a value. Use the **▲** or **▼** button if required to make this value read 3000.
6. Press the **F** button the message **CAL End** followed by the next function will be seen. Press and release the **F** button until the message **FUNC End** is seen and the display moves back to normal display mode. The readings viewed should now show 0 for an input of 3000 and 3000 for an input of 6000 with the display being linear in between e.g. an input of 4000 should now be displayed as 1000.

## 8 Weighted digital input operation & electrical connections

This chapter describes the special weighted digital input mode available on the PM4-BC. To operate in this mode the **SEt I nP** function must be set to **d, nP**.

The weighted digital input mode allows up to 8 inputs to be given weighted values, these weighted values are added together for each active input. The added values will be displayed and can be retransmitted if an analog or serial retransmission option is fitted.

The functions which control this mode are **d, nP** which allows the number of digital inputs required to be set from 1 to 8 and **d, 1, d, 2, d, 3** etc. which allows the weighting for each input to be set. The weighting value can be set to any display value.

**Example** - Four weighted inputs are to be used with the weighted values to be added, displayed and retransmitted as a 4-20mA signal using optional analog retransmission. The display is to have two decimal points and each weighted input in turn is to be given a value of 1.00, 3.00, 5.00 and 10.00 mA. The input signals are to be from a switch inputs with a short circuit to ground being the active signal i.e. active low operation. The retransmission output is set to give a 4mA output when the display shows 0.00 and a 20mA output when the display shows 16.00. Note that whilst the display can show a value greater than 16.00 the analog retransmission is limited to 20mA. The main settings required for this example are:

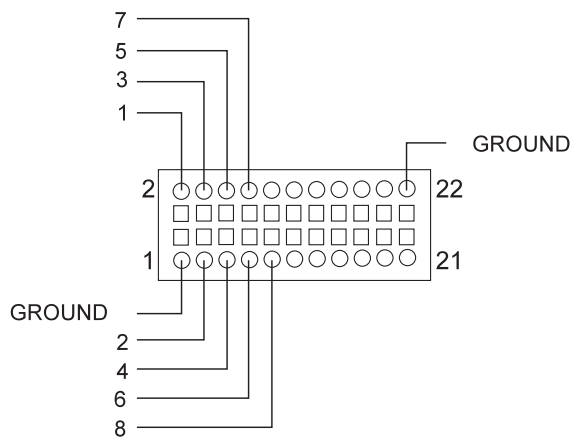
Function	Setting	Description
<b>FEC -</b>	<b>0.00</b>	Sets display value of <b>0.00</b> for 4mA output
<b>FEC ~</b>	<b>16.00</b>	Sets display value of <b>16.00</b> for 20mA output
<b>dCPt</b>	<b>0.02</b>	Sets decimal point to 2 places
<b>d, nP</b>	<b>4</b>	Sets number of weighted inputs to 4
<b>d, 1</b>	<b>1.00</b>	Sets first input weighting to 1.00
<b>d, 2</b>	<b>3.00</b>	Sets second input weighting to 3.00
<b>d, 3</b>	<b>5.00</b>	Sets third input weighting to 5.00
<b>d, 4</b>	<b>10.00</b>	Sets fourth input weighting to 10.00
<b>SEt I nP</b>	<b>d, nP</b>	Sets input type to weighted digital input
<b>dAR POL</b>	<b>Lo</b>	Sets input type to active low operation

The result of these inputs are shown in the table below

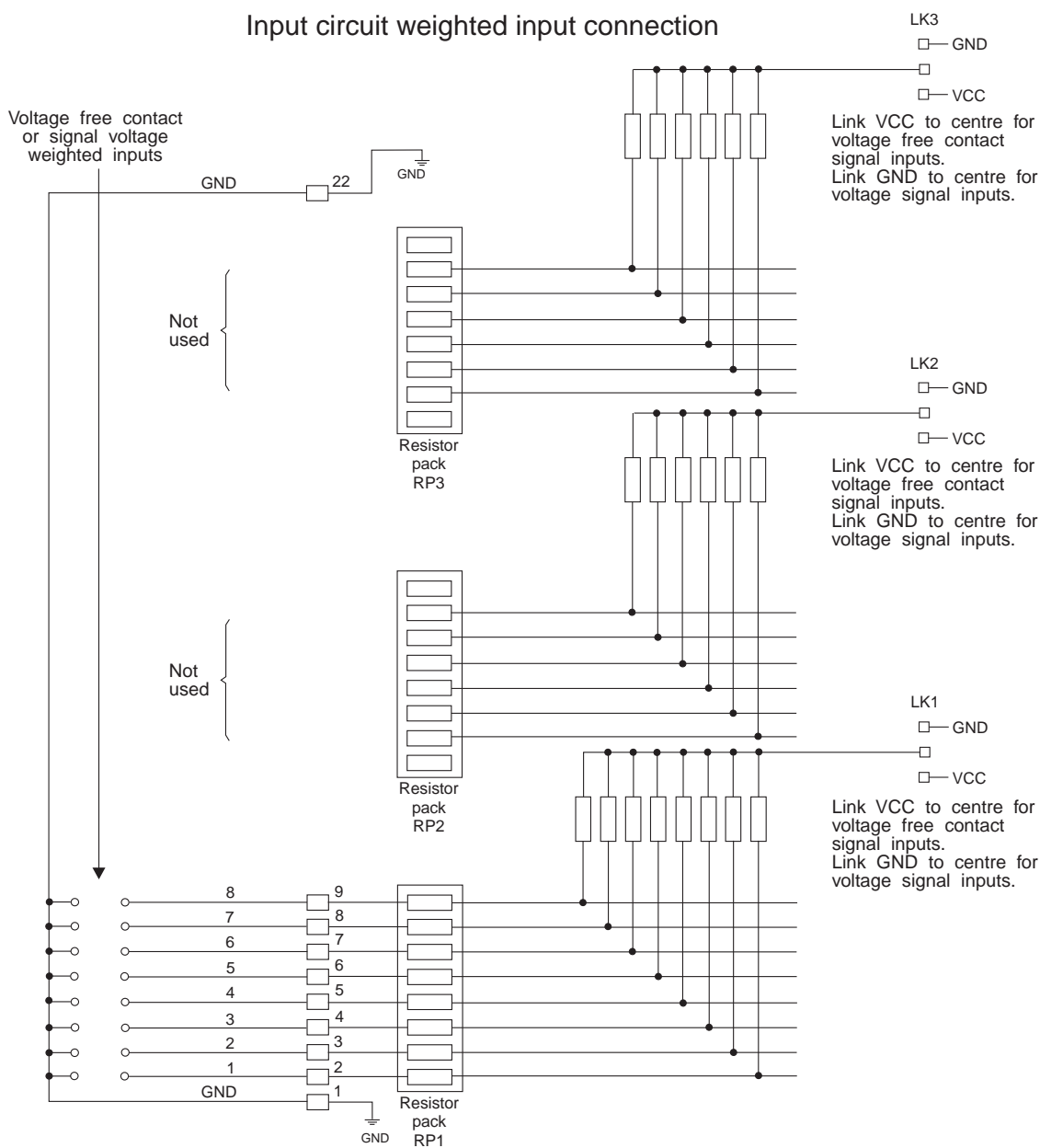
Input 1 state	Input 2 state	Input 3 state	Input 4 state	Display	Retransmission
Inactive	Inactive	Inactive	Inactive	0.00	4mA
<b>Active</b>	Inactive	Inactive	Inactive	1.00	5mA
Inactive	<b>Active</b>	Inactive	Inactive	3.00	7mA
<b>Active</b>	<b>Active</b>	Inactive	Inactive	4.00	8mA
Inactive	Inactive	<b>Active</b>	Inactive	5.00	9mA
<b>Active</b>	Inactive	<b>Active</b>	Inactive	6.00	10mA
Inactive	<b>Active</b>	<b>Active</b>	Inactive	8.00	12mA
<b>Active</b>	<b>Active</b>	<b>Active</b>	Inactive	9.00	13mA
Inactive	Inactive	Inactive	<b>Active</b>	10.00	14mA
<b>Active</b>	Inactive	Inactive	<b>Active</b>	11.00	15mA
Inactive	<b>Active</b>	Inactive	<b>Active</b>	13.00	17mA
<b>Active</b>	<b>Active</b>	Inactive	<b>Active</b>	14.00	18mA
Inactive	Inactive	<b>Active</b>	<b>Active</b>	15.00	19mA
<b>Active</b>	Inactive	<b>Active</b>	<b>Active</b>	16.00	20mA
Inactive	<b>Active</b>	<b>Active</b>	<b>Active</b>	18.00	20mA
<b>Active</b>	<b>Active</b>	<b>Active</b>	<b>Active</b>	19.00	20mA

The electrical connections for weighted digital inputs are as shown below.

## WEIGHTED DIGITAL INPUT



### Input circuit weighted input connection



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## 9 Specifications

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### 9.1 Technical Specifications

Input Data:	20 input lines for BCD, binary or Gray code addressed and strobed inputs can be used to give up to 8 digit display or special weighted digital input (up to 8 inputs). For BCD inputs four of the 20 input bits can be assigned for use as remote decimal point and display hold if required.
Input Types	5V, 12V to 24V or 48V DC contact closure or open collector (factory configured).
Input Logic:	Selectable active high or low.
Decimal Point:	User programmable.
Microprocessor:	MC68HC11 CMOS.
Ambient Temperature:	LED -10 to 60°C.
Humidity:	5 to 95% non condensing.
Power Supply:	AC 240V, 110V or 24V 50/60Hz or DC isolated wide range 12 to 48V or non isolated 24VDC Special supply types 32VAC, 48VAC 50/60Hz or DC isolated 50 to 110V also available. Note: supply type is factory configured.
Power Consumption:	AC supply 4 VA max, DC supply, consult supplier (depends on display type & options fitted).

### 9.2 Options

Alarm relays:	1, 3 or 6 alarm relays (binary, Gray code, whole number BCD ( <b><i>bcd</i></b> <b><i>COdE</i></b> = <b><i>0</i></b> ) and weighted digital input only).
Analog retransmission:	Single or dual. 4-20mA, 0-1V or 0-10V (isolated) (binary, Gray code, whole number BCD ( <b><i>bcdCOdE</i></b> = <b><i>0</i></b> ) and weighted digital input only). 4-20mA output can drive into 1kΩ load maximum.
Digital retransmission:	Binary/BCD (isolated) NPN or PNP (factory configured) binary, Gray code, whole number BCD ( <b><i>bcdCOdE</i></b> = <b><i>0</i></b> ) and weighted digital input only.
Serial communications:	RS232 or RS485 (factory configured) (binary, Gray code, whole number BCD ( <b><i>bcdCOdE</i></b> = <b><i>0</i></b> ) and weighted digital input only).

### 9.3 Physical Characteristics

Bezel Size:	DIN 48mm x 96mm x 10mm.
Case Size:	44mm x 91mm x 120mm behind face of panel.
Panel Cut Out:	45mm x 92mm +1mm &- 0mm.
Connections:	Plug in screw terminals max 2.5mm <sup>2</sup> wire, plus 22 way connector max 1mm <sup>2</sup> wire.
Weight:	400 gms Basic model, 450 gms with option card.

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## 10 Guarantee and service

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The product supplied with this manual is guaranteed against faulty workmanship for a period of 2 years from the date of dispatch.

Our obligation assumed under this guarantee is limited to the replacement of parts which, by our examination, are proved to be defective and have not been misused, carelessly handled, defaced or damaged due to incorrect installation. This guarantee is VOID where the unit has been opened, tampered with or if repairs have been made or attempted by anyone except an authorised representative of the manufacturing company.

Products for attention under guarantee (unless otherwise agreed) **must be returned to the manufacturer freight paid** and, if accepted for free repair, will be returned to the customers address in Australia free of charge.

When returning the product for service or repair a full description of the fault and the mode of operation used when the product failed must be given.

In any event the manufacturer has no other obligation or liability beyond replacement or repair of this product.

Modifications may be made to any existing or future models of the unit as it may deem necessary without incurring any obligation to incorporate such modifications in units previously sold or to which this guarantee may relate.

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**This product is designed and manufactured in Australia.**