1. INSTALLATION

NOTE: Panel Mounting

f. Hold the Power and Input boards together while relocating on their mountings.

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

1. INSTALLATION

NOTE: POWER SUPPLY

Rachets manual when connecting

Caution: Potential danger to life used in a manner not specified by the manufacturer.

Installation should be only performed by technically competent personnel.

1st UNIVERSAL Display Board

Gasket

INPUT / BASE

24-48V (Blue)

OPTION 1

BOARD

USB/Digital Input C Option Board

2nd Universal Input & Base Option 2

PL5, & PL6

Connector PL4B

PC Configurator

Connector PL4A

Panel Mounting

1. Insert instrument into the panel cut-out.

2. Hold front bezel part only firmly and re-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 IPS seal against dust and moisture, ensure gasket is well compressed against the panel, with the 4 tongues located in the same ratchet slot.

CAUTION: When installing the display, ensure the installation instructions may impact the protection provided by the housing.

CAUTION: Check correct operating voltage on the side label before connecting power. An IEC60947-1 & IEC60947-3 compliant isolation device must be used in the power input. An IEC60947-1 & IEC60947-3 compliant isolation device must be used in the power input.

NOTE: The wiring diagrams show all possible option combinations. The connections required depend on the options & modules fitted. Use single stranded wire, only copper wire, and use insulation materials of suitable temperature resistant qualities. Do not crimp or damage cable & conductors.

CAUTION: If an invalid or unknown module is detected in one of the plug-in module slots the message “Fatal Fault. Press C or D” follows by the module fault code module Slot is n, Press C or D,” (where n identifies the problem slot). The Service Contact information is needed to determine what needs to be done. If a fault is detected in more than one slot, the module that can be removed should be removed first. In an open input 1 or 2 is shown as “OPEN”, or as “OFF”. An un-calibrated input is replaced by an open input 1 or 2.

NOTE: Correct the problem causing the error before continuing normal operation.

2. POWER UP SEQUENCE

NOTE: Plug-in modules are automatically detected at power up.

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

3. OPERATION MODE

NOTE: Manual Control Configuration settings, automatic or manual control can be selected from the Manual/Manual selection, or via a digital input. Switching to or from manual mode will have no effect on the display output. Setting Process Variable Value, etc. is set to OFF, the subsequent PID sets are not used.

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

NOTE: Trend Views graph PV; PV & SP; or Max/Min PV between samples, plus active alarms. The Trend Views graph PV; PV & SP; or Max/Min PV between samples, plus active alarms.

NOTE: If a signal break is detected, the value is replaced with "OPEN".

CAUTION: Manual control mode overrules the automatic control loop. It is also possible to select a mode parameter from the set-up menu under the operation modes. Automatic mode parameter can only be changed in the mode window.

NOTE: Correction mode parameters modded into operation mode are not pass code protected.

4. AUTOMATIC TUNING

NOTE: Automatic tuning is not available if the Manual state display is not on the set point, or the scaled process variable value is not within the set point range.

NOTE: See Automatic Tuning section 4 for tuning the PID

5. PID SETS & GAIN SCHEDULING

NOTE: Off/On control is possible with the individual PID sets but cannot be used for the Pre-Tune function. Pre-tune is available with the default proportional band if gain scheduling is turned on.

6. APPLICATION SETUP

NOTE: Manual Control Configuration settings, automatic or manual control can be selected from the Manual/Manual selection, or via a digital input. Switching to or from manual mode will have no effect on the display output. Setting Process Variable Value, etc. is set to OFF, the subsequent PID sets are not used.

NOTE: Off/On control is possible with the individual PID sets but cannot be used for the Pre-Tune function. Pre-tune is available with the default proportional band if gain scheduling is turned on.

NOTE: Correction mode parameters modded into operation mode are not pass code protected.

6. APPLICATION SETUP

NOTE: Off/On control is possible with the individual PID sets but cannot be used for the Pre-Tune function. Pre-tune is available with the default proportional band if gain scheduling is turned on.

NOTE: Off/On control is possible with the individual PID sets but cannot be used for the Pre-Tune function. Pre-tune is available with the default proportional band if gain scheduling is turned on.
a common actuator. Ideally, the slave loop’s natural response time should be at least 5

ets) can be difficult to control with a single control loop. The solution is to split the

Applications with long time lags (e.g. with two or more capacities such as heated jack-

CAUTION: Configuration & commissioning must be completed be-

NOTE: Some modulating valves have positioning circuitry to adjust the valve

11. VALVE MOTOR / 3-POINT STEPPING CONTROL

Switching actuators directly connected to the valve motor must only be used up to half

CAUTION: The windings of a valve motor effectively form an au-

10. REDUNDANT INPUT

The valve control loop has two identical outputs to be assigned to pos-

CAUTION: Calibration & Scaling must be used with care. Careless use could lead to the displayed value bearing no meaningful rela-

3. Single Point Calibration

This is a “zero offset” applied to the process variable across the entire span. Positive valu-

2. Base CAL” at the top of the menu

Modulating valves have neither linear nor binary output. A single point calibration is

To match the characteristics of the attached process or to remove sensor errors. For each loop, independent use of base (undistorted), single

CAUTION: Calibration & Scaling & Tare must be used together to

2. Base CAL” at the top of the menu

10. REDUNDANT INPUT

If both signals are lost at the same time, the PV is replaced with

OPEN” and the normal sensor break actions occur.
Profile Header & Segment Information

Each profile has its own header information plus 1 or more segments. The header contains the configuration settings that apply to all segments in the profile, while the segments define the specific changes to be made over time. A profile can consist of a single segment or multiple segments.

### Profile Segments

- **Ramp Segment**: Changes the setpoint value at a constant rate over a specified time period.
- **Dwell Segment**: Holds the setpoint constant for a specified time period.
- **Join Segment**: Transitions smoothly from one profile segment to another.
- **Repeat Segment**: Repeats the same segment multiple times or continuously.

### Profile Configuration Settings

- **Profile Name**: Unique identifier for each profile.
- **Profile Description**: Optional description of the profile.
- **Profile Start Date**: Date the profile becomes active.
- **Profile End Date**: Date the profile becomes inactive.
- **Profile Priority**: Determines the order in which profiles are applied.

### Profile Cycles & Repeat Sequences

- **Profile Cycles**: Specifies the number of times to repeat the profile.
- **Repeat Sequence**: Specifies the order in which profiles are repeated.

### Repeatability

Profiles can be repeated immediately or delayed by a specified delay time.

### Operating Conditions

- **Start-on SP**: The profile starts immediately when the setpoint is reached.
- **Start-on Time**: The profile starts after a specified time delay.
- **Start-on Port**: The profile starts when a specific input is active.

### End Conditions

- **End-on SP**: The profile ends when the setpoint is reached.
- **End-on Time**: The profile ends after a specified time delay.
- **End-on Port**: The profile ends when a specific input is active.

### Profile Programming

- **Program the profile**: Save or load the profile to the memory or USB stick.
- **Edit the profile**: Modify the existing profile settings.
- **Delete the profile**: Remove the profile from memory or USB stick.

### Alarm Conditions

- **Alarm Low**: An alarm is triggered when the setpoint is below the alarm level.
- **Alarm High**: An alarm is triggered when the setpoint is above the alarm level.

### Data Logging

- **Data Logging**: Enable or disable data logging for the profile.
- **Data Logging Interval**: Specify the interval for logging data.
- **Data Logging Format**: Select the format for storing data.

### Data Transfer

- **USB Interface**: Use the USB interface to transfer data to a computer or another device.
- **Data Transfer Options**: Specify the options for data transfer.

### Troubleshooting

- **Error Code**: Identify and resolve errors encountered during profile operation.
- **Error Message**: Display error messages for specific issues.

### Configuration

- **Configuration Settings**: Customize the profile settings to meet specific requirements.
- **Configuration Options**: Select the configuration options applicable to the profile.

### Calibration

- **Calibration Reminder**: Prompt the user to perform calibration when necessary.
- **Calibration History**: View the calibration history for the profile.

### References

- **Related Publications**: Access additional documentation and resources.
- **Related Websites**: Connect to relevant websites for more information.

### Additional Resources

- **User Manual**: Detailed instructions for using the product.
- **Technical Papers**: Access technical papers and whitepapers.
- **FAQs**: Frequently Asked Questions to help solve common issues.

---

**NOTE:**

- Always check the latest documentation and user manual for the most up-to-date information.
- Be sure to follow all safety guidelines and precautions when operating the instrument.
- Contact your local sales representative for assistance or support.

---

**CAUTION:**

- Avoid using the device near flammable or explosive materials.
- Use only authorized software and applications.
- Regularly backup important data to prevent loss.

---

**Notice:**

- This manual is intended for use by qualified personnel only.
- Improper use may result in damage to the device or personal injury.

---

**Warning:**

- Do not disassemble the device without proper authorization.
- Safety checks and maintenance must be performed by qualified personnel.

---

**Disclaimer:**

- The information provided in this document is subject to change without notice.
- The manufacturer assumes no responsibility for any errors or omissions in this document.

---

**Accessories:**

- USB cables
- USB memory sticks
- Power adapters

---

**Contact Us:**

- For more information, visit our website or contact your local sales representative.
18. SPECIFICATIONS

Thermocouple

Supported Input Types

- **Sampling Rate**: 10 per second.
- **Ranges**:
  - Thermocouple Types & Isolation: Reinforced safety isolation from outputs and other inputs.
  - **User Calibration**: Single or two point. +ve values added to Process Variable.
  - **Impedance**: >10M.
  - **Accuracy**: ±0.25% of input range ±1 LSD.

Detection:

- **Sensor Break**:
  - Thermocouple & RTD - Control goes to pre-set power value.
  - **+±10000, but always constrained by the setpoint limit settings.**

Process Control Loop 1

- **Loop 1**: Ratio Control
- **Loop 2**: Controlled
- **Cascade Control**: Master Loop Slave Loop

Type: 1 x Triac output. Plug-in Modules 1, 2 & 3.

Isolation: Isolated, except from other SSR driver & configuration socket.

Drive Capability:

- Driver voltage >10V into 500 Ω

Base Relay 4-5

- **Type**: 1 x Logic / SSR Driver output. Plug-in Module 1, 2 & 5.
- **Rating**: Relays an SSR output with 200 mA, 500 mA operations at full load or 100 mA, 150 mA operations at half load.
- **Relay**: Dual relay modules have shared common terminal.

Base Relay 3-2

- **Type**: 1 x Logic single pole single throw (SPST). Plug-in Modules 2 & 3.
- **Rating**: Max. of 400mA at 12VDC with 100mA, 150mA operations at half load or 100mA, 150mA operations at half load.

Base Relay 1-2

- **Type**: 1 x Logic single pole single throw (SPST). Plug-in Modules 1.
- **Rating**: Max. of 400mA at 12VDC with 100mA, 150mA operations at half load or 100mA, 150mA operations at half load.

Driver Voltage: 

- Overload protection: 300V

- **Overload Current**: 300V max

- **Overload Voltage**: 300V max

- **Overload Temperature**: 120°C max

Power Rating:

- **Type**: 3W Power Rating: 24 V nominal (19 to 28 V DC), into 910 Ω
- **Isolation**: Isolated, except from other SSR driver & configuration socket.

Display Characters:

- 0 to 9, a to z, A to Z, plus ( ) @ ö ß - and _

**DISPLAY**

- **Resolution**: 10 places.
- **Sampling Rate**: 1; 2; 5; 10; 15; 30 seconds or 1; 2; 5; 10; 15; 30 minutes.

**OPERATING CONDITION FOR INDOOR USE**

- **Temperature**: 0°C to 50°C (20°C to 40°C). Relative Humidity: 20% to 90% non-condensing.

- **Ambient Temperature**: 0°C to 50°C (20°C to 40°C). Relative Humidity: 20% to 90% non-condensing.

**ALARM**

- **Alarm Hysteresis**: Adjustable deadband from 1 LSD to full span (in display units).

- **Alarm Point (9999)**: Alarm setpoint source is the active setpoint source.

- **Alarm Point (9999)**: Alarm setpoint source is the active setpoint source.

- **Alarm Point (9999)**: Alarm setpoint source is the active setpoint source.

**COMMUNICATIONS**

- **PROFILER**: 19200 baud rate via RS232 or RS485 for remote configuration & profile files to/from PC software.

- **19200 baud rate via RS232 or RS485 for remote configuration & profile files to/from PC software.**

- **19200 baud rate via RS232 or RS485 for remote configuration & profile files to/from PC software.**

- **19200 baud rate via RS232 or RS485 for remote configuration & profile files to/from PC software.**

- **19200 baud rate via RS232 or RS485 for remote configuration & profile files to/from PC software.**

- **19200 baud rate via RS232 or RS485 for remote configuration & profile files to/from PC software.**

**FIRMWARE**

- **Version**: 1.00

- **Release**: 1.00

- **Release**: 1.00

- **Release**: 1.00

- **Release**: 1.00

**RESET**

- **Normal Factory Settings**: Can be reset to factory settings.

- **Normal Factory Settings**: Can be reset to factory settings.

- **Normal Factory Settings**: Can be reset to factory settings.

- **Normal Factory Settings**: Can be reset to factory settings.

- **Normal Factory Settings**: Can be reset to factory settings.

**DIMENSIONS**

- **Panel Cut-out Size**: 92 mm x 92 mm. Tolerance +0.5, -0.0mm.

- **Display Area**: 80 x 80 mm.

- **Display Area**: 80 x 80 mm.

- **Display Area**: 80 x 80 mm.

- **Display Area**: 80 x 80 mm.

- **Display Area**: 80 x 80 mm.

**OPERATING TEMPERATURE**

- **Temperature**: 0°C to 50°C (20°C to 40°C). Relative Humidity: 20% to 90% non-condensing.

- **Ambient Temperature**: 0°C to 50°C (20°C to 40°C). Relative Humidity: 20% to 90% non-condensing.

- **Ambient Temperature**: 0°C to 50°C (20°C to 40°C). Relative Humidity: 20% to 90% non-condensing.

- **Ambient Temperature**: 0°C to 50°C (20°C to 40°C). Relative Humidity: 20% to 90% non-condensing.

- **Ambient Temperature**: 0°C to 50°C (20°C to 40°C). Relative Humidity: 20% to 90% non-condensing.
Clears the recorder memory.

Menus & screens displayed depend on how the instrument is configured. Most screens revert to Operation Mode after 2 minutes without key activity, those marked D for >1sec accepts or P.

Cascade

Two-sub-menu with global settings affecting all profiles. Press Timer Start Function If enabled, delayed timer starts are possible, and if the selected profile has a day & time trigger waits until the time set, then starts automatically.

Clear Recordings?

Select Profile To Write If writing a profile to the USB Memory Stick, choose a profile to write from the list provided.

Recorder Status Information

Status (Recording or Stopped); active trigger icons; recording mode & time remaining and a %memory bar-graph - see the Data Recorder, section 17.

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.

Select Active Setpoint

Selects if the main or alternate setpoint is active for the loop shown.

LED Labels:

- 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%).
- Screen to Profile Setup Menu

Create a Profile

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 editable when the profiles are not active.
- c) Only the Loop 1-2 Auto-Hold (Master) works when used for Cascade, the Loop 1 Auto-Hold doesn’t.
- d) The Pre-Tune can be engaged whilst a profile is running, except within a Ramp or Step segment.
- e) The Pre-Tune can be engaged whilst a profile is running, except within a Ramp or Step segment.
- f) The Pre-Tune cannot engage ramps or pre-tuning it is suspended until the ramp or pre-tune is completed. The reason is shown if it cannot engage.
- g) The Pre-Tune at Value allows the user to specify where the process test will occur.
- h) The Pre-Tune cannot engage ramps or pre-tuning it is suspended until the ramp or pre-tune is completed. The reason is shown if it cannot engage.
- i) The Pre-Tune cannot engage ramps or pre-tuning it is suspended until the ramp or pre-tune is completed. The reason is shown if it cannot engage.
- j) The Pre-Tune at Value allows the user to specify where the process test will occur.
- k) The Pre-Tune cannot engage ramps or pre-tuning it is suspended until the ramp or pre-tune is completed. The reason is shown if it cannot engage.
- l) The Pre-Tune cannot engage ramps or pre-tuning it is suspended until the ramp or pre-tune is completed. The reason is shown if it cannot engage.
- m) The Pre-Tune cannot engage ramps or pre-tuning it is suspended until the ramp or pre-tune is completed. The reason is shown if it cannot engage.
- n) The Pre-Tune cannot engage ramps or pre-tuning it is suspended until the ramp or pre-tune is completed. The reason is shown if it cannot engage.
- o) The Pre-Tune cannot engage ramps or pre-tuning it is suspended until the ramp or pre-tune is completed. The reason is shown if it cannot engage.
- p) The Pre-Tune cannot engage ramps or pre-tuning it is suspended until the ramp or pre-tune is completed. The reason is shown if it cannot engage.
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.

Input Filter Time
Filters unwanted noise from input signal. Adjustable from 0.1 to 100.0 seconds or OFF (default = 2s).

Display Value
Setpoint Lower Limit
Minimum allowable setpoint value. Adjustable within Input Span limits.

Slave SP Scale Max
The effective cascade slave setpoint value equating to 100% power demand from master loop.

Anti Wind-Up Limit
10 to 100% power level, where further integral action is suspended. Lower values inhibit overshoot.

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.

Configure Digital Inputs
Select any available digital input or soft digital input to be configured. The current status is shown as Assigned or Unused.

Aux A Input Lower Limit
Scales the values used (between ±0.001 & ±10000) when auxiliary input A is at minimum and maximum values for a remote setpoint. The scaled input.

Auxiliary Input A Type
From 0-20 or 4-20 mA; 0-5, 1-5, 0-10 or 2-10 VDC Linear.

Primary Power Lower Limit
Minimum limit for Primary Output Power, from 0 to 90%. Must be.

Main Setpoint Value
The current value of the Main Setpoint. Local setpoints are adjustable between the Setpoint Upper and Lower Limits. Remote setpoints can only be adjusted when the.

Lost Recorder Warning
If the Recorder Configuration menu is entered on an instrument without this option. select these before restarting the recording otherwise nothing will be recorded.

Master Mode Format
The data format required by the attached setpoint slaves. From: Integer; integer with 1 decimal place & Floating Point (when in Modbus Master mode).

Master Mode, or Slave Address
Modbus Slave address (1 to 255), or multi-zone Setpoint Master Mode – if RS485 fitted (Master mode not supported via Ethernet).

Master Select
Select the source step for the master manifold function. The actual setpoint value of the selected source is broadcast to the slave controllers.

Alternate Setpoint Offset
An offset applied to the Alternate Setpoint.

Main Setpoint Offset
An offset applied to the Main Setpoint whilst recording, the recorder automatically stops, and the Main To Be Recorded on at selected(s). If no recording is selected for the Main.

OutputSEL
Inclusive of the Main Setpoint and complete with the Main Setpoint Offset.

Alarm n Configuration
... 7 alarms are listed with any already used shown as "Assigned". The relevant screen sequences are repeated for each alarm.

Alarm n Inhibit
Alarm n Latch Enable
Remote alarm output inhibit latch. If enabled, an output remains on after the alarm condition has cleared. Note: Switched status retained after power.

Alarm n Output
Display status of the recorder output given to maximum level (e.g. 30Vp-p). Adjustable from 0 to 999.

8776 & 8777 Process Controller Quick Start Manual PK531 (0037-75563) Page 6 of 6

NOTE: Recording restarts automatically on exit from Recorder Configuration. Alerting function works only if alarms are assigned and the alarm condition remains.

The supported data rates 10/100BASE-T (10 or 100 Mbps) are automatically detected. If feeding in the desired data rate, alternate steps 3.

Packet Type
9600 or None

Address
You must enter the IP address of the IP device. E.g. 192.0.2.1

Port
The default port used for Modbus TCP is 502.

NOTE: Access is restricted to the subnet mask of this device. The IP address must be a valid address within the range of the IP device.

Device connection - Bus PC connector: the PC Serial COM port that you connect to. Start and Stop bits - 1 data bits - 8. Bit Rate & Address settings must be compatible for the device to communicate with the PC. E.g. Modbus line must be set to 9600 for 115200 baud (as shown below).

Device connection - Ethernet connection: Modbus TCP. The IP address is the only important setting. Use the default address of 0.0.0.0 if your network uses DHCP, BondID or Autodiscovery is available, or if you do not know your network settings.

NOTE: Port setting - 502. The supported data rates 10/100BASE-T (10 or 100 Mbps) are automatically detected.