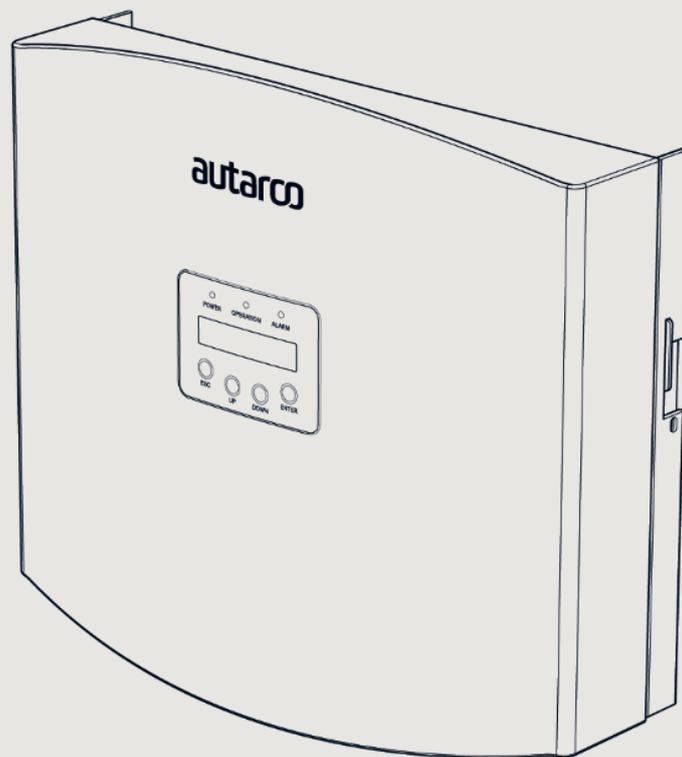


3P-PELD-MII

Installation and
operation manual



This manual is an integral part of the unit. Please read the manual carefully before installation, operation or maintenance. Keep this manual for future reference.

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1.1 Read this first

This manual contains important information for use during installation and maintenance of the Power Export Limit Device (PELD) with Autarco's inverters.

To reduce the risk of electrical shock, and to ensure the safe installation and operation, the following safety symbols appear throughout this document to indicate dangerous conditions and important safety instructions.



WARNING! Indicates safety instruction, which if not correctly followed, can result in injury or property damages.



RISK OF ELECTRIC SHOCK! Indicates safety instructions, which if not correctly followed, could result in electric shock.



HOT SURFACE! Indicates safety instructions, which if not correctly followed, could result in burns.

1.2 Target Audience

This manual is intended for anyone who uses Autarco inverters in conjunction with a Power Export Limiting Device (PELD). Before any further action, the operators must first read all safety regulations and be aware of the potential danger to operate high-voltage devices. Operators must also have a complete understanding of this device's features and functions.



ATTENTION! Qualified personnel means a person with valid license from the local authority in:

- Installing electrical equipment and PV power systems (up to 1500 V).
- Applying all applicable installation codes and using Personal Protective Equipment.
- Analyzing and reducing the hazards involved in performing electrical work.



WARNING! Do not use this product unless it has been successfully installed by qualified personnel in accordance with the instructions in chapter 4 "Installation".

1.3 Intended application

This manual applies to the following product:

- S2.3P-PELD-MII. For limiting up to 10 inverters at a time

Please note that all current inverter models excluding the UX Series are capable of internal power export limitation using an external current clamp or consumption meter. The internal PELD functionality is only applicable for systems with one inverter. Please see the relevant inverter series manual for more information. External power export limitation with the help of the PELD is possible with all inverters.



WARNING! Electrical installations must be done in accordance with the local and national electrical safety standards.



WARNING! It is forbidden to insert or unplug the CT cable when power is on. If the CT cable is accidentally disconnected, please turn off the main AC switch and wait for 5 mins before reconnecting the cable.



WARNING! Risk of electric shock. Do not remove the cover. There are no user serviceable parts inside. Refer servicing to qualified and accredited service technicians.



DANGER! Do not stand close to the PELD during severe weather conditions such as lightning, etc.



WARNING! The PELD may become hot during operation; please don't touch the heat sink or peripheral surface during or shortly after operation.



WARNING! Risk of electric shock from energy stored in capacitors. Do not remove cover until 5 minutes after disconnecting all sources of supply. Warranty may be voided if any unauthorized removal of cover.



WARNING! The installation, service, recycling and disposal of the inverters must be performed by qualified personnel in compliance with national and local standards and regulations. Please contact your dealer to get the information of an authorized repair facility for any maintenance or repairmen.

Any unauthorized actions including modification of product functionality of any form will affect the validation of warranty service; Autarco may deny the obligation of warranty service accordingly.

1.5

Notice for use

The PELD has been constructed according to the applicable safety and technical guidelines. Use the Export Device in installations that meet the following specification **ONLY**:

1. Permanent installation is required
2. The electrical installation must meet all the applicable regulations and standards.
3. The PELD must be installed according to the instructions stated in this manual.
4. The PELD must be installed according to the correct technical specification.
5. To install the PELD you should notice the phase of sampling voltage and the direction of sampling current, then you can connect sampling wires and CT (current transformer).

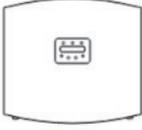
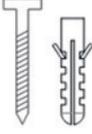
2.1 Product description

Autarco's Power Export Limiting Device can monitor and control the backflow power from the inverter to the grid thus providing export power control of inverters. It also has an integrated data logging function as well. The power export limiting device is suitable for use with all solar PV grid tie inverters.

2.1 S2.3P-PELD-MII - Front view



When you receive your PELD-MII, please ensure that all the parts listed below are included:

<p>PELD x1</p>	<p>Back plate x1</p>	<p>Expansion screw set x4</p>	<p>Locking screw x2</p>
			
<p>AC connector x1</p>	<p>CT connectors x3 COM connector x1</p>	<p>WiFi antenna x1</p>	<p>RJ45 connector x1</p>
			
<p>RS485 Communication terminal x5</p>	<p>User manual</p>	<p>Quick installation guide x1</p>	
			

Please contact Autarco support if any item is missing.

The two-line Liquid Crystal Display (LCD) is located at the front panel of the PELD, which shows the following information:

- PELD operation status and data
- Service messages for operators

2.3 Front panel display



There are four keys at the front panel of the PELD (from left to right): ESC, UP, DOWN and ENTER keys. The keypad is used for:

- Scrolling through the displayed options (the UP and DOWN keys);
- Access to modify the adjustable settings (the ESC and ENTER keys).

2.4 LED status indicator lights

There are three LED status indicator lights at the front panel of the inverter, as shown in figure 3.1.

2.4 Status indicator lights

Light	Status	Description
POWER 	ON	Export Device power on
	OFF	Export Device power off
OPERATION 	ON	Communication with inverter
	OFF	No communication with inverter
ALARM 	ON	Backfeed power over 100W or inverter fault.
	OFF	No alarm

3.1 Install location

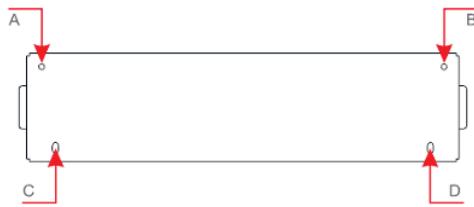
To select a location for the PELD, the following criteria should be considered:

- The temperature of the PELD can reach up to 75°C.
- The PELD is designed to work in an extended temperature range from -25°C to 60°C.
- The PELD must not be placed in direct sunlight.
- The PELD should be installed with a minimum of 300mm clearance from other devices.

3.2 Mounting the PELD

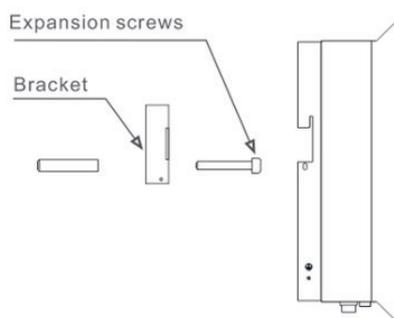
Attach the mounting plate horizontally on to the wall. Then mark A, B and C to fix the mounting plate (see figure 4.1).

3.1 Bracket



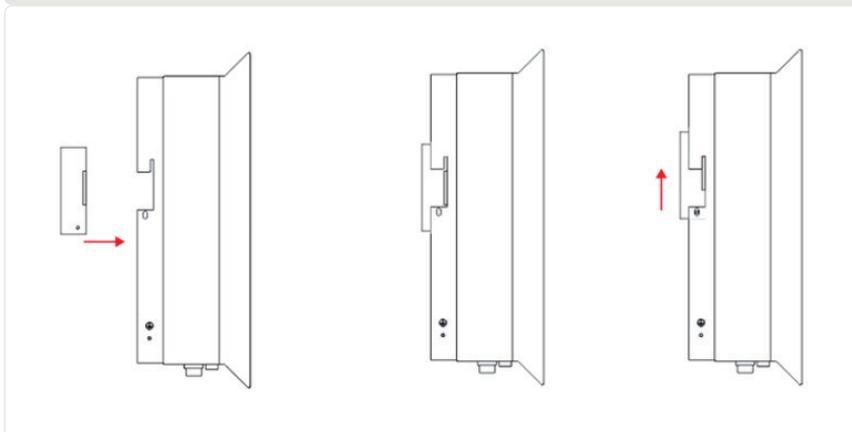
Drill three $\phi 8$ holes and insert expandable plugs into the holes which make the bracket alignment. After that, fix the bracket on the wall (see figure 3.2). Make sure that the wall is flat.

3.2 Fix the bracket on the wall



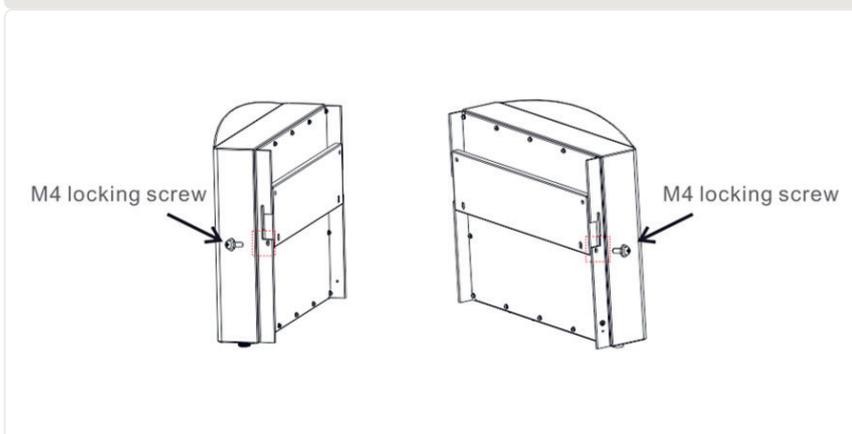
Hang the PELD in the bracket by the steps below
(see figure 3.3)

3.3 Hang the PELD in the bracket



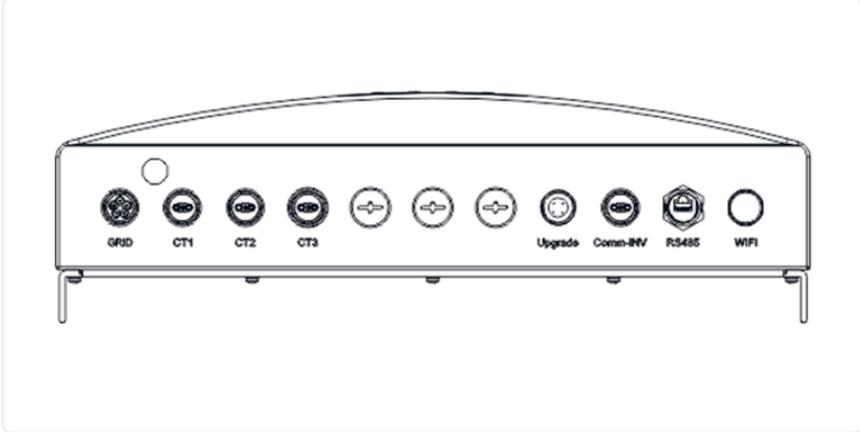
Fix the two screws at the side of the bracket to secure the PELD. Do not overtighten the screws.
(see figure 3.4)

3.4 Fix the two screws



The PELD is designed for electrical connection without removing the cover. The meaning of the symbols located at bottom of the PELD is listed below:

3.5 S2.3P-PELD-MII Bottom view



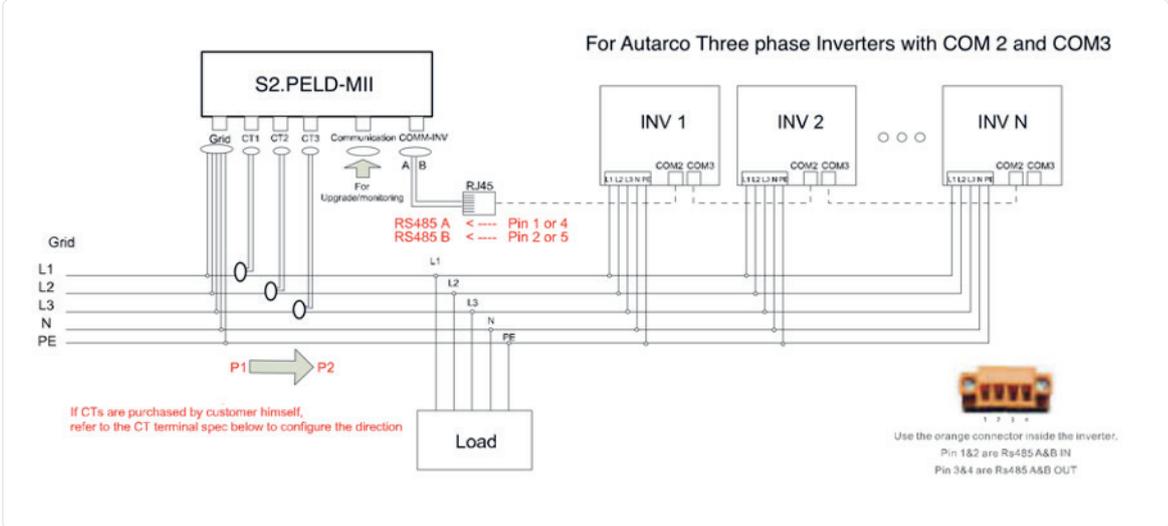
3.1 The meaning of the symbols located at bottom of the PELD

Grid	AC voltage sampling terminal
CT1/2/3	AC current sampling terminals (L1, L2, L3 respectively)
Upgrade	Autarco digital communication stick connection
Comm_INV	RS485 Communication with Autarco inverter
RS485	Reserved, not utilized
WIFI	WiFi antenna to monitoring platform (Wireless) (Not used for Europe)

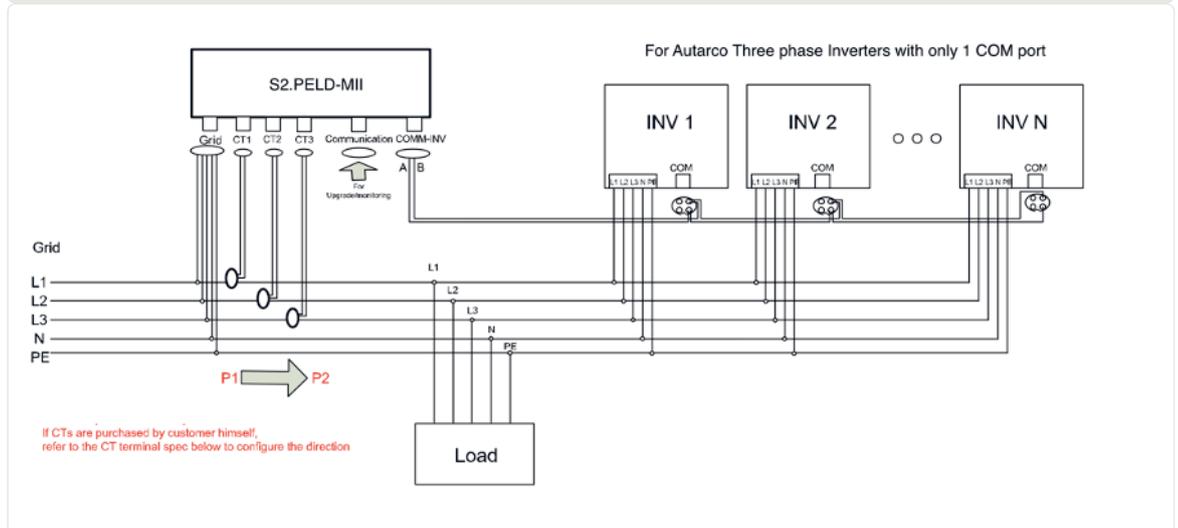


ATTENTION! A 5A breaker or 10A fuse is recommended between the PELD & AC Power supply.

3.6 For Autarco Three-phase inverters with COM2 & COM3



3.7 For Autarco Three-phase inverters with only 1 COM port



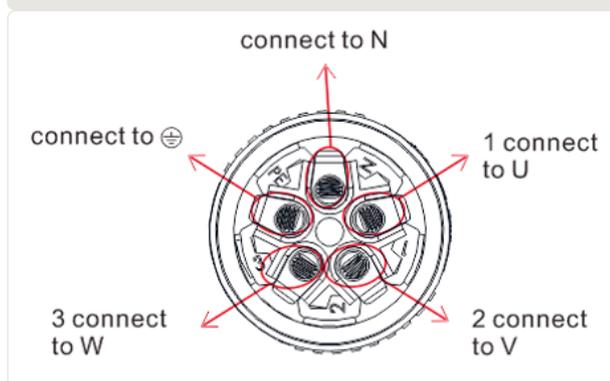
Note that the PELD shall be installed near the measuring point for current/voltage. The CT cables and grid input cable are usually limited in length. In order to shorten the length of CT and grid input cable, the PELD is recommended to be installed near the customer distribution box.

The PELD is delivered without CT's. These must be ordered separately for the current range that has to be measured. *Please refer to Section 3.7 for details.*

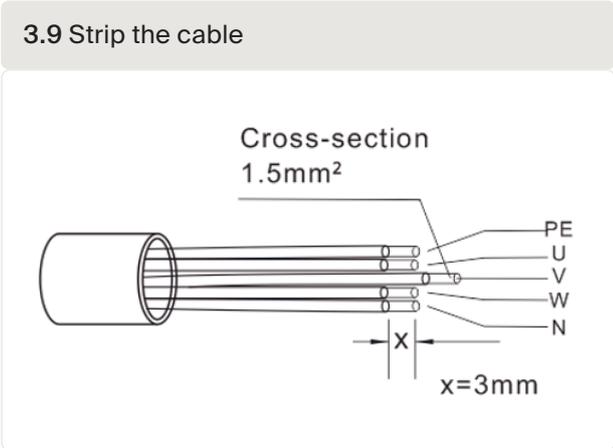
3.4 Make the Grid input cable

- Measure the distance from PELD to the power distribution box. Choose the proper cable for grid input. Use a 5-core cable for Autarco 3 phase PELD. Check the connections carefully and make sure the cables inside the connector cannot touch each other.
- For three phase inverter installation, connect L1, L2, L3 to pin 1, 2, 3 and connect N to pin4, connect PE to (see figure 3.8).

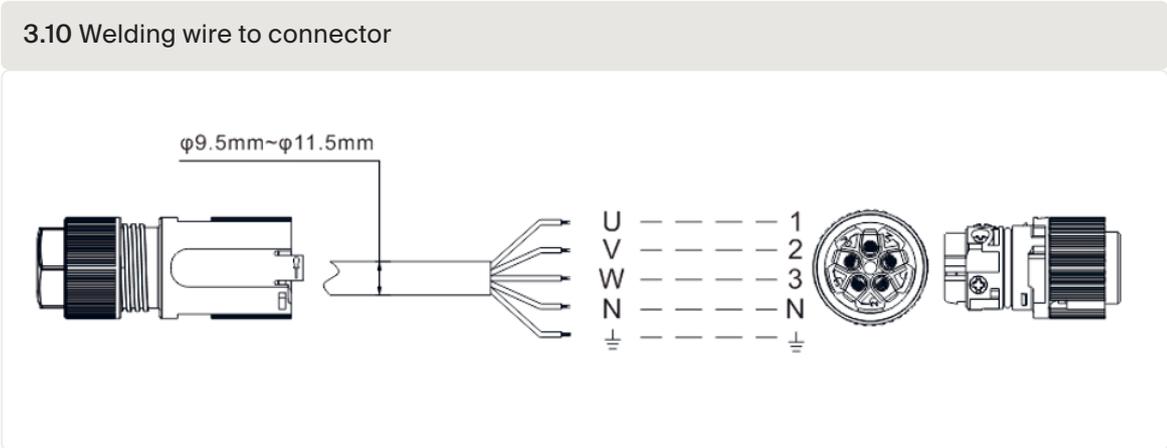
3.8 Three phase connection



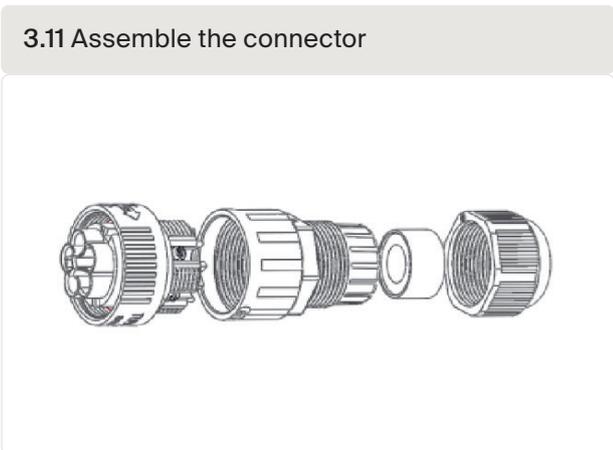
C. Strip the end of cable to 3mm (see figure 3.9)



D. Feed the cable through the washer and use a suitable screwdriver to fix the wire to the connector (Recommended torque is 10 Nm; AC Cable diameter 9.5mm ~ 11.5mm) (see figure 3.10)



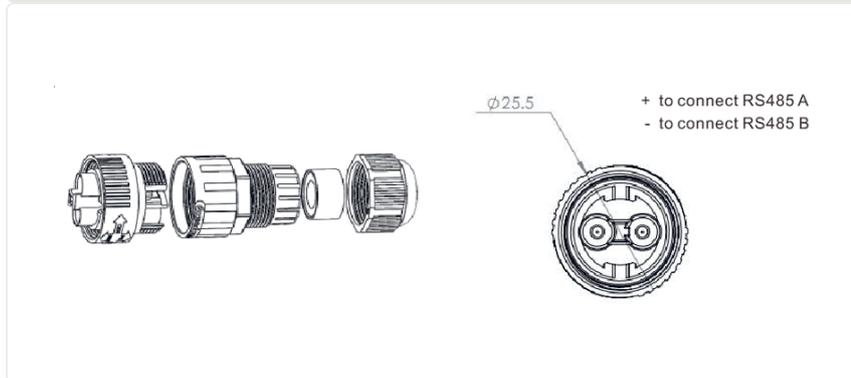
E. Assemble the connector. (see figure 3.11)



Make RS485 cable (COMM-INV port)

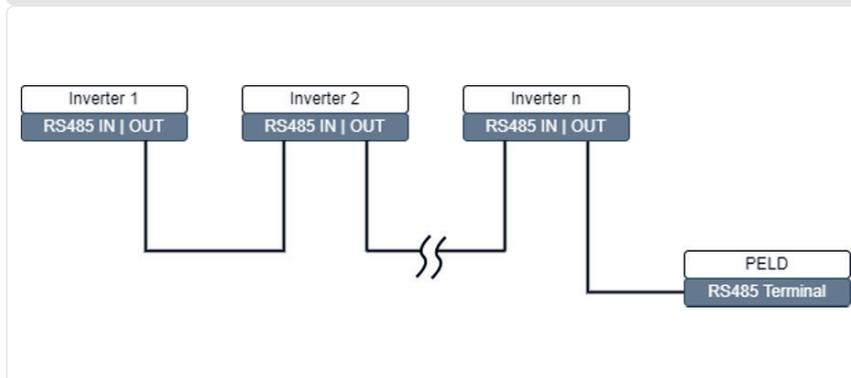
1. Refer to figure 3.12, the RS485 terminals for inverter and PELD are already assembled. Suggested RS485 cable: preferred 0.5-1.0mm².

3.12 RS485 Terminal



2. Refer to figure 3.13, connect communication cable between inverter with PELD, and then measure the distance from PELD to inverter. Use proper cable for RS485 connection 0.5-1.0mm².

3.13 RS485 Cable connection



3. Follow Step 1 to assemble 2 connectors to each end of the cable. If the RJ45 comms ports are used on the inverter, you also may use standard Ethernet cables for connection from one inverter to the second one and so on. Then you only need to assemble one cable from the last inverter to PELD.
4. Make sure RS485A and RS485B connect to the same pin on each inverter !

- The case of PELD is metal and must be grounded.
- Measure the distance from PELD to ground point, then prepare the proper grounding cable. The ground cable may be 2.5-4 mm.
- Use an O type terminal as an accessory to connect the ground cable to PELD. (figure 3.13)

3.14 Assemble ground cable



Connect and fix the CT

In order to measure the backflow current, the CT's (Current transformers) shall be installed at the PCC (Point of Common Coupling), i.e. just behind the customer's main switch (see figure 3.6), instead of the load branch circuit.. See below, the steps for successfully installing CTs.



ATTENTION! For three phase systems, CT1, CT2 and CT3 must be installed on L1 (U), L2 (V) and L3 (W) with correct sequence, otherwise the PELD can not detect the correct data. The CT cable outer diameter is 6.5mm-7.5mm, cross-sectional area 1.5mm².

1. Switch off the main switch, disassemble line cables.
2. Insert the cables through the CT, make sure the P1 on CT is towards the grid and P2 is towards the inverter.
3. Connect CT1, CT2, CT3 on the inverter, see figure 3.5. Red cable is positive, black cable is negative.
4. Reconnect the line cables.



Note!

- If the CT's are installed in the wrong place or direction, the PELD will not work correctly!
- The CT must be grounded on the secondary side.
- To prevent overheating, always make sure the secondary side of the CT's is connected to the PELD before switching on power.

Refer to Figure 3.15, the side with words should face downstream. Reconnect the line cable to the main switch.

Refer to Figure 3.15, the side with words should face downstream. Reconnect the line cable to the main switch.

3.15 CT current pointing to inverter

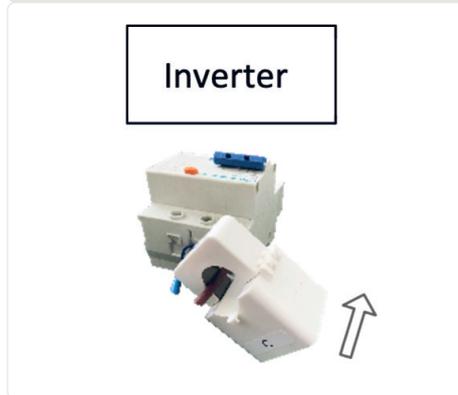
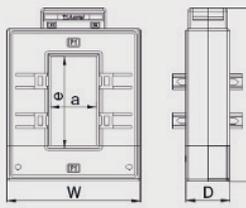


Figure 3.16 presents a few examples of Current Transformer ratios. It is possible to select your own brand and type as long as they meet the requirements and safety standards.

3.16 The meaning of the symbols located at bottom of the PELD

	Specification	Dimensions (mm)			Hole size (mm)		Ratio
		W	H	D	a	e	
	CT-60x40-300 A	114	140	36	42	62	300:5 A
	CT-80x40-600 A	122	162	40	42	82	600:5 A
	CT-80x40-1000 A	122	162	40	42	82	1000:5 A
	CT-160x80-2000 A	184	254	52	82	162	2000:5 A
	CT-160x80-3000 A	184	254	52	82	162	3000:5 A



Note: Autarco recommends customers to purchase suitable current transformers from local suppliers according to the max possible current in different projects. As long as the secondary current is 5A, no matter what the primary current is, it will not affect the warranty of the PELD devices and inverters.



Reminder: Set the CT Sampling Ratio in Advanced Settings; Set CT Parameter

3.8

Connect the grid input to the distribution box.

The grid input cable can be connected at the inverter grid breaker or an independent breaker.



ATTENTION! Do not connect the grid input cable to the load breaker, it could cause inverter loss of control when the load breaker trips.



ATTENTION! Do not directly connect the AC output of the inverter to any private AC equipment. The PV inverter is designed to feed AC power directly into the public utility power grid.

Please follow *figure 3.6* system diagram to connect the grid input cable to the main switch. The cable sequence must match the PELD grid terminal sequence.

- Please follow figure 3.6, system diagram to connect multiple-inverters.
- PELD can control a maximum of 10 inverters, and different models are allowed.
- The firmware of the inverter must support PELD use.
- The inverter RS485 address must be set to different values: please set address from 01 to 09.
- Before starting up the inverter please follow Section 5.4.1 to set the inverter number in PELD.

All inverters that are connected to the PELD can be monitored by a single Autarco Ethernet/WiFi/4G stick.



Note: When an inverter is connected to PELD, no other monitoring device is allowed to be connected to the inverter.

4.1 Commissioning

1. Switch off all the AC breakers and DC breakers in the system.
2. Complete AC and DC wirings for inverters by following inverter manuals.
3. Connect AC cables to the Grid terminal on the PELD.
4. Install the CTs to the grid connection side with correct direction as mentioned in the PELD manual.

4.1 PELD & CT Cable connections



5. Connect RS485 communication cables between inverters and PELD Comm-INV port.
6. Switch on the DC breakers for Inverters and set the inverters to “OFF” in LCD and Set “External EPM Set”- “5G EPM” -”Failsafe: ON”. Then assign slave addresses accordingly in inverters.
7. Switch on all the AC breakers for inverters and PELD
8. Set PELD settings including “Inverter Qty Set”, “Backflow Power”, “Set CT Ratio” and “Set Capacity” based on the actual system configuration.
9. Turn on some loads and check the power flow data on PELD. Negative power indicates taking power from the grid and CT direction is correct. Positive power indicates export power to the grid and the CT direction is reversed (Change the CT direction accordingly).
10. If the CT direction is confirmed correct and PELD is not reporting any alarms, set all inverters to ON in the inverter LCD.
11. Commissioning Completed.

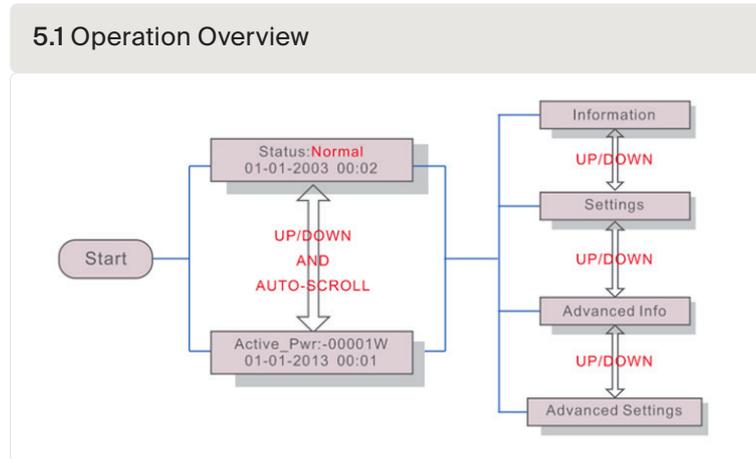
4.2 Decommissioning

In order to avoid the backflow power to the grid, please stop the inverter before stopping the PELD.

1. Turn off the inverter output AC breaker or select “grid off” on each inverters’ LCD.
2. Turn off the inverter input DC breaker.
3. Turn off the grid input breaker of PELD.
4. Disconnect all the cables of PELD, disassemble PELD after 5 minutes.

5.1 Introduction

During normal operation, the display alternately shows the power of the grid side and the operation status. Screens can also be scrolled manually by pressing the UP and DOWN keys. Press the ENTER key to access the Main Menu



There are 4 status messages:

- Normal: The system works normally.
- RS485 AllFail: PELD has lost communication with ALL inverters
- CT FailSafe: Current Sensor has failed.
- RS485 Fail: PELD has lost communication with one or more inverters

If you see a fault message, check all wiring and make sure RS485 + and - are wired the same on all inverters.

There are four submenus in Main Menu (see *figure 5.2*)

- Information
- Settings
- Advanced Info.
- Advanced Settings

5.2.1 Information

Autarco PELD main menu provides access to operational data and information. The information is displayed by selecting "Information" from the menu and then scrolling up or down through the list. See *figure 6.2*.

5.2 Information list

Display	Description
VacA_Grid: 000.0V IacA_Grid: 000.0A	Vac_Grid: Grid voltage and current.
VacB_Grid: 000.0V IacB_Grid: 000.0A	
VacC_Grid: 000.0V IacC_Grid: 000.0A	
Load_Pwr: 0000.0KW Total_PINV: 0000.0KW	Load_Pwr: Load Power. Total_PINV: Total output power of inverters.
Export Limited: 000% Frequency: 00.00Hz	Export Limited: Inverter output power percentage. Frequency: Grid frequency.
Active_APwr: +00000W Active_BPwr: +00000W	Active_Pwr: Power of the power grid.
Active_CPwr: +00000W Active_TPwr: +00000W	Active_Pwr: Power of the power grid. Active_TPwr: :Power flows through CTs.
Inverter SN: XXXXXXXXXXXXXXXXXX	Series number of the inverter.

5.2.2 Lock screen

Pressing the ESC key returns to the Main Menu. Pressing the ENTER key locks (*Figure 5.3(a)*) or unlocks (*Figure 5.3 (b)*) the screen.

5.3 Locks and unlocks the screen of LCD



(a)



(b)

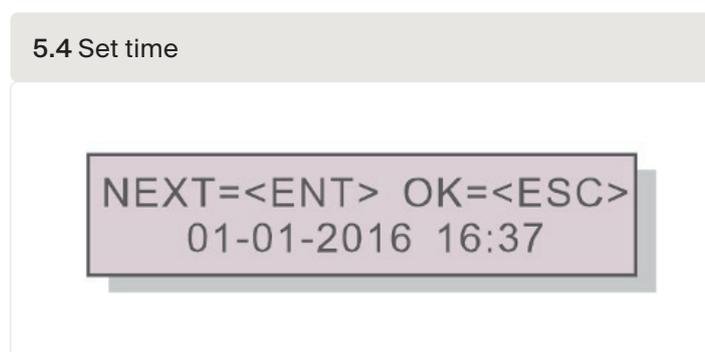
5.2.3 Settings

The following submenus are displayed when the Settings menu is selected.

- Set Time
- Set Address

5.2.4 Set time

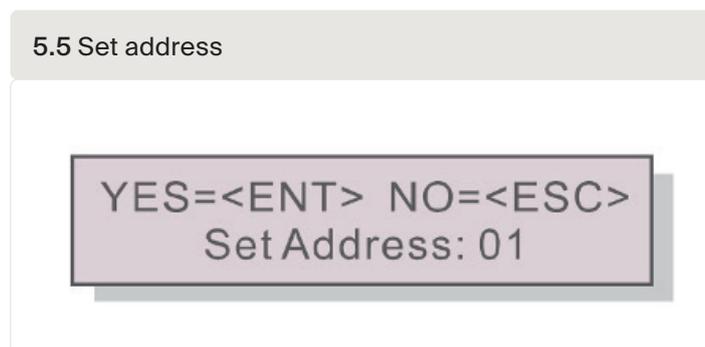
This function allows time and date setting. When this function is selected, the LCD will display a screen as shown in *Figure 5.4*



Press the UP/DOWN keys to set time and data. Press the ENTER key to move from one digit to the next (from left to right). Press the ESC key to save the settings and return to the previous menu.

5.2.5 Set address

This function is used to set the address when multiple inverters are connected to see monitoring. The address number can be assigned from "01" to "99" (see figure 5.5). The default number is <01>



Press the UP/DOWN keys to set the address. Press the ENTER key to save the settings. Press the ESC key to cancel the change and return to the previous menu.



Notice: Access to this area is for fully qualified and accredited technicians only. To Enter menu “Advanced Info.” and “Advanced setting” you need a password.

Select “Advanced Info.” from the Main Menu. The screen will require the password as below.

5.6 Set password



```
YES=<ENT> NO=<ESC>
Password:0000
```

The default password is “0010”. Please press “down” to move the cursor, press “up” to select the number. After entering the correct password the Main Menu will display a screen and be able to access the following information.

1. Inverter Power
2. CT connect status
3. Version
4. Model Inverter
5. Communication Data
6. Energy Info

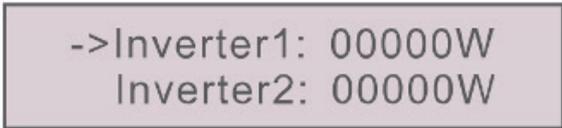
The screen can be scrolled manually by pressing the UP/DOWN keys. Pressing the ENTER key gives access to a submenu. Press the ESC key to return to the Main Menu.

5.3.1

Inverter power

The screen shows the information of INV Power for each inverter which is connected to the PELD.

5.7 Inverter power

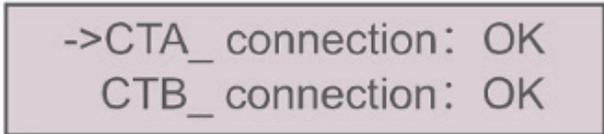


```
->Inverter1: 00000W
Inverter2: 00000W
```

5.3.2 CT connect status

For the position of three-phase CT installation and direction of current detection refer to section 3.7. If marking on CT is towards the grid, then PELD detection will display OK as shown in *figure 5.8*. Otherwise, the status will display "NG" which indicates the wrong CT direction.

5.8 CT connect status



```
->CTA_connection: OK
CTB_connection: OK
```

Note: it is possible that NG will be shown when the current-transformer is connected correctly if the cable is smaller than designed for. Make sure the cable lies centralized in the core for proper reading.

5.3.3 Software

The screen shows the model version and the software version of the inverter.

5.9 Software version



```
Software Ver.: 11
```

5.3.4 Model inverter

The screen shows the rated power of the inverters that are connected to the PELD. Only one inverter will be shown currently.

5.10 Model inverter



```
Model: 50000
```

5.3.5 Communication data

The screen shows the internal communication data of the inverter. This page is for service technicians only.

5.11 Communication data



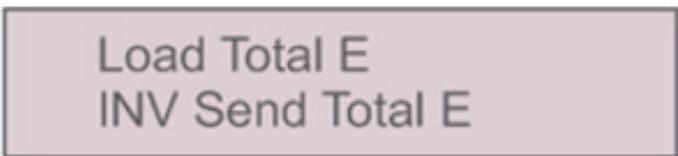
01-05: 00 00 00 00 00
06-10: 00 00 00 00 00

5.3.6 Energy info

This shows the energy records on the PELD.

1. Load Total E ; 2. INV Send Total E ; 3. Send Grid Total E ; 4. Get Grid Total E

5.12 Energy info



Load Total E
INV Send Total E



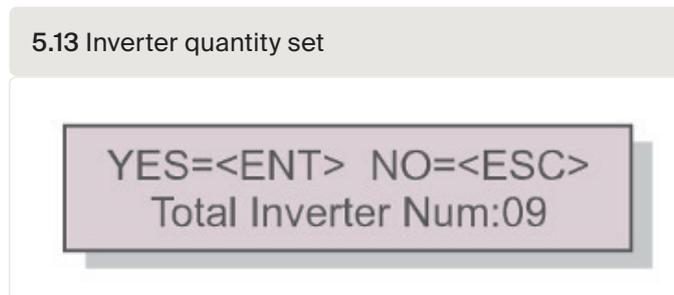
Notice: Access to this area is for fully qualified and accredited technicians only. Please follow 5.3 to enter password to access this menu.

The default password is “0010”. Please press “down” to move the cursor, press “up” to select the number. Select Advanced Settings from the Main Menu to access the following options:

- Inverter Qty. Set
- Set Backflow Power
- Set CT Ratio
- Fail safe ON/OFF
- Backflow Work Mode
- PELD ON/OFF
- Transmit ON/OFF
- System Upgrade
- Reset Password
- Restore settings
- Set capacity

5.4.1 Inverter quantity set

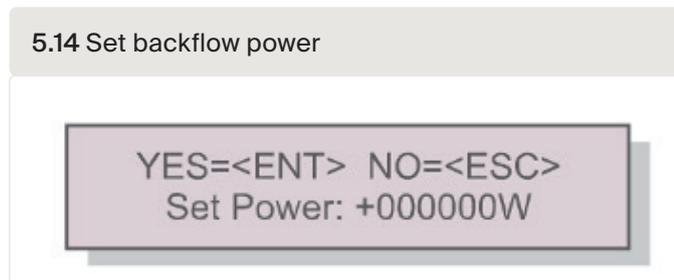
This submenu is used for setting the number of connected inverters.



When you enter this screen, it shows the total number of inverters connected to the PELD. (see figure 5.13). The number (01~99) can be selected by pressing the UP/ DOWN keys. Press the ENTER key to set the inverter number, ESC key to return to the previous menu.

5.4.2 Backflow Power

This submenu is used to set allowed power that the inverters can insert back into the grid.



Press the UP/DOWN keys to set data. Press the ENTER key to set backflow power, then press UP/ DOWN keys to change the number (in units of 100 Watt). Press the ESC key to save the settings and return to the previous menu.

5.4.3 Set CT ratio

This is used to set the CT ratio for the current transformer. Setting range is from 20:1 to 9900:1 with 10:1 interval. For example, if 1000:5A current transformer is used, please set the ratio as 200:1. The default CT parameter setting is 30: 1.

5.14 Set CT parameter

YES=<ENT> NO=<ESC>
Set CT Para:0030:1

Press the UP/DOWN keys to set data. Press the ENTER key to set the CT Parameter. Press the ESC key to save the settings and return to the previous menu. Measuring range is 5 A.

5.4.4 Failsafe ON/OFF

This submenu is used for setting fail safe on/off. Fail safe indicates whether there is communication between the PELD and inverters. The default setting is "Run". Don't change this parameter without a technician.

5.15 FailSafe ON/OFF

YES=<ENT> NO=<ESC>
FailSafe: RUN

Failsafe ON: PELD will control the output power of the connected inverters.

Failsafe OFF: PELD will not control the output power of the connected inverters.

Failsafe operation works over the RS485-bus.

Failsafe settings determine how the inverter operates if there is a loss of connection with any device. There are 3 error modes:

- RS485 AllFail: PELD has lost communication with ALL inverters
- RS485 Fail: PELD has lost communication with one or more inverters
- CT FailSafe: Current Sensor has failed.

Failsafe Error Mode	With Failsafe ON	With Failsafe OFF
RS485 All Fail	All Inverters stop	All Inverters will remain on
RS485 Fail	Specific inverter OFF; others ON	Affected inverter will remain on
CT Fail Safe	PELD will stop all inverters	All Inverters will remain on

5.4.5 Backflow work mode

This submenu is used for set backflow work mode: 01, 02. "01" is the default mode.

5.16 Backflow work mode

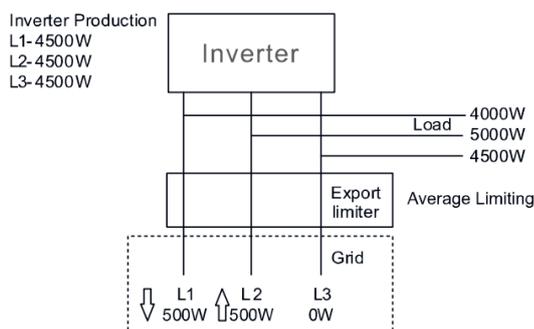
YES=<ENT> NO=<ESC>
Mode:01

Mode "01" is the average limiting mode:

In this mode the average export power over 3 phases is 0. If the load on the 3 phases is not equal, this means that one phase may export power and another phase takes power from the net.

See the example in *figure 5.17*: the output power of the inverter on each phase is the average of the three-phase load power. The output power of the inverter (4500 W) is higher than the phase with the lowest power (4000 W) from the three phases.

5.17 Mode 01



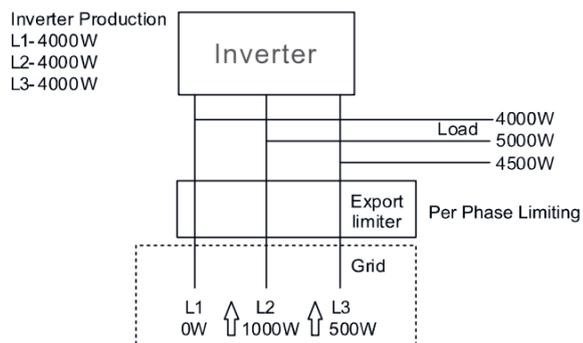
Mode "02" is the per phase limiting mode:

In this mode the export power is 0 on each phase. The inverter will generate a power equal to the lowest load power.

See the example in *figure 5.18*: the inverter only generates the power that equals one of three-phase loads that has the lowest load power of a certain phase (here 4000 W).

Mode 02 is recommended in case of very uneven distribution of load on a 3 phase network.

5.18 Mode 02



5.4.6 PELD ON/OFF

This submenu is used for switching PELD on/off. It decides whether the PELD is operational or not.

5.19 PELD switch

YES=<ENT> NO=<ESC>
Switch: OFF

Switching PELD ON: the device can monitor and manage the working condition of inverters in real time, and it prevents backflow generated.

Switching PELD OFF: device shuts down the function of controlling backflow power.

5.4.7 Transmit ON/OFF

This is a setting for technician use only. Please keep the switch as OFF for normal use.

Transmission switch allows communication with inverters behind the PELD, if enabled, PELD will stop operating until turned off.

5.20 Transmission switch

YES=<ENT> NO=<ESC>
Switch: OFF

5.4.8 System upgrade

The upgrade of PELD's system can be realized through the RS485 communication port with an upgrade stick. Please consult our technical engineer for more details.

5.21 System update

YES=<ENT> NO=<ESC>
Current Ver.: 11

5.4.9 Reset password

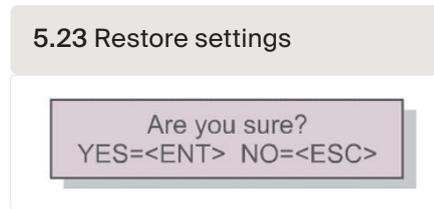
Enter the current password before setting a new password. Press the DOWN key to move the cursor. Press the UP key to revise the value. Press the ENTER key to execute the setting. Press the ESC key to return to the previous menu.

5.22 Reset password

YES=<ENT> NO=<ESC>
Password: 0000

5.4.10 Restore settings

When Restore Settings is selected, the LCD will display a message as shown in *figure 5.23*:



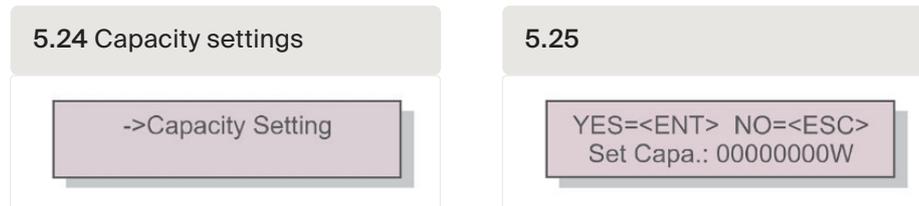
Press the ENTER key to execute the setting.
Press the ESC key to return to the previous menu.



Note: Do not do this on an active system. First stop operation.

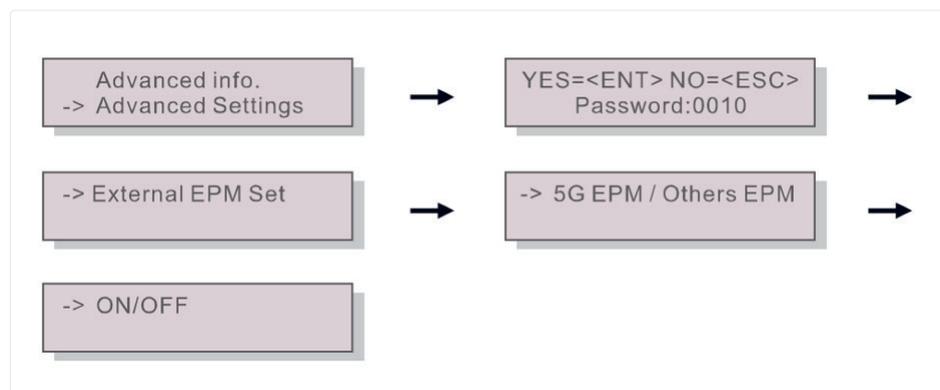
5.4.11 Set capacity

This setting is used to set the total sum of the capacities of the connected inverters.



5.4.12 Set inverters

The PELD is available with different operation modes. To make sure that the inverters can work with the MII version, set the inverters into the correct operation mode.



Note! If you are using S2.3P-PELD-MII, please select 5G EPM, and set “Failsafe Set: ON”



Note! If 5G EPM is chosen, all inverters produced before Nov 30th 2019 need to update the firmware. Please contact support@autarco.com for instructions on the firmware upgrade. The UX firmware must be V3A or higher.



Note! If the setting is not correct. FailSafe operation will not work

The PELD is designed in accordance with the most important international safety and EMC requirements. Before delivering to the customer, the PELD has been subjected to several tests to ensure its optimal operation and reliability.



Note! Follow Section 8, for a full Installation checklist for your PELD.

In case of failure, the LCD screen will display an alarm message.

The PELD can show both alarms generated by the PELD and alarms generated by inverters. There are 3 PELD generated alarms that may appear on LCD:

1. **Backflow**

There is a backflow current to the grid. Customers must stop the inverter, and check the connections for the RS485 cable between PELD and inverter.

2. **INV. fault**

There are fault alarms in an inverter; please check inverter status.

3. **Fail safe**

- RS485 AllFail: PELD has lost communication with ALL inverters
- RS485 Fail: PELD has lost communication with one or more inverters
- CT FailSafe: Current Sensor has failed
- M-ComFailsafe: PELD has lost communication with the Meter inside
- M-VFailsafe: One phase voltage of the meter is ZERO

Model	S2.3P-PELD-MII
AC Input	
Rated voltage	400V, 3/N/PE
Input voltage range	100V~263V (L to N), 176V~456V (L to L)
Input frequency range	45~65 Hz
Communication	
Inverter communication	Modbus RS485
Communication interface	2 pin RS485, RJ45
Maximum communication inverter numbers	10
Maximum communication distance	1000m
Monitoring	WiFi / LAN / 4G (Autarco Digital Monitoring sticks)
General data	
Ambient temperature	-25°C ~ +60°C
Relative Humidity	5% ~ 95%
Ingress protection	IP65
Self power consumption	< 15W
Dimensions (W*H*D)	488mm*446mm*149mm
Weight	5.4kg
AC connection	Quick connection terminal
Display	LCD, 2*20Z
CT connection	Plug terminal
CT specification	Table A.
Features	
Failsafe function	Yes
Remote upgrade	Yes
Control time	5s
Power Accuracy	3%
Warranty	2 years

8.1 Installation Checklist (On-Site)

- Is the primary current of the CT Clamps sized according to the main connection?
- Are the CT Clamps measuring the current to/from the grid?
(See Figure 3.6 from the manual below)
- Are each of the CT Clamps placed on the phase that matches the PELD input and facing the correct direction?
When the AC switch is off on the inverters, all currents should be negative on the PELD display. **(Note: Power will display in Helios and MyAutarco as positive)**
- Place the PELD close to the meter board. Table A shows the maximum length for Autarco provided meters.
For other meters you may refer to this website to determine the max length <https://www.se.com/ww/en/faqs/FA212605/>
- Is the Address on the PELD 01?
- Is the first inverter connected to the PELD with Address 01? And all following inverters Address set numerically?
Note: It is not possible to set the inverter Address remotely so this must be done correctly on site. Can only be viewed remotely.
- Is the Total Capacity set on the PELD matching with the total capacity of inverters.
Note: It is not possible to set the inverter Capacity remotely so this must be done correctly on site. Can only be viewed remotely.
- Are the RS485 cables linking the PELD to each inverter connected in sequence, i.e. + to + and - to -, which is A to A and B to B.
- Is the Monitoring Device installed in the PELD and not the inverter?

8.2 Helios: Digital O&M Checklist

When the On-Site checklist is completed it should ensure all data is displayed correctly in Helios. After selecting the relevant System in Helios, go to “Asset Management → Digital O&M”.

PELD Status;

- Are the CT readings in line with consumption when the inverters have AC switched off? All power readings should be positive in Helios.
- Is the number of connected inverters correct?

PELD Settings:

- Is CT Ratio on the PELD matching the CT used?
See Table A below for Autarco supplied CT.
- Is the Backflow Power correct?
- Is Failsafe turned on for all inverters and the PELD?
This is optional, but recommended
- If loads are unbalanced, is the work mode set to “min of one phase”?

Table A CT Ratio and max distance for Autarco supplied CT

PELD

	Clamp Primary/ Secondary Current	PELD Setting: CT Ratio	Wiring included yes/no	Max Distance from PELD
ACREL 150A (AKH-0.66/ K-φ24 150/5)	150:5	30	Yes	1 mm
S2.CT 30x15-300A.1	300:5	60	No	2m (with 1.5mm wires)