



Connection and configuration of a CDP with KOSTAL inverters





APPLICATION NOTES (M028E0401-03-14A)




SAFETY PRECAUTIONS


Follow the warnings described in this manual with the symbols shown below.

	<p>DANGER Warns of a risk, which could result in personal injury or material damage.</p>
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	<p>WARNING Indicates that special attention should be paid to a specific point.</p>
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If you must handle the unit for its installation, start-up or maintenance, the following should be taken into consideration:

	<p>Incorrect handling or installation of the unit may result in injury to personnel as well as damage to the unit. In particular, handling with voltage applied may result in electric shock, which may cause death or serious injury to personnel. Defective installation or maintenance may also lead to the risk of fire. Carefully read the manual prior to connecting the unit. Follow all the installation and maintenance instructions for the unit throughout its working life. Pay special attention to the installation standards of the National Electrical Code.</p>
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	<p>Consult the instruction manual before using the unit Failure to follow the instructions marked with this symbol in the manual may cause Injuries or damage to the unit and/or installations.</p>
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CIRCUTOR, SA reserves the right to modify features or the product manual without prior notification.

DISCLAIMER

CIRCUTOR, SA reserves the right to make modifications to the device or the unit specifications set out in this instruction manual without prior notice.

CIRCUTOR, SA, on its web site, supplies its customers with the latest versions of the device specifications and the most updated manuals.

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LOG OF REVISIONS**Table 1: Log of revisions.**


Date	Revision	Description
10/14	M028E0401-03-14A	Original version

Note: The images of the units are solely for the purpose of illustration and may differ from the original unit.

1.- INTRODUCTION

KOSTAL offers several inverter models that can be managed via the **CDP Dynamic power controller**.

For the **CDP** controller to be able to correctly manage the inverter, communication between the two devices must be correct and both products must be correctly programmed.

	<p>These application notes are not meant as a substitute for the CDP or inverter manuals, but rather as additional support for individuals who need to interconnect the two devices.</p>
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Even so, the guides and manuals of each product should be consulted and each company is responsible for providing technical support.

An inverter from the **KOSTAL PIKO** family of inverters will be used as the model in these application notes.

NOTE: Images and information on the inverter are taken from the official documents and manuals provided by the manufacturer.

NOTE: The test has been conducted using the **KOSTAL PIKO 10.1** inverter, s.n.90391MEF00014, HW:040350 SW:04.03

2.- KOSTAL PIKO INVERTER

The **CDP** and the inverter communicate via an RS-485 bus. This RS-485 bus can connect up to 32 inverters, although the number of inverters in the vast majority of domestic installations ranges from 1 to 3.

2.1.- COMMUNICATION CABLE

To communicate with a **KOSTAL PIKO** inverter using a **CDP**, the inverter must be equipped with a communications card with an RS-485 interface.

The connector is a terminal for a 0.25mm² cable

Functions of the communication cable terminals between the **CDP** and the inverter:

Table 2: Functions of the communication cable terminals.

CDP R2 channel communications connector		INVERTER	
Terminal	Description	Terminal	Description
1	A+	A+	RS-485 A +
3	B-	B-	RS-485 B -
5	GND	GND	GND

It is not necessary to wire the GND terminal, although it is advisable to do so for

long distances.

2.1.1. CONNECTION OF ONE INVERTER

Figure 1 shows the connection between the **CDP** and a single inverter.

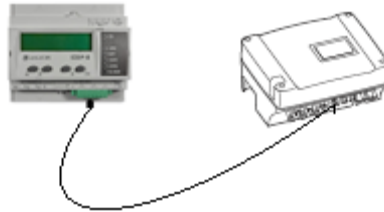


Figure 1: Connection between a CDP and a single inverter.

2.1.2. CONNECTION OF SEVERAL INVERTERS

Figure 2 shows the connection between the **CDP** and several inverters.

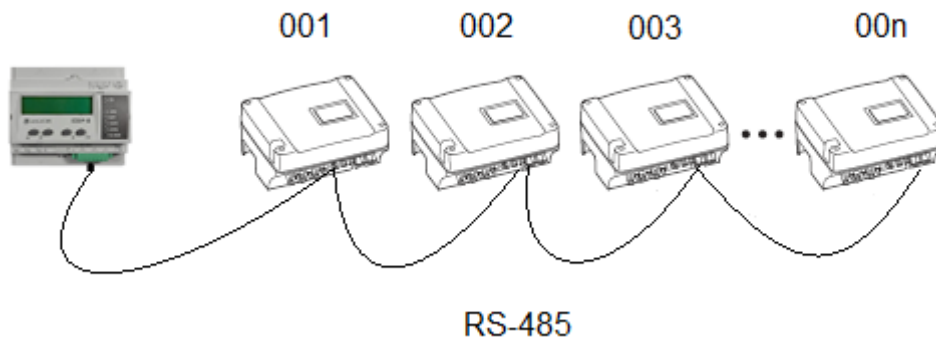


Figure 2: Connection between a CDP and several inverters.


The communication cable between the inverters must have the following configuration **Table 3**:

Table 3: Communications cable connection.

Inverter 1 cable end	Inverter 3 cable end	Inverter n cable end
A	A	A
B	B	B
GND	GND	GND

2.2.- INVERTER COMMUNICATION CONFIGURATION

The following describes how to use the display to configure the inverter for ensuring correct communication with the **CDP**.

	<p>The AC and DC sides of the inverter must be connected to the mains before it can turn on. Consult the inverter manual if you have any doubts.</p>
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The web server or the display (only for type II communications card) can be used for configuring any parameter in the KOSTAL inverter.

The front panel display may vary according to the inverter model, **Figure 3** and **Figure 4**.

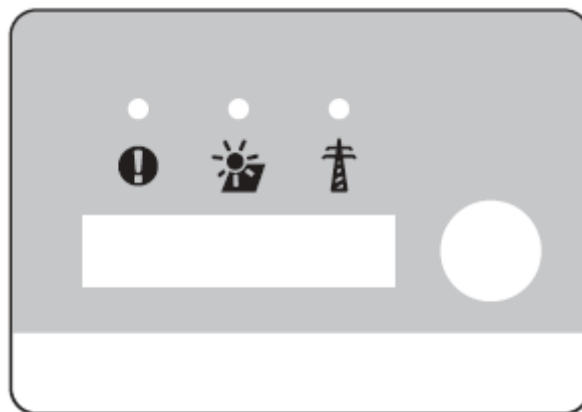


Figure 3:PIKO 3.0/3.6/4.2/5.5 screen (with type I communications card)

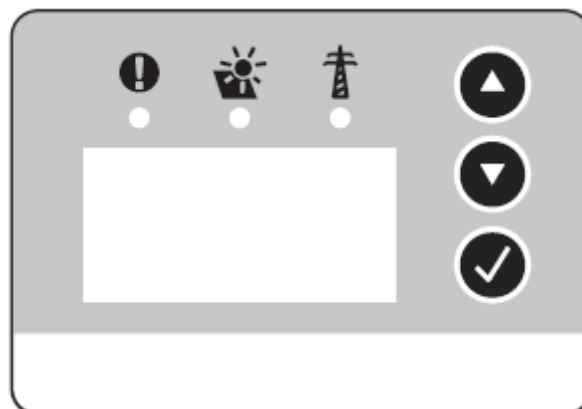


Figure 4: PIKO 7.0/8.3/10.1/10/12/15/17/20 screen (with type II communications card)

Programming the inverter on the web server is recommended, given that it streamlines the programming and enables a faster and easier configuration.

The parameters to be configured are:

- ✓ Peripheral number
- ✓ Analogue input function.


The communications speed is 19200 bps, a fixed parameter.

When a KOSTAL inverter is selected in the **CDP**, the device adjusts the communication speed to the inverters' speed.

2.2.1. COMMUNICATION BETWEEN THE INVERTER AND THE PC BY ETHERNET CABLE

The KOSTAL inverter is equipped with a web server that can be accessed using the IP address shown on the display of the unit.

To view the IP address, follow the instructions below:

- 1.- Press the  button in the main menu until the inverter icon appears shaded, as shown in **Figure 5**.

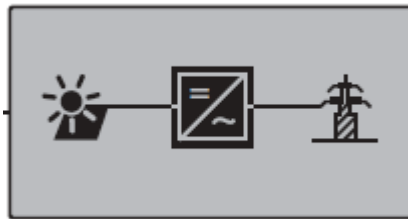




Figure 5: Main menu screen.

- 2.- Press "Enter"

- 3.- Press the  button until you reach the "Communication" option. Press "Enter".

- 4.- Press the  button until you reach the "Network 2 Configuration" option. Press "Enter".

This window shows the current IP address of the inverter.

See the chapter on how to access the web server in the inverter manual.

2.2.2. CONFIGURATION

The following values must be programmed in the web server, **Figure 6**:

- ✓ **Peripheral number**: enter the number 1 (if there is 1 inverter) and consecutive numbers following 1 (if there are several inverters).
- ✓ **Analogue input function** the "**Sensors**" option must be selected for this variable

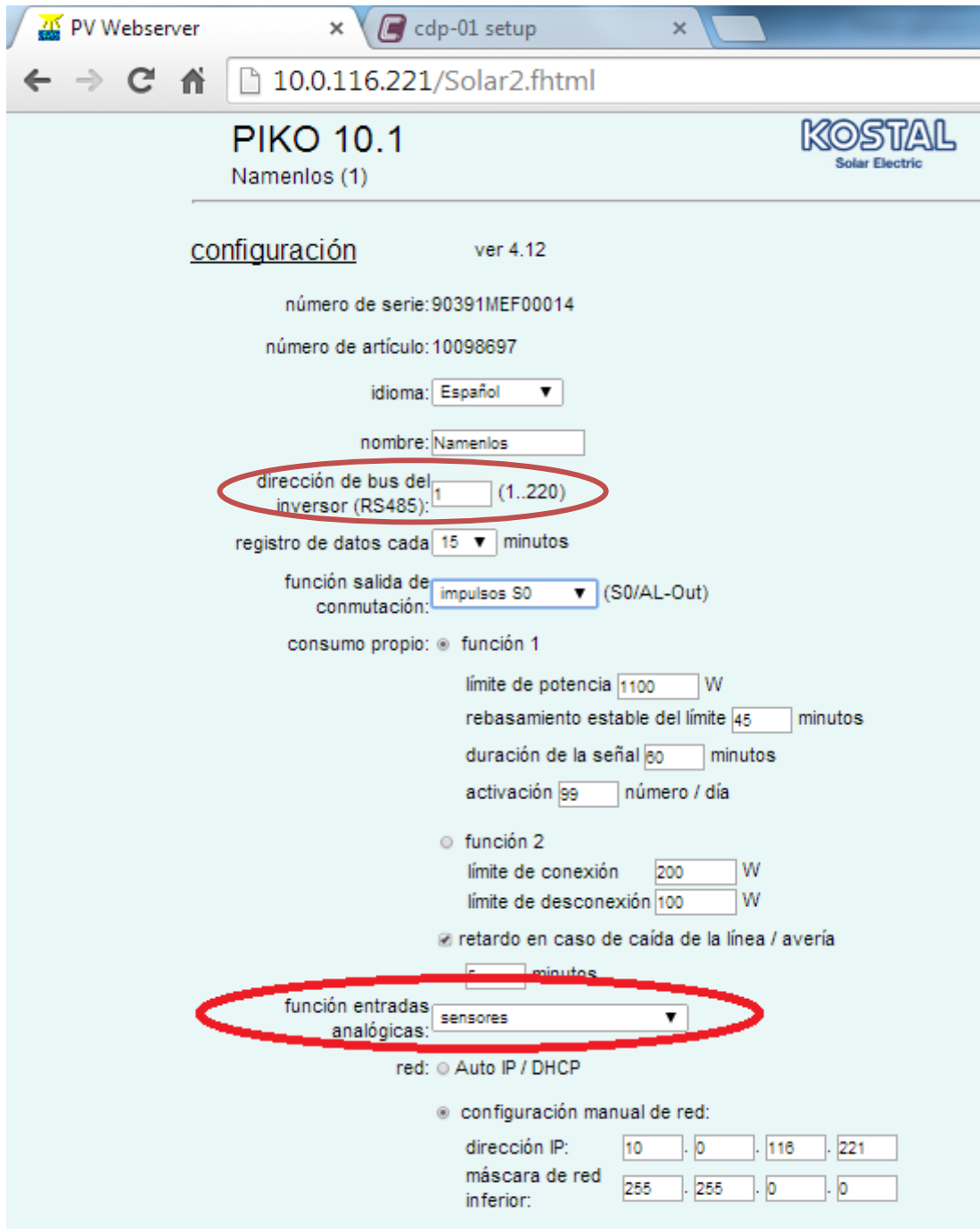


Figure 6: KOSTAL inverter configuration screen.

3.- CDP CONFIGURATION

There is a configuration web site for the **CDP** where all the parameters of the connected inverter have to be entered.

To do so, enter "/setup" at the end of the navigation bar where the **CDP** is monitoring so that the following, for example, appears in the navigation bar: **"10.0.110.212/setup"**

Next, the **CDP** configuration window will open (**Figure 7**).

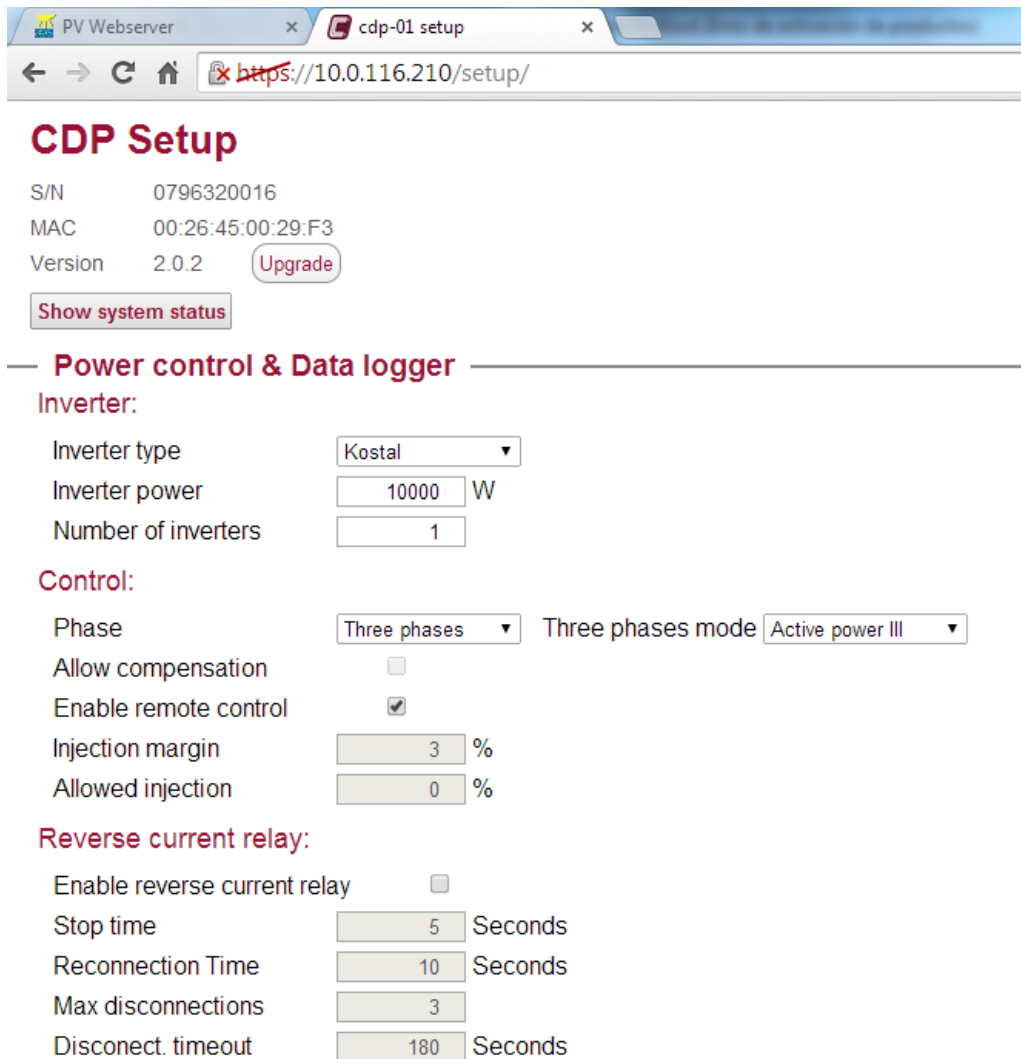


Figure 7: CDP configuration web site.

The most important inverter parameters that have to be configured in the **CDP** are (**Table 4**):

Table4: Parameters to be configured in the CDP.

Parameter	Description
Inverter type	Inverter model. In this case select: Kostal
Inverter power	Total power to be controlled by the CDP.
Number of inverters	Number of inverters to control.
Phase	Architecture of the inverter connections



Consult the manual for more information on the configuration of the CDP.

When working with several three-phase inverters in cascade, the sum of the power of all the inverters must be programmed in the ***Inverter Power*** variable in the **CDP** so that the same regulation percentage is sent to each one.

When working with single-phase inverters in three-phase installations, the total power of all the inverters must be programmed by selecting the "**three single phases**" option in the "**Phase**" variable, and then entering the number of sets of three single-phase inverters in the installation in the "**Number of inverters**" variable.

Example: If there are six 2 kW single-phase inverters (two on the L1 phase, two on the L2 phase and two on the L3 phase) the following configuration should be entered:

- ***Inverter power:*** 12000 W
- ***Number of inverters:*** 2
- ***Phase:*** three single phases

However, if there are three 2 kW single-phase inverters (one inverter per phase) the following configuration should be entered:

- ***Inverter power:*** 6000 W
- ***Number of inverters:*** 1
- ***Phase:*** three single phases

4.- COMMUNICATIONS TEST AND REGULATION

4.1.- COMMUNICATIONS TEST

Check the communication between the inverter and the **CDP**, through the COM1 LED of the **CDP**:

- ✓ When the KOSTAL inverter is selected the COM1 LED remains steady. This is because the communication is broadcast and thus the **CDP** cannot guarantee how many inverters are connected.



The number of inverters **MUST** be programmed using the CDP SETUP web site.

Correct communication between the **CDP** and the inverters connected to it can be checked on the configuration web site. To do so, press the "**Show system status**" button.

When this button is pressed, the **CDP** will scan the connected inverters and indicate how many of the total number of inverters that the CDP has been assigned to control have been detected.

The following image will appear if the communication is correct, **Figure 8** :

CDP Setup

S/N 0796320016
 MAC 00:26:45:00:29:F3
 Version 2.0.1.11 [Upgrade](#)

[Show system status](#)

Inverter 1: OK.
 8150 packets transmitted.
 7849 received.
 3.7% loss

Load analyzer: OK.
 Grid analyzer: Not used.
 Pv analyzer: Not used.

— **Power control & Data logger** —

Inverter:

Inverter type ▾
 Inverter power W
 Number of inverters

Figure 8: Checking communication between the CDP and the inverter.

4.2.- REGULATION TEST

The following test can be performed to ensure the **CDP** is correctly performing the regulation:

We assume a 3000W inverter generating 1400W.
This value can be seen on the inverter display.

Next, program the **CDP** indicating that the inverter power is 6000W. The **CDP** will send the inverter a new setpoint so it can change its MPPT and the inverter will reduce photovoltaic generation by 50%, generating 700W.



Do not forget to reprogram the **CDP** with the initial inverter power value after completing the test.

5.- MAINTENANCE AND TECHNICAL SERVICE

In the case of any query in relation to unit operation or malfunction, please contact the **CIRCUTOR, SA** Technical Assistance Service.

Technical Assistance Service

Vial Sant Jordi, s/n 08232 - Viladecavalls (Barcelona)


Tel.: 902 449 459 (Spain) / +34 937 452 900 (outside of Spain)

email: sat@circutor.es

6.- GUARANTEE

CIRCUTOR guarantees its products against any manufacturing defect for two years after the delivery of the units.

CIRCUTOR will repair or replace any defective factory product returned during the guarantee period.

	<ul style="list-style-type: none"> • No returns will be accepted and no unit will be repaired or replaced if it is not accompanied by a report indicating the defect detected or the reason for the return. • The guarantee will be void if the unit has been improperly used or the storage, installation and maintenance instructions listed in this manual have not been followed. "Improper usage" is defined as any operating or storage condition contrary to the national electrical code or that surpasses the limits indicated in the technical and environmental features of this manual. • CIRCUTOR accepts no liability due to the possible damage to units or other parts of the installation, nor will it cover any possible sanctions derived from a possible failure, improper installation or "improper usage" of the unit. Consequently, this guarantee does not apply to failures occurring in the following cases: <ul style="list-style-type: none"> - Overvoltages and/or electrical disturbances in the supply; - Water, if the product does not have the appropriate IP classification; - Poor ventilation and/or excessive temperatures; - Improper installation and/or lack of maintenance; - Buyer repairs or modifications without the manufacturer's authorisation.
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