masibus
A Sonapar Company

**Operation Manual**
# PDA,PDV


**PROGRAMMABLE CURRENT/VOLTAGE TRANSDUCER**

## INTRODUCTION

The Masibus PDA / PDV is used to measure and convert AC Current or Voltage input into a load independent DC current or voltage output signal. Output signal generated is proportional to the root mean square value of the input Current or Voltage. It is equipped with two load independent, galvanically-isolated analogue outputs that can be configured for different input range and output curves. The output is usually linked to remote monitoring equipment such as RTU, recorders, PLC's, SCADA systems etc.

Available only in single phase version, externally powered. AC transducer offers an economical and accurate means of current & voltage measurement on systems where transducers are calibrated to true RMS measurement. It provides accuracy class 0.2 with up to 3 KV isolation.

Programming of the Transducer is easy by means of user friendly mMFT windows based configuration software.

## SPECIFICATIONS

**Input:**

**AC Voltage**

| | |
|---|---|
| Nominal Input (Un) (PT Secondary) | 57.7 V to 415 V AC |
| Measuring Voltage Range | 0 to 130 % Un |
| Measurement Method | True RMS |
| Burden | <0.3VA at Un |
| PT Ratio | 1 to 9999.999 Programmable on site |
| Maximum Overload voltage | 1.3 x Un Continuously<br>2 x Un for 1 s, with up to 10 repetitions at 10 s intervals |

**AC Current**

| | |
|---|---|
| Nominal Input (In) (CT Secondary) | 1A to 5A |
| Measuring Current Range | 0 to 150 % In |
| Measurement Method | True RMS |
| Burden | <0.2VA at In |
| CT Ratio | 1 to 9999.999 Programmable on site |
| Maximum overload current | 2 x In continuously<br>20 x In for 1 s, with up to 10 repetitions at 100 s intervals |

| | |
|---|---|
| **Frequency** | 45 to 65Hz |
| **Analogue output** | |
| Accuracy Class | 0.2 as per IEC60688 standard |
| No. of Outputs | 2 |
| Output type | 4-20mA, 0-20mA, 0-10V, 0-5V, 1-5V DC |
| Maximum load resistance | ≤750 Ω for 20 mA, ≥ 2 k Ω for 10 V (for each output) |
| Response time | <500mS |
| Ripple | <0.4% Peak to Peak |
| Usage Group | I |
| External magnetic field | 0.5 mT |
| Common Mode Voltage | 100 Vrms |

**Auxiliary Power Supply**

| | |
|---|---|
| **Power Supply** | Universal Aux. Supply :85-265VAC, 50/60Hz or 100-300VDC<br>Burden : < 5.5VA (2.2W) |
| | DC Aux. Supply : 20-60VDC<br>Burden : < 2.2W |

**Isolation (Withstanding Voltage)**
Between primary terminals* and secondary terminals**: At least 3000 V AC for 1 minute
Between primary terminals*: At least 3000 V AC for 1 minute
Between secondary terminals**: At least 500 V AC for 1 minute
* Primary terminals indicate aux power terminals & input terminals.
** Secondary terminals indicate analogue O/P-1 and analogue O/P-2.
**Insulation resistance:** 200MΩ or more at 500 V DC between Input/Output/Power/Case and grounding terminal

**Environmental**

| | |
|---|---|
| Operating temperature | 0…10 … 23 … 35…55ºC |
| Storage temperature | -40 to 85°C |
| Relative humidity | 25-95% non-condensing |
| Pre-conditioning | 30 min acc. to IEC 60688 |
| Installation Category | CAT III for < 300V AC |
| Protection Class | II |
| Pollution Degree | 2 |
| Ingress protection | Housing IP40, Terminals IP20 |

**Physical**

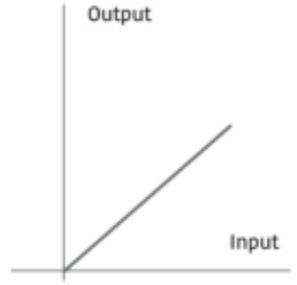
| | |
|---|---|
| Mounting Type | DIN Rail |
| Dimension (in mm) | 71H x 61W x 112D |
| Case Material | ABS |
| Weight | 0.4 Kg |
| Connector type | Metal Screw |
| Conductor size for terminals | ≤ 4 $mm^2$ |

**Communication ports**
**Mini USB type**: For on-site configuration

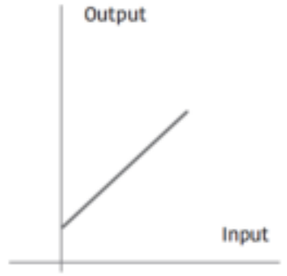
**Configuration software tool**
**mMFT**
For on-site configuration of measurement inputs, output and online parameter reading. It can be freely downloaded from www.masibus.com

## INPUT - OUTPUT SIGNAL CURVES

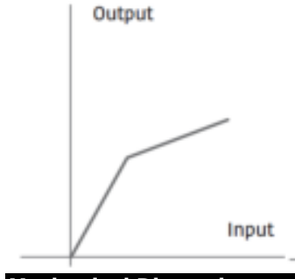
Curve A:
Linear



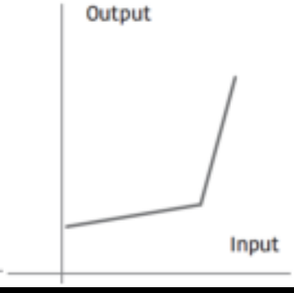

Curve B:
Linear with live zero




Curve C:
Compressed upper region

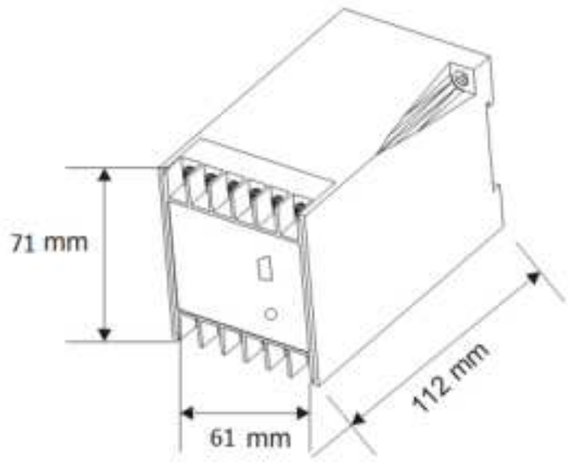



Curve D:
Compressed lower region

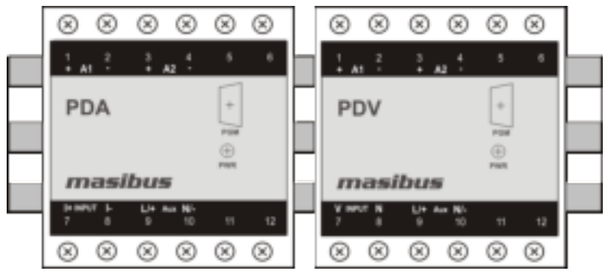



## Mechanical Dimensions

**Isometric view**



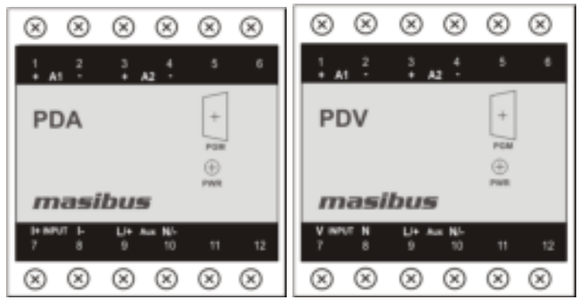

**Installation details**




## SAFETY/WARNING PRECAUSTIONS

To ensure that the device can be operated safely and all functions can be used, please read these instructions carefully.
Installation and Start-up must be carried out by qualified personnel only. The relevant county-specific regulations must also be observed.
Before start-up it is particularly important to ensure:
- Terminal wiring: check that all cables are correctly connected according to the connection diagram
- All wiring must confirm to appropriate standards of good practice and local codes and regulations. Wiring must be suitable for voltage, current and temperature rating of the system.
- Unused control terminals should not be used as jumper points as they may be internally connected, which may cause damage to the unit.

## TERMINAL CONNECTION




| Terminal No. | Description |
|---|---|
| **1 A1 +<br>2 A1 -** | For Analog Output -1 |
| **3 A2 +<br>4 A2 -** | For Analog Output -2 |
| **6 INPUT I+/V<br>7 INPUT I-/N** | For Current/Voltage Input |
| **8 L/+<br>9 N/-** | Aux. Power Supply Input |

## FRONT PANEL DESCRIPTION

| Symbol | Function |
|---|---|
| **PWR** | ON when unit is power up with Aux. Supply |
| **PGM** | Communication port for Parameter configuration |

## PTs and CTs

Large electrical installations have high voltages and currents, which may exceed the direct connection rating of the PDA/PDV. In this case, Potential Transformers (PTs) and Current Transformers (CTs) are used to precisely "step down" or reduce the voltage and current level to suit the Transducer rating. Potential Transformers usually have a full-scale output of 110V/240V ac and Current Transformers, a full-scale output of 1A/5A.

The PTs (Potential Transformers) and CTs (Current Transformers) must be planned, installed and tested by a qualified electrical contractor before wiring the transducer. The accuracy of the measurement also depends on the accuracy of the PTs and CTs.

Instrument Class 1 or better PTs and CTs are recommended. Do not use protection class CTs to feed the PDA, as they have poor accuracy and phase characteristics. Ensure that the CT primary rating has been selected so that your normal load variation lies between 40% and 80% of its full scale. If your CT is over-rated, say if the load is always less than 10% of the CT primary rating, accuracy suffers.

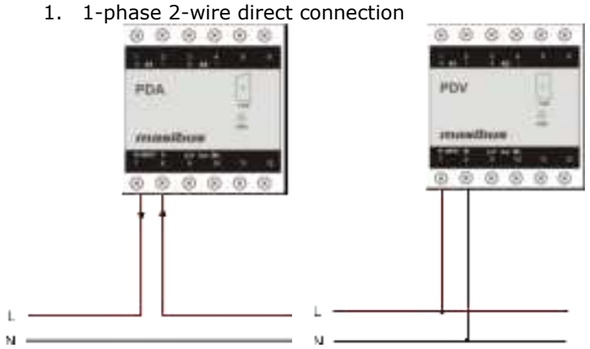
## PT, CT WIRING

The PTs and CTs must have adequate VA rating to support the burden (loading) on the secondary. You may want to support the auxiliary supply burden from one of the PTs. CTs wiring can impose additional burden (loading) on the CT. For example, if the CT has a 5A secondary and the wire resistance is 1.0 Ω, then the CT has to support an additional burden of 5VA. The wiring distance from the CT secondary to instrument should be such that, VA of wire path between PDA and CT along with VA of PDA should not exceed the VA rating of CT, otherwise the CT could get over-burdened and give large errors.

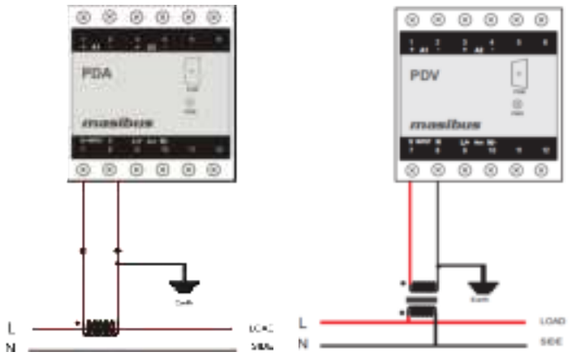
PDA/PDV should be conveniently located for easy connections of voltage (PT) and Current (CT) signals.

## Terminal Wiring Details

1. 1-phase 2-wire direct connection




2. 1-phase 2-wire using CT/PT connection




## Jumper Setting for Output

Type of output (current or voltage signal) has to be set by the Jumper Setting.

For Setting of Jumper the user needs to open the transducer housing & set the jumper located on PCB to the desired output type Voltage or Current. Output range changing is not possible with jumper setting.
Refer below Fig. for jumper setting.

| Jumper Setting | Type of Output Signal |
|---|---|
| Jumper 3&4 Short, 1&2 Open   | load-independent current |
| Jumper 1&2 Short, 3&4 Open   | load-independent voltage |

## Configuration Via Programming port

A PC with USB interface along with the configuration cable TT7SCC and the configuration software are required to Program the transducer. The configuration software mMFT is available on our Website (www.masibus.com).

**The connections between**
"PC ←→ TT7SCC ←→ Masibus PDA/PDV Transducer"
The power supply must be applied to Transducer before it can be Configured.

## TROUBLESHOOTING TIPS

The information in Table-1 describes potential problems and their possible causes. It also describes checks you can perform or possible solutions for each. After referring to this table, if you cannot resolve the problem, contact our sales representative.

**Table–1: Troubleshooting**

| Potential Problem | Possible Cause | Possible Solution |
|---|---|---|
| The Power Led OFF after applying control Power to the PDA/PDV. | The PDA/PDV may not be receiving the necessary Power. | Verify that the PDA/PDV line (L) and neutral (N) terminals are Receiving the necessary power. |
| The data being displayed is inaccurate or not what you expect. | Incorrect setup values. | Check that the correct values have been entered for PDA/PDV setup parameters (CT and PT ratings, Output setting). |
| | Incorrect voltage inputs. | Check PDA/PDV voltage input terminals to verify that adequate voltage is present. |
| | PDA/PDV is wired improperly. | Check that all CTs or PTs are connected correctly and that they are energized. Check shorting terminals. |

**UNIT NOT TURNING ON**
The problem can be bad connection / power of incorrect rating.
First check, power on terminal of the instrument itself if it is not present then the fault is in power cable.
**One must take care while dealing with Power wirings because it may create electrical shock.**

**UNSTABLE READING**
Check for loose connections.
First verify that all conventional instrumentation norms have been followed for wiring.
Check for ripple on power supplies of Input section and Output sections. If power supplies have ripples, input voltage may be low or there is some failure on power supply card.

OUTPUT NOT MATCHING WITH THE EXPECTED VALUE
It is a normal tendency to doubt the instrument performance when the Output is not matching the expected value. Kindly make sure that the output is incorrect with respect to input signal, before attempting any re-calibration.
Account for measuring instrument's inaccuracies, lead errors and calibration errors. Care must be taken when measuring Output signal.
An ordinary 3½ digit multimeter is used it can show reading which deviates from what the instrument is showing as the accuracy of the multimeter may not be as good as the that of the instrument. So use calibrating instrument of accuracy better than 0.1% for purpose of calibration.
**If these troubleshooting tips do not solve your problem then, please contact technical support at either nearest area office or Main Head Office as given on the first page.**

For operation manual please visit www.masibus.com
Specifications are subject to change without notice due to Continuous improvements.
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