INSTALLATION PROCEDURE

FOR THE INNOVEC DIR4

POWERED PROCESS INDICATOR

WITH FOUR SETPOINTS

DIR4 POWERED PROCESS INDICATOR CALIBRATION PROCEDURE

Thank you for purchasing an Innovec product. This instrument, the DIR4, measures a 4-20mA or 0-10VDC analogue input. It produces a 4.5 digit (19999 counts) display with a 25mm digit height. The span value (what the maximum input signal is equal to) and zero input (what 4mA is equal to) are set from a zero and span potentiometer in the rear of the instrument, decimal point, display brightness, alarm high/low selection, relay switch on point, relay switch off point for four (4) set point relays are set from the front touch buttons. These values are stored in non-volatile prom memory for a minimum period of 10 years.

Step 1 - Panel Installation

The instrument is supplied in an aluminium enclosure designed to be panel mounted. The enclosure is 72x144x85mm deep.

Step 2 - Electrical Connection

The instrument has been supplied with screw terminals to enable easier installation. **Before connecting power to the instrument always check the label** for the supply the instrument has been configured for.

For 240VAC operation connect **AC** power to:

(a)**Terminal 19 is 240VAC supply**
(b)Terminal 20 is neutral supply
(c)Terminal 18 is ground supply

For 120VAC operation connect **AC** power to:

(a)**Terminal 19 is 120VAC supply**
(b)Terminal 20 is neutral supply
(c)Terminal 18 is ground supply

For 18-36VDC operation connect **DC** power to:

(a)**Terminal 19 is 24VDC supply**
(b)Terminal 20 is 0VDC supply
(c)Terminal 18 is ground supply

Step 3 - Input Signal Connection

The instrument accepts inputs of a 4-20mA or 0-10VDC.

- If you are using 4-20mA input, then connect the positive of your input to terminal two (2) (positive input), and the negative to terminal one (1) (input common).
- If you are using a 0-10VDC voltage input, then connect your positive to terminal three (3) (positive input), and your VDC common to terminal one (1) (input common).

Step 4 - Using the 24VDC Loop Supply

The 24VDC loop supply is available on terminal four (4) but is limited to a current capacity of approximately 30mA. If you are going to use the 24VDC loop power supply to supply a 2 wire transmitter then connect the positive of the 2 wire transmitter to terminal four (4) and the negative of the transmitter to terminal two (2). Terminal one (1) is not used in that case.

Step 5 - Relay Outputs

The instrument incorporates four Set point relays with changeover contacts which are configured for failsafe operation. This means the relay coils are energised during

normal operation and de-energise in alarm condition and power failure. The connections are:

Terminal 6	=	AL4 normally closed contact
Terminal 7	=	AL4 normally open contact
Terminal 8	=	AL4 common contact
Terminal 9	=	AL3 normally closed contact
Terminal 10	=	AL3 normally open contact
Terminal 11	=	AL3 common contact
Terminal 12	=	AL2 normally closed contact
Terminal 13	=	AL2 normally open contact
Terminal 14	=	AL2 common contact
Terminal 15	=	AL1 normally closed contact
Terminal 16	=	AL1 normally open contact
Terminal 17	=	AL1 common contact

Step 6 – Input Signal Display Calibration

The display calibration is factory set for a 4-20mA input = 0-100.00 If no change is required to the display calibration it is not necessary to continue with this procedure but instead go to step 7.

Step 6-A

To set the instrument for a new range it is necessary to remove it from its case. If the instrument is pre-calibrated and wish to fine tune go to Step 6-B. This is accomplished by unscrewing the four (4) self- tappers in the rear of the case and pulling gently. This will cause the rear wall of the case with the screw terminal strip and motherboard to page 3 to come out, giving access to the range selection dip switch.

The display is configured by selecting the required display range on dip switch **SW1.** The dip switch should be set for the range where the maximum input signal (20mA in a 4-20mA input instrument) equals maximum number of units on the display.

Switch 1 open, switches 2, 3 and 4 closed display range = 32 to 100
Switch 2 open, switches 1, 3 and 4 closed display range = 100 to 300
Switch 3 open, switches 1, 2 and 4 closed display range = 300 to 500
Switch 4 open, switches 1, 2 and 3 closed display range = 500 to 1000
Switches 1, 2, 3 and 4 open display range = 700 to 1999

Step 6-B

(a) Insert minimum input signal (for the range selected) and adjust zero potentiometer for the minimum display value.
(b) Insert maximum input signal (for the range selected) and adjust span potentiometer for the maximum display value.
(c) Repeat (a), and (b), until the unit displays the correct value.

Step 7 – Display Brightness and relay set point Calibration

All functions of the instrument are programmable from the four touch buttons mounted on the front of the instrument.

▲	▼	mode	prog/run

To enter the programming mode press:

Prog/run

The display shows:

Setup

For access to the programming mode. It is necessary to push in sequence:
UP BUTTON then DOWN BUTTON then UP BUTTON again.

▲	▼	▲

You are now in the programming mode. The instrument displays:

DP

This is the **decimal point selection**. Only the up button is used and you choose **no** decimal points or **position one 0.0001**, **position two 00.001**, **position three 000.01 or position four 0000.1**. Pushing the up button will cause the DP position to increment. If no changes are required or when you have selected the required decimal point position press:

Mode

To show:

disp1

Which is the **display brightness** and a number. The intensity of the LED digits can be adjusted. The number goes: 0,1,2,3,4,5,6,7,8,9. Pushing the up button will cause the number to increment or pushing the down button will cause the number to decrement. When the up or down button is being pushed, the number increments or decrements and the display brightness increases or decreases accordingly. If no changes are required or when you have selected the required display brightness press,

Mode

To show:

In lo

Then after approximately 3 seconds:

00

This is the value that equals 4 mA and cannot be changed. **PLEASE NOTE: In this unit the display calibration is done by rear mounted ZERO and SPAN potentiometers.** Press:

Mode

To show:

In hi

This is for the digital calibration. The display in 'hi' stays on the display for approximately 3 seconds before being replaced by the number previously programmed into the unit that is the digital calibration maximum figure (value equal to 20mA). **PLEASE NOTE: In this unit the display calibration is done by rear mounted ZERO and SPAN potentiometers.**
~~In the programming mode the selected digit flashes at approximately 1Hz. This flashing of the selected digit is to alert the operator which digit has been selected. Pressing the up button causes digit 1 to increment from 0 to 9. When you have achieved the required number on digit 1, please push the down button. Pushing the down button causes digit 1 to stop flashing and digit 2 to start flashing~~
If no changes are required or when you have selected the required figure press:

Mode

To show:

R1hi

This is the high or low alarm operation selection which determines the direction the hysteresis will operate for set point relay 1. Pressing the up arrow will cause the display to change from r1H1 to r1LO. If a high alarm is required leave r1H1 on the display and press:

Mode

To show:

R1on

This is for set point relay 1 turn on point. The display r1on stays on the display for approximately 3 seconds before being replaced by the number previously programmed into the unit that is the set point relay one turn on figure.

In the programming mode the selected digit flashes at approximately 1Hz. This flashing of the selected digit is to alert the operator which digit has been selected. Pressing the up button causes digit 1 to increment from 0 to 9. When you have achieved the required number on digit 1, please push the down button. Pushing the down button causes digit 1 to stop flashing and digit 2 to start flashing

If no changes are required or when you have selected the required figure press:

If no changes are required or when you have selected the required figure press:

Mode

To show:

R1oFF

This is for set point relay 1 turn off point. The display r1oFF stays on the display for approximately 3 seconds before being replaced by the number previously programmed into the unit that is the set point relay one turn off figure.

In the programming mode the selected digit flashes at approximately 1Hz. This flashing of the selected digit is to alert the operator which digit has been selected. Pressing the up button causes digit 1 to increment from 0 to 9. When you have achieved the required number on digit 1, please push the down button. Pushing the down button causes digit 1 to stop flashing and digit 2 to start flashing
If no changes are required or when you have selected the required figure press:

Mode

To move to the next variable:

r2HI

This is the high or low alarm operation selection which determines the direction the hysteresis will operate for set point relay 2. Pressing the up arrow will cause the display to change from r2H1 to r2LO. If a high alarm is required leave r2H1 on the display and press:

Mode

To show:

r2on

This is for set point relay 2 turn on point. The display r2on stays on the display for approximately 3 seconds before being replaced by the number previously programmed into the unit that is the set point relay two turn on figure.

In the programming mode the selected digit flashes at approximately 1Hz. This flashing of the selected digit is to alert the operator which digit has been selected. Pressing the up button causes digit 1 to increment from 0 to 9. When you have achieved the required number on digit 1, please push the down button. Pushing the down button causes digit 1 to stop flashing and digit 2 to start flashing
If no changes are required or when you have selected the required figure press:

Mode

To show:

r2oFF

This is for set point 2 relay turn off point. The display r2oFF stays on the display for approximately 3 seconds before being replaced by the number previously programmed into the unit that is the set point relay two turn off figure.

In the programming mode the selected digit flashes at approximately 1Hz. This flashing of the selected digit is to alert the operator which digit has been selected. Pressing the up button causes digit 1 to increment from 0 to 9. When you have achieved the required number on digit 1, please push the down button. Pushing the down button causes digit 1 to stop flashing and digit 2 to start flashing
If no changes are required or when you have selected the required figure press:

Mode

To move to the next variable:

r3HI

This is the high or low alarm operation selection which determines the direction the hysteresis will operate for set point relay 3. Pressing the up arrow will cause the display to change from r3H1 to r3LO. If a high alarm is required leave r3H1 on the display and press:

Mode

To show:

r3on

This is for set point relay 3 turn on point. The display r3on stays on the display for approximately 3 seconds before being replaced by the number previously programmed into the unit that is the set point relay 3 turn on figure.

In the programming mode the selected digit flashes at approximately 1Hz. This flashing of the selected digit is to alert the operator which digit has been selected. Pressing the up button causes digit 1 to increment from 0 to 9. When you have achieved the required number on digit 1, please push the down button. Pushing the down button causes digit 1 to stop flashing and digit 2 to start flashing
If no changes are required or when you have selected the required figure press:

Mode

To show:

r3oFF

This is for set point 3 relay turn off point. The display r3oFF stays on the display for approximately 3 seconds before being replaced by the number previously programmed into the unit that is the set point relay 3 turn off figure.
In the programming mode the selected digit flashes at approximately 1Hz. This flashing of the selected digit is to alert the operator which digit has been selected. Pressing the up button causes digit 1 to increment from 0 to 9. When you have achieved the required number on digit 1, please push the down button. Pushing the down button causes digit 1 to stop flashing and digit 2 to start flashing
If no changes are required or when you have selected the required figure press:

Mode

To move to the next variable:

r4HI

This is the high or low alarm operation selection which determines the direction the hysteresis will operate for set point relay 4. Pressing the up arrow will cause the display to change from r4H1 to r4LO. If a high alarm is required leave r4H1 on the display and press:

Mode

To show:

r4on

This is for set point relay 4 turn on point. The display r4on stays on the display for approximately 3 seconds before being replaced by the number previously programmed into the unit that is the set point relay 4 turn on figure.

In the programming mode the selected digit flashes at approximately 1Hz. This flashing of the selected digit is to alert the operator which digit has been selected. Pressing the up button causes digit 1 to increment from 0 to 9. When you have achieved the required number on digit 1, please push the down button. Pushing the down button causes digit 1 to stop flashing and digit 2 to start flashing
If no changes are required or when you have selected the required figure press:

Mode

To show:

r4oFF

This is for set point 4 relay turn off point. The display r4oFF stays on the display for approximately 3 seconds before being replaced by the number previously programmed into the unit that is the set point relay two turn off figure.

In the programming mode the selected digit flashes at approximately 1Hz. This flashing of the selected digit is to alert the operator which digit has been selected. Pressing the up button causes digit 1 to increment from 0 to 9. When you have achieved the required number on digit 1, please push the down button. Pushing the down button causes digit 1 to stop flashing and digit 2 to start flashing
If no changes are required or when you have selected the required figure press:

Mode

And the display shows:

DP

The instrument has returned to the first variable.
If you have finished configuring the instrument then press:

Prog/Run

The instrument returns to run mode and all variables are written to nonvolatile memory.
[It should be noted that if none of the buttons are pressed in a twelve (12) second period the instrument will revert back to run mode without saving any variables to the nonvolatile memory.] If a mistake has been made you can cycle through the variables using the button marked:

Mode

If no buttons have been pressed for 12 seconds the instrument will automatically revert back to run mode.

VAC active supply
Rear Terminal Connection details
Please note: The DIR4 normally operates in failsafe mode. The relays are normally energised and de-energise (lose power to their coils) in alarm condition. This also means should loss of power occur to the entire instrument relays would go into alarm condition. Where a relay contact is shown as **normally closed** in the above diagram and table it is meant as an energised relay.

Terminal 1	Input common
Terminal 2	mA input positive +
Terminal 3	Volts input +
Terminal 4	24VDC loop supply
Terminal 5	Not used
Terminal 6	AL4 normally closed contact
Terminal 7	AL4 normally open contact
Terminal 8	AL4 common contact
Terminal 9	AL3 normally closed contact
Terminal 10	AL3 normally open contact
Terminal 11	AL3 common contact
Terminal 12	AL2 normally closed contact
Terminal 13	AL2 normally open contact
Terminal 14	AL2 common contact
Terminal 15	AL1 normally closed contact
Terminal 16	AL1 normally open contact
Terminal 17	AL1 common contact
Terminal 18	Ground supply
Terminal 19	VAC active supply
Terminal 20	VAC Neutral supply

Rear Terminal Connection details

Span Potentiometer● ● Zero Potentiometer

Rear View