

Installation and Operating Instructions

Paladin Advantage 254-XZZ

Operating and Installation Guide

A programmable transducer for the conversion of electrical parameters in a system.

Introduction

The Paladin Advantage, 254-XZZ, is a programmable transducer which provides measurement isolation and conversion of all main electrical parameters into an industry standard DC output signal. The 254-XZZ can be used in single and three-phase balanced or unbalanced, 3 or 4 wire electrical systems. The 254-XZZ has an accuracy of CL0.2 and includes RS485 Modbus RTU communications protocol and Pulse/Alarm output as standard.

Measurement

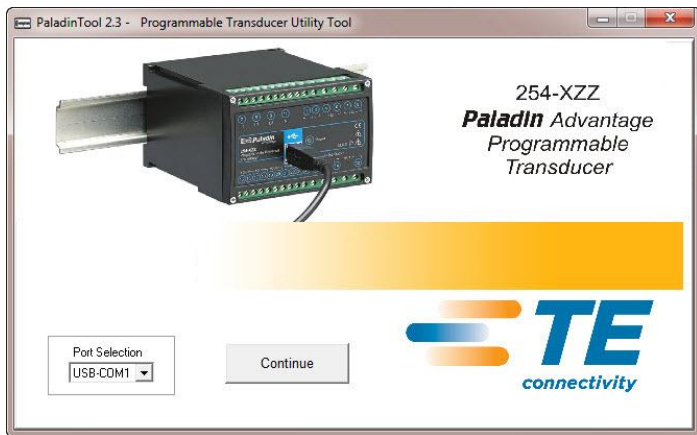
The 254-XZZ is an accurate device for the conversion of all main electrical parameters into a Voltage or mA output and provides measurement, isolation and conversion of upto 4 user defined Inputs and Outputs.

The device is supplied programmed to the users requirements but can be easily be reprogrammed to suit any application.

Setup

The Paladin Advantage, 254-XZZ, is individually calibrated to full accuracy. No further adjustments or setup is required.

Should the unit need reprogramming please refer to the Programming Guide for further information.



Installation

Warnings



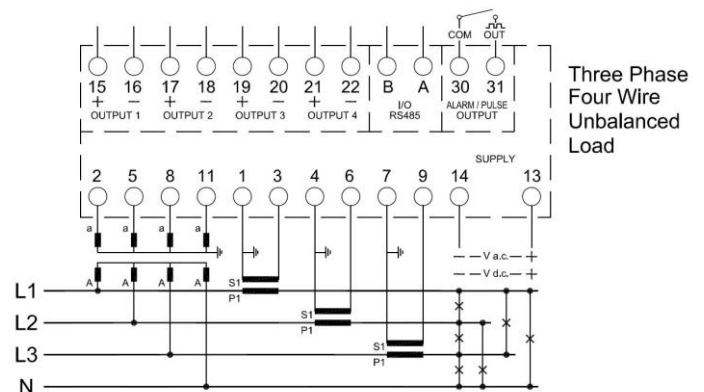
Caution: Risk of Electric Shock

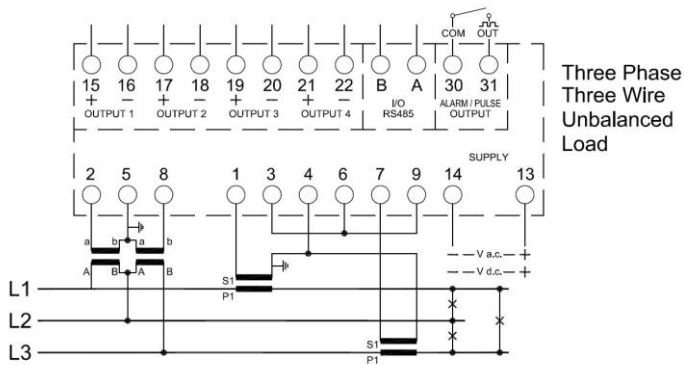
- During normal operation, voltages hazardous to life may be present at some of the terminals of this unit.
- At voltages below that specified in the Range of Use the meter may shut down. However, voltages hazardous to life may still be present at some of the terminals of this unit.
- Installation and servicing should be performed only by qualified, properly trained personnel abiding by local regulations.
- Ensure all supplies are de-energised before attempting connection or other procedures.
- Terminals should not be user accessible after installation and external installation provisions must be sufficient to prevent hazards under fault conditions.
- This unit is not intended to function as part of a system providing the sole means of fault protection - good engineering practice dictates that any critical function be protected by at least two independent and diverse means.
- The unit does not have internal fuses therefore external fuses must be used for protection and safety under fault conditions.
- Never open-circuit the secondary winding of an energized current transformer.
- This product should only be operated with the CT secondary connections earthed.
- If this equipment is used in a manner not specified by the manufacturer, protection provided by the equipment may be impaired.

Connections Diagrams

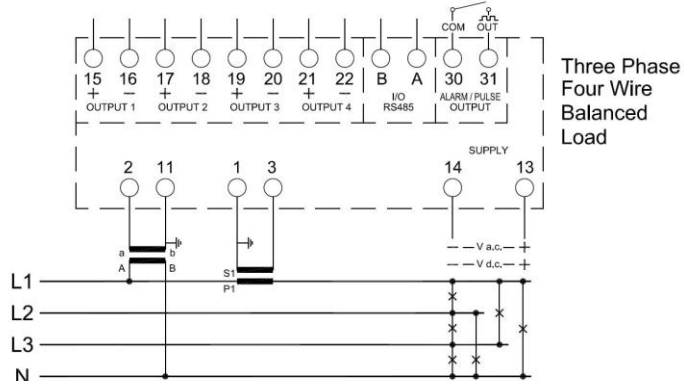
WARNING.

It is essential that the primary current is isolated BEFORE connecting or disconnecting the secondary current connections

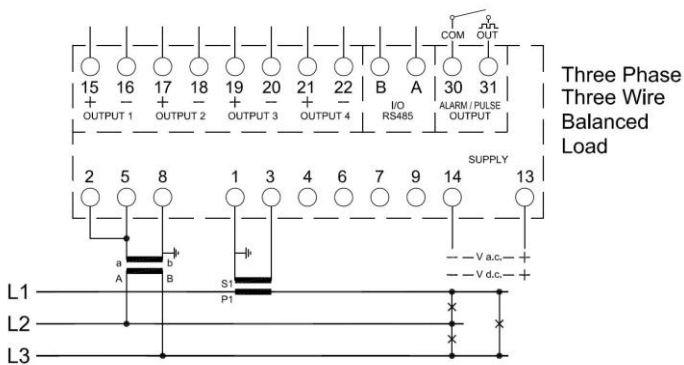




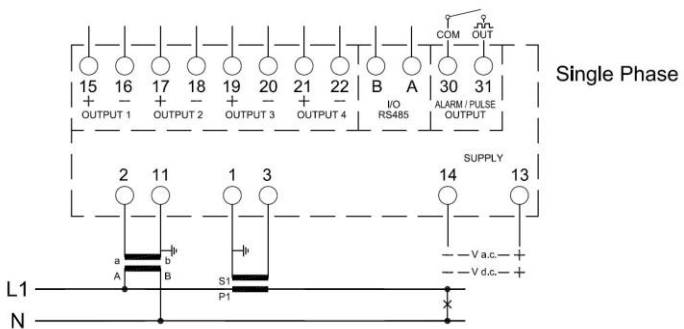
Three Phase
Three Wire
Unbalanced
Load



Three Phase
Four Wire
Balanced
Load



Three Phase
Three Wire
Balanced
Load



Single Phase

Safety

The unit is designed in accordance with BS EN 61010-1:2001 (IEC 61010-1:2001) – Permanently connected use, Normal condition. Installation category III, pollution degree 2, basic insulation for rated voltage. Measurement Category III.

EMC Installation Requirements

Whilst this unit complies with all relevant EU EMC (electromagnetic compatibility) regulations, any additional precautions necessary to provide proper operation of this and adjacent equipment will be installation dependent and so the following can only be general guidance:

- Avoid routing wiring to this unit alongside cables and products that are, or could be, a source of interference.
- The supply to the unit should not be subject to excessive interference. In some cases, a supply line filter may be required.
- To protect the product against incorrect operation or permanent damage, surge transients must be controlled. It is good EMC practice to suppress transients and surges at the source. The unit has been designed to automatically recover from typical transients; however in extreme circumstances it may be necessary to temporarily disconnect the supply for a period of greater than 10 seconds to restore correct operation.
- Screened communication leads are recommended and may be required. These and other connecting leads may require the fitting of RF suppression components, such as ferrite absorbers, line filters etc., if RF fields cause problems.
- It is good practice to install sensitive electronic instruments that are performing critical functions in EMC enclosures that protect against electrical interference causing a disturbance in function.

Wiring

Connections are made via shrouded screw-clamp 0.05-4mm wire. Choice of cable should meet local regulations for the operating voltage.

Connector plugs are suitable for copper wires only and will accept one stranded 0.05 – 4mm² (30 - 11AWG) stranded core cables. This instrument is intended for panel mounting. Terminals must be enclosed within the panel. For mains terminals use wire rated at 600V, 60°C minimum temperature. Terminal screws are fully tightened for shipment and must be undone before wire insertion. Terminal screws should be tightened to 0.5 Nm (4.4 lbf in) only.

Fusing

This unit must be installed with external fuses in the voltage supply lines of type fast blow 1A maximum. Choose fuses of a type and with a breaking capacity appropriate to the supply and in accordance with local regulations.

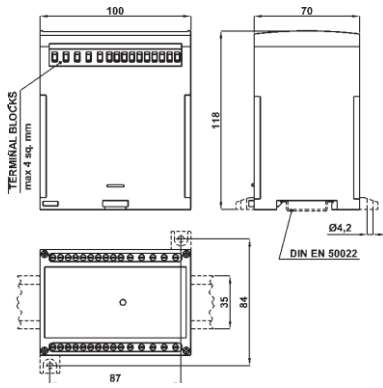
A suitable switch or circuit breaker conforming to the relevant parts of IEC 60947-1 and IEC 60947-3 should be included in the installation. It should be positioned so as to be easy to operate, in close proximity to the equipment, and clearly identified as the disconnecting device.

Maintenance

In normal use, no maintenance is needed. As appropriate for service conditions, isolate from electrical power, inspect the unit, and remove any dust or other foreign material present. Periodically check all connections for freedom from corrosion and screw tightness, particularly if vibration is present.

The front of the case should be wiped with a dry cloth only. Use minimal pressure, especially over the viewing window area. If necessary wipe the rear case with a dry cloth. If a cleaning agent is necessary, isopropyl alcohol is the only recommended agent and should be used sparingly. Water should not be used. If the rear case exterior or terminals should be contaminated accidentally with water, the unit must be thoroughly dried before further service. Should it be suspected that water might have entered the unit, factory inspection and refurbishment is recommended.

Case Dimensions



The unit is intended for mounting on a standard DIN rail. Avoid mounting the unit where there is excessive vibration; in excessive direct sunlight; or outside a reasonably stable ambient temperature of -10 to +45°C.

Range of Use

Values of measured quantities, components of measured quantities, and quantities which affect measurement errors to some degree, for which the product gives meaningful readings:

Voltage	5 ... 120% of nominal
Current	5 ... 120% of nominal
Active power	50 ... 120% of nominal
Apparent power	50 ... 120% of nominal

Power is only registered when voltage and current are within their respective range of use.

Accuracy

Voltage (V)	< 0.2% of range
Current (A)	< 0.2% of range
Neutral current calculated (A)	< 1% of range
Frequency (Hz)	< 0.1 Hz
Active power (W)	± 0.2% of range
Reactive power (VAr)	± 0.2% of range
Apparent power (VA)	± 0.2% of range
Active energy (kWh)	Class 1 (IEC 62053-21) section 4.6 ¹
Reactive energy (kVArh)	Class 1 IEC 62053-23 ²
THD	up to 31 st harmonic
Response time to step input	<200ms

Outputs

	0... +/- 1mA	0... +/- 5mA
	0... +/- 10mA	0... +/- 20mA
Analogue Output	4... +/- 20mA	
	0... +/- 1V	2... +/- 10V
	All programmable	

RS485 output

Type	2-wire half duplex
Baud rate	9600, 19200, 38400

*Ensure any external circuits connected to RS-485 output modules are provided with double/reinforced insulation.

Pulse / Alarm Output

Type	User defined Solid State Relay
Pulse duration	30msec to 1000 msec
Alarm Delay	0-120 secs
Hysteresis	1 – 99 %

Reference Conditions of Influence Quantities

Influence Quantities are variables that affect measurement errors to a minor degree. Accuracy is verified under nominal value (within the specified tolerance) of these conditions.

Ambient temperature	23°C ±1°C
Input waveform	50 or 60Hz ±2%
Input waveform	Sinusoidal (distortion factor <0.005)
Magnetic field of external origin	Terrestrial flux

Environment

Operating temperature	-10°C to +45°C*
Storage temperature	-30°C to +70°C*
*Maximum operating and storage temperatures are in the context of typical daily and seasonal variation.	
Relative humidity	0 to 90%, non-condensing
Altitude	Up to 2000m
Warm up time	1 minute
Vibration	10Hz to 50Hz, IEC 60068-2-6, 2g
Shock	30g in 3 planes
Dielectric voltage Withstand test	4kV, 50Hz for 1 minute supply/inputs/outputs 700V, 50Hz 1minute output/output

Mechanics

Dimensions	100 × 70 x (W×H)
Depth	118 mm maximum
Sealing	IP23 (front panel)
Mounting	DIN Rail (DIN 43880)

Approval, Certification, and Standards Compliance

EMC, Emissions	BS EN 61326, Class A (Industrial)
EMC, Immunity	BS EN 61326, Class A (Industrial)
Safety	BS EN 61010-1:2001

Specification Input

Nominal input voltage	100 to 230V AC L-N (173 – 400V AC L-L)
Max. continuous input overload voltage	120% of nominal
Max. short duration input Voltage	2 x range maximum
Nominal input voltage burden	< 0.5VA all phases
Nominal input current	1 or 5 A
Max. short duration input current	20 x nominal (for 300msec)
Frequency	45 to 65Hz
Supply burden	6 VA

Explanation of Symbols



Refer to manual



Danger of electric shock



Do not discard

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Tyco Electronics UK Ltd

TE Energy
Freebournes Road
Witham, Essex CM8 3AH
Phone: +44 (0)870 870 7500
Fax: +44 (0)870 240 5289
Email: Crompton.info@te.com
www.crompton-instruments.com

