Paladin Advantage
Universal Programmable Transducer

Software Programming Guide

TE connectivity ENERGY

Paladin Advantage—Programming Guide

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 Modbus® (RS485) communications protocol and Pulse/Alarm output as standard.

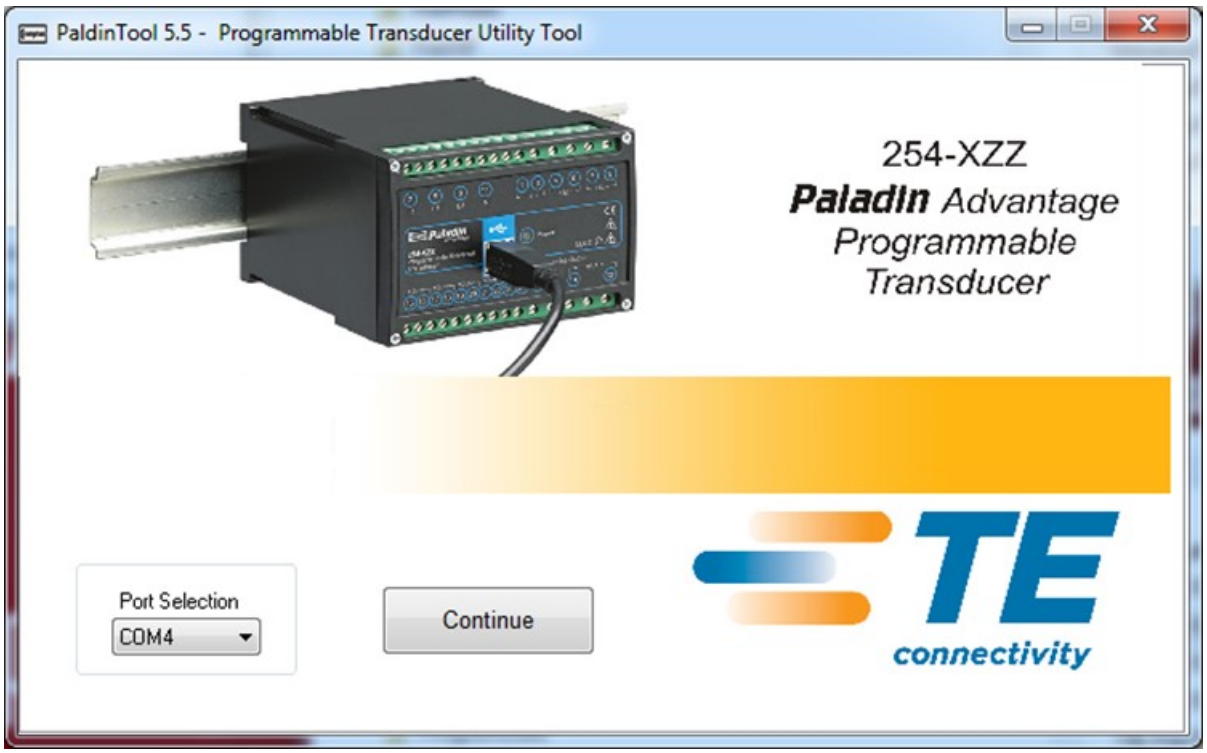
General Information

The 254-XZZ is supplied programmed with up to 4 user defined Inputs and Outputs. It is, however, possible to re-program the device to suit any application.
The unit is (re)programmed using the software available on the website.
www.crompton-intsruments.com
and is called Paladin Advantage Utility Tool.
The PaladinTool utility runs on a Personal Computer (PC) with Microsoft Windows Operating System. The programmable transducer must be connected to the PC by a standard printer USB cable (not provided), and the auxiliary supply powered-on.

The USB connection to the transducer is fully isolated, allowing a safe programmability of the transducer itself even if it is completely wired to a live system.

Download and Installation

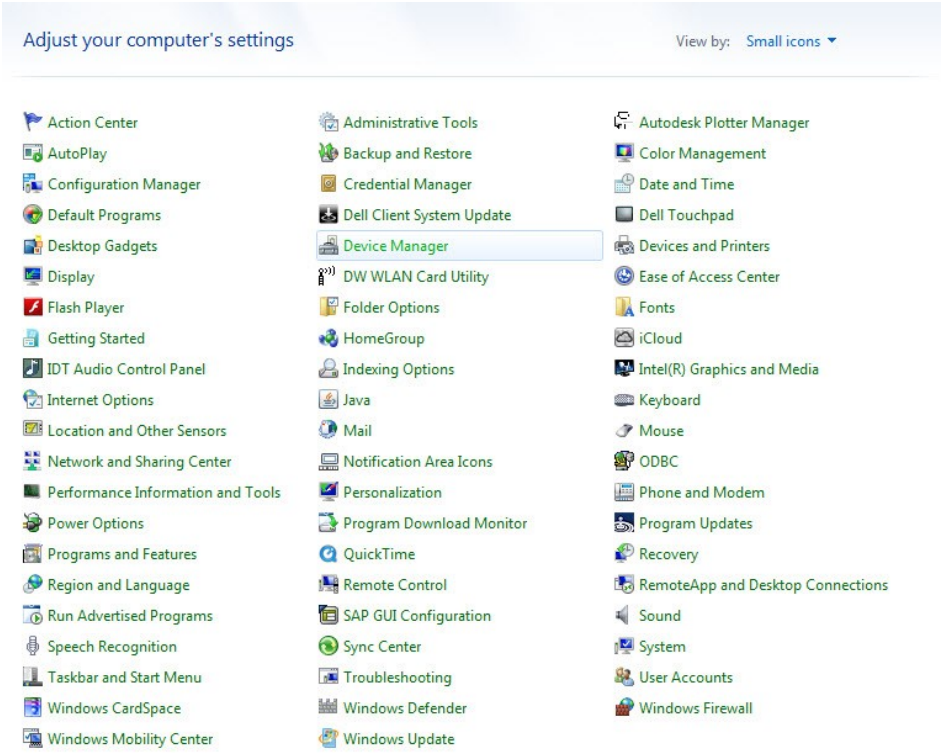
Please proceed in this order:
2.1 Download the program from the website into a directory / folder of your choice.
2.2 Power-on the transducer and connect it to the PC via the USB cable.
2.3 The Windows Operating System will recognize the new connected device and automatically install the required drivers.
2.4 Launch the Paladin Advantage Utility Tool by double clicking on the PaladinTool.exe file (the utility does not need to be installed). Ignore, clicking on "OK", error messages relevant to COM(n) that may appear, and eventually the following window opens:
2.5 Select, from the Port Selection drop-down menu, the correct USB-COM port to which the programmable transducer is connected and then press "Continue". Details on how to find the correct COM port are detail overleaf.



Finding the COM Number

To know which is the correct USB-Com port, in Windows go to "Control Panel", then "System", then "Device Manager", then "Ports (COM & LPT)": there you should see to which number is associated the USB Serial Com Port.

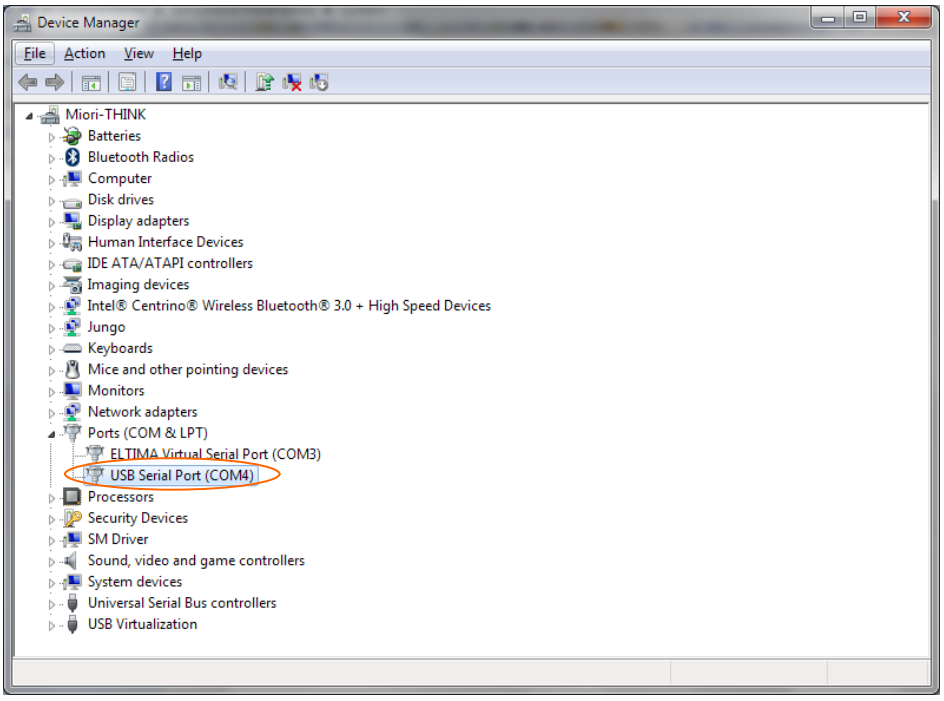
Control Panel



From START button in Windows.

Select Control Panel.

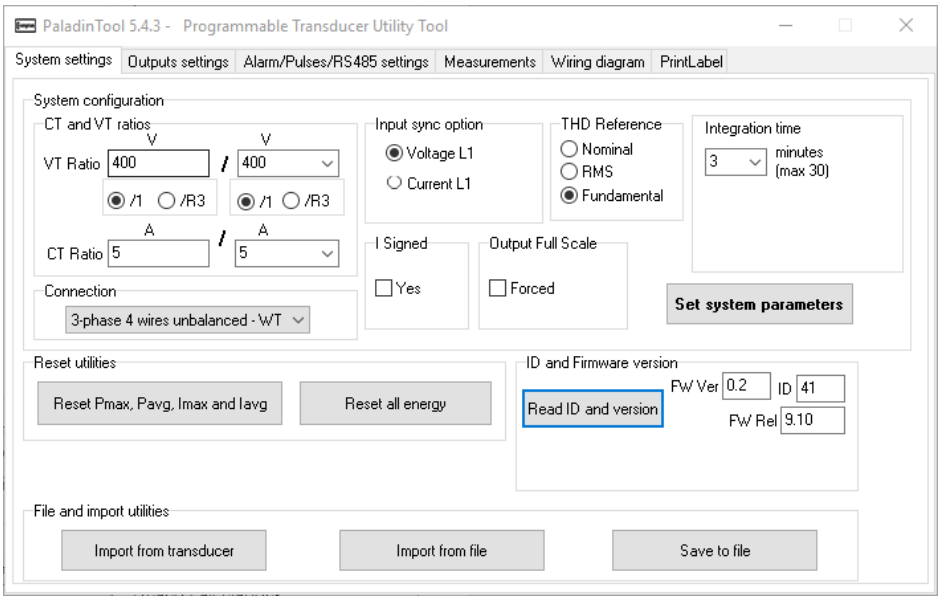
Device Manager



Expand the selection under Ports (COM & LPT)

COM port number assigned with Serial USB Port is the correct one.

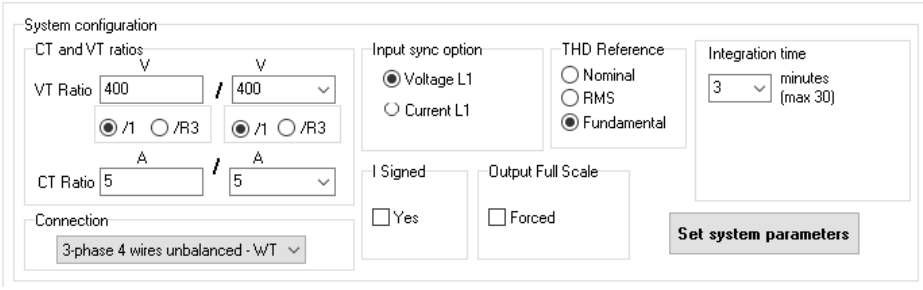
System Settings



The System Settings tab is used to configure the Advantage transducer for the

- Main parameters of the electrical system.
- Reset the energy parameters
- Import and export the transducer settings and save to a file.

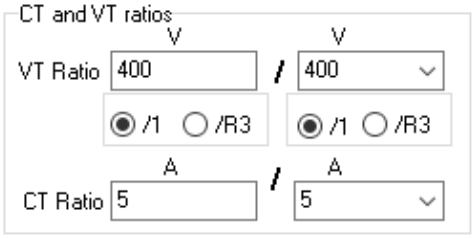
System Configuration



Within system settings the system configuration is used to set the parameters of the electrical systems

- CT and VT Ratio
- Input that the product uses for synchronisation
- Reference for the THD calculation
- Integration period for the demand calculations
- System Type

CT and VT Ratios

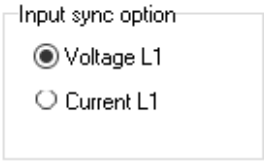


Enter the primary and secondary VT ratio
The secondary voltage is selectable from the drop down list.

Voltages can be entered at L-N (/1) or L-L (/R3) values.

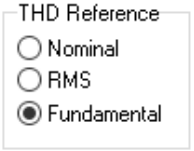
The secondary current is selectable 5 or 1 Amp(s).
Other secondary values are available.

Synchronisation



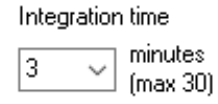
All electronic product rely on synchronisation to a particular input. The default is usually the Voltage L1 input as this is more stable.
Where Voltage L1 is not present synchronisation may be derived from the Current L1 input.

THD



This sets the reference by which the THD is calculated.
The default is **Fundamental**.
In systems with very low power consumption calculation from nominal may give a more accurate representation of the distortion in the system..

Demand Integration

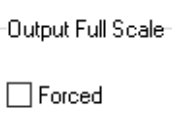


This sets time period for demand calculations.
Max 30 mins

I Signed

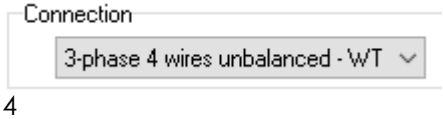
If checked, the output signals related to the current measurements become bidirectional.

Output Full Scale



If checked, the output signal will not exceed nominal limits during overload conditions.

System Connection Type

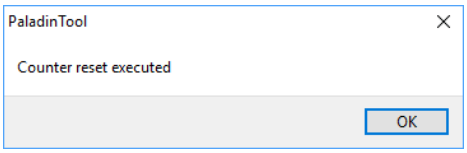


Select the electrical system type.

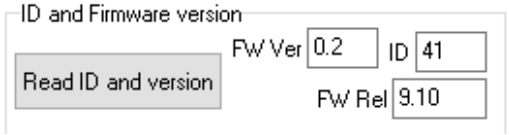
- 3 Phase 4Wire unbalanced (default)
- 3 Phase 3Wire unbalanced
- 3 Phase 4Wire balanced
- 3 Phase 3Wire balanced
- Single Phase

Reset Energy Parameters

Use these buttons to reset Maximum and average values for active Power and Current.
All phases.
The Reset Energy button resets all energy parameters.



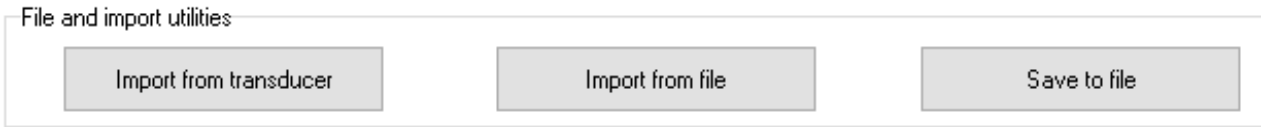
Product Details



Pressing the **Read ID and version** button will send a request to the product for the Product ID code and the product software version.
The response will be shown in the windows. (Numbers are for example only and will vary by product)

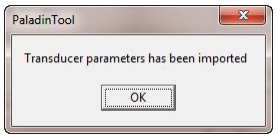
This can also be used to verify the communication between the PC and the product.

Import / Save Configuration Settings



Should multiple products be required in the same electrical system. The above buttons can be use to save the configuration settings to a file on the connected PC.
This file can then be downloaded to multiple products using the **Set system parameters** button.

Pressing this button uploads the configurations currently in the product connect via the USB cable into the configuration software.

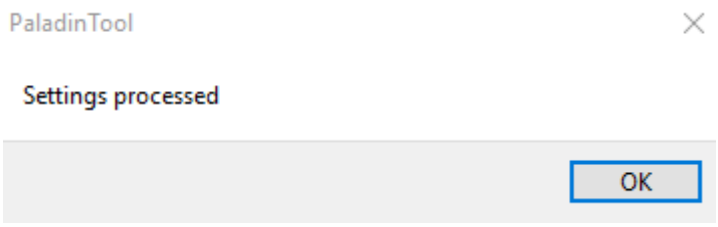


Pressing this button imports a previously saved file from a folder on the PC into the software program

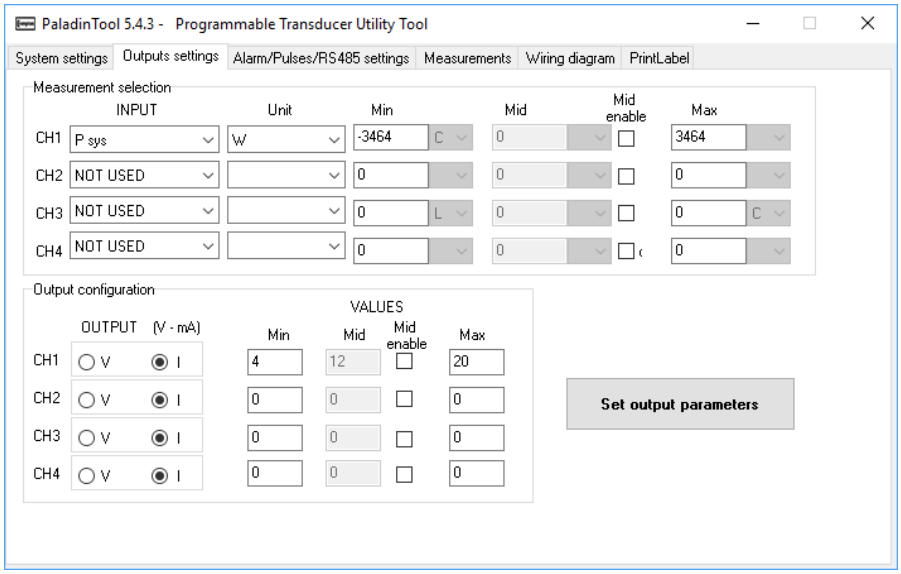
Pressing this button saves the current configuration in the software to a file on the PC. This maybe an uploaded configuration from another product, modified or new.

Downloding the parameters to the product

Pressing this button downloads the current settings in the software to the product.
Successful download will be indicated by the window below.

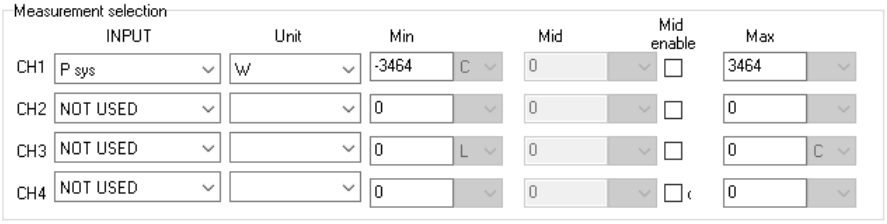


Output Parameters and Settings



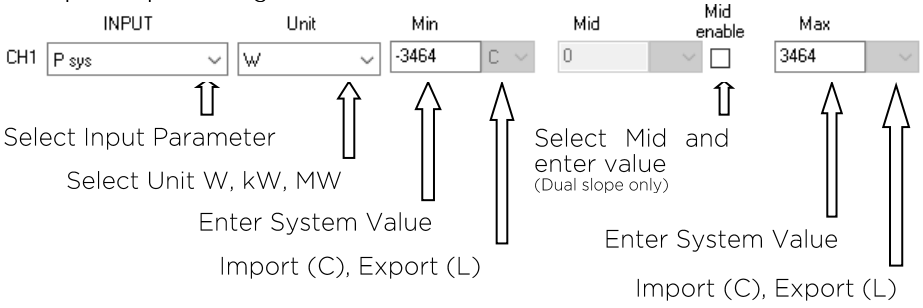
The **Output Settings** tab is used to define and set the output of the transducer.
The product is available with two(2) outputs and four (4) outputs.

Output Selection and Value

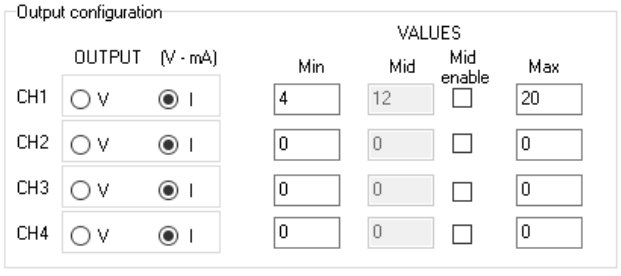


Each output (channel) can be assigned to any of the electric system parameters shown in table 1.
Each parameter has an associated unit with Min, (mid), and Max values.

Example Output setting.

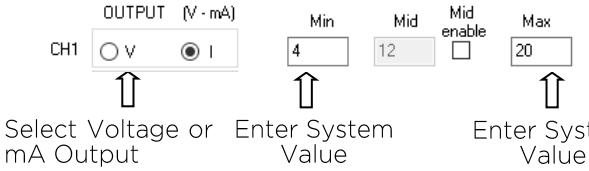


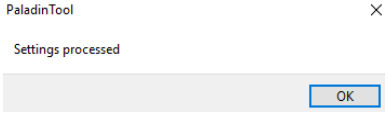
Output Values



The output values can be V or mA.
Should a mid point be selected in the parameter above then the mid is automatically enabled here.

Output Values. Example

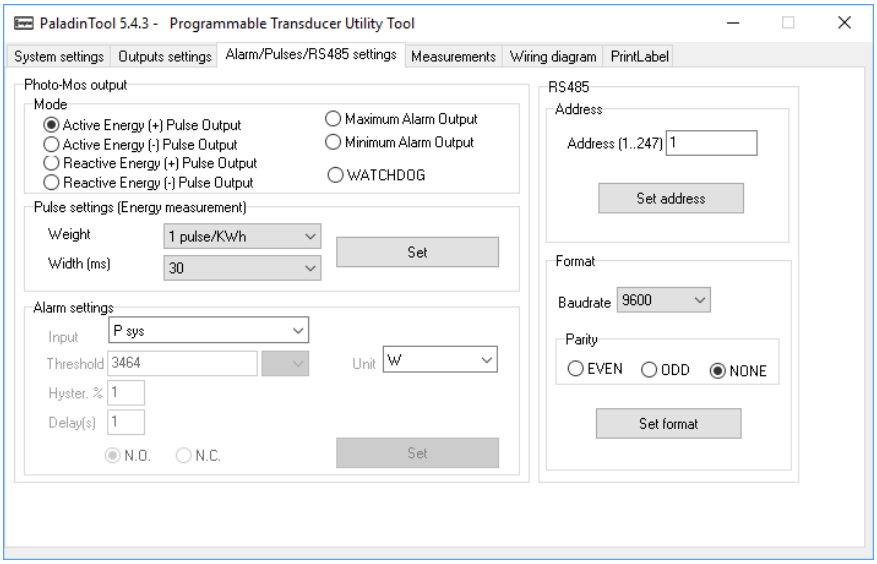




Input Parameters—Table 1

Button	Id	Description
Voltage	VL1	Volts L1 - N
	VL2	Volts L2 - N
	VL3	Volts L3 - N
	2VL12	Volts L1 - L2
	VL23	Volts L2 - L3
	VL31	Volts L3 - L1
	AVG V12 V23 V31	Average Vvlt-age (L-L)
	AVG V1N V2N V3N	Average Vvlt-age (L-N)
	DELTA V	Volts diff L-L
	DELTA VN	Volts diff L-N
Current	IL1	Current L1
	IL2	Current L2
	IL3	Current L3
	IN	Neutral I
	AVG I1 I2 I3	Average Current
	DELTA I	Current diff
	I1 MAX	I1 Max demand
	I2 MAX	I2 Max demand
	I3 MAX	I3 Max demand
	I1 AVG	Average I1
	I2 AVG	Average I2
	I3 AVG	Average I3
Active Power	P	System power
	P1	Power L1
	P2	Power L2
	P3	Power L3
	PMAX	Max power
	PAVG	Average power
Reactive Power	Q	System VAr
	Q1	System VAr L1
	Q2	System VAr L2
	Q3	System VAr L3
Apparent Power	S	System VA
	S1	System VA L1
	S2	System VA L2
	S3	System VA L3
Power Factor	PF	Power factor
	PF AVG	Average PF
	PF1	PF L1
	PF2	PF L2
	PF3	PF L3
ANGLE	SYS ANGLE	System Angle
	ANGLE L1	Phase Angle L1
	ANGLE L2	Phase Angle L2
	ANGLE L3	Phase Angle L3
	FREQ	Frequency
THD	THDV1	THD V1
	THDV2	THD V2
	THDV3	THD V3
	THD I1	THD I1
	THD I2	THD I2
	THD I3	THD I3
COSPHI	COSPHI 1	Displacement P.F
	COSPHI 2	Displacement P.F
	COSPHI 3	Displacement P.F

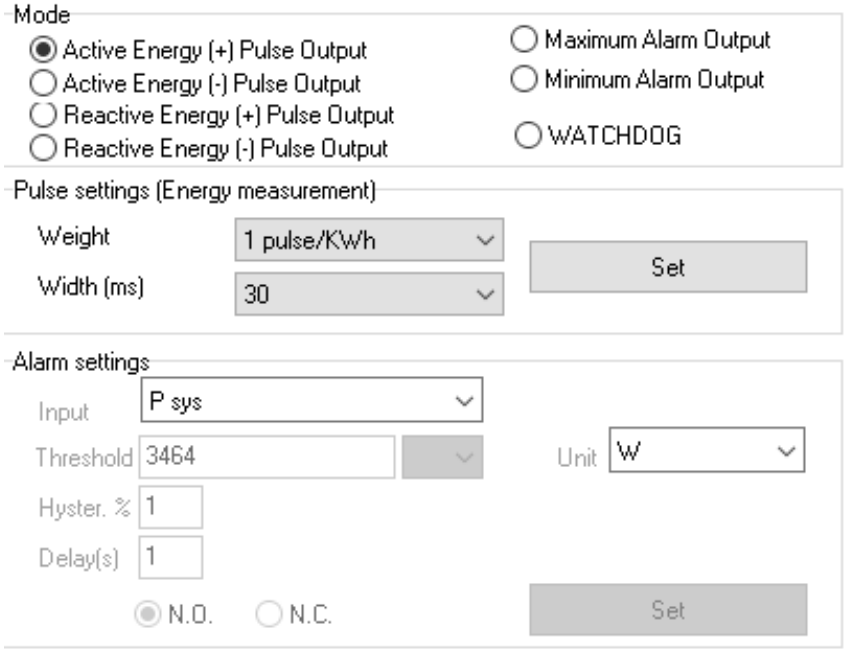
Alarm / Pulsed and Communication Settings



The Alarm/Pulse/RS485 settings tab is used to set the additional outputs of the transducer.

- A solid state relay which can be configured to pulse or alarm output.
- Modbus ® protocol

Digital Output Configuration



This screen details the settings required for the digital output.

The unit is only fitted with one output.
Both Pulse and Alarm in the same product Is not supported.

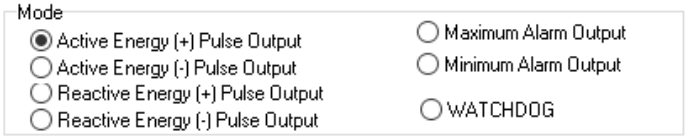
The solid state relay can be configured to operate as

- A pulsed output for active (W) or reactive(VAr) power.
- OR as a Min/Max Alarm

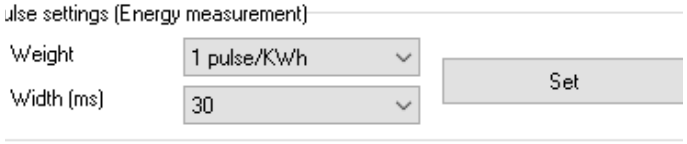
Selecting the pulse option activates the settings definitions for the pulsed output and deactivates (grey) the alarm settings.

Selecting the alarm option activates the settings definitions for the alarm output and deactivates (grey) the pulse settings.

Digital Alarm Mode



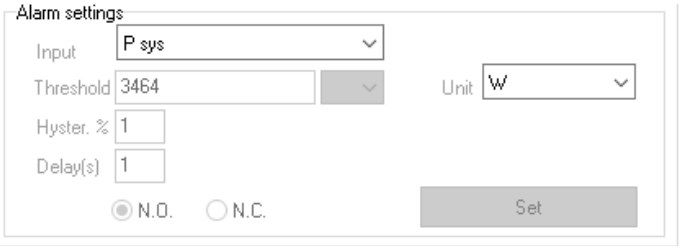
Pulsed Energy Settings



When the pulse parameters are defined, press the **Set** button to send the details to the product.

The **Settings processed** window confirms that the data has been stored in the product.

Alarm Settings



If Alarm mode is selected. The above parameters need to be defined.
The input parameter must be selected from the list in Table 2

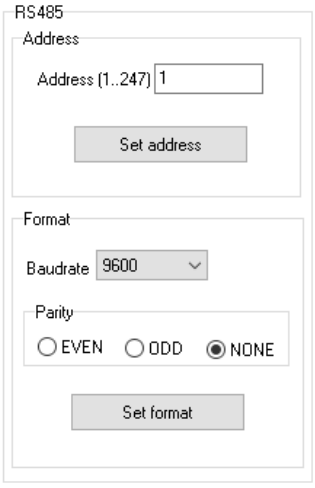
The threshold at which the alarm should activate and the unit of measurement (eg. W, kW, MW)

Hysteresis as a percentage of the threshold value.

Delay in seconds for the alarm to activate

When all the parameters are defined. Pressing the **Set** button transfers the details to the product. The **settings processed** window confirms that the values have been stored.

Modbus Parameters

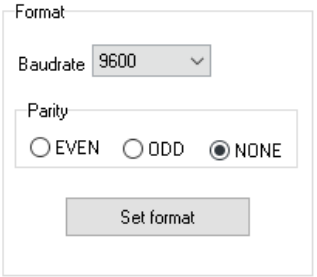


The address of each Paladin Advantage can be set to any value between 1 and 247.

The baud rate is selectable from
9600 (default)
19200
38400

Parity is also selectable using the selection buttons.

Enter the correct address value and press the **Set address** button.
The product will respond with **Settings processed** to confirm that the details have been stored in the product.

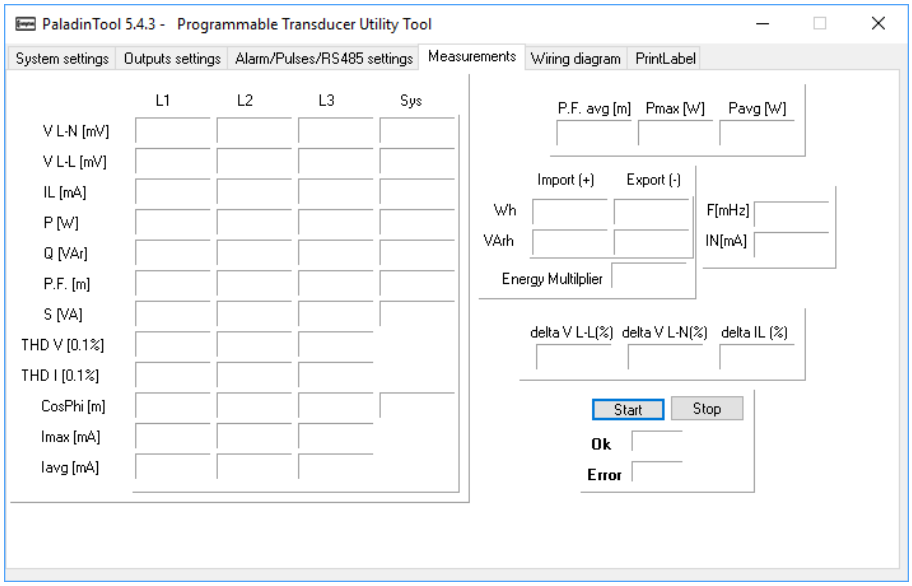


Select the baud rate and required parity and press the **Set address** button.
The product will respond with **Settings processed** to confirm that the details have been stored in the product.

For further information on the Modbus® communications protocol including RS485 connectivity and address mapping please refer to the 254-XZZ Communications guide.

Alarm Parameters—Table 2

Button	Id	Description
Voltage	VL1	Volts L1 - N
	VL2	Volts L2 - N
	VL3	Volts L3 - N
	2VL12	Volts L1 - L2
	VL23	Volts L2 - L3
	VL31	Volts L3 - L1
	AVG V12 V23 V31	Average Voltage (L-L)
	AVG V1N V2N V3N	Average Voltage (L-N)
	DELTA V	Volts Diff L-L
	DELTA VN	Volts Diff L-N
Current	IL1	Current L1
	IL2	Current L2
	IL3	Current L3
	IN	Neutral I
	AVG I1 I2 I3	Average Current
	DELTA I	Current Diff
	I1 MAX	I1 Max Demand
	I2 MAX	I2 Max Demand
	I3 MAX	I3 Max Demand
	I1 AVG	Average I1
	I2 AVG	Average I2
	I3 AVG	Average I3
Active Power	P	System Power
	P1	Power L1
	P2	Power L2
	P3	Power L3
	PMAX	Max Power
	PAVG	Average Power
Reactive Power	Q	System VAr
	Q1	System VAr L1
	Q2	System VAr L2
	Q3	System VAr L3
Apparent Power	S	System VA
	S1	System VA L1
	S2	System VA L2
	S3	System VA L3
Power Factor	PF	Power Factor
	PF AVG	Average PF
	PF1	PF L1
	PF2	PF L2
	PF3	PF L3
ANGLE	SYS ANGLE	System Angle
	ANGLE L1	Phase Angle L1
	ANGLE L2	Phase Angle L2
	ANGLE L3	Phase Angle L3
	FREQ	Frequency
THD	THDV1	THD V1
	THDV2	THD V2
	THDV3	THD V3
	THD I1	THD I1
	THD I2	THD I2
	THD I3	THD I3
COSPHI	COSPHI 1	Displacement P.F
	COSPHI 2	Displacement P.F
	COSPHI 3	Displacement P.F
	VN-MAX123	L-N Max Volts
	V-MAX123	L-L Max Volts
	I-MAX123	Max Line Amps
	WATCH-DOG	Supply failure or fault



The measurements screen can be used to verify the values of the main electrical parameters.

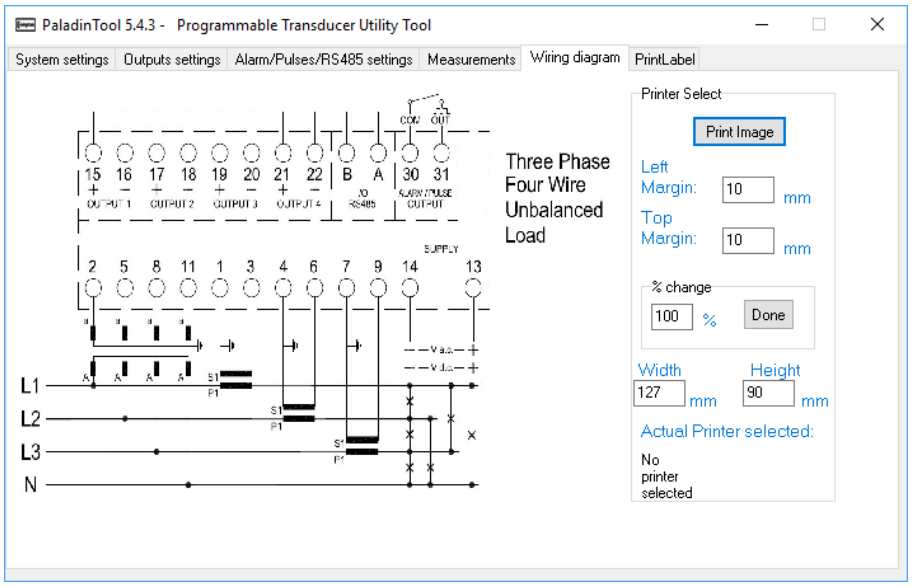
This screen can also be used to verify the communications with the product via the USB port.

For units of measurement please refer to the Modbus® communications guide.

Pressing start will being the communication with the product. Successful data receipts are should in the OK window.

Pressing the stop button halts the data exchange.

Wiring Diagrams



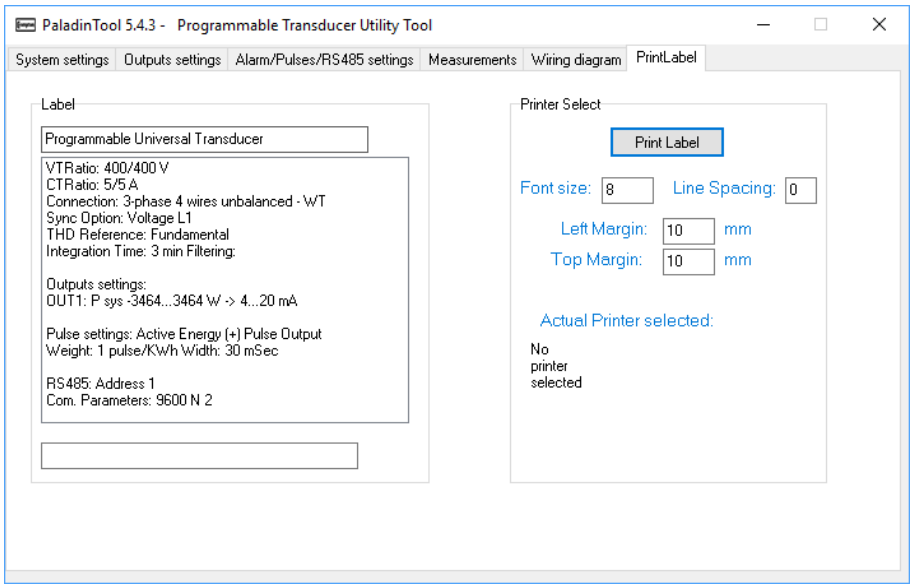
Selection of the system type changes the wiring diagram to the correct.

The wiring diagram can be printed to any printer installed on the PC.

Selection of the printer is made by pressing the button.

This can also be used to select the printer properties.

Label Details



Details enter from the other screens are summarised here.

Font, Line Spacing and margin can also be defined.

Selection of the printer is made by pressing the button.

This can also be used to select the printer properties.

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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

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