# 4081 & 4082 Process Controller Quick Start Manual PK531 (0037-75563) Page 1 of 6

The following symbols are use on the product labels:





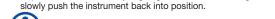
Installation should be only performed by technically competent personnel. It is the responsibility of the installing engineer to ensure that the configuration is safe. Local regulations regarding electrical installation & safety must be observed - e.g. US National Electrical Code (NEC) and/or Cana dian Electrical Code. Impairment of protection will occur if the product is used in a manner not specified by the manufacturer.

USB/Digital Input C Option Board

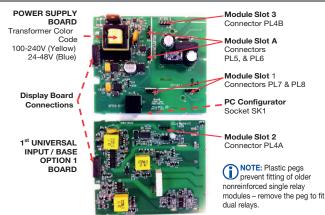
# Installing Plug-in Modules Board Mounting Struts (x8) & Front Removal Latch (x1) Plua-in Module A 2nd Universal Input & Base Option 2 Plua-in Module 3 1st Universal Input & Base Option 1 wer Supply Board Plug-in Module Plua-in Module 2

To access the plug-in modules, first remove the instrument from the housing.

- a. Pull front out to engage Front Latch. This prevents removal without a tool.
- b. Press latch with screwdriver through top vent hole. Remove front from case.
- c. Detach main boards by lifting first the upper, and lower mounting struts.
- d. Plug required modules into the correct connectors, as shown below.
- e. Locate the module tongues in corresponding slot(s) on the opposite board.
- Hold the Power and Input boards together while relocating on their mountings.
- g. Push the boards forward to ensure correct connection to the Display board.
- h. Replace the instrument by aligning the boards with the guides in the housing, and then





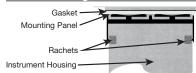


# Re-fitting the Main Boards

This product is designed to allow the user to reconfigure some hardware options in the field by changing the modules fitted in slots 1, 2, 3, & A. The main boards (display/CPU, power supply, inputs 1 & 2 and digital input/USB) are factory fitted, but may be removed while reconfiguring the plug-in modules. Take care when re-fitting these boards. Observe the power supply board transformer color, and case labelling to check the supply voltage, otherwise irreparable damage may occur.



CAUTION: In the event of a fault, replacement of defective main boards should only be carried out by trained personnel.



- 1. Insert instrument into the panel cut-out.
- 2. Hold front bezel perimeter only firmly and re-fit mounting clamp. Push the clamp forward, using a tool if necessary, until gasket compresses and instrument is held firmly in position.

NOTE: For an effective IP66 seal against dust and moisture, ensure gasket is well compressed against the panel, with the 4 tongues located in the same ratchet slot.

Main Board Connectors

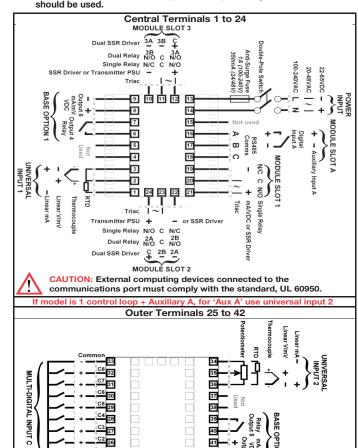


**CAUTION:** The instrument is double insulated. All external circuits connected must provide double insulation. Failure to comply with the installation instructions may impact the protection provided CAUTION: Check correct operating voltage on the side label before connecting power. A UL listed anti-surge fuse should be fitted to the power input. An IEC60947-1 & IEC60947-3 compliant isolation

switch should be fitted close to the unit, in easy reach of the opera-



tor, and appropriately marked. NOTE: The wiring diagrams show all possible option combinations. The connections required depend on the options & modules fitted. Use single strand (1.2mm / AWG18 max size) copper wire, except for thermocouple inputs, where the correct thermocouple or compensating cable and connectors



### 2. POWER UP SEQUENCE

Following the power-up self-test and logo screen, the instrument normally enters Operation Mode, from which the user can select the instrument's Main Menu (refer to the Screen Sequences on page 5). The exceptions to this are the first power-up after purchase where the Setup Wizard is shown, or if a plug-in module error is detected.

If an invalid or unknown module is detected in one of the plug-in module slots the message "Fault Found, Press O, for details" followed by "Replace faulty module in Module Slot n, Press O," (where n identifies the problem slot). The Service Contact information is displayed next showing details of who to contact if a fault persists.



**CAUTION:** Do not continue using the product until the issue causing the error is resolved.

### 3. OPERATION MODE

This mode is entered at power on, or can be accessed from the Main Menu. The initial screens shown in operation mode vary depending on the options fitted and the configuration. Subsequent screens display and may allow the selection or adjustment\* of Setpoints, setpoint ramps, enable/disable control, auto/manual operation, alarm status, profiler & recorder status and graphical trend views. Some screens will persist until the user navigates away, others will 'time-out' back to the main screen (refer to Operation Mode: in Screen Sequences).

Press  $\mho$  or  $\Diamond$  briefly to move forward/back through parameters. Where adjustment is possible\*, press ♥ or ♦ to alter the values. The next/previous screen follows the last parameter - or hold down to or d >1 sec to skip straight to next/previous screen accept\* If required, all Operation Mode parameters can be made read only (see Display Configuration on page 6) and others may be removed from this mode altogether.

NOTE: Configuration must be completed before starting normal operations.

### Single Control Loop: Normal Operation

LED Indicators Process Variable Value Actual Setpoint Value Control Deviation Graph scaled ±5% of input span

LED Function Labels 1400 1-Loop Operation

Engineering Units

# Single Control Loop: Profiler Status

LED Indicators Process Value & Setpoint Profile Name & Progress Segment No. Type & Progress or Delay Time 1-Loop Profile Status

LED Function Labels **Engineering Units** 

Profile Status Indicator: ► Run, || Held, ■ Stopped

If enabled in Display Configuration, the prior screen allows the user to Select, Run, Hold or Abort a profile. The next screen shows the profile event output status

### Two Control Loops: Normal Operation

LED Indicators Process Variable\* & Actual Setpoint Values\* Loop Descriptions\*

Engineering Units\* 2-Loop Operation

LED Function Labels Indicators for Alarm and Remote Setpoint active Control Deviation (±5% of

span) & Power Graphs\*

LED Function Labels

Process Variable Values

Engineering Units\*

& Setpoints\*

\* = in loop 1 & 2 screen area

### **Two Control Loops: Profiler Status** LED Indicators

Profile Status Indicators' ► Run, | Held, ■ Stopped Loop Descriptions\*

2-Loop Profile Status

Profile Name & Progress Segment No. Type & Progress or Delay Time

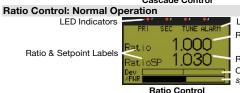
### \* = in loop 1 & 2 screen area **Cascade Control: Normal Operation** LED Indicators

Cascade Status Master Setpoint (Slave SP if Cascade Open

PVM 240.0 PUS 260.0 \* 240.0 ℃ Cascade Control

LED Function Labels Master Process Value Slave Process Value

Control Deviation (+5% of span) & Power Graphs



LED Function Labels Relative Process Value

Relative Setpoint Control Deviation (±5% of span) & Power Graphs



Trend View

Trend Upper Scale Value PV Value At Cursor Line Trend Lower Scale Value Sample Interval (or Time At Cursor Line)

The Trend Views graph PV; PV & SP; or Max/Min PV between samples, plus active alarms. Graph format and sample intervals are set in Display Configuration. Trend scale values adjust automatically to visible data (between 2 to 100% of input span). 120 of 240 historical data points visible. Pressing ♥ or ♠ moves the Cursor Line back through the last 240 data points.

NOTE: Data is not retained at power down or if the sample interval is changed.

Depending on the Control Configuration settings, automatic or manual control can be selected from the Auto/Manual selection screen, or via a digital input. Switching to or from manual mode is via Bumpless Transfer.

In Manual mode the Setpoint display is replaced by a -100 to 100% power output level, labelled "Man".

Press ♥ or ♦ to set the required manual power.

When using VMD control, Manual mode replaces the Setpoint display with the valve movement status (Opening, Closing or Stopped), and is labelled "Man".

The  $\triangle$  key opens the valve and the  $\nabla$  key closes the valve.

If Manual control is selected when in Cascade mode, the slave loops % power value is shown. This is the power output fed directly to the control actuator (e.g. heaters).



NOTE: Selecting Manual Control will cause a running profile to hold until control is returned to automatic mode.



**CAUTION:** Manual mode overrides the automatic control loop. It also ignores any output power limits, valve open/close limits and the control enable/disable setting. The operator is responsible for maintaining the process within safe limits.

If the process or auxiliary inputs are >5% above or below the scale max/min, the displayed value is replaced with the word "HIGH" or "LOW".

If a signal break is detected, the value is replaced with "OPEN"; except in Ratio control where an open input 1 or 2 is shown as "x1-Open" or "x2-Open".

An un-calibrated input is replaced by "ERROR".

In OPEN or ERROR conditions, the Control Outputs go to the pre-set power value (see Control Configuration on page 6).



**CAUTION:** Correct the problem causing the error condition before continuing normal operation.

# **Customizing Operator Mode**

The user can choose to enable or disable some operator mode screens from the Display Configuration menu (see page 6). These are: cascade mode switching; auto/manual control selection; setpoint ramp-rate values; selecting the setpoint source; control enable/disable; clear latched outputs; manually triggering a recording; recorder status information and trend views – these are marked in the screen list on page 5 to indicate that they are optional. In addition, up to 50 configuration mode parameters can be copied into operation mode using the PC software. Any parameters selected in this way are shown at the end of the mal operator mode screen sequence.



NOTE: Configuration mode parameters copied into operation mode are not pass code protected.

It is recommended that you only enable operator mode screens if they are important for daily operation. Consider using Supervisor Mode (see section 21) for parameters that the operator may need less often or that you want to limit access to.

### 4. AUTOMATIC TUNING

To automatically optimize the PID tuning (PI tuning in VMD mode) for the process, you can use Pre-Tune, Self-Tune or Auto Pre-Tune independently for each loop. Pre-tune performs a single start-up disturbance test. It stops running when the test has completed. The user chooses which PID set the new tuning terms will be applied to, and this selection does not change the selected "active PID set". There are two modes: Standard Pre-Tune which tests the process response half-way from the activation point (the process value when pre-tune began running) to the current setpoint; or Pre-Tune at Value which allows the user to specify the exact process value at which the test will occur.



**CAUTION:** Consider possible process over-shoot when selecting the value to tune at. If there is a risk of damage to the product or equipment select a safe value.

If Auto Pre-Tune is selected, a Standard Pre-tune will attempt to run at every power up. If Self-Tune is selected it constantly monitors the process and adjusts the tuning when control errors occur. Auto pre-tune and self-tune apply the new tuning terms to the current Active PID set. Auto pre-tune and self-tune are not possible with cascade.



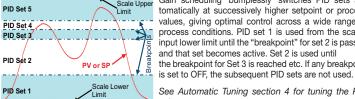
NOTE: To pre-tune a cascade, first select "Cascade-Open" to tune the PID set(s) on the slave. After the slave has successfully tuned, remember to pre-tune the master/slave combination (this time select "Cascade-Closed"). The cascade remains open until you do this.

See PID Sets & Gain Scheduling on this page and Automatic Tuning on page 5. Refer to the Full Product Manual (from your supplier) for more about tuning.

NOTE: Automatic tuning will not engage if either proportional band is set to On/ Off control. Also, pre-tune (including and auto pre-tune attempt) will not engage if the setpoint is ramping or the Process Variable is <5% of span from setpoint. Also refer to Profile Notes.

### **5. PID SETS & GAIN SCHEDULING**

Up to 5 sets of PID tuning terms (primary & secondary proportional bands or on-off differential, integral & derivative times, overlap/deadband) can be entered for each control loop, allowing the unit to be pre-set for differing conditions. For each loop one set can be selected as the "Active PID" set, or alternatively, if the process conditions change significantly during use (e.g. if it is partially exothermic as the temperature rises) Gain Scheduling can be employed.



Scale Upper Gain scheduling 'bumplessly' switches PID sets automatically at successively higher setpoint or process values, giving optimal control across a wide range of process conditions. PID set 1 is used from the scaled input lower limit until the "breakpoint" for set 2 is passed and that set becomes active. Set 2 is used until the breakpoint for Set 3 is reached etc. If any breakpoint

See Automatic Tuning section 4 for tuning the PID



NOTE: ON/OFF control is possible with the individual PID sets but cannot be used with gain scheduling. On/off control is replaced with the default proportional band if gain scheduling is turned on.

### 6. APPLICATION SETUP

# Setup Wizard

An easy **Setup Wizard** runs automatically at first ever power-up. Follow the wizard to setup parameters required for basic applications. The screens/parameters marked "w" in the Screen Sequences lists are included, see pages 5 & 6. The wizard can be run again at any time from the main menu. An option to reset all parameters to default (recommended) is offered when manually running the wizard

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# Pre-Commissioning Considerations

The next sections provide guidance for more complex applications where the wizard is not sufficient. It is important to understand how the instrument is to be used before commencing with the setup. Consideration must be given to the following questions:

If fitted, how will the 2nd input be used?

- One loop only (2nd input not used in this application)
- Two independent control loops.
- Valve feedback for loop 1
- A "redundant" backup for the 1st input (see section 10).
- Cascaded with the first control loop (see section 7).
- A reference input for ratio control (see section 8).

### How will the instrument control the process?

- Primary only or primary & secondary control outputs (see section 12).
- Direct valve motor drive outputs (see section 11).

The table below shows the main input and control configuration settings for these application types (see page 6 for the configuration menus).

Process Type* (only if 2nd input fitted)	Loop 1/Master Control Configuration: Control Select	Control Configuration: Control Type	Loop 2 / Slave Control Configuration: Control Select	Control Configuration: Control Type
One Loop* Input 2 Config. Input 2 Usage = Not Used	Standard PID Control Select = Control Std.  Valve Motor Drive Control Select = VMD (TPSC) Ctrl.	Primary Only Control Type = Single Primary/Secondary Control Type = Dual		
Two Loops* Input 2 Config. Input 2 Usage	Standard PID Control Select= Control Std.	Primary Only Control Type = Single Primary/Secondary Control Type = Dual	Standard PID Control Select = Control Standard	Primary Only Control Type = Single Primary/Secondary Control Type = Dual
	Valve Motor Drive Control Select = VMD (TPSC) Ctrl.		Valve Motor Drive Control Select = VMD (TPSC) Control	
+Feedback* Input 2 Config. Input 2 Usage = Feedback	Valve Motor Drive Ctrl. Select = VMD (TPSC) Control			
Redundant* Input 2 Config. Input 2 Usage = Redundant Input	Standard PID Control Select = Control Std.	Primary Only Control Type = Single Primary/Secondary Control Type = Dual		
	Valve Motor Drive Ctrl. Select = VMD (TPSC) Ctrl.			
Cascade* Input 2 Config. Input 2 Usage = Standard AND Loop 1 / Master Config.   Control Mode = Cascade			Standard PID Control Select = Control Standard  Valve Motor Drive Control Select = VMD (TPSC) Control	Primary Only Control Type = Single Primary/Secondary Control Type = Dual
Ratio* Input 2 Config. I Input 2 Usage = Standard AND Loop 1 / Master Config. I Control Mode = Ratio	Standard PID Control Select = Control Std. Valve Motor Drive Control Select = VMD (TPSC) Control			

Which outputs will be used for control, and are alarms or event outputs needed?

- Output configuration (see page 6).
- Alarms & Profile Events (see pages 5 & 6).

Where will the controller setpoint come from?

- Local setpoint(s) only, or a remote setpoint input (see page 6).
- Profile Control (see section 15).
- Is Input re-configuration required:
- Analog input calibration & scaling (see section 13).
- Digital input functions (see section 9).
- Which other features are to be used?
- Data Recorder (see section 17).
- Serial Communications (see section 19).
- USB Interface (see section 16).



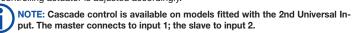
CAUTION: Configuration & commissioning must be completed before proceeding to Operation Mode. It is the responsibility of the installing engineer to ensure that the configuration is safe.

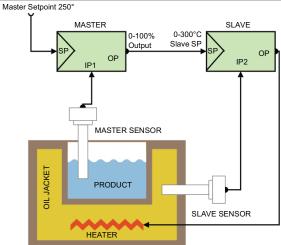
# 7. CASCADE CONTROL MODE

Applications with long time lags (e.g. with two or more capacities such as heated jackets) can be difficult to control with a single control loop. The solution is to split the process into two or more cascaded loops consisting of a Master and Slave(s) acting on a common actuator. Ideally, the slave loop's natural response time should be at least 5 times faster than the master

The master loop compares the process temperature with the desired setpoint and its correcting variable (0 to 100% PID output) becomes the slave loops effective setpoint

(scaled to suit the process). This setpoint is compared to the slave's process input, and the controlling actuator is adjusted accordingly.





In this example the controlling actuator is a heater, indirectly heating the product via an oil jacket. The maximum input to the slave represents 300°C, thus restricting the jacket temperature. At start-up the master compares the product temperature (ambient) to its setpoint (250°C) and gives 100%. This sets the maximum slave setpoint (300°C), which is compared to the oil temperature (ambient) and the slave requests max. heater output.

As the oil temperature rises towards the slave setpoint, its output falls. Eventually, the product temperature will also begin rising, at a rate dependant on the transfer lag between the oil jacket and the product. This causes the master's PID output to decrease, reducing the slave setpoint. The oil temperature is reduced towards the new slave setpoint. This continues until the system becomes balanced. The result is quicker, smoother control with the ability to cope with changes in the load. Overshoot is minimized and the jacket temperature is kept within acceptable limits.

### Cascade Operation

# **Normal Cascade Operation**

During operation, the master and slave are coupled together and. "Cascade" is displayed. The master process value and setpoint are most relevant to the user. This setpoint is directly adjustable, and the process value of the slave controller is displayed for information only

### Cascade-Open

The cascade can be disconnected via the keypad. This switches from normal operation to direct control of the slave. "Cascade-Open" is displayed. The process is then controlled and adjusted solely by the slave controller using its internal setpoint (displayed as SlaveSP). Switching back to Cascade is "Bumpless".



**CAUTION:** The master process value is not under control when the cascade is open, but will be affected by the slave process. The operator is responsible for maintaining safe conditions.

### Manual Mode

The controller can be put into manual mode (via digital inputs or menu selection), bypassing the cascade to take direct control of the slave loop's correcting variable. Manual power is adjusted from -100 to 100%. "MAN" is displayed in manual mode.



CAUTION: Manual mode disables the cascade loop. It also ignores any output power limits, valve open/close limits and the control enable/disable setting. The operator is responsible for maintaining the process within safe limits.

The user can tune manually or use the pre-tune feature (see Automatic Tuning).

In either case the slave control loop must first be optimized on its own, followed by the master loop in combination with the previously tuned slave.

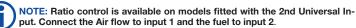
# To pre-tune a cascade:

- . Go to the Automatic Tuning menu
- 2. Select "Cascade-Open" to tune the PID set(s) on the slave.
- 3. After the slave has successfully tuned, pre-tune the master/slave combination (this time select "Cascade-Closed"). The cascade remains open until you do this.
- To manually tune a cascade: 1. Open the cascade, breaking the link from master to slave.
  - Set the slave controller setpoint manually to an appropriate value.
- 3. Tune the slave for relatively fast control ('proportional only' is often sufficient).
- 4. Close the cascade and tune the master/slave combination.

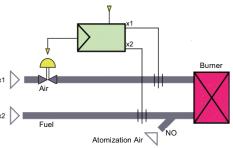
### 8. RATIO CONTROL MODE

A ratio control loop is used where the quantity of one of the material is to be controlled in proportion to the measured quantity of a second material. The controller mixes the materials at the desired ratio by adjusting the flow of input 1. The flow of input 2 may be controlled separately, but is not controlled by this loop.

The process value used by the controller is therefore determined by the ratio of the two inputs rather than being measured as one process variable.



Below is an example of standard ratio control using stoichiometric combustion. For optimum combustion the fuel-air ratio must be controlled. The ratio is selected so that there are no inflammable residues in the waste gas.



It is normal in this application to display the process value and setpoint as relative values rather than the physical ratio or absolute values. A scaling factor is set such that the displayed value will be 1.00 at the correct stoichiometric ratio for the application

Inputs 1 and 2 are configured and scaled to match the attached flow meters. In this example a 4 to 20 mA signal at x1 represents 0 to 1000m<sup>3</sup>/h of airflow controlled by a valve. The second 4 to 20 mA signal at x2 represents 0 to 100m<sup>3</sup>/h of fuel oil. The fuel flow is not affected by this control loop. Atomizing air is fed in with the fuel oil at a constant rate 'NO'. This must be considered when calculating the correct fuel/air mix. Total airflow is x1 + NO. The stoichiometric factor, SFac is entered to match the desired ratio, E.g for 10 parts total airflow to one part fuel. SFac would be 10.

The setpoint (entered as a relative value such as 1.00) is multiplied by SFac when calculating the control deviation. E.g. with a setpoint of 1.00 and SFac of 10 the controller attempts to make the physical ratio 10. With a setpoint of 1.03 it would attempt to make the ratio 10.3 for 3% excess air.

The instantaneous (controlled) process value is calculated from the physical ratio, divided by SFac. Like the setpoint, this is displayed as relative value. E.g. if SFac is 10, 59.5m<sup>3</sup>/h air is measured at x1, 0.5m³/h atomizing air is applied at NO and 6m³/h fuel is measured at x2, the instantaneous process value would be

$$\frac{x1 + NO}{x2 * SFac} = \frac{59.5 + 0.5}{6 * 10} = 1.00$$

### 9. DIGITAL INPUTS

Digital inputs are driven to one of two states (active or inactive) by an applied voltage signal or a contact opening/closing. They can be used for profile selection (see Digital Input Setup sub-menu on page 6), with any remaining inputs available for functions such as selecting setpoint sources, running a profile or driving an output on/off (the Digital Input Specifications on page 4 lists all possible functions).

A diagnostic screen assists commissioning

Slot A, C1 to C8 & Soft digital input status

Profile select bit format (BCD or Binary)

ick Inputs to Invert

Profile selected (e.g. BCD 6 from C1-C3)

by combining physical inputs, alarms &

events using Boolean logic. The input AND

selections are globally OR'd with input OR

selections, alarms & events. By using the

Digital Input Function

invert inputs function, NAND & NOR

Loop 2 Auto/Manual

Loop 1 SP Selection Loop 2 SP Selection

Loop 1 Pre-tune En/Dis

equivalents can be created

and fault finding by showing the current

signal state for all digital inputs.

(**☑** = Active, **Ø** = Unavailable)



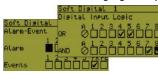
Digital inputs can be inverted to reverse Digital Input Setup their action with an "on" input turning off. Step thorough each input using the U key. Press û to invert **☑** the highlighted input and 

to un-invert 

Hold 

down to skip to next screen accepting the values shown

> Highlighted Input Four "soft" digital inputs can be configured



Soft inputs and any physical digital inputs not allocated for profile selection can be used to change the instrument status. Functions include: Setpoint or Auto/man select; control on/off; automatic tuning; clearing latched outputs; profile control; data recording; forcing outputs on/off or mimicking key presses.

If the 2nd universal input is fitted, it can be used with a backup sensor so that if the main sensor fails, the instrument automatically switches to the redundant sensor. In this condition, if input 1 has a signal break alarm configured it will activate, but any other process input or control status alarms seamlessly switch to the 2nd input. This input continues to be used until the signal to input 1 is restored. The user may not even be aware of the sensor fault, so signal break alarms should be configured for both inputs to provide notification.

The redundant sensor must be of the same type, and be correctly located in the application ready to take over if needed. If this option is selected, the 2nd input cannot be used for other functions



NOTE: If both signals are lost at the same time, the PV is replaced with "OPEN" and the normal sensor break actions occur.

### 11. VALVE MOTOR / 3-POINT STEPPING CONTROL

When directly controlling motorized modulating valves, set the Control Mode to VMD in configuration mode to enable the 3-point stepping Valve Motor Drive control algorithm. This provides switched outputs to move the valve further open, or further closed when a control deviation error is detected. If the error is reduced to zero no further output is required until the load conditions change.

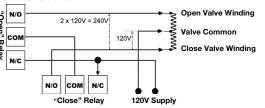


NOTE: Some modulating valves have positioning circuitry to adjust the valve position. These need a DC linear mA or voltage output and use the standard control algorithm (Set Control Mode to Standard).

VMD doesn't allow On-Off Control (Prob. Band minimum is 0.5% of input span) and usually requires PI control, where the Derivative parameter is turned OFF.

# Special Wiring Considerations for Valve Motor Control

Valve Motor Drive (VMD) mode requires two identical outputs to be assigned to position the valve. One to Open and one to Close the valve. These outputs can be two single relays, two triacs, two SSR drivers or one dual relay, but it is recommended to use two single relays (SPDT change-over contacts), and to interlock the wiring as shown. This prevents both motor windings from being driven at the same time. even under fault conditions.





CAUTION: The windings of a valve motor effectively form an autotransformer, This causes a voltage doubling effect when power is applied to either the Open or Close terminal, causing twice the supplied voltage at the other terminal.

Switching actuators directly connected to the valve motor must only be used up to half of their rated voltage. The internal relay and triac outputs are rated at 240 VAC Therefore, the maximum motor voltage when using them is therefore 120 V unless interposing relays are used. Interposing relays or other devices used to control the valve must themselves be rated for twice the motor supply voltage.

The VMD mode in this instrument uses a boundless, open-loop, algorithm. It does not require any kind of position feedback in order to correctly control the process and can therefore avoid problems associated with faulty feedback signals.

However, where feedback is available it can still be displayed as a percentage (0 to 100%) of the possible valve opening.

Valve Position Feedback is usually provided by means of a potentiometer mechanically linked to the valve. The output of a related flow meter can also be used to indicate the relative valve position. Flow meters typically have linear 0-20/4-20 mA or 0-5/0-10 V signals. To display the position/flow signal the 2nd input is must be configured for this purpose.

The input is adjusted and scaled to read 0 to 100% for valve fully closed to fully open or for the flow rate equating to fully closed and open.

### Valve Limiting

When Valve Position Indication is to be used the signal can be used by the instrument to limit the valve movement. Valve limits can be set beyond which the controller will not attempt to drive the valve.



**CAUTION:** These limits must be used with care. They are effectively control power limits. Do not set values that prevent proper control of the process!

# 12. CONTROL TYPE

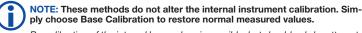
The control type defines if a control loop has single (unidirectional) or dual (bidirectional) control outputs. Single control has a primary output only. This can drive the process in one direction (e.g. heating only, cooling only, increasing humidity etc). Dual control has both primary and secondary outputs which can force the process to increase or decrease (e.g. heating & cooling, humidifying & dehumidifying etc). This selection isn't required for VMD control which provides direct 3-point stepping control for valves, and always has one output to increase and another to decrease the process value (see section 11).

# 13. INPUT CALIBRATION & SCALING

The process inputs can be adjusted to match the characteristics of the attached process or to remove sensor errors. For each loop, independent use of base (unadjusted), single point offset or two point calibration strategies are possible, as is the use of multi-point scaling for the displayed values.



**CAUTION:** Calibration & Scaling must be used with care. Careless use could lead to the displayed value bearing no meaningful relationship to the actual process variable. There is no front panel indication of when these parameters are in use.



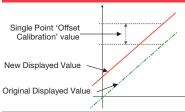
ply choose Base Calibration to restore normal measured values Re-calibration of the internal base values is possible, but should only be attempt-

ed by qualified personnel as it overwrites the factory calibration - refer to the Full Product Manual if this is required.

# ngle Point Calibration

This is a 'zero offset' applied to the process variable across the entire span. Positive values are added to the reading, negative values are subtracted. It can be used if the error is constant across the range, or the user is only interested in a single critical value. Simply enter a value equal, but opposite to the observed error.

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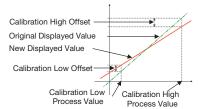
This example shows a positive offset

E.g. if the process displays 27.8 when it should read 30, an offset of +2.2 would correct the displayed value to 30.

The same offset is applied to all values, so at 100.0 the new value would be

# Two Point Calibration

This method is used where an error is not constant across the range. Separate offsets are applied at two points in the range to eliminate both zero and span errors. Measure the error at a low point in the process, and again at a high point. In the Input Calibration, enter the desired low point as the Calibration Low PV value, and an equal, but opposite value to the observed error as the Calibration Low Offset. Repeat this for the high point PV and calibration offset in the next screen



This example shows the effect of adding a positive Low Offset and a negative High Offset.

E.g. if the process displays +0.0 at the low end, an offset of +0.5 would change the value to +0.5 A high end value of 100 with a - 1.7 offset would read 98.3.

There is a linear relationship between the two calibration points.

NOTE: Choose values as near as possible to the bottom and top of your usable span to achieve maximum calibration accuracy. The effect of any error can grow past the chosen calibration points.

If an input is connected to a linear signal (mA, mV or VDC), multi-point scaling can be enabled for that input from the Input Configuration sub-menu, so that a non-linear signal

The scaled input upper & lower limits define the values shown when the input is at minimum and maximum values. Up to 15 breakpoints can scale the input vs. displayed value between these limits

Enter the 1st Scaling point (this is a % of the scaled input span), and the desired display value to be shown at that input value. Next set the 2nd point and display value, followed by the 3rd etc. Continue unit all breakpoints are used or you have reached 100% of the input span. A breakpoint set at 100% ends the sequence It is advisable to concentrate the break points in the area of the range with the most non-linearity, or an area of particular importance to the application.

# 14. SETPOINT SOURCES

The setpoint is the target value at which the instrument attempts to maintain the process variable. Each loop can have a Main "local" setpoint set from the keypad and Alternate setpoint. The alternate setpoint sources can be either another local Setpoint" or a remote setpoint (RSP), set by a mA or V DC signal fed to the auxiliary or 2nd process input. The controller can only use one setpoint source at a time for each loop. This is called the "Active Setpoint"

Main/alternate setpoint selection can be made via a digital input: from Control Configuration of the control control configuration of the control cont ration or if enabled in Display Configuration, an operator menu can be used to select

Refer to the control configuration screen on page 6 for setpoint settings.



NOTE: In profile control mode, the selected profile provides the active setpoint source for one or both control loops (see section 15). Once profile control mode is exited, the selected Main or Alternate setpoints become

# 15. PROFILER OPTIONS

The Profiler (or setpoint programmer) feature allows the user to store up to 255 profile segments (each with the possibility of 2 setpoints in two-loop control), shared between a maximum of 64 Profiles. Each profile controls the value of the setpoint(s) over time; increasing, decreasing or holding their values as required.

NOTE: If this feature is fitted, Profiler options are added to the Main Menu, and optionally to Operation Mode. See sections 3 & 20.

Controllers supplied without the Profiler option can be upgraded in the field by purchasing a licence code. To obtain the correct code you must tell your supplier the instrument serial number - this can be found in Service & Product Information.

To enter this code, hold down the △ + ♦ kevs during the power-up splash screen

Enter the 16-character licence code in the displayed screen, then press U.

To confirm if profiling is installed, refer to Service & Product Information.

# **General Profile Configuration**

General profile configuration settings apply to all profiles. They enable/disable profile editing while running, and automatic starting of profiles that were setup with delay or day & time start triggers. When disabled profiles can only be manually started, and this is with immediate effect even if they have a delay or day & time trigger defined

When enabled, delayed starts are possible, and if the selected profile has a day & time trigger it will wait and then start at the time set.

# Profile Header & Segment Information

Each profile has its own header information plus 1 or more segments. The header contains the profiles name; if it is to control one, two loops or cascade; how it should start & stop; abort/power-loss recovery actions and if it should repeat. Segments can be ramps, dwells, steps or special segments such as holds, ends, joins or loop backs.

NOTE: Header information is only stored as the Segment creation sequence begins. No profile is created if you exit before this point. Segment information is stored as each segment is created, but the profile remains invalid until an end or join segment is defined.



Following a Start Trigger, profiles can start immediately, or if enabled after a delay, or at a specified day & time (Recorder only).

NOTE: Profiles with segments outside of the current setpoint limits will not run. A "profile not valid" error shows.

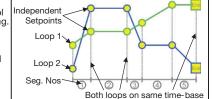
Segments have an end of segment Target Setpoint. If the 1st segment is a Ramp-Time, the slope needed to reach the target changes with the Starting Setpoint value. For a Ramp-Rate segment, the time will change instead. A Dwell (or "soak") holds the last segments value. Step segments jump straight to the target value.

Segments in two-loop controllers control the setpoints of both loops

NOTE: If the last segment is a Join, the join target profile will start, but if the join target has been deleted the profile sequence will abort. An End segment ends the profile or sequence of joined profiles.

### Two Loop Profiles

If required, the setpoint of both control loops can be maintained when profiling The example to the right shows how this works. Auto-Hold settings and target setpoints are independent for each loop, but the segment types and time settings are the same. Seg. ①& ② shows a ramp and a dwell with the shared time base.



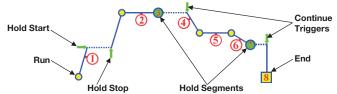
The ramp direction can be different (Seg. 3), and although one loop can-

not ramp while the other dwells, a "dwell" is achieved by a ramp with its final setpoint value at the same value as the previous segment (Seg. ®). Similarly, if only one loop is to Step to a new value, make the other "step" to its existing setpoint value. If you later change the previous setpoint, you may have to change both segments.

The Loop-back feature takes both loops back to the previous segment. Ramp-Rate segments are not possible with 2-loop profiling.

NOTE: Either loop can cause the profile to auto-hold. The profile continues only when both loops are back within their hold bands

### **Run/Hold Seaments**

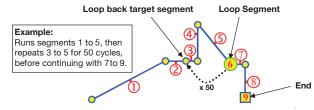


A **Hold** condition during a segment maintains the current setpoint value of both loops. Once the hold is stopped the Ramp or Dwell continues.

NOTE: A running segment will hold if the operator or a digital input instructs it to, during "auto-hold", if one of the profile control loops is disabled, if a cascade is set to "open" or if manual control is selected.

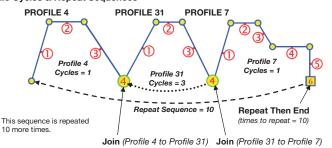
A Hold Segment maintains the value of the last segment. The profile does not continue until a Continue Trigger occurs. This can be via a key press, a digital input signal or after waiting for a time of day (Recorder only).

# **Loops Segments**



A Loop Segment goes back to a specified segment. This action is repeated for the required number of times (1 to 9999) before the profile continues onwards. More than one Loop Segment can be used, but they must not cross.

### **Profile Cycles & Repeat Sequences**

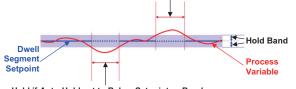


A profile can be made to run itself 1 to 9999 times or continuously using the Profile Cycles setting. A profile ending with **Repeat Then End** will run the entire sequence of profiles again 1 to 9999 times or continuously.

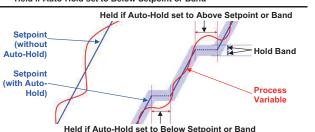
### Auto-Hold

Each segment has independent Auto-Hold settings. If used, these ensure process and profile remain synchronized. If the process does not closely match the setpoint, the profile can be held until it returns within bounds. The segment time is increased by the time that the process is out of bounds. When Auto-Hold is active the profile status is shown as Held. The user can choose to hold the profile if the process beyond the Hold Band Above only, Below only or Band (either side of the setpoint). 2-loop profiling has individual Auto-Hold settings for the two loops. The entire profile (i.e both loops) will be held if either process is outside of its Auto-Hold Band.

# Held if Auto-Hold set to Above Setpoint or Band

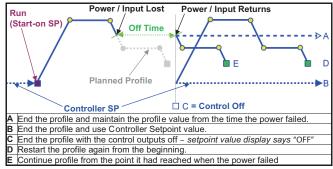


Held if Auto-Hold set to Below Setpoint or Band



# End, Abort and Power/Signal Lost Recovery

If the power is cut or the input is lost (either signal for 2-loop profiling) while a profile is running, the instrument will use the defined Profile Recovery Method once the signal power returns. These options are explained below.



On Recorder versions, option **E** will always be used if the power / signal is lost for less than the Profile Recovery Time. If the power / signal is lost for more than this time the defined Profile Recovery Method is used.

Similar options are offered for the Profile End Action taken at the normal profile end, or for the Profile Abort Action if the profile is force to end before it is finished. These can be defined to act in a similar manner as A. B or C above.

## 16. THE USB INTERFACE

The USB Interface can be used to upload or download instrument settings to or from a USB memory stick. It allows easy configuration of multiple instruments or the transfer of settings to/from the PC configuration software. If the Data Recorder or Profiler options are fitted, recordings and profile information can also be transferred via USB memory stick.

NOTE: If this feature is fitted, a USB Menu option is added to the Main Menu. See USB Port information in section 20.

# USB Memory Stick Folders & Files

When a USB stick is inserted, the instrument looks for, and if necessary creates the DE-VICE, CONFIG, PROFILE and RECORDER folders. Files must be located in these folders in order to be used. When preparing to upload files from your PC, ensure that you save them to the correct folder on the memory stick.



PROFILE\*

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RECORDER - Recorder log olders/files The user is asked for a new ecorder sub-folder name before ensferring recorder data to USB. The log files (\*.csv) are placed in this folder CAUTION: If the file name already

ists, data will be overwritter



CAUTION: Do not remove the memory stick from the USB port whilst a data transfer operation is in progress. Data loss or corruption may

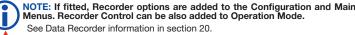
The first recorder log file is named 001-0001.csv. A new file is created with the first 3 digits incremented (e.g. 002-0001.csv; 003-0001.csv etc) each time the data being recorded is changed. The last 4 digits increment (e.g. 001-0002.csv; 001-0003.csv etc) if the file size reaches 65535 lines, if a recording is stopped then re-started or if there is a period of >10s without an alarm when recording from an alarm trigger.



**CAUTION:** During Data Transfer, normal operation carries on in the background, but operator access to other screens is not possible. Transfer of full memory can take up to 20 minutes. Only begin a transfer when access (e.g. setpoint changes) will not be required.

## 17. DATA RECORDER

This option can record the process conditions to memory over time. It operates independently from the Trend Views.



**CAUTION:** This feature includes a battery backed Real Time Clock (RTC). Servicing and replacement of the internal lithium battery should only be carried out by a trained technician.

The RTC also expands the profiling capabilities and allows a "calibration due" reminder at a specified date. See page 5 for **Profile Setup**:, & page 6 - **Input Configuration**: for the calibration reminder, and Clock Configuration for RTC settings

For each control loop, a combination of values can be recorded at each sample, selected from: Process Variable: Maximum or Minimum PV (since the previous sample): Setpoint: Primary Power, Secondary Power or Auxiliary Input values. Additionally the status of Alarms and Profiler Events can be recorded, as can when the unit is turned On/Off.



NOTE: If recorded, each alarm/event change forces an extra sample to be recorded, reducing the remaining recording time available

Sample rates between 1 second and 30 minutes are possible, with the data recorded until the memory is full, or continuous First In/First Out memory overwriting the oldest data with new. See Recorder Configuration on Page 6 for more details.

# Recorder Triggers

Options for starting/stopping recordings include Manually (from the recorder menu or a screen added to operation mode); a Digital Input; during a Running Profile; or Record on Alarm. Any active trigger that has been configured will cause the recorder to run. The recorder status screen has a % memory used bar graph and icons for the active record triggers.



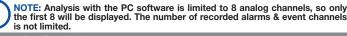






Manual Record ON Digital Input ON Profile Record ON Alarm Record ON

Recordings can be transferred to a memory stick using the USB Port or downloaded to the PC software via the configuration port or serial communications if fitted. Recordings are stored in Comma Separated format (.csv) which can be opened and analysed with the optional PC software. The recorded data files can also be opened directly into a spreadsheet, or imported into other software. See Section 16.



The recorders RTC allows a "calibration due reminder" to be shown if the date is equal to or after the Calibration Reminder Date. The reminder screen persists until the O key is pressed. If due, the reminder is shown at Power-up, and repeated every 24hrs until the reminder date

See Input Configuration: for the calibration reminder settings.

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18. SPECIFICATION	S					
Sampling Rate:	10 per second.					
Resolution:	16 bits. Always four times better than display resolution.					
Impedance:	>10MΩ resistive, except DC mA (5Ω) and V (47kΩ). Error <0.01% of span per °C change in ambient temperature.					
Temp Stability: Supply Variation:	Supply voltage influer			е.		
Humidity Influence:	Negligible if non-cond		i supply limits.			
Process Display:	Displays up to 5% over		oan limits.			
User Calibration:	Single or two point. +	ve values added to	Process Variable	,		
	-ve values subtracted	from Process Varia	able			
Sensor Break Detection:	Thermocouple & RTD High & Sensor Break to 10 V and 1 to 5 V o	alarms activate. Lir nly) - Control goes	lear (4 to 20 mA, 2 to pre-set power	2		
Isolation:	value. Low & Sensor B Reinforced safety isol					
Supported	Type	Range °C	Range °F			
Thermocouple Types &	В	+100 to 1824°C	+211 to 3315°F			
Ranges:	С	0 to 2320°C	32 to 4208°F			
	D	0 to 2315°C	32 to 4199°F			
	E	-240 to 1000°C	-400 to 1832°F	*		
	J K	-200 to 1200°C	-328 to 2192°F -400 to 2503°F	*		
	L	0 to 762°C	32 to 1402°F	*		
	N	0 to 1399°C	32 to 2551°F	*		
	PtRh 20%:40%	0 to 1850°C	32 to 3362°F			
	R	0 to 1759°C	32 to 3198°F			
	S	0 to 1762°C	32 to 3204°F	*		
	T	-240 to 400°C	-400 to 752°F			
Thermocouple		place can be displa				
Calibration:	Linearization better that marked * in the table a better than better than BS4937, NBS125 & IE	±0.1% of full range, ±1LSD (±1°C for internal CJC if enabled). Linearization better than better ±0.2°C (±0.05 typical) on ranges narked * in the table above. Linearization for other ranges is better than better than ±0.5°C. 3S4937, NBS125 & IEC584				
Supported RTD Types & Ranges:	Type	Range °C -199 to 800°C	Range °F -328 to 1472°I	_		
a hangoo.	3-Wire PT100 NI120	-80 to 240°C	-112 to 464°F			
	Optional decimal place can be displayed on all ranges					
RTD Calibration:	0.1% of full range, $\pm 1$ LSD. Linearization better than $\pm 0.2^{\circ}$ C ( $\pm 0.05$ typical). PT100 input to BS1904 & DIN43760 (0.00385 $\Omega/\Omega/^{\circ}$ C).					
	Sensor current 150µA ±10%.					
RTD Excitation:	<del>'</del>	±10%.				
Lead Resistance:	<0.5% of span error for	±10%. max 50Ω per lead, b	palanced.			
	<del>'</del>	±10%.				
Lead Resistance: Supported Linear	<0.5% of span error for Type	±10%. max 50Ω per lead, b Range °C	palanced. Range °F			
Lead Resistance: Supported Linear	<0.5% of span error for  Type  mA DC  mV DC  V DC	±10%. max 50Ω per lead, b Range °C 0 to 20 mA DC 0 to 50 mV DC 0 to 5 V DC	palanced.  Range °F  4 to 20 mA DC  10 to 50 mV DC  1 to 5 V DC			
Lead Resistance: Supported Linear	<0.5% of span error for Type  MA DC  MV DC  V DC  V DC	±10%. max 50Ω per lead, b Range °C 0 to 20 mA DC 0 to 50 mV DC 0 to 5 V DC 0 to 10 V DC	palanced.  Range °F  4 to 20 mA DC  10 to 50 mV DC  1 to 5 V DC  2 to 10 V DC			
Lead Resistance: Supported Linear	<0.5% of span error for Type  MA DC  MV DC  V DC  V DC  Potentiometer	±10%. max 50Ω per lead, b Range °C 0 to 20 mA DC 0 to 50 mV DC 0 to 5 V DC 0 to 10 V DC ≥100 ohms	palanced.  Range °F  4 to 20 mA DC  10 to 50 mV DC  1 to 5 V DC  2 to 10 V DC  N/A	C		
Lead Resistance: Supported Linear Types & Ranges	<0.5% of span error for  Type  MA DC  MV DC  V DC  V DC  Potentiometer  Scalable from -2000 from 0 to 3 places, 1 place above 99	±10%. max 50Ω per lead, t Range °C 0 to 20 mA DC 0 to 50 mV DC 0 to 5 V DC 0 to 10 V DC ≥100 ohms but rounds to 2 pla 9.99 and no decim	palanced.  Range °F  4 to 20 mA DC  10 to 50 mV DC  2 to 10 V DC  N/A  Mal point selectable ces above 99.999 al above 9999.9	C		
Lead Resistance: Supported Linear Types & Ranges  Maximum Overload:	<0.5% of span error for  Type  MA DC  MV DC  V DC  V DC  Potentiometer  Scalable from -2000 from 0 to 3 places, 1 place above 99 1A or 30V on voltage	±10%. max 50Ω per lead, the Range °C 0 to 20 mA DC 0 to 50 mV DC 0 to 5 V DC 0 to 10 V DC ≥100 ohms but rounds to 2 playeye and no deciming terminals (at 2)	palanced.  Range °F  4 to 20 mA DC  10 to 50 mV DC  2 to 10 V DC  N/A  Mal point selectable ces above 99.999 al above 9999.9	C		
Lead Resistance: Supported Linear Types & Ranges  Maximum Overload: DC Calibration:	<0.5% of span error for  Type  MA DC  MV DC  V DC  V DC  Potentiometer  Scalable from -2000 from 0 to 3 places, 1 place above 99 1A or 30V on voltage ±0.1% of full range, ±	±10%. max 50Ω per lead, b Range °C 0 to 20 mA DC 0 to 50 mV DC 0 to 5 V DC 0 to 10 V DC ≥100 ohms but rounds to 2 plate 9.99 and no deciming terminals (at 2 the	palanced.  Range °F  4 to 20 mA DC  10 to 50 mV DC  2 to 10 V DC  N/A  pala point selectable ces above 99.999.9  25°C ambient).	e 9;		
Lead Resistance: Supported Linear Types & Ranges  Maximum Overload:	<0.5% of span error for  Type  MA DC  MV DC  V DC  V DC  Potentiometer  Scalable from -2000 from 0 to 3 places, 1 place above 99 1A or 30V on voltage	±10%.  max 50Ω per lead, be Range °C  0 to 20 mA DC  0 to 50 mV DC  0 to 5 V DC  ≥100 ohms  0 to 10 V DC  ≥100 ohms  0 to 100000. Decime but rounds to 2 played and no decime input terminals (at 2 1LSD.	palanced.  Range °F  4 to 20 mA DC  10 to 50 mV DC  2 to 10 V DC  N/A  pala point selectable ces above 99.999.9  25°C ambient).	e 9;		
Lead Resistance: Supported Linear Types & Ranges  Maximum Overload: DC Calibration: DC Input Multi-Point	<0.5% of span error for Type  MA DC  MV DC  V DC  V DC  Potentiometer  Scalable from -200f from 0 to 3 places, 1 place above 99 1A or 30V on voltage ±0.1% of full range, ± Up to 15 scaling value 0.1 and 100% of inpu  Function	±10%. max 50Ω per lead, b Range °C 0 to 20 mA DC 0 to 50 mV DC 0 to 5 V DC ≥100 ohms 0 to 100000. Decimbut rounds to 2 pla 9.99 and no deciminput terminals (at 2 lLSD. se can be defined at t. Input 1	palanced.  Range °F  4 to 20 mA DO  10 to 50 mV DO  1 to 5 V DC  2 to 10 V DC  N/A  pal point selectables above 99.998 al above 9999.9 25°C ambient).  Input 2	e 9;		
Lead Resistance: Supported Linear Types & Ranges  Maximum Overload: DC Calibration: DC Input Multi-Point Linearization:	<0.5% of span error for  Type  MA DC  MV DC  V DC  V DC  Potentiometer  Scalable from -2000 from 0 to 3 places, 1 place above 99  1A or 30V on voltage ±0.1% of full range, ±  Up to 15 scaling value  Up to 15 scaling value  Function  Process Control	±10%.  max 50Ω per lead, b  Range °C  0 to 20 mA DC  0 to 50 mV DC  0 to 10 V DC  ≥100 ohms  0 to 100000. Deciming the terminals (at 2 1LSD.  es can be defined at t.  Input 1  Loop 1	palanced.  Range °F  4 to 20 mA DC  10 to 50 mV DC  1 to 5 V DC  2 to 10 V DC  N/A  pal point selectable ces above 99.999 al above 9999.9  25°C ambient).  Input 2  Loop 2	e 9;		
Lead Resistance: Supported Linear Types & Ranges  Maximum Overload: DC Calibration: DC Input Multi-Point Linearization:	<0.5% of span error for  Type  MA DC  MV DC  V DC  V DC  Potentiometer  Scalable from -2000 from 0 to 3 places, 1 place above 99  1A or 30V on voltage ±0.1% of full range, ±  Up to 15 scaling value  Up to 15 scaling value  Function  Process Control  Cascade Control	±10%.  max 50Ω per lead, b  Range °C  0 to 20 mA DC  0 to 50 mV DC  0 to 5 V DC  0 to 10 V DC  ≥100 ohms  0 to 100000. Decime but rounds to 2 pla 9.99 and no decime input terminals (at 2 1LSD.  es can be defined at t.  Input 1  Loop 1  Master Loop	palanced.  Range °F  4 to 20 mA DC  10 to 50 mV DC  1 to 5 V DC  2 to 10 V DC  N/A  pal point selectable ces above 99.993 al above 9999.9  25°C ambient).  Input 2  Loop 2  Slave Loop	e e );		
Lead Resistance: Supported Linear Types & Ranges  Maximum Overload: DC Calibration: DC Input Multi-Point Linearization:	<0.5% of span error for  Type  MA DC  MV DC  V DC  V DC  Potentiometer  Scalable from -2000 from 0 to 3 places, 1 place above 99  1A or 30V on voltage ±0.1% of full range, ±  Up to 15 scaling value  Up to 15 scaling value  Function  Process Control	±10%.  max 50Ω per lead, b  Range °C  0 to 20 mA DC  0 to 50 mV DC  0 to 10 V DC  ≥100 ohms  0 to 100000. Deciming the terminals (at 2 1LSD.  es can be defined at t.  Input 1  Loop 1	palanced.  Range °F  4 to 20 mA DC  10 to 50 mV DC  1 to 5 V DC  2 to 10 V DC  N/A  pal point selectable ces above 99.999 al above 9999.9  25°C ambient).  Input 2  Loop 2	e e );		
Lead Resistance: Supported Linear Types & Ranges  Maximum Overload: DC Calibration: DC Input Multi-Point Linearization:	<0.5% of span error for  Type  MA DC  MV DC  V DC  V DC  Potentiometer  Scalable from -2000 from 0 to 3 places, 1 place above 99  1A or 30V on voltage ±0.1% of full range, ±  Up to 15 scaling value  Up to 15 scaling value  Function  Process Control  Cascade Control	±10%.  max 50Ω per lead, b  Range °C  0 to 20 mA DC  0 to 50 mV DC  0 to 5 V DC  ≥100 ohms  0 to 100000. Decime but rounds to 2 pla  9.99 and no decime input terminals (at 2  1LSD.  as can be defined at t.  Input 1  Loop 1  Master Loop  Controlled	palanced.  Range °F  4 to 20 mA DC  10 to 50 mV DC  2 to 10 V DC  N/A  pala point selectable ces above 99.999 al above 9999.9  25 °C ambient).  Input 2  Loop 2  Slave Loop  Un-controlled	e e;;		
Lead Resistance: Supported Linear Types & Ranges  Maximum Overload: DC Calibration: DC Input Multi-Point Linearization:	<0.5% of span error for Type  mA DC  mV DC  V DC  V DC  Potentiometer  Scalable from -200f from 0 to 3 places, 1 place above 99 1A or 30V on voltage ±0.1% of full range, ± Up to 15 scaling value 0.1 and 100% of inpu Function Process Control Cascade Control Ratio Control Remote Setpoint Valve Pos. Feedback	±10%.  max 50Ω per lead, be Range °C  0 to 20 mA DC  0 to 50 mV DC  0 to 5 V DC  ≥100 ohms  0 to 10 V DC  ≥100 ohms  0 to 100000. Decime but rounds to 2 plays and no decime input terminals (at 2 input 1 LSD.  as can be defined at t.  Input 1  Loop 1  Master Loop  Controlled  Variable  -	palanced.  Range °F  4 to 20 mA DO  10 to 50 mV Dr  1 to 5 V DC  2 to 10 V DC  N/A  pal point selectables above 99.998  al above 9999.9  25°C ambient).  Input 2  Loop 2  Slave Loop  Un-controlled Variable  RSP on loop  Valve on loop	e e ;;		
Lead Resistance: Supported Linear Types & Ranges  Maximum Overload: DC Calibration: DC Input Multi-Point Linearization:	<0.5% of span error for  Type  MA DC  MV DC  V DC  V DC  Potentiometer  Scalable from -2000 from 0 to 3 places, 1 place above 99  1A or 30V on voltage ±0.1% of full range, ±  Up to 15 scaling value  Up to 15 scaling value  Function  Process Control  Cascade Control  Ratio Control  Remote Setpoint  Valve Pos. Feedback  RSP Linear inputs onl	±10%.  max 50Ω per lead, be Range °C  0 to 20 mA DC  0 to 50 mV DC  0 to 10 V DC  ≥100 ohms  0 to 100000. Deciming the terminals (at 2 las)  LSD.  se can be defined at the terminals (at 2 las)  Input 1  Loop 1  Master Loop  Controlled Variable  -  y, scalable between	palanced.  Range °F  4 to 20 mA DC  10 to 50 mV DC  1 to 5 V DC  2 to 10 V DC  N/A  pal point selectable ces above 99.993 al above 999.9 25°C ambient).  Input 2  Loop 2  Slave Loop  Un-controllect Variable  RSP on loop  Valve on loop 1-9999 to 10000,	e e e;;		
Lead Resistance: Supported Linear Types & Ranges  Maximum Overload: DC Calibration: DC Input Multi-Point Linearization: Input Functions:	<0.5% of span error for Type  mA DC  mV DC  V DC  V DC  Potentiometer  Scalable from -200f from 0 to 3 places, 1 place above 99 1A or 30V on voltage ±0.1% of full range, ± Up to 15 scaling value 0.1 and 100% of inpu Function Process Control Cascade Control Ratio Control Remote Setpoint Valve Pos. Feedback	±10%.  max 50Ω per lead, be Range °C  0 to 20 mA DC  0 to 50 mV DC  0 to 10 V DC  ≥100 ohms  0 to 100000. Deciming the terminals (at 2 las)  LSD.  se can be defined at the terminals (at 2 las)  Input 1  Loop 1  Master Loop  Controlled Variable  -  y, scalable between	palanced.  Range °F  4 to 20 mA DC  10 to 50 mV DC  1 to 5 V DC  2 to 10 V DC  N/A  pal point selectable ces above 99.993 al above 999.9 25°C ambient).  Input 2  Loop 2  Slave Loop  Un-controllect Variable  RSP on loop  Valve on loop 1-9999 to 10000,	e e e;;		
Lead Resistance: Supported Linear Types & Ranges  Maximum Overload: DC Calibration: DC Input Multi-Point Linearization:	<0.5% of span error for  Type  MA DC  MV DC  V DC  V DC  Potentiometer  Scalable from -2000 from 0 to 3 places, 1 place above 99  1A or 30V on voltage ±0.1% of full range, ±  Up to 15 scaling value  Up to 15 scaling value  Function  Process Control  Cascade Control  Ratio Control  Remote Setpoint  Valve Pos. Feedback  RSP Linear inputs onl	±10%.  max 50Ω per lead, be Range °C  0 to 20 mA DC  0 to 50 mV DC  0 to 5 V DC  0 to 10 V DC  ≥100 ohms  0 to 100000. Decime but rounds to 2 played and no decime input terminals (at 2 LSD.  as can be defined at t.  Input 1  Loop 1  Master Loop  Controlled Variable	palanced.  Range °F  4 to 20 mA DC  10 to 50 mV DC  1 to 5 V DC  2 to 10 V DC  N/A  pal point selectable ces above 99.993 al above 999.9 25°C ambient).  Input 2  Loop 2  Slave Loop  Un-controllect Variable  RSP on loop  Valve on loop 1-9999 to 10000,	e e i 1 1 1 1 but gs		
Lead Resistance: Supported Linear Types & Ranges  Maximum Overload: DC Calibration: DC Input Multi-Point Linearization: Input Functions:	<0.5% of span error for Type mA DC mV DC V DC V DC Potentiometer Scalable from -2000 from 0 to 3 places, 1 place above 99 1A or 30V on voltage ±0.1% of full range, ± Up to 15 scaling value 0.1 and 100% of inpu Function Process Control Cascade Control Ratio Control Remote Setpoint Valve Pos. Feedback RSP Linear inputs onl actual setpoint value  Type mA DC	±10%.  max 50Ω per lead, be Range °C  0 to 20 mA DC  0 to 50 mV DC  0 to 5 V DC  0 to 10 V DC  ≥100 ohms  0 to 100000. Decime but rounds to 2 players and no decime input terminals (at 2 1LSD.  Input 1  Loop 1  Master Loop  Controlled Variable  -  y, scalable between is kept within the scange  0 to 20 mA DC	Palanced.  Range °F  4 to 20 mA DO  10 to 50 mV DO  1 to 5 V DC  2 to 10 V DC  N/A  palal point selectable ces above 99.99.9  21 above 99.99.9  22 cambient).  Palanced.  Input 2  Loop 2  Slave Loop  Un-controlled Variable  RSP on loop  Valve on loop  1-9999 to 10000, etpoint limit settin  Offset Range  4 to 20 mA Do	e e i i i 1 1 1 1 but gs		
Lead Resistance: Supported Linear Types & Ranges  Maximum Overload: DC Calibration: DC Input Multi-Point Linearization: Input Functions:  Auxiliary Input A Supported Input Types	<0.5% of span error for Type mA DC mV DC V DC V DC Potentiometer Scalable from -2000 from 0 to 3 places, 1 place above 99 1A or 30V on voltage ±0.1% of full range, ± Up to 15 scaling value 0.1 and 100% of inpu Function Process Control Cascade Control Ratio Control Remote Setpoint Valve Pos. Feedback RSP Linear inputs onl actual setpoint value  Type mA DC V DC	±10%.  max 50Ω per lead, be Range °C  0 to 20 mA DC  0 to 50 mV DC  0 to 5 V DC  ≥100 ohms  0 to 10 V DC  ≥100 ohms  0 to 100000. Deciment rounds to 2 players  group and no deciment rounds to 3 players  terminals (at 2 players)  Input 1  Loop 1  Master Loop  Controlled Variable  -  y, scalable between is kept within the services and the services are services are services and the services are services are services and the services are services	palanced.  Range °F  4 to 20 mA DO  10 to 50 mV DO  1 to 5 V DC  2 to 10 V DC  N/A  palal point selectable ces above 99.99.99 all above 9999.9 25°C ambient).  Input 2  Loop 2  Slave Loop 2  Slave Loop 2  Variable  RSP on loop  Variable  RSP on loop  Valve on loop  1-9999 to 10000, etpoint limit settin  Offset Range  4 to 20 mA DO  1 to 5 V DC	e e e e e e e e e e e e e e e e e e e		
Lead Resistance: Supported Linear Types & Ranges  Maximum Overload: DC Calibration: DC Input Multi-Point Linearization: Input Functions:  Auxiliary Input A Supported Input Types & Ranges:	<0.5% of span error for Type  mA DC  mV DC  V DC  V DC  Potentiometer  Scalable from -2000 from 0 to 3 places, 1 place above 99 1A or 30V on voltage ±0.1% of full range, ± Up to 15 scaling value 0.1 and 100% of inpu Function Process Control Cascade Control Ratio Control Remote Setpoint Valve Pos. Feedback RSP Linear inputs onl actual setpoint value  Type  mA DC  V DC  V DC	±10%.  max 50Ω per lead, be Range °C  0 to 20 mA DC  0 to 50 mV DC  0 to 5 V DC  ≥100 ohms  0 to 10 V DC  ≥100 ohms  0 to 100000. Decime but rounds to 2 players  9.99 and no decime input terminals (at 2 players  1LSD.  as can be defined at t.  Input 1  Loop 1  Master Loop  Controlled Variable   y, scalable betweer is kept within the si  Range  0 to 20 mA DC  0 to 5 V DC  0 to 10 V DC	Palanced.  Range °F  4 to 20 mA DO  10 to 50 mV DO  1 to 5 V DC  2 to 10 V DC  N/A  palal point selectable ces above 99.99.9  21 above 99.99.9  22 cambient).  Palanced.  Input 2  Loop 2  Slave Loop  Un-controlled Variable  RSP on loop  Valve on loop  1-9999 to 10000, etpoint limit settin  Offset Range  4 to 20 mA Do	e e e e e e e e e e e e e e e e e e e		
Lead Resistance: Supported Linear Types & Ranges  Maximum Overload: DC Calibration: DC Input Multi-Point Linearization: Input Functions:  Auxiliary Input A Supported Input Types & Ranges:  Accuracy:	<0.5% of span error for Type  mA DC  mV DC  V DC  V DC  Potentiometer  Scalable from -200f from 0 to 3 places, 1 place above 99 1A or 30V on voltage ±0.1% of full range, ± Up to 15 scaling value 0.1 and 100% of inpu Function  Process Control Cascade Control Ratio Control Remote Setpoint Valve Pos. Feedback RSP Linear inputs onl actual setpoint value  Type  mA DC  V DC  V DC  ±0.25% of input range.	±10%.  max 50Ω per lead, be Range °C  0 to 20 mA DC  0 to 50 mV DC  0 to 5 V DC  ≥100 ohms  0 to 10 V DC  ≥100 ohms  0 to 100000. Decime but rounds to 2 players  9.99 and no decime input terminals (at 2 players  1LSD.  as can be defined at t.  Input 1  Loop 1  Master Loop  Controlled Variable   y, scalable betweer is kept within the si  Range  0 to 20 mA DC  0 to 5 V DC  0 to 10 V DC	palanced.  Range °F  4 to 20 mA DO  10 to 50 mV DO  1 to 5 V DC  2 to 10 V DC  N/A  palal point selectable ces above 99.99.99 all above 9999.9 25°C ambient).  Input 2  Loop 2  Slave Loop 2  Slave Loop 2  Variable  RSP on loop  Variable  RSP on loop  Valve on loop  1-9999 to 10000, etpoint limit settin  Offset Range  4 to 20 mA DO  1 to 5 V DC	e e e e e e e e e e e e e e e e e e e		
Lead Resistance: Supported Linear Types & Ranges  Maximum Overload: DC Calibration: DC Input Multi-Point Linearization: Input Functions:  Auxiliary Input A Supported Input Types & Ranges:  Accuracy: Sampling Rate:	<0.5% of span error for  Type  mA DC  mV DC  V DC  V DC  Potentiometer  Scalable from -200f from 0 to 3 places, 1 place above 99  1A or 30V on voltage  ±0.1% of full range, ±  Up to 15 scaling value 0.1 and 100% of inpu  Function  Process Control  Cascade Control  Ratio Control  Remote Setpoint  Valve Pos. Feedback  RSP Linear inputs onl actual setpoint value  Type  mA DC  V DC  ±0.25% of input range 4 per second.	±10%.  max 50Ω per lead, be Range °C  0 to 20 mA DC  0 to 50 mV DC  0 to 5 V DC  ≥100 ohms  0 to 10 V DC  ≥100 ohms  0 to 100000. Decime but rounds to 2 players  9.99 and no decime input terminals (at 2 players  1LSD.  as can be defined at t.  Input 1  Loop 1  Master Loop  Controlled Variable   y, scalable betweer is kept within the si  Range  0 to 20 mA DC  0 to 5 V DC  0 to 10 V DC	palanced.  Range °F  4 to 20 mA DO  10 to 50 mV DO  1 to 5 V DC  2 to 10 V DC  N/A  palal point selectable ces above 99.99.99 all above 9999.9 25°C ambient).  Input 2  Loop 2  Slave Loop 2  Slave Loop 2  Variable  RSP on loop  Variable  RSP on loop  Valve on loop  1-9999 to 10000, etpoint limit settin  Offset Range  4 to 20 mA DO  1 to 5 V DC	e e e e e e e e e e e e e e e e e e e		
Lead Resistance: Supported Linear Types & Ranges  Maximum Overload: DC Calibration: DC Input Multi-Point Linearization: Input Functions:  Auxiliary Input A Supported Input Types & Ranges:  Accuracy:	<0.5% of span error for  Type  mA DC  mV DC  V DC  V DC  Potentiometer  Scalable from -200f from 0 to 3 places, 1 place above 99  1A or 30V on voltage, ± Up to 15 scaling value 0.1 and 100% of inpu  Function  Process Control  Cascade Control  Ratio Control  Remote Setpoint  Valve Pos. Feedback  RSP Linear inputs onl actual setpoint value  Type  mA DC  V DC  V DC  ±0.25% of input range  4 per second.  16 bits.	x±10%.  max 50Ω per lead, be Range °C  0 to 20 mA DC  0 to 50 mV DC  0 to 10 V DC  ≥100 ohms  0 to 100000. Deciming the terminals (at 2 last)  LSD.  as can be defined at the terminals (at 2 last)  LSD.  y, scalable between is kept within the service of the service of the terminals (at 2 last)  Range  0 to 20 mA DC  0 to 5 V DC  0 to 10 V DC  e ±1 LSD.	palanced.  Range °F  4 to 20 mA DO  10 to 50 mV DO  1 to 5 V DC  2 to 10 V DC  N/A  pal point selectables above 99.998 al above 999.9 25°C ambient).  Inywhere between  Input 2  Loop 2  Slave Loop  Un-controlled Variable  RSP on loop  Valve on loop  1-9999 to 10000, etpoint limit settin  Offset Range  4 to 20 mA DO  1 to 5 V DC  2 to 10 V DC	e e e e e e e e e e e e e e e e e e e		
Lead Resistance: Supported Linear Types & Ranges  Maximum Overload: DC Calibration: DC Input Multi-Point Linearization: Input Functions:  Auxiliary Input A Supported Input Types & Ranges:  Accuracy: Sampling Rate: Resolution: Impedance: Sensor Break	<0.5% of span error for  Type  mA DC  mV DC  V DC  V DC  Potentiometer  Scalable from -2000 from 0 to 3 places, 1 place above 99  1A or 30V on voltage ±0.1% of full range, ±  Up to 15 scaling value 0.1 and 100% of inpu  Function  Process Control  Cascade Control  Ratio Control  Remote Setpoint  Valve Pos. Feedback  RSP Linear inputs onl actual setpoint value  Type  mA DC  V DC  V DC  V DC  ±0.25% of input range 4 per second.  16 bits.  110MΩ resistive, exce 4 to 20mA, 2 to 10V as 100 cm.	x±10%.  max 50Ω per lead, the Range °C  0 to 20 mA DC  0 to 50 mV DC  0 to 5 V DC  10 to 10 V DC  ≥100 ohms  10 to 100000. Decime but rounds to 2 players  10 to 100000. Decime but rounds to 2 players  11 LSD.  12 sc can be defined at the second but rounds to 2 players  12 players  13 players  14 players  15 players  16 players  16 players  17 players  18 players  18 players  19 players  10 to 20 mA DC  10 to 10 V DC  10 to 5 V ranges of the second but read the second but rea	Palanced.  Range °F  4 to 20 mA DO  10 to 50 mV DO  1 to 5 V DC  2 to 10 V DC  N/A  palal point selectable ces above 99.99.9  25°C ambient).  Palal point selectable ces above 99.99.9  Slave loop 2  Slave Loop 2  Slave Loop 2  Slave Loop 2  Variable RSP on loop  Variable RSP on loop  Valve on loop  1-9999 to 10000, etpoint limit settin  Offset Range  4 to 20 mA DO  1 to 5 V DC  2 to 10 V DC	e e e e e e e e e e e e e e e e e e e		
Lead Resistance: Supported Linear Types & Ranges  Maximum Overload: DC Calibration: DC Input Multi-Point Linearization: Input Functions:  Auxiliary Input A Supported Input Types & Ranges:  Accuracy: Sampling Rate: Resolution: Impedance: Sensor Break Detection:	<0.5% of span error for  Type  MA DC  MV DC  V DC  V DC  Potentiometer  Scalable from -2000 from 0 to 3 places, 1 place above 99  1A or 30V on voltage  ±0.1% of full range, ±  Up to 15 scaling value 0.1 and 100% of inpu  Function  Process Control  Cascade Control  Ratio Control  Remote Setpoint  Valve Pos. Feedback  RSP Linear inputs onl actual setpoint value  Type  MA DC  V DC  V DC  V DC  ±0.25% of input range 4 per second.  16 bits.  >10MΩ resistive, exce 4 to 20mA, 2 to 10V apre-set power value if	x±10%.  max 50Ω per lead, the Range °C  0 to 20 mA DC  0 to 50 mV DC  0 to 50 V DC  10 to 10 V DC  ≥100 ohms  10 to 100000. Decime but rounds to 2 players  10 to 100000. Decime but rounds to 2 players  11 LSD.  12 sc can be defined at the second but rounds to 2 players  12 players  13 players  14 LSD.  15 Range  16 to 20 mA DC  17 to 50 V DC  18 to 10 V DC  19 to 10 V DC  19 to 10 V DC  19 to 10 V DC  20 to 10 V DC  21 LSD.	Palanced.  Range °F  4 to 20 mA DO  10 to 50 mV DO  1 to 5 V DC  2 to 10 V DC  N/A  Palal point selectable ces above 99.99.99  all above 99.99.99  all above 99.99.99  all above 99.99.99  Part of the selectable ces above 99.99.99  Input 2  Loop 2  Slave Loop 2  Slave Loop Un-controlled Variable  RSP on loop 1  Variable  RSP on loop 1  Valve on loop 1  -9999 to 10000, etpoint limit settin  Offset Range 4 to 20 mA DO 1  1 to 5 V DC 2 to 10 V DC 2  Part of V (47kΩ).	e e e e e e e e e e e e e e e e e e e		
Lead Resistance: Supported Linear Types & Ranges  Maximum Overload: DC Calibration: DC Input Multi-Point Linearization: Input Functions:  Auxiliary Input A Supported Input Types & Ranges:  Accuracy: Sampling Rate: Resolution: Impedance: Sensor Break Detection: Isolation:	<0.5% of span error for Type  MA DC  MV DC  V DC  V DC  Potentiometer  Scalable from -200f from 0 to 3 places, 1 place above 99 1A or 30V on voltage ±0.1% of full range, ± Up to 15 scaling value 0.1 and 100% of inpu  Function  Process Control  Cascade Control  Ratio Control  Remote Setpoint  Valve Pos. Feedback RSP Linear inputs onl actual setpoint value  Type  MA DC  V DC  V DC  V DC  ±0.25% of input range 4 per second. 16 bits.  >10MΩ resistive, excet 4 to 20mA, 2 to 10V a pre-set power value if Reinforced safety isol	x±10%.  max 50Ω per lead, the Range °C  0 to 20 mA DC  0 to 50 mV DC  0 to 5 V DC  10 to 10 V DC  ≥100 ohms  10 to 100000. Decime but rounds to 2 plays and no decime input terminals (at 2 1LSD.  11 LSD.  12 Scan be defined at the second but the	Palanced.  Range °F  4 to 20 mA DO  10 to 50 mV DO  1 to 5 V DC  2 to 10 V DC  N/A  Palal point selectables above 99.99.9  25°C ambient).  Palanced.  Input 2  Loop 2  Slave Loop  Un-controlled Variable  RSP on loop  Valve on loop  1 e9999 to 10000, etpoint limit settin  Offset Range  4 to 20 mA DO  1 to 5 V DC  2 to 10 V DC  Palanced.	e e e e e e e e e e e e e e e e e e e		
Lead Resistance: Supported Linear Types & Ranges  Maximum Overload: DC Calibration: DC Input Multi-Point Linearization: Input Functions:  Auxiliary Input A Supported Input Types & Ranges:  Accuracy: Sampling Rate: Resolution: Impedance: Sensor Break Detection:	<0.5% of span error for  Type  MA DC  MV DC  V DC  V DC  Potentiometer  Scalable from -2000 from 0 to 3 places, 1 place above 99  1A or 30V on voltage  ±0.1% of full range, ±  Up to 15 scaling value 0.1 and 100% of inpu  Function  Process Control  Cascade Control  Ratio Control  Remote Setpoint  Valve Pos. Feedback  RSP Linear inputs onl actual setpoint value  Type  MA DC  V DC  V DC  V DC  ±0.25% of input range 4 per second.  16 bits.  >10MΩ resistive, exce 4 to 20mA, 2 to 10V apre-set power value if	x±10%.  max 50Ω per lead, by Range °C  0 to 20 mA DC  0 to 5 V DC  0 to 5 V DC  0 to 10 V DC  ≥100 ohms  0 to 100000. Deciminate terminals (at 2 1 1 LSD.  as can be defined at the second of the se	Palanced.  Range °F  4 to 20 mA DC  10 to 50 mV DC  1 to 5 V DC  2 to 10 V DC  N/A  Palal point selectables above 99.998  al above 9999.9  25°C ambient).  Palanced.  Input 2  Loop 2  Slave Loop  Un-controllectorial variable  RSP on loop  Valve on loop  Valve on loop  1-9999 to 10000, etpoint limit settin  Offset Range  4 to 20 mA DC  2 to 10 V DC  and V (47kΩ).  Ponly. Control goes only. C	e e e e e e e e e e e e e e e e e e e		

Auxiliary Input A			
Selectable Digital Input	Function	Logic High	Logic Low
Functions:	гл Loop 1 Control Select	Enabled	Disabled
	Cop 2 Control Select	Enabled	Disabled
	Loop 1 Auto/Manual Select Loop 2 Auto/Manual Select	Automatic Automatic	Manual Manual
	Loop 2 Auto/Manual Select	Main SP	Alternate SP
	Loop 2 Setpoint Select	Main SP	Alternate SP
	Loop 1 Pre-Tune Select	Stop	Run
	[7] Loop 2 Pre-Tune Select	Stop	Run
	Loop 1 Self-Tune Select	Stop	Run
	Loop 2 Self-Tune Select Profile Run/Hold	Stop	Run
	Profile Huld Segment Release	Hold No Action	Run Release
	■ Profile Abort	No Action	Abort
	Data Recorder Trigger	Not Active	Active
	■ Output n Forcing	Off/Open	On/Closed
	■ Clear All Latched Outputs	No Action	Reset
	Output n Clear Latch	No Action	Reset
	■ Key n Mimic (for 〈コ ▽ △ ひ) ■ Inputs C1-C7 can be used as	No Action Binary 0	Key Pressed Binary 1
	Binary or BCD Profile Selection		Dillary I
	*The High/Low function can be sw		puts to Invert
Digital Input	Inputs work in parallel with equiv	alent menus,	so either can
Sensitivity:	change the function status. Response		cond.
	■ = Level Sensitive: High or low se		
	Γ¹ = Edge Sensitive: High-Low or L function. Pre-Tune always off at μ	ow-High trans	ent auto pre-
	tune), but others retain their powe	r-off status at	power-on.
Std. Logic State:	Inputs held high via pull-up resisto		
/olt-free (or TTL):	Logic High = Open contacts (>500	0Ω) or 2 to 24	VDC signal.
	Logic Low = Closed contacts (<509	$\Omega$ ) or -0.6 to +0	0.8 VDC signal
nverted Logic	Swaps the actions listed above (elliphing if selected input is inverted).	e.g. Profile Ab	orts on Logic
Number Available	0 to 9. One from Module Slot A, 8	from Multi Di	nital Innut C
solation:	Reinforced safety isolation from o		
DUTPUTS	Troilloided salety isolation north	uipuis allu Olf	ioi iriputs.
	astic pegs prevent fitting of old	er non-reinfo	orced single
nelay module	es - Remove the peg to fit du		
	e reinforced isolation)		
Single Relay 1-3	4 01 1 1 1 1 1 (0.00)	T. D	
Type:	1 x Single pole double throw (SPD		
Rating:	2A resistive at 120/240VAC with rated AC voltage/current. De-rate		rations at full
solation:	Reinforced safety isolation from in		r outputs.
Dual Relay 2-3		,	,
Гуре:	2 x Single pole single throw (SPS)	Γ*). Plug-in Mo	dules 2 & 3.
Rating:	2A resistive at 120/240VAC with	>200,000 ope	
Ü	rated AC voltage/current. De-rate	for DC loads.	
adation:	*Dual relay modules have shared of		
solation:	Reinforced safety isolation from in	puts and othe	r outputs.
Base Relay 4-5	1 v single pole single throw (CDCT	) Bass sutant	tc 1 2 5
Гуре: Rating:	1 x single pole single throw (SPST 2A resistive at 120/240 VAC with		
iaing.	rated voltage/current. De-rate for		nations at Iuli
solation:	Reinforced safety isolation from in		r outputs.
SSR Driver 1-3			
Гуре:	1 x Logic / SSR Driver output. Plu	g-in Modules	1, 2 & 3.
Orive Capability:	Driver voltage >10V into 500Ω mir	•	
solation:	Isolated, except from other SSR di		ration socket.
2x SSR Driver 2-3			
Гуре:	2 x Logic / SSR Driver outputs*. P	lug-in Module	s 2 & 3.
Orive Capability:	Driver voltage >10 V into 500Ω mi	nimum.	
	*Dual SSR Driver modules have sh		
solation:	Isolated, except from other SSR di	river & configu	ration socket.
Triac 1-3			
Type:	1 x Triac output. Plug-in Modules	1, 2 & 3.	
Operating Voltage:	20 to 280Vrms (47 to 63 Hz)	@ 05°0'	
Current Rating:	0.01 to 1A (full cycle rms on-state de-rates linearly above 40°C to 0.5		
solation:	Reinforced safety isolation from in		er outpute
inear DC 1, 6-7	s	. Pato and othe	. Juipuis.
Type:	1 x Analog DC output. Plug-in Mod	dule 1 & Base	outputs 6 & 7
Ranges	0 to 5, 0 to 10, 2 to 10 V & 0 to 20,		
	00/ 2004/00 day drive urban used for	or control outp	uto or 0 10 \/
· ·	2% over/under-drive when used for	20 mA).	uts, or 0-10 v
	adjustable Transmitter PSU (max 2		
	adjustable Transmitter PSU (max 2 8 bits in 250mS (10 bits in 1s typic	cal, >10 bits in	>1s typical).
	adjustable Transmitter PSU (max 2 8 bits in 250mS (10 bits in 1s typic ±0.25% of range, (mA @ 250Ω, V	cal, >10 bits in / @ 2kΩ). Deg	>1s typical).
Accuracy:	adjustable Transmitter PSU (max 2 8 bits in 250mS (10 bits in 1s typic ±0.25% of range, (mA @ 250Ω, V to ±0.5% for increasing burden (to	cal, >10 bits in $\ell$ @ 2k $\Omega$ ). Deg 500 $\Omega$ specifi	>1s typical). rades linearly cation limit).
Accuracy: solation:	adjustable Transmitter PSU (max 2 8 bits in 250mS (10 bits in 1s typic ±0.25% of range, (mA @ 250Ω, V	cal, >10 bits in $\ell$ @ 2k $\Omega$ ). Deg 500 $\Omega$ specifi	>1s typical). rades linearly cation limit).
Accuracy: solation: fransmit PSU 2-3	adjustable Transmitter PSU (max 2 8 bits in 250mS (10 bits in 1s typic ±0.25% of range, (mA @ 250Ω, V to ±0.5% for increasing burden (to Reinforced safety isolation from in	cal, >10 bits in / @ 2kΩ). Deg 500Ω specifications and other	>1s typical). rades linearly cation limit).
Accuracy: solation: fransmit PSU 2-3	adjustable Transmitter PSU (max 2 8 bits in 250mS (10 bits in 1s typic ±0.25% of range, (mA @ 250Ω, V to ±0.5% for increasing burden (to Reinforced safety isolation from in 1xDC Excitation output. Plug-in Modu	cal, >10 bits in $\Omega$ @ 2kΩ). Deg to 500Ω specific puts and otherwise 2 & 3. <b>Caut</b>	>1s typical). rades linearly cation limit). r outputs.
Accuracy: solation: Iransmit PSU 2-3 Type:	adjustable Transmitter PSU (max 2 8 bits in 250mS (10 bits in 1s typic ±0.25% of range, (mA @ 250Ω, V to ±0.5% for increasing burden (to Reinforced safety isolation from in 1xDC Excitation output. Plug-in Modu Transmit PSU is supported. Do in	cal, >10 bits in $(2000000000000000000000000000000000000$	>1s typical). rades linearly cation limit). r outputs. ion: Only one positions.
Resolution: Accuracy: Isolation: Transmit PSU 2-3 Type: Power Rating:	adjustable Transmitter PSU (max 2 8 bits in 250mS (10 bits in 1s typic ±0.25% of range, (mA @ 250Ω, V to ±0.5% for increasing burden (to Reinforced safety isolation from in 1xDC Excitation output. Plug-in Modu	cal, >10 bits in $\ell$ @ $2k\Omega$ ). Deg $0.500\Omega$ specific puts and other ales 2 & 3. <b>Caut</b> int fit in both $0.500\Omega$ minimum.	>1s typical). rades linearly cation limit). r outputs. ion: Only one positions. m resistance.

Reinforced safety isolation from inputs and other outputs.

Isolation:

COMMUNICATIONS  PC Configuration	
PC Configuration Functions	PC software configuration, data extraction and profile creation
	PC software configuration, data extraction and profile creation.
Connection: Isolation:	RS232 via PC Configurator Cable to RJ11 socket under case.
isolation.	Isolated from all inputs/output except SSR drivers. Not recommended for use in live applications.
RS485	
Functions	Setpoint broadcast master or general communications slave
	(inc. extraction of data recordings, transfer of configuration &
	profile files to/from PC software).
Connection:	Plug-in Module Slot A. Connection to rear terminals 16-18.
Protocol:	Modbus RTU.
Address Range	Slave address 1-255 or Setpoint master broadcast mode.
Supported Speeds:	4800, 9600, 19200, 38400, 57600 or 115200 bps.
Data Type:	10 or 11 (1 start & 1 stop bit, 8 data bits plus 1 optional parity bit).
Isolation:	240V reinforced safety isolation from all inputs and outputs.
Ethernet	
Functions	General communications (inc. extraction of data recordings
Connection:	transfer of configuration & profile files to/from PC software).  Locates in Module Slot A. Connection via RJ45 connector or
Connection:	top of case.
Protocol:	Modbus TCP. Slave only.
Supported Speed:	10BaseT or 100BaseT (automatically detected).
Isolation:	240V reinforced safety isolation from all inputs and outputs
USB	2.51. John of Sea Salety Isolation from all impute and outputs
Functions	Extraction of data recordings, transfer of configuration & pro-
1 U.IUIIOI 13	files files to/from PC software or direct to another controller.
Connection:	Connection via optional front mounted connector.
Protocol:	USB 1.1 or 2.0 compatible. Mass Storage Class.
Supply Current:	Up to 250mA.
Targeted Peripheral:	USB Memory Stick with FAT32 formatted file system.
Isolation:	Reinforced safety isolation from all inputs and outputs.
LOOP Control	Troining out out to location from an impate and outputs.
Control types	1 or 2 control loops, each with either standard PID (single or
Control types	dual control) or Valve Motor Drive (3-point stepping PID control).
	2 internally linked cascade loops, with standard PID (single or
	dual control) or Valve Motor Drive (3-point stepping PID control)
	1 Ratio loop for combustion control.
VMD Feedback	Second input can provide valve position feedback or flow in-
	dication. Feedback not required or used for control algorithm
Tuning Types:	Pre-tune, Auto Pre-tune, Self-tune or manual tuning with up to
Online Online alsoline as	5 PID sets stored internally.
Gain Scheduling	Automatically switches the 5 PID sets at user definable break- points relating to PV or SP value.
Proportional Bands:	Single (Primary) or Dual (Primary & Secondary - e.g. Heat &
roportional Bando.	Cool) 1 to 9999 display units or On-Off control.
Automatic Reset:	Integral Time Constant, 1s to 99min 59s or OFF
Rate:	Derivative Time Constant, 1s to 99 min 59s or OFF
Manual Reset:	Bias 0 to 100% (-100% to +100% with Dual control).
Deadband/	Overlap (+ve values) or Deadband (-ve values) between Prima-
Overlap:	ry & Secondary Proportional Bands for Dual Control, Adjust-
	able In display units - limited to 20% of the combined primary
Differenti-1	& secondary proportional band width.
Differential:	ON-OFF switching differential 1 to 300 display units
Auto/Manual Control:	Selectable with "bumpless" transfer when switching betweer Automatic and Manual control.
Cycle Times:	Selectable from 0.5s to 512s.
Setpoint Ramp:	Ramp rate selectable 1 to 9999 LSDs per hour or Off (infinite)
ALARMS	Than prace selectable into 3333 Lobs per flour of Off (infillite)
	7 alarme can be assigned as Process High: Process Low DV
Alarm Types:	7 alarms can be assigned as Process High; Process Low; PV-SP Deviation; Band; Control Loop; Rate Of Signal Change per
	minute – all with adjustable minimum duration* before activa-
	tion and optional start-up inhibit function.
	Input Signal Break; % Recorder Memory Used, Control Power
	High, Control Power Low or Unused.
	*CAUTION: If the duration is less than this time, the
Alarm Hysteresis:	alarm will not activate no matter what the signal value is.  Adjustable deadband from 1 LSD to full span (in display units)
wanti riyotelesis.	for Process, Band or Deviation Alarms.
Combination Alarm &	<del> </del>
Events Outputs:	running or ended) to switch an output. This can be when the
	condition is true, or the condition is not true.
DATA RECORDER	
Recording Memory:	1Mb non-volatile flash memory. Data retained when power is
	turned off.
Recording Interval:	1; 2; 5; 10; 15; 30 seconds or 1; 2; 5; 10; 15; 30 minutes.
Recording Capacity:	Dependent on sample rate and number of values recorded.
	Example: Two values will record for 21 days at 30s intervals.
	More values or faster sample rates reduce the duration.
RTC Battery Type:	VARTA CR 1616 3V Lithium.
	Clock runs for >1 year without power.

Real Time Clock error <1 second per day.

RTC accuracy

Profile Capacity	In be purchased from your supplier if the feature is disabled.  Max 255 segments, shared by max 64 profiles
Segment Types	Ramp Up/Down over time, Ramp Rate Up/Down*, Step
ocginent types	Dwell, Hold, Loop, Join A Profile, End or Repeat Sequence Then End. *Ramp Rate Up/Down is not available when profile controls two loops
Timebase	hh:mm:ss (Hours, Minutes & Seconds).
Segment Time	Maximum segment time 99:59:59 hh:mm:ss. Use loop-back for longer segments (e.g. 24:00:00 x 100 loops = 100 days).
Ramp Rate	0.001 to 9999.9 display units per hour.
Hold Segment Release	Release With Key Press, At Time Of Day or Digital Input.
Profile Starting Point	The first segment setpoint(s) begin from either the setpoint, or current measured input value, of the controlled loop(s)
Delayed Start	After 0 to 99:59 (hh:mm) delay, or at specified day(s) & time.
End On	Keep Last Profile Setpoint, Use Controller Setpoint or Contro Outputs Off.
Abort Action Power/signal Loss	Keep Last Profile Setpoint, Use Controller Setpoint or Contro Outputs Off.  Continue Profile, Restart Profile, Keep Last Profile Setpoint.
Recovery	Use Controller Setpoint or Control Outputs Off.
Auto-Hold	Hold if input >Band above and/or below SP for each segment.
Profile Control	Run, Manual Hold/Release, Abort or jump to next segment.
Profile Timing Accuracy	0.02% Basic Profile Timing Accuracy. ±<0.5 second per Loop, End or Join segment.
Profile Cycling	1 to 9999 or Infinite repeats per profile.
Sequence Repeats	1 to 9999 or Infinite repeats of joined profile sequence.
Loop Back	1 to 9999 loops back to specified segment.
Segment Events	Events turn on for the duration of the segment. For End Segments, the event state persists until another profile starts, the user exits from profiler mode, or the unit is powered down.
OPERATING CONDITION	ONS (FOR INDOOR USE)
Temperature:	0°C to 55°C (Operating), –20°C to 80°C (Storage).
Relative Humidity:	20% to 90% non-condensing.
Altitude	<2000m above sea level.
Supply Voltage and Power:	Mains versions: 100 to 240VAC ±10%, 50/60Hz, 24VA.  Low voltage versions: 20 to 48VAC 50/60Hz 15VA or 22 to 65VDC 12W.
Front Panel Cleaning	Wash with warm soapy water and dry immediately. Close the USB cover (if fitted) before cleaning.
CONFORMANCE NOR	MS
EMI:	Complies with EN61326-1:2013. CE
	Complies with UL61010-1 edition 3, CE, UL, cUL.
Safety Considerations:	Pollution Degree 2, Installation Category II.
Safety Considerations: Front Panel Sealing:	To IP66 (IP65 front USB connector). IP20 behind the panel.
Front Panel Sealing:	
Front Panel Sealing:  DISPLAY	To IP66 (IP65 front USB connector). IP20 behind the panel. (IP rating not recognized / approved by UL).
Front Panel Sealing:	To IP66 (IP65 front USB connector). IP20 behind the panel. (IP rating not recognized / approved by UL).  160 x 80 pixel, monochrome graphic LCD with a two color
Front Panel Sealing:  DISPLAY	To IP66 (IP65 front USB connector). IP20 behind the panel. (IP rating not recognized / approved by UL).
Front Panel Sealing:  DISPLAY  Display Type:	To IP66 (IP65 front USB connector). IP20 behind the panel. (IP rating not recognized / approved by UL).  160 x 80 pixel, monochrome graphic LCD with a two color (red/green) backlight.
Front Panel Sealing:  DISPLAY  Display Type:  Display Area:	To IP66 (IP65 front USB connector). IP20 behind the panel. (IP rating not recognized / approved by UL).  160 x 80 pixel, monochrome graphic LCD with a two color (red/green) backlight.  66.54mm (W) x 37.42mm (H).  0 to 9, a to z, A to Z, plus () @ ö ß - and _  One optional trend graph for each control loop each with 120 of 240 data points shown in a scrollable window. Data is not
Front Panel Sealing:  DISPLAY  Display Type:  Display Area:  Display Characters:	To IP66 (IP65 front USB connector). IP20 behind the panel. (IP rating not recognized / approved by UL).  160 x 80 pixel, monochrome graphic LCD with a two color (red/green) backlight.  66.54mm (W) x 37.42mm (H).  0 to 9, a to z, A to Z, plus () @ ö ß - and _  One optional trend graph for each control loop each with 120 of 240 data points shown in a scrollable window. Data is not retained when power turned off or if time base is changed.  Any active alarm, plus PV (solid) & SP (dotted) at sample time or Max/Min PV between samples (candle-stick graph).
Front Panel Sealing:  DISPLAY Display Type:  Display Area: Display Characters: Trend Views:	To IP66 (IP65 front USB connector). IP20 behind the panel. (IP rating not recognized / approved by UL).  160 x 80 pixel, monochrome graphic LCD with a two color (red/green) backlight. 66.54mm (W) x 37.42mm (H). 0 to 9, a to z, A to Z, plus () @ ö ß - and _ One optional trend graph for each control loop each with 120 of 240 data points shown in a scrollable window. Data is not retained when power turned off or if time base is changed.  Any active alarm, plus PV (solid) & SP (dotted) at sample time
Front Panel Sealing:  DISPLAY Display Type:  Display Area: Display Characters: Trend Views:  Trend Data:	To IP66 (IP65 front USB connector). IP20 behind the panel. (IP rating not recognized / approved by UL).  160 x 80 pixel, monochrome graphic LCD with a two color (red/green) backlight.  66.54mm (W) x 37.42mm (H).  0 to 9, a to z, A to Z, plus () @ ö ß - and _  One optional trend graph for each control loop each with 120 of 240 data points shown in a scrollable window. Data is not retained when power turned off or if time base is changed.  Any active alarm, plus PV (solid) & SP (dotted) at sample time or Max/Min PV between samples (candle-stick graph). Auto scales from 2 to 100% of Input Span.  1; 2; 5; 10; 15; 30 seconds or 1; 2; 5; 10; 15; 30 minutes.
Front Panel Sealing:  DISPLAY Display Type:  Display Area: Display Characters: Trend Views:  Trend Data:  Trend Sample Rate:	To IP66 (IP65 front USB connector). IP20 behind the panel. (IP rating not recognized / approved by UL).  160 x 80 pixel, monochrome graphic LCD with a two color (red/green) backlight.  66.54mm (W) x 37.42mm (H).  0 to 9, a to z, A to Z, plus () @ ö ß - and _  One optional trend graph for each control loop each with 120 of 240 data points shown in a scrollable window. Data is not retained when power turned off or if time base is changed.  Any active alarm, plus PV (solid) & SP (dotted) at sample time or Max/Min PV between samples (candle-stick graph). Auto scales from 2 to 100% of Input Span.  1; 2; 5; 10; 15; 30 seconds or 1; 2; 5; 10; 15; 30 minutes.
Front Panel Sealing:  DISPLAY Display Type:  Display Area: Display Characters: Trend Views:  Trend Data:  Trend Sample Rate:  DIMENSIONS	To IP66 (IP65 front USB connector). IP20 behind the panel. (IP rating not recognized / approved by UL).  160 x 80 pixel, monochrome graphic LCD with a two color (red/green) backlight.  66.54mm (W) x 37.42mm (H).  0 to 9, a to z, A to Z, plus () @ ö ß - and _  One optional trend graph for each control loop each with 120 of 240 data points shown in a scrollable window. Data is not retained when power turned off or if time base is changed.  Any active alarm, plus PV (solid) & SP (dotted) at sample time or Max/Min PV between samples (candle-stick graph).  Auto scales from 2 to 100% of Input Span.  1; 2; 5; 10; 15; 30 seconds or 1; 2; 5; 10; 15; 30 minutes.  Set independently for each trend graph.
Front Panel Sealing:  DISPLAY Display Type:  Display Area: Display Characters: Trend Views:  Trend Data:  Trend Sample Rate:  DIMENSIONS  Weight: Size: Mounting Panel:	To IP66 (IP65 front USB connector). IP20 behind the panel. (IP rating not recognized / approved by UL).  160 x 80 pixel, monochrome graphic LCD with a two color (red/green) backlight.  66.54mm (W) x 37.42mm (H).  0 to 9, a to z, A to Z, plus () @ ö ß - and _  One optional trend graph for each control loop each with 120 of 240 data points shown in a scrollable window. Data is not retained when power turned off or if time base is changed.  Any active alarm, plus PV (solid) & SP (dotted) at sample time or Max/Min PV between samples (candle-stick graph).  Auto scales from 2 to 100% of Input Span.  1; 2; 5; 10; 15; 30 seconds or 1; 2; 5; 10; 15; 30 minutes. Set independently for each trend graph.  0.65 kg maximum.  96 x 96 mm (Front Bezel). 117 mm (Depth Behind Panel).  Panel must be rigid. Maximum thickness 6.0mm (0.25 inch).
Front Panel Sealing:  DISPLAY Display Type:  Display Area: Display Characters: Trend Views:  Trend Data:  Trend Sample Rate:  DIMENSIONS  Weight: Size:	To IP66 (IP65 front USB connector). IP20 behind the panel. (IP rating not recognized / approved by UL).  160 x 80 pixel, monochrome graphic LCD with a two color (red/green) backlight.  66.54mm (W) x 37.42mm (H).  0 to 9, a to z, A to Z, plus () @ ö ß - and _  One optional trend graph for each control loop each with 120 of 240 data points shown in a scrollable window. Data is not retained when power turned off or if time base is changed.  Any active alarm, plus PV (solid) & SP (dotted) at sample time or Max/Min PV between samples (candle-stick graph).  Auto scales from 2 to 100% of Input Span.  1; 2; 5; 10; 15; 30 seconds or 1; 2; 5; 10; 15; 30 minutes. Set independently for each trend graph.  0.65 kg maximum.  96 x 96 mm (Front Bezel). 117 mm (Depth Behind Panel).

Refer to Communications Configuration on page 6 for general communications settings, and Configuration via Software in section 22 if you need to set the Ethernet options IP



NOTE: The Full Product Manual (from your supplier) has detailed communications protocol and parameter addressing information.

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# 20. SCREEN SEQUENCES

Menus & screens displayed depend on how the instrument is configured. Most screens revert to Operation Mode after 2 minutes without key activity, those marked  $\odot$  below persist. Menus marked  $\odot$  = Require un-lock codes for access. Screens marked **W** are repeated in the Setup Wizard. Screens marked are only shown if enabled in Display Configuration.

### Screen Navigatio

		Operation Mode:		- Screens marked 🖸 are only shown if they are enabled in Display Configuration.	
		Calibration Check Due Warning	(3)	If Calibration Reminder is set in Input Configuration, and the due date has passed Recorder version only. Press $\nabla + \Delta$ to postpone of	calibration.
		LED Labels:	<u> </u>	ED indicator functions. Defaults are PRI, SEC, TUNE & ALARM - LED functions and their labels can be altered with the configuration s	
	9 c	Process Value & Setpoint (or MAN):	S	Process values and effective Setpoint (%Manual Power in Manual Mode or Valve Open / Stop / Close for VMD Manual Mode).	oonware.
	Single Loop	Bar Graphs:			VMD mode).
,				Control Deviation graph (±5% span) and Power graph (0-100% primary, ±100% primary & secondary or Valve OPEN/STOP/CLOSE in \ If VMD Control with input 2 used for position feedback, the power bar-graph shows 0 to 100% valve position.	
on S	٥ و	LED Labels:	(1)	ED indicator functions. Defaults are PRI, SEC, TUNE & ALARM – LED functions and their labels can be altered with the configuration softw	
ᇗ	Two	Process Value & Setpoints (or MAN):		Process values and effective Setpoint values for both loops (%Manual Power in Manual Mode or Valve Open / Stop / Close for VMD Manual	
<u>.</u>		Bar Graphs:		Control Deviation graphs (±5% span) and Power graphs (0-100% primary, ±100% primary & secondary or Valve OPEN / STOP / CLOSE in	VMD mode).
ee.	Cascade	LED Labels: Cascade Status, Master & Slave	(3)	LED indicator functions Defaults are PRI, SEC, TUNE & ALARM - these labels can be altered with configuration software.	tor Cotnoint value (Clave
Š	ont	Process Values & Setpoint (or MAN):		Cascade Status. Cascade = Cascade operating; Cascade Open = master / slave loops not linked. Master & Slave Process Values. Mast Setpoint if Cascade Open, or Manual Power level in Manual Mode).	ster Setpoint value (Slave
ase	ဗ္ဗဗ	Bar Graphs:		Control Deviation graph (±5% span) and Power graph (0-100% primary, ±100% primary & secondary or Valve OPEN / STOP / CLOSE in V	VMD mode).
٠٠٠ ط	_	LED Labels:	(3)	EED indicator functions. Defaults are PRI, SEC, TUNE & ALARM - these labels can be altered with configuration software.	
	Ratio Contro	Ratio:		Relative Ratio value and relative Setpoint value.	
-	සිදු	Ratio Setpoint (or MAN):		Ratio Setpoint value (or Manual Power level when in Manual Mode).	
		Bar Graph:		Control Deviation graph (±5% span) and Power graph (0-100%).	
	•	Profile Control		If a profile is running, from: Do Nothing; Abort Profile (end immediately); Jump to Next Profile Segment; Hold Profile or Release H	Hold
		LED Labels:	1	ED indicator functions. Defaults are PRI, SEC, TUNE & ALARM - these labels can be altered with configuration software.	
ı	Profile Info	Process Value & Setpoints (or MAN):	0	Process values and effective Setpoint values (%Manual Power in Manual Mode or valve Open / Stop / Close for VMD Manual Mode or valve Op	lode).
	윤트	Bar Graphs:		Profile name & progress bar graph with Running/Held/Stopped indicator.	,-
ı				Current profile segment progress bar graph, with segment number and type.	
	_	Event Status		Active / inactive status of all configured Events - Profiler mode only.	
	_	Cascade Mode		Cascade-Open breaks the master-slave link when commissioning & tuning. Slave SP is adjustable directly. Caution: Return to Cascade	
	٠	Auto/Manual Control Selection		Switches the loop shown between automatic and manual control - setpoint replaced by manual power level in manual mode. The	nese screens possible r each control loop in
		Setpoint Value Display & Adjustment		tur view and adjust local (internal) serpoints for the loop. The lactive SP is marked Hemote serpoints are read only.	rn - if configured for
		Setpoint Ramp Rate		Setpoint Ramp Rate adjustment for the loop shown (in display units per hour).	loop or cascade peration.
	٠	Select Active Setpoint		Selects if the main or alternate setpoint is active for the loop shown.	Joration.
	•	Control Enable		Enables/disables the control loop outputs for the loop shown - setpoint is replaced by "OFF" when disabled.	
		Alarm Status		Lists any active alarms. The titles "Alarm n" can be replaced with the PC configuration software to a user defined 8 character na	ame for each alarm.
	•	Clear Latched Outputs		Hold down $\nabla$ or $\Delta$ for 3 seconds to clear selected latched output – Output only resets if the condition that caused it to latch on is no	o-longer present.
		Recorder Memory Full Warning		Warns if the recorder memory is used up and that recording has either stopped or is overwriting older data if in FIFO recording m	mode.
	•	Manual Recorder Trigger		Set the manual recording trigger on or off. Even if set to off, recording will still take place if another recording trigger is active.	
	•	Recorder Status Information		Status (Recording or Stopped); active trigger icons; recording mode & time remaining and a %memory bar-graph - see the Data Re	ecorder, section 17.
	•	Trend View (Loop 1)		A trend graph of PV & SP, or the Max/Min value of the PV between samples. Any active alarm(s) are indicated at the top of the gr	raph.
	•	Trend View (Loop 2)		A trend graph of PV & SP, or the Max/Min value of the PV between samples. Any active alarm(s) are indicated at the top of the gr	raph.
		- Custom Display screens		Up to 50 Configuration parameters can be copied into Operation Mode using the PC software. In this mode they are not pass co	ada muskankad
					ode protected.
		o		Up to 50 Configuration parameters can be copied into Operation Mode using the PC software. In this mode they are not pass control Note: Operation Mode screens can be made globally read only from Display Configuration	ode protected.
	<u> </u>	Setup Wizard:	14/		ode protected.
	8	Setup Wizard Unlocking		Enter correct code number to access Setup Wizard. Default Value = 10	
	8			Enter correct code number to access Setup Wizard. Default Value = 10  Decide whether start wizard with current settings or default values (recommended). CAUTION: Resetting defaults all parame	eters, not just those
	8	Setup Wizard Unlocking		Enter correct code number to access Setup Wizard. Default Value = 10	eters, not just those
	8	Setup Wizard Unlocking	W	Enter correct code number to access Setup Wizard. Default Value = 10  Decide whether start wizard with current settings or default values (recommended). CAUTION: Resetting defaults all parame covered by the quick setup wizard. For more complex applications the user may have to reconfigure other Configuration Mode s	eters, not just those
	8	Setup Wizard Unlocking Reset Defaults or Continue	w	Enter correct code number to access Setup Wizard. Default Value = 10  Decide whether start wizard with current settings or default values (recommended). <b>CAUTION: Resetting defaults all parame covered by the quick setup wizard.</b> For more complex applications the user may have to reconfigure other Configuration Mode s instrument.	eters, not just those
		Setup Wizard Unlocking Reset Defaults or Continue - Screens marked w	w	Enter correct code number to access Setup Wizard. Default Value = 10  Decide whether start wizard with current settings or default values (recommended). CAUTION: Resetting defaults all parame covered by the quick setup wizard. For more complex applications the user may have to reconfigure other Configuration Mode s instrument.  Press O to select each major configuration parameter in turn. Follow the on-screen prompts to alter the values.	eters, not just those
		Setup Wizard Unlocking Reset Defaults or Continue  - Screens marked w Setup Wizard Completed	w	Enter correct code number to access Setup Wizard. Default Value = 10  Decide whether start wizard with current settings or default values (recommended). CAUTION: Resetting defaults all parame covered by the quick setup wizard. For more complex applications the user may have to reconfigure other Configuration Mode s instrument.  Press O to select each major configuration parameter in turn. Follow the on-screen prompts to alter the values.	eters, not just those settings before using the
		Setup Wizard Unlocking Reset Defaults or Continue  - Screens marked w Setup Wizard Completed Supervisor Mode:	w	Enter correct code number to access Setup Wizard. Default Value = 10  Decide whether start wizard with current settings or default values (recommended). CAUTION: Resetting defaults all parame covered by the quick setup wizard. For more complex applications the user may have to reconfigure other Configuration Mode s instrument.  Press O to select each major configuration parameter in turn. Follow the on-screen prompts to alter the values.  Confirms completion of the Setup Wizard. Exits to Operation Mode.  If Supervisor Mode is configured (requires PC software to configure screens sequence), enter correct code number to continue. I Press O to select up to 50 Configuration parameters in turn. Follow on-screen prompts to alter values. – see their Configuration Medical Press O to select up to 50 Configuration parameters in turn. Follow on-screen prompts to alter values. – see their Configuration Medical Press O to select up to 50 Configuration parameters in turn. Follow on-screen prompts to alter values. – see their Configuration Medical Press O to select up to 50 Configuration parameters in turn. Follow on-screen prompts to alter values. – see their Configuration Medical Press O to select up to 50 Configuration parameters in turn.	eters, not just those settings before using the Default Value = 10 lenu entry for details.
	<b>&amp;</b>	Setup Wizard Unlocking Reset Defaults or Continue  - Screens marked w Setup Wizard Completed Supervisor Mode: Supervisor Mode Unlocking - Supervisor Mode Screens Configuration Menu	w	Enter correct code number to access Setup Wizard. Default Value = 10  Decide whether start wizard with current settings or default values (recommended). CAUTION: Resetting defaults all parame covered by the quick setup wizard. For more complex applications the user may have to reconfigure other Configuration Mode s instrument.  Press © to select each major configuration parameter in turn. Follow the on-screen prompts to alter the values.  Confirms completion of the Setup Wizard. Exits to Operation Mode.  If Supervisor Mode is configured (requires PC software to configure screens sequence), enter correct code number to continue. Press © to select up to 50 Configuration parameters in turn. Follow on-screen prompts to alter values. – see their Configuration Melectric to the Configuration Melectric	eters, not just those settings before using the  Default Value = 10 lenu entry for details.
	<b>&amp;</b>	Setup Wizard Unlocking Reset Defaults or Continue  - Screens marked w Setup Wizard Completed Supervisor Mode: Supervisor Mode Unlocking - Supervisor Mode Screens Configuration Menu Configuration Mode Unlocking	w	Enter correct code number to access Setup Wizard. Default Value = 10  Decide whether start wizard with current settings or default values (recommended). CAUTION: Resetting defaults all parame covered by the quick setup wizard. For more complex applications the user may have to reconfigure other Configuration Mode s instrument.  Press O to select each major configuration parameter in turn. Follow the on-screen prompts to alter the values.  Confirms completion of the Setup Wizard. Exits to Operation Mode.  If Supervisor Mode is configured (requires PC software to configure screens sequence), enter correct code number to continue. I Press O to select up to 50 Configuration parameters in turn. Follow on-screen prompts to alter values. — see their Configuration Mode.  Refer to the Configuration sequences on the following formation about the Configuration mode and the Configuration Mode.	eters, not just those settings before using the Default Value = 10 lenu entry for details.
	<b>a</b>	Setup Wizard Unlocking Reset Defaults or Continue  - Screens marked w Setup Wizard Completed Supervisor Mode: Supervisor Mode Unlocking - Supervisor Mode Screens Configuration Menu Configuration Mode Unlocking Configuration Options	w	Enter correct code number to access Setup Wizard. Default Value = 10  Decide whether start wizard with current settings or default values (recommended). CAUTION: Resetting defaults all parame covered by the quick setup wizard. For more complex applications the user may have to reconfigure other Configuration Mode s instrument.  Press O to select each major configuration parameter in turn. Follow the on-screen prompts to alter the values.  Confirms completion of the Setup Wizard. Exits to Operation Mode.  If Supervisor Mode is configured (requires PC software to configure screens sequence), enter correct code number to continue. Press O to select up to 50 Configuration parameters in turn. Follow on-screen prompts to alter values. – see their Configuration Mode.  Refer to the Configuration Enter correct code number to access Configuration Mode. Default Value = 10	eters, not just those settings before using the Default Value = 10 lenu entry for details.
	<b>a</b>	Setup Wizard Unlocking Reset Defaults or Continue  - Screens marked w Setup Wizard Completed Supervisor Mode: Supervisor Mode Unlocking - Supervisor Mode Screens Configuration Menu Configuration Medu Configuration Options USB Menu	w	Enter correct code number to access Setup Wizard. Default Value = 10  Decide whether start wizard with current settings or default values (recommended). CAUTION: Resetting defaults all parame covered by the quick setup wizard. For more complex applications the user may have to reconfigure other Configuration Mode s instrument.  Press O to select each major configuration parameter in turn. Follow the on-screen prompts to alter the values.  Confirms completion of the Setup Wizard. Exits to Operation Mode.  If Supervisor Mode is configured (requires PC software to configure screens sequence), enter correct code number to continue. Press O to select up to 50 Configuration parameters in turn. Follow on-screen prompts to alter values. — see their Configuration Mode.  Enter correct code number to access Configuration Mode. Default Value = 10  Select required Configuration Menu Option from list. Press O to continue.	eters, not just those settings before using the Default Value = 10 lenu entry for details.
	<b>a</b>	Setup Wizard Unlocking Reset Defaults or Continue  - Screens marked w Setup Wizard Completed Supervisor Mode: Supervisor Mode Unlocking - Supervisor Mode Screens Configuration Menu Configuration Mode Unlocking Configuration Options USB Menu USB Mode Unlocking	w	Enter correct code number to access Setup Wizard. Default Value = 10  Decide whether start wizard with current settings or default values (recommended). CAUTION: Resetting defaults all parame covered by the quick setup wizard. For more complex applications the user may have to reconfigure other Configuration Mode s instrument.  Press O to select each major configuration parameter in turn. Follow the on-screen prompts to alter the values.  Confirms completion of the Setup Wizard. Exits to Operation Mode.  If Supervisor Mode is configured (requires PC software to configure screens sequence), enter correct code number to continue. Press O to select up to 50 Configuration parameters in turn. Follow on-screen prompts to alter values. – see their Configuration Mode.  Enter correct code number to access Configuration Mode. Default Value = 10  Select required Configuration Menu Option from list. Press O to continue.  Enter correct code number to access USB Menu. Default Value = 10	eters, not just those settings before using the Default Value = 10 lenu entry for details.
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	8	Setup Wizard Unlocking Reset Defaults or Continue  - Screens marked w Setup Wizard Completed Supervisor Mode: Supervisor Mode Unlocking - Supervisor Mode Unlocking - Supervisor Mode Unlocking Configuration Menu Configuration Menu Configuration Options  USB Menu USB Mode Unlocking Read/Write To USB Device Select Profile To Write Enter A File or Folder Name  Writing Profile/Configuration/Log Transfer Successful Select File Reading Profile/Configuration Transfer Successful Transfer Failure Recorder Control Recorder Mode Unlocking Manual Recorder Trigger Recorder Status Information	w	Decide whether start wizard with current settings or default Value = 10  Decide whether start wizard with current settings or default values (recommended). CAUTION: Resetting defaults all parame covered by the quick setup wizard. For more complex applications the user may have to reconfigure other Configuration Mode s instrument.  Press O to select each major configuration parameter in turn. Follow the on-screen prompts to alter the values.  Confirms completion of the Setup Wizard. Exits to Operation Mode.  If Supervisor Mode is configured (requires PC software to configure screens sequence), enter correct code number to continue. Press O to select up to 50 Configuration parameters in turn. Follow on-screen prompts to alter values. — see their Configuration Mode. Default Value = 10  Enter correct code number to access Configuration Mode. Default Value = 10  Select required Configuration Menu Option from list. Press O to continue.  Enter correct code number to access USB Menu. Default Value = 10  From: Read/Write Configuration File; Write Recorder Log File or Read/Write Profile File.  If writing a profile to the USB Memory Stick, choose a profile to write from the list provided.  Enter an 8-character folder name for logs, or a file name for configurations and profiles. An extension (bct for configurations, pautomatically. Caution: Existing files/folders with the same name will be over-written.  Recorder log, profile or configuration being written to USB. Caution: Do not disconnect USB device until completed! Data loss or configuration or Profile file to transfer from the USB stick. Caution: A configuration read overwrites all existing instrum. Profile or configuration is being read. Caution: Do not remove the memory stick whist this operation is in progress. Data loss of Confirmation of successful data transfer. Press O to continue  For write failures, check the disk space on the USB stick. For read failures, check the maximum number of profiles/segments is in Enter correct code number to access Data Recorder Me	Default Value = 10 lenu entry for details.  In Menu ing page for onfiguration  off for profiles) is added corruption may result.  ment settings.  or corruption may result.  not being exceeded  t or digital input).
	8	Setup Wizard Unlocking Reset Defaults or Continue  - Screens marked w Setup Wizard Completed Supervisor Mode: Supervisor Mode Unlocking - Supervisor Mode Unlocking - Supervisor Mode Unlocking Configuration Mode Unlocking Configuration Options  USB Mode Unlocking Read/Write To USB Device Select Profile To Write Enter A File or Folder Name  Writing Profile/Configuration/Log Transfer Successful Select File Reading Profile/Configuration Transfer Failure Recorder Control Recorder Mode Unlocking Manual Recorder Trigger Recorder Status Information Clear Recordings?	w	Enter correct code number to access Setup Wizard. Default Value = 10  Decide whether start wizard with current settings or default values (recommended). CAUTION: Resetting defaults all parame covered by the quick setup wizard. For more complex applications the user may have to reconfigure other Configuration Mode s instrument.  Press \(^\Delta\) to select each major configuration parameter in turn. Follow the on-screen prompts to alter the values.  Confirms completion of the Setup Wizard. Exits to Operation Mode.  If Supervisor Mode is configured (requires PC software to configure screens sequence), enter correct code number to continue. Press \(^\Delta\) to select up to 50 Configuration parameters in turn. Follow on-screen prompts to alter values. — see their Configuration Enter correct code number to access Configuration Mode. Default Value = 10  Enter correct code number to access Configuration Mode. Default Value = 10  From: Read/Write Configuration Menu Option from list. Press \(^\Delta\) to continue.  Enter correct code number to access USB Menu. Default Value = 10  From: Read/Write Configuration File; Write Recorder Log File or Read/Write Profile File.  If writing a profile to the USB Memory Stick, choose a profile to write from the list provided.  Enter an 8-character folder name for logs, or a file name for configurations and profiles. An extension (bct for configurations, pautomatically. Caution: Existing files/folders with the same name will be over-written.  Recorder log, profile or configuration being written to USB. Caution: Do not disconnect USB device until completed! Data loss or configuration or Profile file to transfer from the USB stick. Caution: A configuration read overwrites all existing instrum Profile or configuration is being read. Caution: Do not remove the memory stick whist this operation is in progress. Data loss of confirmation of successful data transfer. Press \(^\Delta\) to continue.  For write failures, check the disk space on the USB stick. For read failures, check the maximu	Default Value = 10 lenu entry for details.  In Menu ing page for onfiguration  off for profiles) is added corruption may result.  ment settings.  or corruption may result.  not being exceeded  t or digital input).
	8	Setup Wizard Unlocking Reset Defaults or Continue  - Screens marked w Setup Wizard Completed Supervisor Mode: Supervisor Mode Unlocking - Supervisor Mode Unlocking - Supervisor Mode Unlocking Configuration Mode Unlocking Configuration Mode Unlocking Configuration Options  USB Menu USB Mode Unlocking Read/Write To USB Device Select Profile To Write Enter A File or Folder Name  Writing Profile/Configuration/Log Transfer Successful Select File Reading Profile/Configuration Transfer Successful Transfer Failure Recorder Control Recorder Mode Unlocking Manual Recorder Trigger Recorder Status Information Clear Recordings? Profile Setup	w	Enter correct code number to access Setup Wizard. Default Value = 10  Decide whether start wizard with current settings or default values (recommended). CAUTION: Resetting defaults all parame covered by the quick setup wizard. For more complex applications the user may have to reconfigure other Configuration Mode s instrument.  Press Ü to select each major configuration parameter in turn. Follow the on-screen prompts to alter the values.  Confirms completion of the Setup Wizard. Exits to Operation Mode.  If Supervisor Mode is configured (requires PC software to configure screens sequence), enter correct code number to continue.  Press Ü to select up to 50 Configuration parameters in turn. Follow on-screen prompts to alter values. — see their Configuration Menter correct code number to access Configuration Mode. Default Value = 10  Enter correct code number to access Configuration Mode. Default Value = 10  From: Read/Write Configuration Menu Option from list. Press Ü to continue.  Enter correct code number to access USB Menu. Default Value = 10  From: Read/Write Configuration File; Write Recorder Log File or Read/Write Profile File.  If writing a profile to the USB Memory Stick, choose a profile to write from the list provided.  Enter an 8-character folder name for logs, or a file name for configurations and profiles. An extension (bct for configurations, pautomatically. Caution: Existing files/folders with the same name will be over-written.  Recorder log, profile or configuration being written to USB. Caution: Do not disconnect USB device until completed! Data loss or confirmation of successful data transfer. Press Ü to continue  Select Configuration is being read. Caution: Do not remove the memory stick whist this operation is in progress. Data loss of confirmation of successful data transfer. Press Ü to continue  For write failures, check the disk space on the USB stick. For read failures, check the maximum number of profiles/segments is in Enter correct code number to access Data Recorder Menu — Default Val	Default Value = 10 lenu entry for details.  In Menu ing page for onfiguration  off for profiles) is added corruption may result.  ment settings.  or corruption may result.  not being exceeded  t or digital input).
	8	Setup Wizard Unlocking Reset Defaults or Continue  - Screens marked w Setup Wizard Completed Supervisor Mode: Supervisor Mode Unlocking - Supervisor Mode Unlocking - Supervisor Mode Unlocking Configuration Mode Unlocking Configuration Mode Unlocking Configuration Options  USB Menu USB Mode Unlocking Read/Write To USB Device Select Profile To Write Enter A File or Folder Name  Writing Profile/Configuration/Log Transfer Successful Select File Reading Profile/Configuration Transfer Failure Recorder Control Recorder Mode Unlocking Manual Recorder Trigger Recorder Status Information Clear Recordings?  Profile Setup Profile Setup Menu Unlocking	w	Enter correct code number to access Setup Wizard. Default Value = 10  Decide whether start wizard with current settings or default values (recommended). CAUTION: Resetting defaults all parame covered by the quick setup wizard. For more complex applications the user may have to reconfigure other Configuration Mode's instrument.  Press © to select each major configuration parameter in turn. Follow the on-screen prompts to alter the values.  Confirms completion of the Setup Wizard. Exits to Operation Mode.  If Supervisor Mode is configured (requires PC software to configure screens sequence), enter correct code number to continue. Press © to select up to 50 Configuration parameters in turn. Follow on-screen prompts to alter values. – see their Configuration Mode. Default Value = 10  Enter correct code number to access Configuration Mode. Default Value = 10  From: Read/Write Configuration Menu Option from list. Press © to continue.  Enter correct code number to access USB Menu. Default Value = 10  From: Read/Write Configuration File; Write Recorder Log File or Read/Write Profile File.  If writing a profile to the USB Memory Stick, choose a profile to write from the list provided.  Enter an 8-character folder name for logs, or a file name for configurations and profiles. An extension (bct for configurations, pautomatically. Caution: Existing files/folders with the same name will be over-written.  Recorder log, profile or configuration being written to USB. Caution: Do not disconnect USB device until completed! Data loss or confirmation of successful data transfer. Press © to continue  For write failures, check the disk space on the USB stick. Caution: A configuration read overwrites all existing instrum. Profile or configuration is being read. Caution: Do not remove the memory stick whist this operation is in progress. Data loss of Confirmation of successful data transfer. Press © to continue  For write failures, check the disk space on the USB stick. For read failures, check the maximum number of profiles/segments	Default Value = 10 Idenu entry for details.  In Menu ing page for onliguration  off for profiles) is added corruption may result.  Into being exceeded  It or digital input).  Inderens section 17.
Read Write	8	Setup Wizard Unlocking Reset Defaults or Continue  - Screens marked w Setup Wizard Completed Supervisor Mode: Supervisor Mode Unlocking - Supervisor Mode Unlocking Configuration Menu Configuration Mode Unlocking Configuration Options  USB Menu USB Mode Unlocking Read/Write To USB Device Select Profile To Write Enter A File or Folder Name  Writing Profile/Configuration/Log Transfer Successful Select File Reading Profile/Configuration Transfer Successful Transfer Failure Recorder Control Recorder Mode Unlocking Manual Recorder Trigger Recorder Status Information Clear Recordings?  Profile Setup Profile Setup Menu Unlocking General Profile Configuration:	w	Enter correct code number to access Setup Wizard. Default Value = 10  Decide whether start wizard with current settings or default values (recommended). CAUTION: Resetting defaults all parame covered by the quick setup wizard. For more complex applications the user may have to reconfigure other Configuration Mode s instrument.  Press U to select each major configuration parameter in turn. Follow the on-screen prompts to alter the values.  Confirms completion of the Setup Wizard. Exits to Operation Mode.  If Supervisor Mode is configured (requires PC software to configure screens sequence), enter correct code number to continue.  Press U to select up to 50 Configuration parameters in turn. Follow on-screen prompts to alter values. − see their Configuration Menter to continue.  Enter correct code number to access Configuration Mode. Default Value = 10  From: Read/Write Configuration Menu Option from list. Press U to continue.  Enter correct code number to access USB Menu. Default Value = 10  From: Read/Write Configuration File; Write Recorder Log File or Read/Write Profile File.  If writing a profile to the USB Memory Stick, choose a profile to write from the list provided.  Enter an 8-character folder name for logs, or a file name for configurations and profiles. An extension (bct for configurations, pautomatically, Caution: Existing files/folders with the same name will be over-written.  Recorder log, profile or configuration being written to USB. Caution: Do not disconnect USB device until completed! Data loss or a Confirmation of successful data transfer. Press U to continue  Select Configuration read overwrites all existing instrum Profile or configuration is being read. Caution: Do not remove the memory stick whist this operation is in progress. Data loss of Confirmation of successful data transfer. Press U to continue  For write failures, check the disk space on the USB stick. For read failures, check the maximum number of profiles/segments is a configuration of successful data transfer. Press U to contin	Default Value = 10 lenu entry for details.  In Menu ing page for onfiguration  off for profiles) is added corruption may result.  In the details of the corruption may result.  In the details of the corruption may result.  In the details of the corruption may result.  In the detail of the corruption may result.

[	Crea	te a Profile	()	Sub-menu to Create profiles. A warning is displaye	ed if 64 profiles or 255 segments is exceeded. Press		J.
	E	Inter Profile Name	(1)	Up to 16 characters can be used to give each profile a unique descriptive name.			
	٨	Number of Loops (Profile Type)	(1)	Select if this profile will: 1) Control the setpoint of first loop only or; 2) Control the setpoint of both loop. or; 3) Control Cascade This setting cannot be edited later.			
				Note: the segment type and time settings are comm			
Dotaile	igi P	Profile Starting Setpoint	(1)	From: Current Setpoint or Current Process Variable. Us	ses the measured PV or effective SP when profile is starte	d, for the beginning of the first segment.	
	Pel P	Profile Start Trigger	(1)	From: None (profile start is not delayed); After Delay or	Day and Time. Note: Timer triggers only effective when T	imer Start Function is set to Enabled.	
1	P P	Profile Start Time	(3)	The time (hh:mm) when the profile should run. – if Day $$	and Time is the Profile Start Trigger. Caution: Take call	re not to clash with other profiles.	
	eac	Profile Start Day(s)	(3)	Day(s) when the profile should run. From: Mon; Tue; W	ed; Thu; Fri; Sat; Sun; Mon-Fri; Mon-Sat; Sat-Sun or Eve	ery Day if Day and Time is the Trigger.	
	I,	Profile Start Delay Time	(L)	The delay time, up to 99:59 (hh:mm), for a profile to wa	ait after the start request has been given. Profile only bed	ins when this time has elapsed.	
1	Profile 1	Profile Recovery Method	(1)	Power-on action if profile was running at power-do	own (e.g. a power cut), or following correction of a sig	anal break. From: Control outputs off:	
	2	, , , , , , , , , , , , , , , , , , , ,	_	Restart profile; Maintain last profile setpoint; Use c	ontroller setpoint; Continue profile from where it was	when power failed.	
	P	Profile Recovery Time	(1)	Recovery Method is ignored (profile continues from	n where power failed), if power is off for less than this	s time. Max 99:59 (hh:mm) Recorder	only.
	P	Profile Abort Action	(1)	Action after profile is forced to stop before its end.	From: Control outputs off; Maintain last profile setpo	oint or Use controller setpoint.	
	P	Profile Cycles	(1)	The number of times the program should run each	time it is started (1-9999 or Infinite).		
-	S	Segment Number	(3)	Shows the number of the profile segment being cre	eated from 1-255		
	S	Segment Type	(T)	From: Ramp Time (time to reach target SP): Ramp	Rate (rate of change towards target SP - Single loc	op profiles only): Step (jump to target S	SP). Dwell
		9	0	(keep current SP); Hold (hold profile until released);	; Loop (back to previous segment); Join (to another p	profile); End or Repeat Sequence Then	End.
	L	.oop 1 Target Setpoint	(1)	The setpoint value Loop 1 should reached by the e	end of this segment if type is Ramp Time, Ramp Rate	e or Step.	
	L	.oop 2 Target Setpoint	(1)	The setpoint value Loop 2 should reached by the $\boldsymbol{\varepsilon}$	end of this segment if type is Ramp Time or Step Tv	vo-Loop profiles only.	
	S	Segment Ramp Time	(3)	The time (hh:mm:ss) for the loops to reach their Se	gment Target Setpoints - if segment type is Ramp Ti	me.	
	S	Segment Ramp Rate	(L)	The rate of change towards the Segment Target Se	etpoint if segment type is Ramp Rate. The rate can b	e set from 0.001 to 9999.9 units per ho	our.
		Segment Dwell Time	_	The time (hh:mm:ss) the loop(s) maintain their curre			
	፹	Number of Loops		, , , , , , , , , , , , , , , , , , , ,	loop back to a previous segment, before continuing	forward to the next segment	
-	De l'		_			ŭ	
1	せっ	Slave Maximum Setpoint	(1)	·	allowed for the Slave Temperature. Present for Ramp		
	Ĕ B	Back to Segment Number	_		ck to from the list of segments shown. Note: loops m		
	Segr	.oop 1 Auto-Hold Type	(1)	From: None (no auto-hold); Above Setpoint (hold if	too high); Below Setpoint (hold if too low) or Band (h	nold if too high or low).	
	<u>e</u> L	.oop 1 Auto-Hold Band Value	(1)	The distance from loop 1 setpoint beyond which the	ne profile is held.	For Two-Loop Profiles, either loop can	cause
	Profile	.oop 2 Auto-Hold Type	(1)	Options as for Loop 1 - Two-Loop profiles only.		the profile to hold.  Note: The Profile continues only whe	en both
1		.oop 2 Auto-Hold Band Value	(D)	The distance from loop 2 setpoint beyond which th	ne profile is held.	loops are back within their Auto-Hole	d Bands.
		Hold Segment Release Type	_	• • •	ator/Digital input or be set wait until a specified Time	of Day - Recorder version only	
		Hold Release Time			ease - if Release Type is Time Of Day. The segment i	•	timo
				* * * * * * * * * * * * * * * * * * * *	., .		uirie.
		imes To Repeat Sequence		The number of times the entire sequence of profiles should run. – if the last segment is Repeat Sequence Then End.			
		Segment End Type	(1)	Action after profile ends. From: Control outputs off; Maintain last profile setpoint; Use controller setpoint.			
	S	Select Profile To Join	(1)	Choose a profile to join to from the list provided. Chosen profile will start immediately the current profile ends. – if final segment set as a Join.			
	E	vent n	(3)	Select if events (1 to 5) are active during this segm	ent. For end segments, Active events stay on until the	ne unit exits profiler mode or a new prof	file runs.
	Е	Edit A Profile Header		Choose the profile to be edited from the list of prof	file names provided. The number of loops in a profile	cannot be changed. For profile he	eader &
	Е	Edit A Profile Segment		Choose the profile and segment to be edited from	the lists. Other segments cannot be changed into En		
		nsert A Segment			om the lists provided. End, Join or Repeat segments		ile" above
		Delete A Segment			eted from the lists provided. End, Join or Repeat seg	ments cannot be deleted.	
		Delete A Profile		Choose the profile to be deleted from the list of na	•		
l.		Delete All Profiles		Deletes all profiles from memory. The user is promp	pted to confirm that all profiles should be deleted. C	aution: Use with care!	
		Profile Control		5			
		Profile Control Menu Unlocking		Enter correct code number to access the Profile Co			
	Р	Profile Control			ile (end immediately); Jump to Next Profile Segment; s; Select Profile; End Profile Control; (return to std. co		
	S	Select Profile			the selected profile starts (after a delay or at the Day		tion is via
	Č	occor rome		& Time if set and enabled).	the selected promo starts (after a delay of at the bay	digital input. If not choose from the list	
-	S	Service and Product Info:		/		***************************************	
	P	Plug-in Modules		Lists the type of Plug-in Modules (if any) fitted in m	nodule Slots 1, 2, 3 or A - see model code matrix for	full list of field upgradeable plug-in opt	ions.
	В	Base Options			niversal/Aux input; Output 4 & 5 Relay; Output 5 & 6		
	C	Optional Features		Lists which other optional features are fitted/enable	ed, from: Profiler; USB Port; Data Recorder and 8 Dig	gital Inputs.	
	F	irmware Information		Type and version of firmware.			
		Product Revision Level		Software and Hardware update status			
		Serial Number		The Instrument serial number.			
		Date of Manufacture		The instrument Date of Manufacture (date format is			
		nput 1 Calibration Status			Thermocouple CJC inputs. Caution: All should be		
		nput 2 Calibration Status			d Thermocouple CJC inputs. – Two Input versions on	ly. Caution: All should be "Calibra	ted".
		or Service Contact Information		Contact information for Service, Sales or Technical	Support.		
	_	Automatic Tuning					
		Automatic Tuning Mode Unlocking		Enter correct code number to access Automatic Tu	~	tral laan	
		Control loop 1 or 2			quired the screens can be repeated for the other cor		
		Cascade Mode			. Note: When slave tune complete, repeat choosin		
		Pre-Tune Method		Pre-Tune Standard or Pre-Tune at Value	Standard Pre-Tune tests the process response ha Pre-Tune at Value allows the user to specify where possible over-shoot! The new PID terms can be	n-way from the activation point to the the process test will occur. Caution: C	serpoint. <b>Consider</b>
		Pre-Tune Value		Set the value at which process is tested.	possible over-shoot! The new PID terms can be	stored to any set, but without changing	the "ac-
		Pre-Tune Save Location		Store pre-tune result to one of 5 PID sets.	tive set" from control configuration	o Of Made on disable 1 1 1 1 1 2 1 2	/ -5
	Н	Run Pre-Tune on Set n Now?	W	Runs Pre-Tune for the chosen PID Set.	Note: Pre-Tune is disabled if the control loop is in C from SP; if a Ramping Setpoint is set, or during Profil	יח-טוז ואוספפ or aisabled; if the PV is <5% les. The reason is shown if pre-tune cann	∞ от span not run.
		Pre-Tune Status		Pre-Tune status: Running or Stopped.			
		ngage Self-Tune		Runs Self-Tune for the active DID Set	Note: Self-Tune disabled if control is On Off or disa	hlad If annunged during cotnoint romain	an profile
	Е	Engage Self-Tune Self-Tune Status		Runs Self-Tune for the active PID Set. Self-Tune status: Running or Stopped	Note: Self-Tune disabled if control is On-Off or disa ramps or pre-tuning it is suspended until the ramp of	bled. If engaged during setpoint rampin r pre-tune is completed. The reason is s	ng, profile shown if it
	Е	Engage Self-Tune Self-Tune Status		Runs Self-Tune for the active PID Set. Self-Tune status: Running or Stopped. Enables/Disables Automatic Pre-Tune.	Note: Self-Tune disabled if control is On-Off or disa ramps or pre-tuning it is suspended until the ramp o cannot engage  Note: Attempts to tune the active PID set using standa	r pre-tune is completed. The reason is s	shown if it

# Profile Notes:

- a) The profile type needs to match the control type, i.e. single, dual or cascade.
- b) The Slave Maximum Setpoint parameter is not used when the profiles are not running.
- c) Only the Loop 1 Auto-Hold (Master) works when used for Cascade, the Loop 2 Auto-Hold has no effect.
- d) The Pre-Tune can be engaged whilst a profile is running, except within a Ramp or Step segment.

# 21. SUPERVISOR MODE

The purpose of this function is to allow selected operators access to a lock-code protected sub-set of the configuration parameters, without providing them with the higher level configuration menu unlock code. The PC software is used to copy up to 50 parameters from configuration menus for inclusion in the supervisor mode screen sequence. If the parameter is normally displayed on screen with another parameter, both parameters will appear.



NOTE: Supervisor mode is only available if one or more screens have been configured from the PC software. It is not possible to configure supervisor mode screens without using the software.

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Input Configuration	
Input 1 Setup	Sub-menu to setup 1st input. Press ♥ + ∪ to return to Input Configuration Menu
Input Type	w From Thermocouple, RTD and Linear inputs (mA, mV & VDC or Potentiometer). – see the specifications (page 4) for details. Note: Always re-check units &
Engineering Units	w Select display units from: °C; °F; K; bar; %; %RH; pH; psi or none. Temperature sensor inputs are limited to °C; °F  W Display resolution with 0: 1: 2 or 3 decimal places. Temperature sensor inputs are limited to 0 or 1 decimal places. Input type
Decimal Point Position	w Display resolution with 0, 1, 2 of 3 decimal places. Temperature sensor inputs are infliced to 0 of 1 decimal place.
Scaled Input Lower Limit Scaled Input Upper Limit	Sets the usable span (min = 100 display units, max = range limits - see specs) for temperature inputs. For linear inputs, the Upper & Lower Limits define values shown (from -9999 to 9999.9) when input is at minimum and maximum values. Min span = 100 display units.
Enable Multi-Point Scaling	Enables/disables Linear Input Multi-Point Scaling – not possible with temperature sensor inputs
Scaling Point n	If Multi-Point Scaling is enabled, up to 15 breakpoints* link % input values with the value to be displayed at that input. Adjustable between the linear in
Display Value n	scale limits. 'A Scaling Point set to 100% input ends the sequence.
Cold Junction Compensation	Enables/disables the internal Thermocouple Cold Junction Compensation. The default value is Enabled. – Thermocouple inputs only.
Input Filter Time	Filters unwanted noise from input signal. Adjustable from 0.1 to 100.0 seconds or OFF (default = 2s). Caution: Use with care!
Input 1 Calibration	Sub-menu to calibrate 1st input. Press ♀+ ♡ to return to Input Configuration Menu
Calibration Type	Base (normal) Calibration; Single or 2 point Calibration. Use single or two point calibration to adjust readings. Caution: Use with care!
Calibration Offset	The single point calibration offset. Limited by input span, +Ve values add to, -Ve values subtract from measured input. Default = "OFF".
Calibration Low Value	The controller displayed value at which the low end calibration is being performed. Choose a value close to the bottom of application range.
Calibration Low Offset	Set low offset at known calibrated input minus the displayed value (e.g. for low cal displayed as 10, if known actual =10.4, Low offset would be +0.4).
Calibration High Value	The controller displayed value at which high end calibration is being performed. Choose a value close to the top of application range.
Calibration High Offset	Set high offset at known calibrated input minus the displayed value (e.g. for high cal displayed as 500, if known actual =497 Low offset would be -3).
nput 2 Setup nput Usage	Sub-menu to calibrate 2nd input – if fitted. Press ♥ + ७ to return to Input Configuration Menu w Standard (following options as for input 1), Not Used, Redundant or Feedback. Redundant or Feedback disables use as 2nd control loop.
Std use. Input 2 type, units, scaling etc	. options as for input 1. Redundant: Input 1 settings duplicated. Feedback: mA, mV, VDC or Potentiometer only and used for valve or flow indication only.  Press ♥ + ♠ to begin feedback limit adjustment for the minimum valve travel - if Input 2 is Feedback.
Set Valve Lower Position	Move valve to minimum travel (e.g. fully closed) using
Set Valve Upper Position	Press  ♥ + ♦ to begin feedback limit adjustment for the maximum valve travel - if Input 2 is Feedback
	Move valve to maximum travel (e.g. fully open) using ♥ to close or ♠ to open. Pressing ♥ + ♠ together stores feedback value at maximum travel.
nput 2 Calibration	Sub-menu to calibrate 2nd input – if fitted (procedure as shown for Input 1 Calibration). Press $ ar  abla + ar  abla$ to return to Input Configuration Menu
Calibration Reminder	Sub-menu to setup a calibration reminder – if recorder is fitted. Press $\   \vec{\nabla} + \mathcal{ O} $ to return to Input Configuration Menu
Calibration Reminder Enable/Disable	Enables/disables a Calibration Reminder shown at start-up (and daily thereafter), if the due date has passed.
Calibration Reminder Date	Sets the due date for Calibration Reminder - Recorder version only.
Auxiliary Input A Setup	Sub-menu to setup auxiliary A input – if fitted. Press ♥ + ∪ to return to Input Configuration Menu
Auxiliary Input A Type	From 0-20 or 4-20 mA; 0-5, 1-5, 0-10 or 2-10 VDC Linear.  Scales the values used (between ±0.001 & ±10000) when auxiliary input A is at minimum and maximum values for a remote setpoint. The scaled in
Aux A Input Lippor Limit	value becomes the effective setpoint (constrained within setpoint limits). Caution: Take care to scale correctly especially if used by both loo
Aux A Input Upper Limit Auxiliary Input A Offset	Offset for Auxiliary Input A, from +/-0.001 to 20000 units or OFF. +Ve values add to, -Ve values subtract from measured input. Default = OFF.
Digital Input Setup	Sub-menu to setup the digital inputs – if fitted. Press ♥ + ♡ to return to Input Configuration Menu
Digital Input Status	Digital inputs A; C1 - 8 and "Soft "digital inputs S1 - 4 diagnostic status. If used for Profile Selection, shows bit pattern type and selected profile number
Fick Digital Inputs to Invert	Select digital inputs with ☑ to invert operation (make them <b>OFF</b> when actual state is <b>ON</b> ). Inputs shown as Ø are not available.
Profile Selection Type	The bit pattern to be used for profile selection. Binary or Binary Coded Decimal (BCD). Select None if profile selection not required.
Choose Profile Selection	Select inputs C1-Cn for highest profile number required. Binary or BCD bit patterns can be used. Note: Inputs not available for other uses. Profiles are number
	Binary: C1 = 2; C1-C2 = 4; C1-C3 = 8; C1-C4 = 16; C1-C5 = 32; C1-C6 = 64. 0 to 63. 1st Profile = 0 (all inputs open), 2nd profile = 1 (C1)
	BCD C1 = 2; C1-C2 = 4; C1-C3 = 8; C1-C4 = 10; C1-C5 = 20; C1-C6 = 40; C1-C7 = 64 (≥65 invalid). closed) etc.
Configure Digital Inputs	Select any available digital input or soft digital input to be configured. The current status is shown as Assigned or Unused
Soft Digital Input n Digital Input Logic	Boolean OR and AND of physical inputs for the Soft input "Soft" digital inputs result from the AND selection globally OR ♥ with any other selections. P
Soft Digital Input n Alarm-Event	Boolean OR of Alarms & Events for the Soft digital input.   ♥ or ♦ to select ☑ / deselect ☐ the options. Inputs shown as Ø are not available
Digital Input n Function  Control Configuration:	Select the function to be operated from digital input n. – A full list of possible functions can be found in the specifications section.  Important: Please refer to note in Recorder section about changing the Control Mode.
Control Loop 1	Sub-menu to setup the 1st control loop. Press ♀ + ∪ to return to Control Configuration Menu
Control Mode	From: Standard; Cascade or Ratio. Caution: Choosing Cascade or Ratio disables the use of the 2nd input as a fully independent control lo
Cascade Mode Control Select	Cascade-Open breaks the master-slave connection. Allows slave loop to be tuned & adjusted. Caution: Return to Cascade-Closed when finished Control Standard or VMD (TPSC) Control. VMD is Valve Motor Drive using 3-point stepping control. It provides direct valve open/close outputs.
Control Enable/Disable	Select control Enabled (normal) or Disabled – when disabled, control output(s) for this loop are turned off and the setpoint value is replaced by "OFF"
Control Type	Single - Primary Control (e.g. Heating or Cooling) or Dual - Primary & Secondary (e.g. Heating and Cooling) Dual not with Ratio or VMD.
Auto/Manual Control Selection	Switches the control loop between automatic and manual control. In manual mode the setpoint value is replaced by "MAN"
Primary Control Action	Reverse or Direct. Reverse = "apply primary power when below setpoint". Secondary output action always opposite to Primary.
Control Status Power Output Levels	Display of the current loop 1 process variable and effective setpoint values – Read Only.  Display of the current loop 1 primary and secondary control % output power levels – Read Only. Not shown with VMD Control.
Gain Schedule PID Set in use	Display of the current roop i printary and sectionary control 76 output power levels — nead only, two shown with white control.  Shows the PID set in use based on the current setpoint or process variable value. – If Gain Scheduling in use. Read Only.
PID Set Selection	Use PID Set 1 to 5; or choose Gain Schedule on SP or PV. – select set to be "Active"; or automatically switch sets based changes in SP or PV values.
Set n – Primary Pb	Primary Proportional Band for Gain Set $n$ ( $n$ = up to 5). On-Off control, or 1 display unit to 9999 units – Only set(s) in use shown.
Set n - Secondary Pb Set n - Integral	Secondary Proportional Band for Gain Set n (n = up to 5). On-Off control or 1 display unit to 9999 units – Standard & Dual Control, and for set(s) used.  Integral Time value (Automatic Reset) for Gain Set n (n = up to 5). From 1s to 99min 59s or OFF – Only set(s) in use shown.
Set <i>n</i> – Integral Set <i>n</i> – Derivative	Derivative Time value (Rate) for Gain Set $n$ ( $n$ = up to 5). From 1s to 99 min 59s or OFF – Only set(s) in use shown.
Set n - Overlap / Deadband	Overlap (+ve) or Deadband (-ve) between primary & secondary proportional bands. In display units - limited to 20% of primary + secondary prop band.
Set n – On/Off Diff	On-Off Control hysteresis (deadband) PID Set n (n = up to 5). From 1 display unit to 300 - Only set(s) in use shown.
Set n - Breakpoint	The SP or PV value where the PID Set n begins. Set 1 used from Scaled Input Lower Limit to Set 2 Breakpoint, then Set 2 used to Set 3 Breakpoint etc. breakpoint is set to OFF subsequent PID sets are not used. The final PID set runs to Scaled Input Upper Limit. – If Gain Scheduling in use
Manual Reset (Bias)	Manual Reset value (biasing of control working point) from 0-100% for single control or 100 to +100% for dual control. Lower values inhibit overshoot
Anti Wind-Up Limit Ratio SFAC	The ratio scaling factor used for Stoichiometric Ratio Control. From 0.010 to 99.999.
Ratio NO	A constant between 0.0 & 9999.0, added x1 (input 1) value in Ratio Control mode when calculating the process value. Total is x1 + NO.
Primary Cycle Time	Primary Power Cycle Time from 0.5s to 512s. Relay, SSR Driver or Triac Control Outputs only. Not for VMD Control.  Secondary Power Cycle Time from 0.5s to 512s. Relay, SSR Driver or Triac Control Outputs only. Not for VMD Control.  Minimum limit for Primary Output Power, from 0 to 90%. Must be ≥10% below the upper limit.  Caution: Use with care!
Secondary Cycle Time Primary Power Lower Limit	Minimum limit for Primary Output Power, from 0 to 90%. Must be ≥10% below the upper limit.   *Caution: Use with care!*
Primary Power Upper Limit	Maximum limit for Primary Output Power, from 10 to 100%. Must be ≥10% above the lower limit.
Secondary Power Lower Limit	Minimum limit for Secondary Output Power, from 0 to 90%. Must be ≥10% below than the upper limit.
Secondary Power Upper Limit	Maximum limit for Secondary Output Power, from 10 to 100%. Must be ≥10% above the lower limit.
Sensor Break Pre-set Power Output	Power applied (-100 to +100% or Valve Open/Close) if input or active RSP is lost. Default is OFF (0%). Caution: Set to a safe value for the proce
Motor Travel Time	
Minimum Motor on Time Valve Open Limit	The maximum position the valve will be driven to From Valve Class Limit 1.1.0 to 100.00% (fully appn)
Valve Close Limit	The minimum position valve will be driven to. From 0.0% (fully closed) to Valve Open Limit -1.0.  The minimum position valve will be driven to. From 0.0% (fully closed) to Valve Open Limit -1.0.
Slave SP Scale Min	The effective cascade slave setpoint value equating to 0% power demand from master loop. Caution: Set to safe values for the process! - Limited
Slave SP Scale Max	The effective cascade slave setpoint value equating to 100% power demand from master loop. slave input scaling  The direction to drive the valve if the PV input (or active RSP) is lost In VMD Control Mode only. Caution: Set to a safe value for the process!
Setpoint Lower Limit	Minimum allowable setpoint value. Adjustable within input Span limits.
Setpoint Upper Limit	
Setpoint Ramp Rate	Setpoint Ramp Rate value (1 to 9999 LSDs per hour or OFF). Ramp applied when SP value or source is changed; and from current PV to SP start-up.
Main Setpoint Source	Select Local Setpoint or Not used.
	From: Local Setpoint; Auxiliary Input A; Input 2 or not used – depending on available hardware.
Alternate Setpoint Source Main Setpoint Value	The current value of the Main Setpoint.  Local setpoints are adjustable between the Setpoint Upper and Lower Limits. Remote setpo

Ann distinguishment of the data Sections of the dat	Main Setpoint Offset	An offset applied to the Main Setpoint. +ve values are added and -ve values si	uhtracted. Use when unit is a multi-zon	e slave to change the effective set-	
Chreso Services Active Selection Chreso and Engineering Control Long 2 Control Long 3 Control Long 3 Control Long 3 Control Long 3 Control Lo	·	An offset applied to the Alternate Setpoint. Point. Caution: It should be set to	zero if an offset is not required	if RS485 comms fitted.	
Sortius covers (a)  Output of Configuration screens (a)  Output of Configuration screens (b)  Output of Configuration screens (b)  Output of Losse (b)  Outp	Select Active Setpoint				
Cultar of Configurations reverses.  Lines Contain in Type  Lines Contain in Lines	The state of the s				
Lines Corptan y Configuration screens — Lines Corptan y Configuration Screens — Adjustable 1-10V Transmitter BUL or Screen 5.0.0, 10.1, 2.5 (11 Aug. 20 Aug. 2		Similar screens to Control Loop 1. Cascade and Ratio Control modes use both in	puts, limiting the screens shown her	e accordingly.	
Augustation Four Transmitter PSU. 1 Output a Lisage  W From C. 6, 0.10, 1, 6, 2-10 M 24, 0.00, 4.00 m/s or 0-10 VOC displasable Transmitter PSU. Output a Lisage  W Loop in PSU Colligation is used as a 6-10 VOC displasable Transmitter PSU. Output a Lisage Research Limit Output a		Line to Country to our listed with any already year about a "Assistand" or "Disite	I" The valeyant course converse over	vanantad fau aaab aykayk fikkad	
Ober Off Selection Only of Sel			•	e repeated for each output fitted.	
OWN CR Standard  OPH AND Standard  Alarm of Configurations  - Alarm of Standard  - Alarm of Configurations  - Alarm of Configurations  - Alarm of Configurations  - Alarm of Configurations  - Alarm of Standard  - Alarm o	* **		1 F30.		
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Alarm of Topical and a service of the service of th	Output n Lower Retransmit Limit	w Displayed value at which the retransmission output reaches its minimum level (e.	g. 4 mA if type is 4-20mA). Adjustable	e from -9999 to 9999.	
Allerm on Configuration screens — Allerm on Express — Allerm on Sequence are repeated for each airm. Allerm on Sequence — Allerm on Hydracesia — Aller on Hydracesia — Allerm on Hydracesia — Allerm on Hydracesia — Allerm on Hydracesia —  Who the sequence —  Who the seq		w Displayed value at which the retransmission output gives its maximum level (e.g.	20 mA if type is 4-20mA). Adjustable	from -9999 to 9999.	
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Alarm of himmon Duration Alarm of Inspired Pages 1 Seed of alarm, through which signal must pass before alarm of eacherstale. Do 19980 0 seed – except signal change & break, memory or loop alarms. Alarm of Inhibit On Cord Alarm Type Cortrol in Loop Alarm Alarm Type Cortrol in Loop Alarm Typ	Alarm n Source	w Signal to activate alarm n. From: Input 1, 2 & Aux A; Control Loop 1 & 2; or Loop	1 & 2 Primary/Secondary Power - A	ux A signal break alarm only.	
Alam in Inhibit.  We Prevent salam activation if the alam condition is toward provided as east — except signal break, memory or loop alams.  Alam in Inhibit.  Ocntrion Loop Alam Tips  We Prevent salam activation if the alam condition is toward prevent.  Alam in Inhibit.  White alam condition is toward provided in the alam condition in the alam condition is toward provided. In the provided in the	Alarm n Value		**		
Alarm Initiatis  W Frowms alarm activation if the alarm condition is true at power up. Activation occurs only after the condition has passed and then reoccurred.  W From Manual Loop Alarm Time (from Loop Alarm Time (from Loop Alarm Time (from Loop Alarm Time)  W From Manual Loop Alarm Time (from Loop Alarm Time (from Loop Alarm Time)  W From Manual Loop Alarm Time (from Loop Alarm Time)  W From Manual Loop Alarm Time (from Loop Alarm Time (from Loop Alarm Time)  W From Manual Loop Alarm Time (from Loop Alarm Time)  W From Manual Loop Alarm Time (from Loop Alarm Time)  W From Manual Loop Alarm Time (from Loop Alarm Time)  W From Manual Loop Alarm Time (from Loop Alarm Time)  W From Manual Loop Alarm Time (from Loop Alarm Time)  W From Manual Loop Alarm Time (from Loop Alarm Time)  Modous Party  Modous Pa	•	· · · · · · · · · · · · · · · · · · ·			
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No Communications Warning Moduse Data Pate Moduse Data Pa	·	w Time allowed (after 1 12 power reaches thin of max), for the process to begin resp	boriding. Alaim activates in no respon-	se. – for Maridai Alaim time only.	
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Master Mode, or Slave Address Master Mode Frederic Master Mode or Master M	Modbus Parity	Modbus parity bit checking. From: Odd; Even or None.			
Target register for Steve Master Mode Format Master Mode Format Master Mode Format Master Selpoint Select The data format required by the attached selpoint salves, Form: Integer, integer with 1 deximal place & Floating Point (when in Modeus Master mode).  Select the source loop for the selpoint master function. The actual setpoint value of the selected loop is broadcast to the slave controllers.  Select the source loop for the selpoint master function. The actual setpoint value of the selected loop is broadcast to the slave controllers.  Select these before restarting the Control Mode whilst recording, the recording the Propriet Value of the Select these before restarting the recording otherwise nothing will be recorded.  No Recorder Warning Recording in Progress Warning Place (Carried Trigger) Recorder Status information Recorder Status information Recorder Status information Recorder Status information Recorder Ator Trigger On Alarms Select alarms 1 to 7 can be set to trigger (TRiQ) or not OFF). If any selected alarms is a further profile Event to Record Configuration Recorder Ator Trigger Atorted Trigger Record Ator Trigger Record Record Order Records Record R	Modbus Data Rate	Modbus data speed. From: 4800/9600/19200/38400/57600/115200 bps.			
Master Mode Format  Master Setopion Select  Serial Communications Write Enable  Recorder Configuration: Important: If you change the Control Mode whilst recording, the recorder automatically stops, and the Items To Be Recorder Configuration  Important: If you change the Control Mode whilst recording, the recorder automatically stops, and the Items To Be Recorder General Progress Warning  Recording Progress Warning  Recording Progress Warning  Recording From Progress Warning  Recording From Progress Warning  Recording Mode  Recording Mode  Recording Mode  Recording Mode  Recording Mode  Recording Work Progress  Recording Work Progress  Record Until Memory Used (stops recording) when fully or Continuous FIFO. Caution: FIFO (First In / First Out overwrites oldest data when full).  Recording Alarms  Salest alarms 1 to 7 can be set to trigger (TRO) or not CPF). If any selector How sample place  In Progress Warning  Automatic recording triggers, From: None; On Alarm. During Profile and Alarm or Profile Events on Recording Williams is active, recording with the place.  Loop 1 Values To Record  Aux Input A Value. REC. = Record.  Primary Power or Secondary Power. For each parameter, REC. = Record  Aux Input A Value. REC. = Record.  Clock Configuration:  Language  Select English or the alternate local language. The alternate local language in the format week of the progress of	Master Mode, or Slave Address	Modbus Slave address (1 to 255), or multi-zone Setpoint Master Mode - if RS485	5 fitted (Master mode not supported	via Ethernet).	
Master Setpoint Select Serial Communications Write Enable Enables/disables writing via RS485 or Ethernet. When disabled, all parameters are read only.  Rocorder Configuration: Important IF you change the Control Mode whilst recording, the recorder automatically stops, and the Items To Be Recorded are all unselected (ite. nothing is selected for recording). The user must reselect these before restarting the recording otherwise nothing will be recorded.  No Recorder Warning Recording In Progress Warning Recording In Progress Warning Recording In Progress Warning Recorder Status Information Recorder Status Information Recorder Status Information Recorder Status Information Recording Sample Interval Recorder Status Information Recording Sample Interval Recorder Status Information Recording Sample Interval Recorder Automation Record Information Recorder Status Information Recorder Mode Record Until Memory Used (stops recording when fully in Continuous PIFIC Caution: FIFID ("First In / First dur verwritze oldest data when full). Recording Sample Interval Recorder Automatic recording diagners. From: None; no. I.amm on Profile Records in any trigger active (inc. manual stat or digital input). Trigger On Alarms Loop 1 Values To Record Automatic recording diagners. From: None; no. I.amm on Profile Records in any trigger active (inc. manual stat or digital input). Loop 2 Values To Record For seach control loop, any combination of values can be recorded from Profiles Foreign in any trigger active (inc. manual stat or digital input). Loop 2 Values To Record The status of Alarms (1 to 7) and Profiler Events (1 to 5) can be Note: If an Alarm or Profile Event changes state between samples, this will also recorded; so any will be provided. In the status of Alarms (1 to 7) and Profiler Events (1 to 5) can be Note: If an Alarm or Profile Event changes state between samples, this will also re			•		
Serial Communications Write Enable Recorder Configuration: Important: If you change the Control Mode whilst recording, the recorder automatically stops, and the Items To Be Recorder Configuration in Progress Warning No Recorder Warning Recording Progress Warning Pause (Override Trigger) Recording In Progress Warning Pause (Override Trigger) Recording Mode Recorder Interest of Statis (Recording or Stopped), active trigger loors, recording most but be recorded. Recording Mode Recording Mode Recording Mode Record Interest of Statis (Recording or Stopped), active trigger loors, recording most but be removed. Recorder Configuration Recording Mode Record Unit Memory Used (stops recording when full) or Continuous FIFO. Caution: FIFO (First In / First Out over-writes oldest data when full). Recorder Auto Trigger Record Unit Memory Used (stops recording when full) or Continuous FIFO. Caution: FIFO (First In / First Out over-writes oldest data when full). Recorder Auto Trigger Automatic recording triggers. From: None: On Alarm: During Profile and Alarm or Profile Records if any trigger cathe (inc. manual start or digital input). Select alarms 1 to 7 can be set to trigger (TRG) or not (OFP). If any selected alarms is active, recording will lake place. Loop 1 Values To Record Aux Imput A Values. In EC - Record.  Other Values To Record The status of Alarms (1 to 7) and Profiler Events (1 to 5) can be set to higger (TRG) or not (OFP). If any selected alarms is active, recording will take place.  Clock Configuration:  Activities To Record The status of Alarms (1 to 7) and Profiler Events (1 to 5) can be interest or recorded, using extra memory. Remaining recording time is therefore reduced.  Clock Configuration:  University of the alternate clock Time In httmms: (How is minuted to provided as a provided with the data recorder search on the data recorder of the data of the provided with the data recorder is active.  Display Configuration  Loop 1 Trend Sample Interval Time between value updates on loop 1 trend graph. From: P					
Recorder Configuration: Important: If you change the Control Mode whilst recording, the recorder, automatically stops, and the Items To Be Recorded are all unselected (i.e. nothing is selected for recording). The user must reselect these before restarting the recording otherwise nothing will be recorded.  No Recorder Warning   If the Recorder Configuration menu is entered on an instrument without this option.  If the Recorder Configuration menu is entered on an instrument without this option.  If recording in progress when Recorder Configuration entered Access to the configuration is denied unless the recording is paused.  If recording in progress when Recorder Configuration entered Access to the configuration is denied unless the recording is paused.  If recording in progress when Recorder Configuration entered Access to the configuration is denied unless the recording is paused.  If recording in progress when Recorder Configuration entered Access to the configuration is denied unless the recording is paused.  If recording in Progress Warning   If recording in progress when Recorder Configuration entered Access to the configuration is denied unless the recording is paused.  For continue with Recorder Configuration entered Access to the configuration is denied unless the recording is paused.  Form: Every 1, 2, 5, 10, 15, 30 Seconds, or Every 1, 2, 5, 10, 15, 30 Minutes, (does not affect frend view sample rates).  Recorder Muto Trigger On Alarms  Loop 1 Values To Record   For each control loop, any combination of values can be recorded and arm or Profile Exected is almost a carbon process Variable; Maximum or Minimum PV (since previous sample); Setpoint; Primary Power or Secondary Power. For each parameter, REC = Record.  Clork Venues To Record   Alarms (1 to 7 and Profiler Events (1 to 5) can be Note: If an Alarm or Profile Event changes state between samples, this will also Profiler Events to Record   Profiler Events (1 to 2) Carbon Profiler Events (1 to 2) Carbon Profiler Events (1 to 2) C	•		•	the slave controllers.	
Important: If you change the Control Mode whilst recording, the recording of the recording		Enables/disables witting via no465 or Euremet. When disabled, an parameters a	re read only.		
No Recording Pragress Warning Pause (Override Trigger) Pause (Override Trigger) Pause (Override Trigger) Pause (Override Trigger) Recorder Status Information Recording Mode Recorder Status Information Recording Mode Recording Sample Interval Record Interval Recorder Status Information Recording Sample Interval Recording Sample Interval Recorder Status Information Intervention Status Information Intervention Inter	Important: If you change the Control Mod		re all unselected (i.e. nothing is selec	ted for recording). The user must re-	
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Recorder Status Information Recording Mode Record Mode Recording Mode Record Mode Recording Mode	o o			rding is paused.	
Recording Mode Record Until Memory Used (stops recording when full) or Continuous FIFO. Caution: FIFO (First in / First Out overwrites oldest data when full).  Recorder Auto Trigger Recorder Auto Trigger Automatic recording triggers. From: None; On Alarm; During Profile and Alarm or Profile. Records if any trigger active (inc. manual start or digital input).  Select alarms 1 to 7 can be set to trigger (TRG) or not (OFF). If any selected alarms is active, recording will take place.  For each control loop, any combination of values can be selected alarms is active, recording will take place.  For each control loop, any combination of values can be recorded from: Process Variable; Maximum or Minimum PV (since previous sample); Setpoint; Primary Power or Secondary Power. For each parameter, REC = Record.  Aux input A Value, REC = Record.  Aux input A Value, REC = Record.  Aux input A Value, REC = Record.  The status of Alarms (1 to 7) and Profiler Events (1 to 5) can be interested in the format of Alarms or Profile Event changes state between samples, this will also recorded, as can when the unit is turned On/Off.  Date Format  W The format used for displayed dates: dd/mm/yyyy (Day / Month / Year) or mm/dd/yyyy (Month / Day / Year).  Display Configuration:  Language  Select English or the alternate lock Time In himmss (Hours Minutes; Seconds) format.  Language  Read Only Operation Mode  Display Confrast  Screen contrast (0 and 100) to improve clarity, 100 = maximum contrast.  Loop 1 Trend Sample Interval  The data to display on the loop 1 trend graph. From: Process Value only, PV (solid) & SP (dotted) at sample time, or the Max; Interesting and sample rates for the two trend views and the Loop 2 Trend View Mode  A line between value updates on loop 1 trend graph. From: Process Value only, PV (solid) & SP (dotted) at sample time, or the Max; Interesting and sample rates for the two trend views and the Loop 2 Trend View Mode  A line between value updates on loop 2 trend graph. From: Process Value only, PV (solid)		* ' *	-		
Recording Sample Interval Recorder Auto Trigger Record Side Automatic recording triggers. From: None; On Alarm; During Profile and Alarm or Profile. Records if any trigger active (inc. manual start or digital input).  Select alarms 1 to 7 can be set to trigger (TRG) or not (OFF). If any selected alarms is active, recording will take place.  For each control loop, any combination of values can be recorded from: Process Variable; Maximum or Minimum PV (since previous sample); Setpoint; Deport Values To Record Recor	Recorder Status Information	Status (Recording or Stopped); active trigger icons; recording mode & time rema	ining and a %memory bar-graph - se	e the Data Recorder in section 17.	
Recorder Auto Trigger Trigger On Alarms Select alarms 1 to 7 can be set to trigger (TRG) or not (OFF). If any selected alarms is active, recording will take place.  Loop 1 Values To Record Loop 2 Values To Record Activities To Record Activities To Record Activities To Record The status of Alarms (1 to 7) and Profiler Events (1 to 5) can be; Note: If an Alarm or Profile Event changes state between samples, this will also Profiler Events To Record The status of Alarms (1 to 7) and Profiler Events (1 to 5) can be; Note: If an Alarm or Profile Event changes state between samples, this will also Profiler Events To Record The status of Alarms (1 to 7) and Profiler Events (1 to 5) can be; Note: If an Alarm or Profile Event changes state between samples, this will also Profiler Events To Record The status of Alarms (1 to 7) and Profiler Events (1 to 5) can be; Note: If an Alarm or Profile Event changes state between samples, this will also recorded, using extra memory. Remaining recording time is therefore reduced.  Clock Configuration:  We The format used for displayed dates: dd/mm/yyy (Day / Month / Vear) or mm/dd/yyyy (Month / Day / Year).  Note: Clock settings cannot be we sets the internal clock Time. In hhrmmss (Hours: Minutes: Seconds) format.  Display Configuration:  Language Select English or the alternate local language. The alternate language type purchased can be changed using the PC software.  Read Only Operation Mode Allows Operation Mode to be Read-Only or Read/Write. Operation Mode screens can be seen but their values cannot be changed if set to Read-Only.  Red only: Green only: Red to Green or Green to Red on active Alarm; Red to Green or Green to Red on active Alarm OR Latched Output (default).  Loop 1 Trend Sample Interval  Loop 2 Trend Sample Interval  The data to display on the loop 1 trend graph. From: Process Value only. PV (solid) & SP (dotted) at sample time, or the Max & Min		· · · · · · · · · · · · · · · · · · ·	-		
Trigger On Alarms Select alarms 1 to 7 can be set to trigger (TRG) or not (OFF). If any selected alarms is active, recording will take place.  Loop 1 Values To Record Loop 2 Values To Record Primary Power or Secondary Power. For each parameter, REC = Record Primary Power or Secondary Power. For each parameter, REC = Record Primary Power or Secondary Power. For each parameter, REC = Record Primary Power or Secondary Power. For each parameter, REC = Record Primary Power or Secondary Power. For each parameter, REC = Record Primary Power or Secondary Power. For each parameter, REC = Record Primary Power or Secondary Power. For each parameter, REC = Record Primary Power or Secondary Power. For each parameter, REC = Record Primary Power or Secondary Power. For each parameter, REC = Record Primary Power or Secondary Power. For each parameter, REC = Record Primary Power or Secondary Power. For each parameter, REC = Record Primary Power or Secondary Power. For each parameter, REC = Record Primary Power or Secondary Power Process Variable; Maximum or Minimum PV (since previous sample); Setpoint; Default Primary Power or Secondary Power Process Variable; Maximum or Minimum PV (since previous sample); Setpoint; Primary Power or Secondary Power Process Variable; Maximum or Minimum PV (since previous sample); Setpoint; Default Primary Power P	<u> </u>		-		
Loop 1 Values To Record Loop 2 Values To Record Loop 2 Values To Record Loop 2 Values To Record Primary Power or Secondary Power. For each parameter, REC – Record: Activities To Record The status of Alarms (1 to 7) and Profiler Events (1 to 5) can be recorded, using extra memory. Remaining recording time is therefore reduced.  Clock Configuration: Date Format W The format used for displayed dates: dd/rmm/yyyy (Day / Month / Year) or mm/dd/yyyy (Month / Day / Year). Set Date W Sets the internal clock Date. Entered in the format defined by Date Format screen. Set Time W Sets the internal clock Time In hh:mm:ss (Hours : Minutes : Seconds) format.  Display Configuration: Language Select English or the alternate local language. The alternate language type purchased can be changed using the PC software. Read Only Operation Mode Allows Operation Mode to be Read-Only or Read/Write. Operation Mode screens can be seen but their values cannot be changed if set to Read-Only. Display Contrast Screen contrast (0 and 100) to improve clarity. 100 = maximum contrast. Loop 1 Trend Sample Interval Loop 2 Trend Sample Interval Time between value updates on loop 1 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min. Loop 2 Trend View Mode Time between value updates on loop 2 trend graph. From: Process Value only, PV (solid) & SP (dotted) at sample time, or the Max Min PV between samples (candles-sick graph). Horm: Process Value only, PV (solid) & SP (dotted) at sample time, or the Max Min PV between samples (candles-sick graph). From: Process Value only, PV (solid) & SP (dotted) at sample time, or the Max Min PV between samples (candles-sick graph). From: Process Value only, PV (solid) & SP (dotted) at sample time, or the Max Min PV between samples (candles-sick graph). From: Process Value only, PV (solid) & SP (dotted) at sample time, or the Max Minutes and the potional Data Recorder are completely independent.  Loop				(inc. manual start or digital input).	
Loop 2 Values To Record				N/ (cinno musuisus commus). Cotosint	
Other Values To Record Activities To Record The status of Alarms (1 to 7) and Profiler Events (1 to 5) can be Profiler Events to Record Profiler Events To Record The status of Alarms (1 to 7) and Profiler Events (1 to 5) can be Profiler Event changes state between samples, this will also recorded, as can when the unit is turned On/Off.  Display Configuration:  Display Configuration:  Display Configuration:  Beech Ended Only Operation Mode Display Configuration:  Allows Operation Mode to be Read-Only or Read/Write. Operation Mode screens can be seen but their values cannot be changed if set to Read-Only.  Bed only: Green only: Read only: Green on Green to Read on active Alarm; Red to Green or Green to Red on active Alarm; Red to Green or Green to Red on active Alarm; Red to Green or Green to Red on active Alarm; Red to Green or Green to Red on active Alarm; Red to Green or Green to Red on active Alarm; Red to Green or Green to Red on active Alarm; Red to Green or Green to Read only: Green only: Red only: Green only: Red only: Green only: Green only: Green only: Gr		Primary Power or Secondary Power. For each parameter, REC = Record.	ss variable; Maximum or Minimum P	v (since previous sample); Setpoint;	
Activities To Record The status of Alarms (1 to 7) and Profiler Events (1 to 5) can be Profiler Events To Record Tolock Configuration:  Date Format  W The format used for displayed dates: dd/mm/yyyy (Day / Month / Year) or mm/dd/yyyy (Month / Day / Year).  Set Time. W Sets the internal clock Date. Entered in the format defined by Date Format screen.  Set Time.  Display Configuration:  Language Select English or the alternate local language. The alternate language type purchased can be changed using the PC software.  Allows Operation Mode to be Read-Only or Read/Write. Operation Mode screens can be seen but their values cannot be changed if set to Read-Only.  Display Contrast Screen contrast (0 and 100) to improve clarity. 100 = maximum contrast.  Loop 1 Trend Sample Interval  Loop 2 Trend Sample Interval  Time between value updates on loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min.  The data to display on the loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min.  The data to display on the loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min.  The data to display on the loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min.  The data to display on the loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min.  Loop 2 Trend Wew Mode  Time between value updates on loop 2 trend graph. From: Process Value only. PV (solid) & SP (dotted) at sample time, or the Max The data to display on the loop 2 trend graph. From: Process Value only. PV (solid) & SP (dotted) at sample time, or the Max The data to display on the loop 2 trend graph. From: Process Value only. PV (solid) & SP (dotted) at sample time, or the Max Min PV between samples (candle-stick graph). Alarm active indication is always shown at top of graph.  Operator Visibility  Extra parameters to be visible/adjustation in Operation Mode Inox Profile Control, Recorder Status; Loop 1 & 2 Setpo					
Profiler Events To Record recorded, as can when the unit is turned On/Off.    Deterorded, using extra memory. Remaining recording time is therefore reduced.   Clock Configuration:			larm or Profile Event changes sta	te between samples, this will also	
Date Format  W The format used for displayed dates: dd/mm/yyyy (Day / Month / Year) or mm/dd/yyyy (Month / Day / Year).  Note: Clock settings cannot be changed when the data recorder  Set Time  W Sets the internal clock Date. Entered in the format defined by Date Format screen.  Set Time  Set Set Ill parameters to be visible/adjustation Mode Set In default Values.  Set Set all parameters (except Clock time & date and LED labels) to default values.  Set all parameters (sexcept Clock time & date and LED labels) to default values.  Set all parameters to be visible **  Set all parameters (sexcept Clock time & date and LED labels) to default values.  Set Set Set Set Seconds (Set Ind.)  Note: Clock Settings cannot be changed if the Changed if the Changed When the data recorder is active.  Note: Clock Settings cannot be changed if set to Read-Only. The Changed if the Changed Ind.  Note: Clock Settings and setting.  Set Time Setting and native Alarm OR Latched Output (default).  Note: Clock Settings and setting.  Note: Clock Set	Profiler Events To Record				
Set Date Set Time W Sets the internal clock Date. Entered in the format defined by Date Format screen.  Set Time W Sets the internal clock Time In hh:mm:ss (Hours: Minutes: Seconds) format.  Display Configuration:  Language Select English or the alternate local language. The alternate language type purchased can be changed using the PC software.  Allows Operation Mode to be Read-Only or Read/Write. Operation Mode screens can be seen but their values cannot be changed if set to Read-Only. Display Color  Red only; Green only; Red to Green or Green to Red on active Alarm; Red to Green or Green to Red on active Alarm OR Latched Output (default).  Invert Display Standard or Inverted (negative) display image.  Screen contrast (0 and 100) to improve clarity. 100 = maximum contrast.  Loop 1 Trend Sample Interval Time between value updates on loop 1 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min.  The data to display on the loop 1 trend graph. From: Process Value only, PV (solid) & SP (dotted) at sample time, or the Max or the two trend views and the or the work of the two trend views and the or the work of the work of the two trend views and the or the data to display on the loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min.  Loop 2 Trend Sample Interval Time between value updates on loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min.  The data to display on the loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min.  The data to display on the loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min.  The data to display on the loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min.  The between value updates on loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min.  The data to display on the loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min				- Recorder versions only.	
Set Time w Sets the internal clock Time In hh:mm:ss (Hours : Minutes : Seconds) format.  Display Configuration:  Language Select English or the alternate local language. The alternate language type purchased can be changed using the PC software.  Allows Operation Mode Display Color Red on the Read-Only or Read/Write. Operation Mode screens can be seen but their values cannot be changed if set to Read-Only. Invert Display Standard or Inverted (negative) display image.  Display Contrast Screen contrast (0 and 100) to improve clarity. 100 = maximum contrast.  Loop 1 Trend Sample Interval Time between value updates on loop 1 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min.  Loop 1 Trend View Mode Time between value updates on loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min.  Loop 2 Trend Sample Interval Time between value updates on loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min.  Loop 2 Trend View Mode The data to display on the loop 2 trend graph. From: Process Value only, PV (solid) & SP (dotted) at sample time, or the Max & Min PV between samples (candle-stick graph). Alarm active indication is always shown at top of graph. From the two trend views and the Operator Visibility Extra parameters to be visible/adjustable in Operation Mode from: Profile Control; Recorder Start/Stop; Recorder Status; Loop 1 & 2 Setpoint Select; Loop 1 & 2 Control Select; Loop 1 & 2 Trend View; Loop 1 & 2 Setpoint Ramp Rate. See In Operator Mode lists.  Lock Code Configuration: Set Judicy Adminus Select; Loop 1 & 2 Control Select; Loop 1 Trend Setup Wizard; Configuration Mode; Tuning Menu and Supervisor Mode Lock Codes, plus if fitted, the USB Menu; Recorder Menu; Profiler Control Menu Lock Codes. All independently adjustable (1-9999) or OFF). Default Value for all menus = 10.  Reset To Defaults: Set all parameters (except Clock time & date and LED labels) to default values. Caution: After reset, the user must reconfig		, , , , , , , , , , , , , , , , , , , ,	, ,	Note: Clock settings cannot be	
Display Configuration:  Language Select English or the alternate local language. The alternate language type purchased can be changed using the PC software.  Allows Operation Mode to be Read-Only or Read/Write. Operation Mode screens can be seen but their values cannot be changed if set to Read-Only.  Bed only; Green only; Red to Green or Green to Red on active Alarm; Red to Green or Green to Red on active Alarm OR Latched Output (default).  Invert Display Standard or Inverted (negative) display image.  Display Contrast Screen contrast (0 and 100) to improve clarity. 100 = maximum contrast.  Loop 1 Trend Sample Interval Time between value updates on loop 1 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min.  Loop 1 Trend View Mode The data to display on the loop 1 trend graph. From: Process Value only, PV (solid) & SP (dotted) at sample time, or the Max for the two trend views and the optional planterval Time between value updates on loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min.  Loop 2 Trend Sample Interval Time between value updates on loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min.  Doperator Visibility Extra parameters to be visible/adjustable in Operation Mode from: Profile Control; Recorder Start/Stop; Recorder Status; Loop 1 & 2 Setpoint Select; Loop 1 & 2 Auto/Manual Select; Loop 1 & 2 Control Select; Loop 1 & 2 Control Select; Loop 1 & 2 Setpoint Ramp Rate. See In Operator Mode lists.  Lock Code Configuration: Set all parameters (except Clock time & date and LED labels) to default values. Caution: After reset, the user must reconfigure all required		•	n.		
Larguage Select English or the alternate local language. The alternate language type purchased can be changed using the PC software.  Allows Operation Mode to be Read-Only or Read/Write. Operation Mode screens can be seen but their values cannot be changed if set to Read-Only.  Bed only; Green only; Red to Green or Green to Red on active Alarm; Red to Green or Green to Red on active Alarm OR Latched Output (default).  Standard or Inverted (negative) display image.  Display Contrast  Loop 1 Trend Sample Interval  Time between value updates on loop 1 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min.  Loop 1 Trend View Mode  The data to display on the loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min.  Loop 2 Trend Sample Interval  Time between value updates on loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min.  Loop 2 Trend Sample Interval  Time between value updates on loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min.  Loop 2 Trend View Mode  The data to display on the loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min.  Departor Visibility  Extra parameters to be visible/adjustable in Operation Mode from: Profile Control; Recorder Start/Stop; Recorder Status; Loop 1 & 2 Setpoint Select; Loop 1 & 2 Auto/Manual Select; Loop 1 & 2 Control Select; Loop 1 & 2 Setpoint Ramp Rate. See In Operator Mode lists.  Lock Code Configuration:  Lock Code Values  Reset To Defaults:  Set all parameters (except Clock time & date and LED labels) to default values. Caution: After reset, the user must reconfigure all required		w Sets the internal clock time in hitmin:ss (Hours : Minutes : Seconds) format.			
Allows Operation Mode to be Read-Only or Read/Write. Operation Mode screens can be seen but their values cannot be changed if set to Read-Only. Display Color Red only; Green only; Red to Green or Green to Red on active Alarm; Red to Green or Green to Red on active Alarm OR Latched Output (default). Invert Display Standard or Inverted (negative) display image.  Display Contrast Screen contrast (0 and 100) to improve clarity. 100 = maximum contrast.  Loop 1 Trend Sample Interval Time between value updates on loop 1 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min.  Loop 1 Trend View Mode The data to display on the loop 1 trend graph. From: Process Value only, PV (solid) & SP (dotted) at sample time, or the Max in the Settings and sample rates for the two trend views and the Setting Sample Interval Time between value updates on loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min.  Loop 2 Trend Sample Interval Time between value updates on loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min.  The data to display on the loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min.  The data to display on the loop 2 trend graph. From: Process Value only, PV (solid) & SP (dotted) at sample time, or the two trend views and the optional Data Recorder are completely independent.  Min PV between samples (candle-stick graph). Alarm active indication is always shown at top of graph.  Operator Visibility Extra parameters to be visible/adjustable in Operation Mode from: Profile Control; Recorder Start/Stop; Recorder Start/Stop; Recorder Start/Stop; Recorder Start/Stop; Recorder Start/Stop; Recorder Menu; Profiler Setup Menu and Lock Code Values.  Setup Wizard; Configuration Mode; Tuning Menu and Supervisor Mode Lock Codes, plus if fitted, the USB Menu; Recorder Menu; Profiler Setup Menu and Profiler Control Menu Lock Codes. All independently adjustable (1-9999 or OFF). Default Value for all menus		Select English or the alternate local language. The alternate language type purch	ased can be changed using the PC s	oftware.	
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Loop 1 Trend Sample Interval  Time between value updates on loop 1 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min.  The data to display on the loop 1 trend graph. From: Process Value only, PV (solid) & SP (dotted) at sample time, or the Max for the two trend views and the Secondary of the two trend views and the Secondary of the two trend views and the Optional Data Recorder are completely independent.  Loop 2 Trend Sample Interval  Time between value updates on loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min.  The data to display on the loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min.  The data to display on the loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min.  The data to display on the loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min.  The data to display on the loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min.  The data to display on the loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min.  The data to display on the loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min.  The data to display on the loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min.  The data to display on the loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min.  The data to display on the loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min.  The data to display on the loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min.  The data to display on the loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min.  The data to display on the loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min.  The data to display on the loop 2 trend graph. From					
The data to display on the loop 1 trend graph. From: Process Value only, PV (solid) & SP (dotted) at sample time, or the Max Min PV between samples (candle-stick graph). Alarm active indication is always shown at top of graph. For the two trend views and the optional Data Recorder are completely independent.  Loop 2 Trend Sample Interval Time between value updates on loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min.  The data to display on the loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min.  The data to display on the loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min.  The data to display on the loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min.  The data to display on the loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min.  The data to display on the loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Min.  The data to display on the loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Min.  The data to display on the loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Min.  The data to display on the loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Min.  The data to display on the loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Min.  In data to display on the loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Min.  In data to display on the loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Min.  The data to display on the loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Min.  In data to display on the loop of the two trend views and the optional to person at the optional to display on the loop of graph.  The data to display on the loop of graph.  The data to display on the loop of graph.  The data to display on the loop of graph.  The data to display on the loop of graph.  The data to display on the loop of graph.  The data to display on the loop of graph.  The data to display on the loop of graph.  The dat				- <sub>Y</sub>	
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Loop 2 Trend Sample Interval  Time between value updates on loop 2 trend graph. From: Every 1; 2; 5; 10; 15; 30 Seconds, or 1; 2; 5; 10; 15; 30 Min.  The data to display on the loop 2 trend graph. From: Process Value only, PV (solid) & SP (dotted) at sample time, or the Max  The data to display on the loop 2 trend graph. From: Process Value only, PV (solid) & SP (dotted) at sample time, or the Max  Peterly independent.  Dependent Visibility  Extra parameters to be visible/adjustable in Operation Mode from: Profile Control; Recorder Start/Stop; Recorder Status; Loop 1 & 2 Setpoint Select; Loop 1 & 2 Auto/Manual Select; Loop 1 & 2 Trend View; Loop 1 & 2 Setpoint Ramp Rate. See ☐ in Operator Mode lists.  Lock Code Configuration:  Lock Code Values  Reset To Defaults:  Set all parameters (except Clock time & date and LED labels) to default values. Caution: After reset, the user must reconfigure all required	Loop 1 Trend View Mode	& Min PV between samples (candle-stick graph). Alarm active indication is always s	נ סר (טטננפט) מנ sample time, or the Ma: shown at top of graph.		
Loop 2 Trend View Mode  The data to display on the loop 2 trend graph. From: Process Value only, PV (solid) & SP (dotted) at sample time, or the Max & Min PV between samples (candle-stick graph). Alarm active indication is always shown at top of graph.  Operator Visibility  Extra parameters to be visible/adjustable in Operation Mode from: Profile Control; Recorder Start/Stop; Recorder Status; Loop 1 & 2 Setpoint Select; Loop 1 & 2 Auto/Manual Select; Loop 1 & 2 Control Select; Loop 1 & 2 Trend View; Loop 1 & 2 Setpoint Ramp Rate. See ☐ in Operator Mode lists.  Lock Code Configuration:  Lock Code Values  Set up Wizard; Configuration Mode; Tuning Menu and Supervisor Mode Lock Codes, plus if fitted, the USB Menu; Recorder Menu; Profiler Setup Menu and Profiler Control Menu Lock Codes. All independently adjustable (1-9999 or OFF). Default Value for all menus = 10.  Reset To Defaults:  Set all parameters (except Clock time & date and LED labels) to default values. Caution: After reset, the user must reconfigure all required	Loop 2 Trend Sample Interval			optional Data Recorder are com-	
Operator Visibility  Extra parameters to be visible/adjustable in Operation Mode from: Profile Control; Recorder Status; Loop 1 & 2 Setpoint Select; Loop 1 & 2 Auto/Manual Select; Loop 1 & 2 Control Select; Loop 1 & 2 Trend View; Loop 1 & 2 Setpoint Ramp Rate. See In Operator Mode lists.  Lock Code Configuration:  Lock Code Values  Set up Wizard; Configuration Mode; Tuning Menu and Supervisor Mode Lock Codes, plus if fitted, the USB Menu; Recorder Menu; Profiler Setup Menu and Profiler Control Menu Lock Codes. All independently adjustable (1-9999 or OFF). Default Value for all menus = 10.  Reset To Defaults:  Set all parameters (except Clock time & date and LED labels) to default values. Caution: After reset, the user must reconfigure all required		The data to display on the loop 2 trend graph. From: Process Value only, PV (solid) &	SP (dotted) at sample time, or the Ma	pietely independent.	
Lock Code Configuration:  Lock Code Values  Set all parameters (except Clock time & date and LED labels) to default values.  Lock Code Configuration:  Set all parameters (except Clock time & date and LED labels) to default values.  Lock Code Values  Set all parameters (except Clock time & date and LED labels) to default values.  Lock Code Values  Caution: After reset, the user must reconfigure all required				Loop 1 8 2 Cotpoint Calcate Lagra 4 2	
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Lock Code Values Profiler Control Menu Lock Codes. All independently adjustable (1-9999 or OFF). Default Value for all menus = 10.  Reset To Defaults: Set all parameters (except Clock time & date and LED labels) to default values. Caution: After reset, the user must reconfigure all required	Lock Code Configuration:				
octain parameters (checket short anno a date and a parameter rates) to delican rates and a parameter and a parameter rates and a parameter and	<u> </u>				
Reset To Defaults: settings to the correct values before using the instrument			Caution: After reset, the user mo	ust reconfigure all required	
	Reset To Defaults:	settings to the correct values before using the instrument			

# Reset To Defaults: 22. SOFTWARE SETTINGS

A communications settings screen is shown whenever the user attempts to connect to the instrument from the PC configuration software. If the settings are not as shown below, the PC configuration software cannot communicate with the instrument.

Connection from PC to Bottom Configuration Socket

**Device connector** = Configuration Socket. **PC connector** = the PC Serial Com port that you are connected to. **Start** and **Stop bits** = 1. **Data bits** = 8.

NOTE: When uploading or downloading via the bottom mounted configuration port, the required software communication settings depend on the module fitted in slot A. See the table below.

Slot A Module	Bit Rate	Parity	Address
Slot A Empty	19200	None	1
Digital Input	19200	None	1
Ethernet Comms	9600	None	1
Auxiliary Input	4800	None	1
RS485	Comms Must match the 0	Communication Configurat	ion menu settinas.

# Connection from PC to Rear RS485 Communications Option

**Device connector** = Bus. **PC connector** = the PC Serial Com port that you are connected to. **Start** and **Stop bits** = 1. **Data bits** = 8. **Parity, Bit Rate & Address** settings must match those set in the instruments Communication Configuration menu.

# Connection from PC/Network to Ethernet Port

**Device connector** = Bus. **PC connector** = Ethernet (bus coupler). IP Address = Instrument **IP address** – see note below\*.

The supported data rates 10/100BASE-T (10 or 100 Mbps) are automatically detected.



NOTE: \*An IP address must be set before connecting via Ethernet. Use the default address of 0.0.0.0 if your network uses DHCP, BootP or AutoIP or

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