RAISE~LOWER (SET-POINT) & RAMP GENERATOR

Type 112-65s

User Guide

Doc Ref UD 112-65s Rev3

Continuous development may necessitate changes in these details without notice

Serial No.

(*see inside rear cover for factory set configuration data)*

PROCESS MEASUREMENT, CONTROL & DISPLAY INSTRUMENTATION

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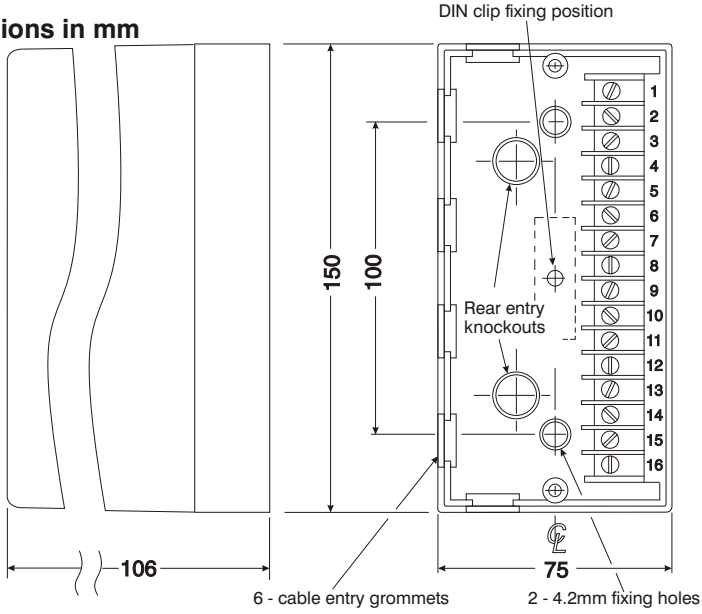
Contents

IMPORTANT - Installation, wiring, commissioning or re-ranging of this instrument should be restricted to authorised skilled personnel. SWITCH OFF ALL POWER SUPPLIES AND ISOLATE SIGNAL WIRING FROM DANGEROUS VOLTAGES BEFORE COMMENCING WORK ON THE INSTRUMENT

Installation

112 Series Modules are designed to be fitted to any flat dry surface using two 4mm screws. Alternatively, by fitting an optional DIN clip, they may be clipped to a rail conforming to BS5584:1978,
EN50 022, DIN46277-3.
Grommets are provided on three sides of the base section and there are two rear entry knock outs in the bottom.

Dimensions in mm



Wiring

Grommets are provided on three sides of the base section and there are two rear entry knock outs in the bottom. Good instrumentation practice should be observed when wiring to the unit to ensure segregation of mains supply and signal wiring. Screened cables should be used for signal / sensor wiring with the screen earthed at one end only.

Power supply considerations

This instrument operates from an AC supply in the range 85-260VAC 3VA Power supply wiring to the instrument should be protected by a suitable fuse and double-pole isolating switch.

Access to Terminals

Isolate all supplies to the unit. Loosen the two module securing screws. *(NB these screws are retained in the top section by captive washers).* Gently pull away the top section of the module from its base to expose the fixing points and wiring terminals. To refit the module, align the module edge connectors with the socket in the base and carefully press home. NB do not over tighten the module securing screws.

Terminal connections

Inputs

Voltage / current

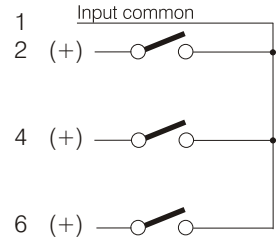
1 (+) Raise/Start
2 (–)

3 (+) Reset
4 (–)

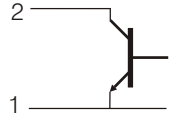
5 (+) Lower/Stop
6 (–)

7 *reserved*
8 *reserved*
9 *reserved*
10 *reserved*

Volt-free contacts / open collector*



* for open collector inputs (npn transistor), connections as for volt-free contact - emitter to common, e.g.



Outputs

Voltage or Current Sink
11 Output (–)
12 Output (+)

Current
12 Output (–)
13 Output (+)

Supply

14 Earth
15 Neutral
16 Line (85-265 Vac)

DC Supply Option

Earth
Negative (–)
Positive (+)

NB *Inputs and outputs are configured during manufacture and are not intended to be changed by the user.*

Operation

Introduction

The 112-65s is supplied configured to operate in either Raise Lower or Ramp Generator mode. The operation of the instrument within each of these modes depends on how the various options are configured. The output signal rise and fall times are user adjustable using internal switches - see 'Switch settings'. With optional PC set-up software, the mode of operation and all available options may be adjusted by the user.

NB Input and Output signal types are configured during manufacture and are not user selectable. Information on the types set may be found on the data label on the side of the enclosure and the connection label on the underside of the plug-in module.

Ramp generator mode

The ramp is controlled by the Start, Stop and Reset inputs. Input signals must be active for a minimum of 100 milliseconds. The Stop signal halts the ramp and holds the output at the current value.

Raise~Lower mode

The output is controlled by the Raise, Lower and Reset input signals. The output will rise whilst the Raise input is active and fall whilst the Lower input is active. With no active Raise or Lower signal the output is held at the current value.

Switch settings

SWITCH OFF ALL POWER SUPPLIES AND ISOLATE SIGNAL WIRING FROM DANGEROUS VOLTAGES BEFORE PROCEEDING.

The period of the output signal and test modes are selected by two internal switches located on the printed circuit board - for location see Fig 1. The unit may also be set to factory defaults using the test mode setting - see page 11 for default settings). The switches may be accessed as follows:

Opening the module

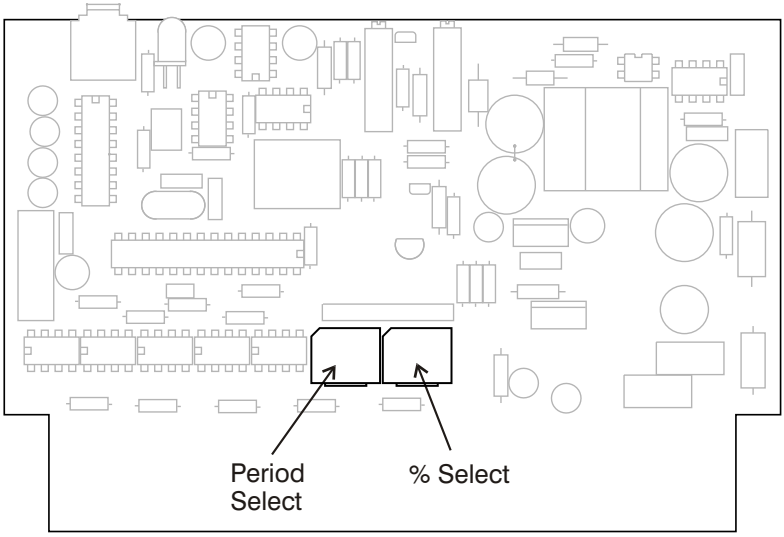
(i) Isolate all supplies to the unit.
(ii) Unscrew two module retaining screws and separate the plug-in module from the base section.
(iii) With the fingers, ease apart the longer sides of the cover releasing the interlocking tongue and groove fastenings to remove the plastic plate with the connections label.
(iv) Slide out the printed circuit board (PCB) noting the location and orientation of the PCB.

Setting output signal period

Refer to Figs. 1 & 2 and set the switches as follows:

(i) Select the lowest position on the 'Period' (coarse setting) switch which will accommodate the desired time.
(ii) Set the '%' (fine setting) switch to the position which will give the nearest time to the desired value.
(iii) Reassemble unit (see Re-assembly) and switch on.

Fig 1 Location of switches



Test modes

To set the instrument into test mode:

(i) Set the Period switch to position '0'.

(ii) Set the % switch to the function required.

(iii) Reassemble unit (see Re-assembly) and switch on.

Note:

Position 'F' is intended for factory use only. If this function is used, the unit will be configured as a Raise~Lower unit and set to default settings for this mode of operation. The Set-up Tool software will be required to change this.

Re-assembly

(i) Slide the printed circuit board into the correct slot in the cover (i.e. ensuring the LED indicator aligns with its window in the front panel).

(ii) Replace the plastic plate by first engaging the side with the two tongues into their slots in the case then press the plate home to engage the single tongue.

(iii) Align the module edge connectors with the socket in the base section and press home.

(iv) Replace module securing screws but do not over tighten.

Fig 2 Switch settings

Period Switch		
Position	Action	
0	Test Mode	
1	15	Seconds
2	30	
3	60	
4	2	Minutes
5	4	
6	8	
7	16	
8	32	
9	64	
A	128	
B	256	
C	512	
D	1024	
E	2048	
F	4096	

% Switch (Test)	
Position	Output
0	Zero
1	25% FSD
2	50% FSD
3	75% FSD
4	100% FSD
5	102.3% FSD
6	Sawtooth 1.5 sec. period
7 - E	Remains on zero
F	Intended for factory use only When powered up in this mode, resets to default settings in Raise~Lower mode

% Switch (Normal)	
Position	% of Period Switch
0	Sets approx. 2 sec.
1	10
2	20
3	30
4	40
5	50
6	60
7	70
8	80
9	90
A -F	100

Configuration with the Set-up Tool

The optional PC set-up tool software enables the mode of operation and all available options to be adjusted.
The software is Windows™ 98/NT/ME/2000/XP compatible.
Communication is via a special serial link cable which requires a free serial COM port.

Hardware installation

Power down the computer. Plug in the serial cable into an empty serial port and plug the free end into the jack socket on the front panel of the 112-65s unit. Power up the computer. Power up the unit.

Software installation

On the SIL CD within the 'Configuration Software' folder, locate and *run* '\112-65s\112-65s_soft\rlinstall.exe'
This software is also available on the SIL website at www.sil.co.uk/software.htm

Set-up tool overview

Figures 3 to 7 illustrate the general procedure for using the Set-up Tool. The numbered items within 'balloons' in each of the figures are cross-referenced with the following general procedure. The options available will depend on which mode of operation (Raise~Lower or Ramp Generator) is selected. Information on the various configuration options available is set out under the following sections 'Ramp Generator Set-up' and Raise Lower Set-up'.

General procedure:

1. Select the appropriate serial port from the drop down list.
2. Click 'Identify Unit'.
3. The current configuration is retrieved and displayed on screen.
4. Click the 'Configuration' tab.
5. Select the required mode of operation i.e. Raise Lower Unit or Ramp Generator from the drop down list.
6. Click 'Inputs' tab.
7. Configure the options as required.
8. Click 'Outputs' tab.
9. Configure the options as required.
10. Click 'Program Unit' tab and click 'Write chosen configuration'.

Notes:

(i) The 'Program Unit' screen also provides an option to 'Reset to default configuration'. If this button is clicked, the available options for the mode of operation currently selected will be set to default values (see Appendix 1).

(ii) Whilst in communication with the Set-up Tool, the front panel indicator will be turned off. In normal operation, the front panel indicator will flash, speeding up to a rapid rate when any input is active.

The following two sections provide information on options which may be configured with the Set-up Tool.

Fig 3 Initial screen

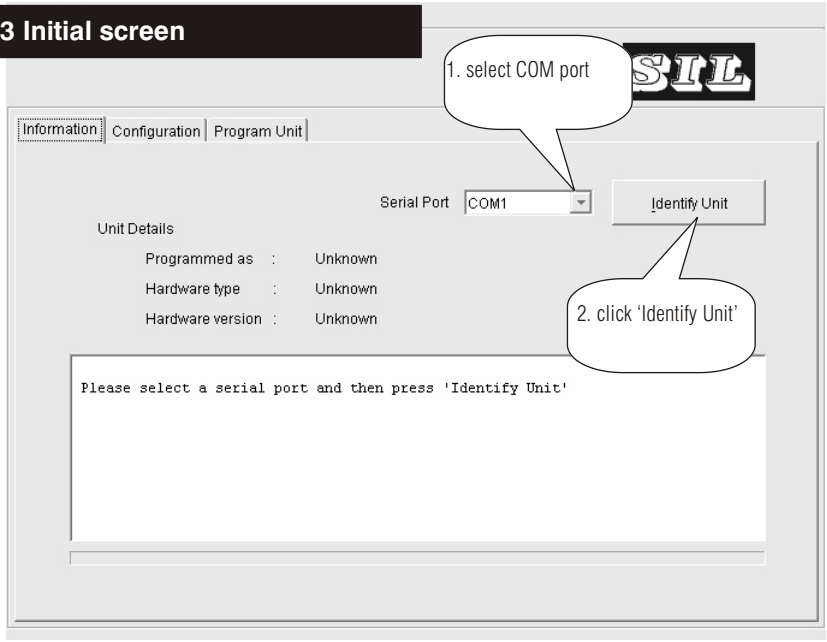


Fig 4 Configuration read from unit

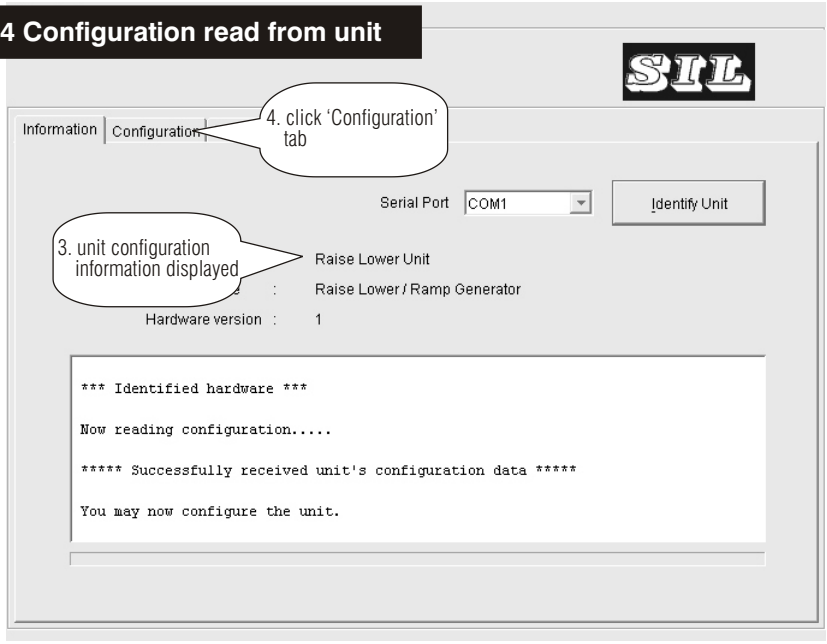


Fig 5 Configuration screen (Inputs)

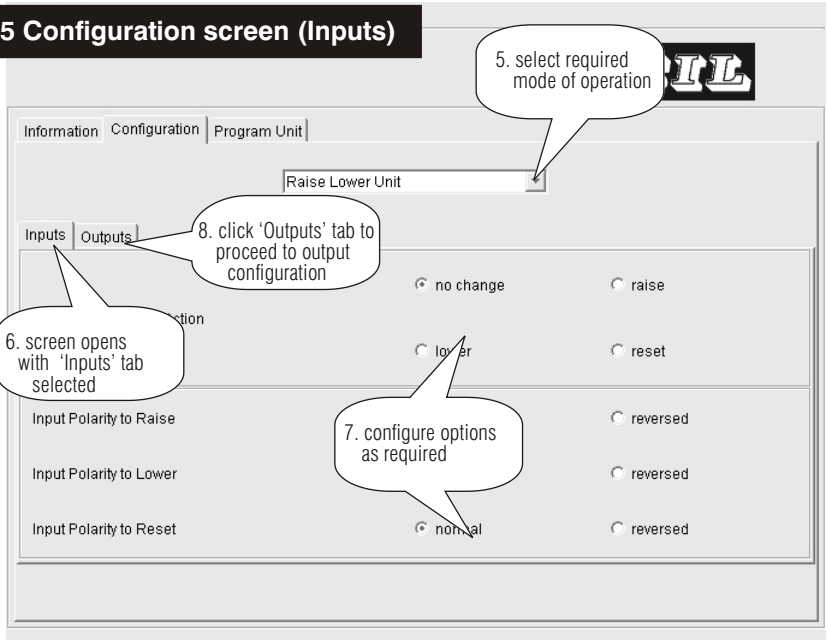


Fig 6 'Outputs' screen

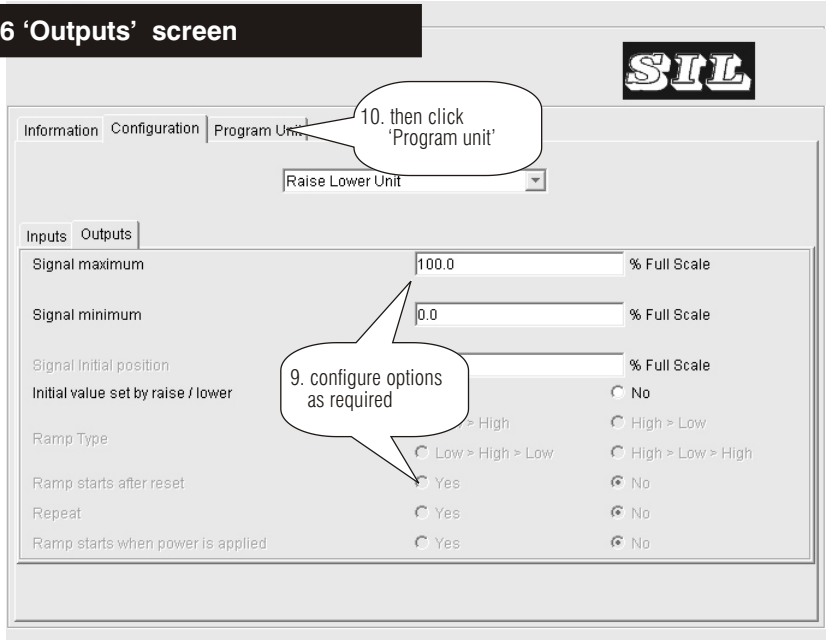
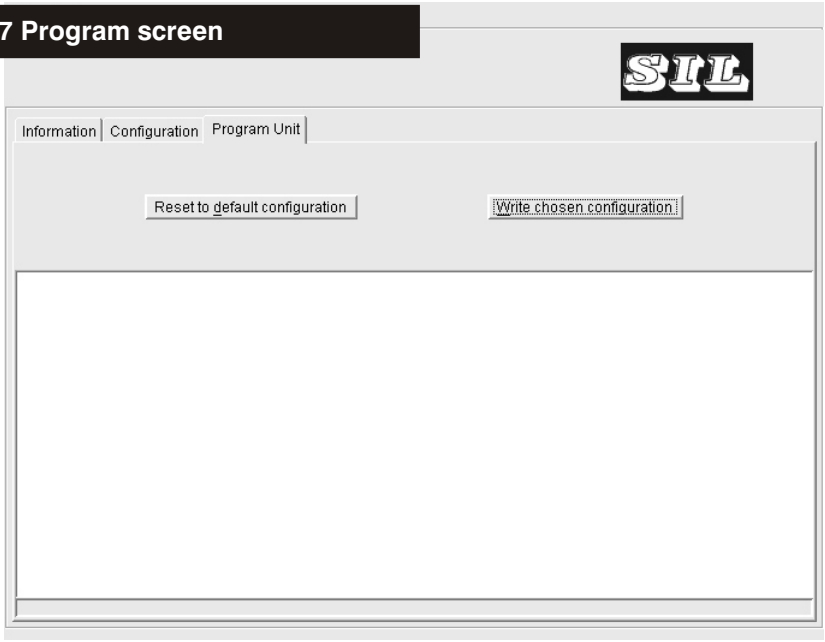


Fig 7 Program screen



RAMP GENERATOR SET-UP

Input screen options . . . . . .

Response to simultaneous Start and Stop input signals - options are:

- ☐ No change
- ☐ Start the ramp from the last value output
- ☐ Stop the ramp and hold at the current value
- ☐ Reset the ramp - subsequent action depends on the 'Ramp starts after reset' output option setting.

Input polarity for Start, Stop and Reset inputs

The active state of each input may be individually set for either -

☐ Normal or ☐ Reversed signals.

'Normal' signal polarity refers to a voltage in the range >5V <50V for a voltage signal input, contact closed for a volt-free contact input, transistor 'ON' for npn open collector input and a current of between10mA and 20mA for a current input.

Output screen options . . . . . .

Output signal maximum and Output Signal minimum

The output from the ramp generator may be set to range between user-adjustable -

☐ Output signal maximum and

☐ Output signal minimum values.

These values may each be set to between 0 - 102.3% of the nominal output signal. For an output signal type of 0-10 V, the output signal may, for example, be set to range from 2 to 10.23 volts or 1 to 9 volts. The software prevents entry of erroneous

data e.g. maximum values less than minimum values, etc.

Ramp type

The form of the output signal is set with a combination of this and the Repeat setting. Ramp type options are:

☐ Low to High 

☐ High to Low 

☐ Low to High to Low 

☐ High to Low to High 

Repeat

Options are:
☐ 'Yes' - the ramp continually repeats or
☐ 'No' - the output ramps for a single period.
This function, when used with the Ramp type function will enable generation of sawtooth or triangular waveforms.

Ramp starts after reset

Options are:
☐ 'Yes' - the ramp is started from the output signal minimum value or
☐ 'No' - the output remains set at the output minimum value until a Start signal is received.

Ramp starts when power is applied

Options are:
☐ 'Yes' - the ramp is started when power to the unit is switched on *or*
☐ 'No' - the output remains set at the output minimum value until a Start signal is received

RAISE ~ LOWER SET-UP

Input screen options . . . . . .

Response to simultaneous Raise and Lower input signals - options are:

☐ No change

☐ Raise the output signal

☐ Lower the output signal

☐ Reset the output - the output value depends on options set under the 'Output signal initial position' settings

Input polarity for Raise, Lower and Reset inputs

The active state of each input may be individually set for either -
☐ Normal or ☐ Reversed signals.
'Normal' signal polarity refers to a voltage in the range >5V <50V for a voltage signal input, contact closed for a volt-free contact input, transistor 'ON' for npn open collector input and a current of between 10mA and 20mA for a current input.

Output screen options . . . . . .

Output signal maximum and Output signal minimum

The output from the ramp generator may be set to range between user-adjustable -
☐ Output signal maximum and
☐ Output signal minimum values.
These values may each be set to between 0 - 102.3% of the nominal output signal. For an output signal type of 0-10 V, the output signal may, for example, be set to range from 2 to 10.23 volts or 1 to 9 volts. The software prevents entry of erroneous settings e.g. maximum values less than minimum values, etc.

Output signal initial position
(i.e. the output signal value present after power up or after reset)- options are**:**
☐ % Full Scale - this value may be set to any value within the ranges specified by the Output Maximum and Output Minimum values.
☐ Initial value set by last output - this option provides a set-point function which returns the output to the previous value before power down. NB This is a special function for use *only* when manually activated inputs are used (e.g. raise / lower push-buttons).

Appendix 1 - Default Settings

The Program Unit screen (Fig 7) provides an option to 'Reset to default configuration'. If this button is clicked, the available options for the mode of operation currently selected will be set to the following values.

Raise Lower mode

Action taken with simultaneous inputs - no change	No change
Raise / Lower / Reset input polarity	all set to Normal
Output maximum	100% FS
Output minimum	0% FS
Output initial value	0% FS

Ramp Generator mode

Action taken with simultaneous inputs - no change	No change
Raise / Lower / Reset input polarity	all set to Normal
Output maximum	100% FS
Output minimum	0% FS
Ramp start after reset	No
Ramp start when power applied	No
Repeating ramp	No
Ramp type	Low to High

Appendix 2 - Specification

INPUT SIGNAL OPTIONS

Minimum pulse width 100 ms

a) Contact closure *(must sink 10mA approx.)*

b) Open collector transistor (npn - *must sink 10mA approx.*)

c) Voltages in the range >5V <50V *(external circuit must source 10mA approx.)*

d) Current signals >10 <20mA

OUTPUT SIGNAL OPTIONS

(Others can be provided)

0-10 mA into 2000 ohms maximum
0-20 mA into 1000 ohms maximum
4-20 mA into 1000 ohms maximum
Current sink 4-20mA @ 30 volts maximum
0-5 Volts into 500 ohms minimum
1-5 Volts into 500 ohms minimum
0-10 Volts into 500 ohms minimum

OUTPUT PERIOD

Coarse switch settings - times to full scale: 15, 30, 60 seconds;
2, 4, 8, 16, 32, 64, 128, 256, 512, 1024, 2048, 4096 minutes
Fine settings (% of coarse setting):
0 - 100% in 10% steps

OUTPUT SIGNAL RANGE

Output signal maximum and minimum values may be set within the range 0-102.3% of full scale

ISOLATION

Maximum Voltage 250V RMS or 400V DC
For active inputs: each of the inputs and the output are isolated from each other and from the power supply.
For passive inputs: the input stage and the output are isolated from each other and from the power supply. However, inputs are connected to each other via the shared internal isolated 24 V transducer supply.

TEMPERATURE RANGE

Operating: -10°C to +60°C;
Storage: -20°C to +70°C

POWER SUPPLY

Universal ac supply accepts 85 Vac to 265 Vac, 50/60Hz
Protected by a fusible resistor.
DC Supply Option:
24 VDC (18-36VDC) 3.5 W
Protected by a 250mA internal self-resetting fuse.

DIMENSIONS

160 (H) x 76 (W) x 106 (D)

WEIGHT

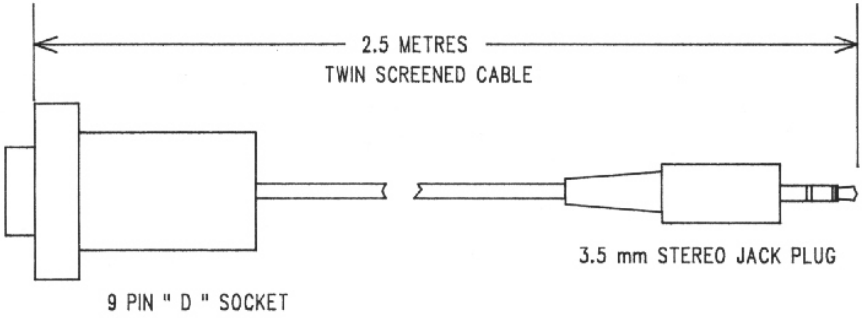
Approx. 0.4kg

SAFETY & EMC

Safety:	EN61010-1
Immunity:	EN50082-1
Emissions:	EN50081-1

CE certified

Appendix 3 - Serial cable



CONNECTIONS :–

9 WAY SOCKET	3.5 mm PLUG
PIN 2	TIP
PIN 3	MIDDLE
PIN 5	BODY

PART No. 2334–1000

Appendix 4 - Factory-set calibration data

DATE	**SERIAL NO**		Notes
Mode	Raise ~ Lower ☐	Ramp Generator ☐	
Power supply	85-265VAC ☐	VDC ☐	
Input signal			
Output period			
Output signal			
Action taken with simultaneous inputs	No change ☐	Raise/Start ☐	
	Lower/Stop ☐	Reset ☐	
Raise/Start input polarity	Normal ☐	Reversed ☐	
Lower/Stop input polarity	Normal ☐	Reversed ☐	
Reset input polarity	Normal ☐	Reversed ☐	
Output maximum	% of full scale		
Output minimum	% of full scale		
Programming kit	Yes ☐	No ☐	
Output initial value	% of full scale		RAISE LOWER ONLY
	or last output value on power off ☐		
Ramp start after reset	Yes ☐	No ☐	RAMP GENERATOR ONLY
Ramp start when power applied	Yes ☐	No ☐	
Repeating ramp	Yes ☐	No ☐	
Ramp type	Low > High ☐	High > Low ☐	
	Low > High > Low ☐		
	High > Low > High ☐		