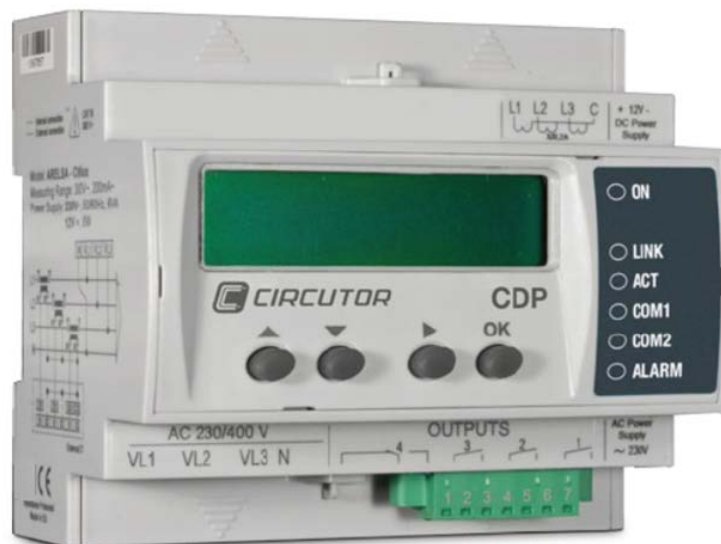




# Connection and configuration of a CDP with KACO NEW ENERGY inverters




## APPLICATION NOTES (M028E0701-03-15E)







## SAFETY PRECAUTIONS


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

	<p><b>DANGER</b> Warns of a risk, which could result in personal injury or material damage.</p>
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	<p><b>ATTENTION</b> 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 installation and maintenance instructions throughout the unit's working life. Pay special attention to the installation standards of the National Electrical Code.</p>
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	<p><b>Consult the instruction manual before using the unit</b> In this manual, if the instructions marked with this symbol are not respected or followed correctly, it can result in injury 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.

[www.circutor.com](http://www.circutor.com)



**CONTENTS**

<b>SAFETY PRECAUTIONS</b> .....	<b>3</b>
<b>DISCLAIMER</b> .....	<b>3</b>
<b>CONTENTS</b> .....	<b>4</b>
<b>LOG OF REVISIONS</b> .....	<b>5</b>
<b>1.- INTRODUCTION</b> .....	<b>6</b>
<b>2.- POWADOR 12.0 TL3 INT INVERTER</b> .....	<b>6</b>
2.1.- COMMUNICATION CABLE .....	6
2.1.1. CONNECTION OF ONE INVERTER.....	7
2.1.2. CONNECTION OF SEVERAL INVERTERS.....	7
2.2.- INVERTER COMMUNICATION CONFIGURATION .....	8
2.2.1. PERIPHERAL NUMBER CONFIGURATION.....	8
2.2.2 INVERTER END OF BUS CONFIGURATION.....	9
<b>3.- CDP CONFIGURATION</b> .....	<b>9</b>
<b>4.- COMMUNICATIONS TEST AND REGULATION</b> .....	<b>11</b>
4.1.- COMMUNICATIONS TEST .....	11
4.2.- REGULATION TEST.....	12
<b>5.- MAINTENANCE AND TECHNICAL SERVICE</b> .....	<b>13</b>
<b>6.- GUARANTEE</b> .....	<b>13</b>

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


<b>Date</b>	<b>Revision</b>	<b>Description</b>
03/15	M028E0701-03-15A	Original version
04/15	M028E0701-03-15B	Several errors
05/15	M028E0701-03-15C	Update company name
10/15	M028E0701-03-15D	Change in the following sections : 2.1.2.
11/15	M028E0701-03-15E	Change in the following sections : 3

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

**1.- INTRODUCTION**

KACO NEW ENERGY 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 <b>CDP</b> 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 **POWADOR** family of inverters will be used as a model in these application notes.

The communications driver of the **CDP** devices called "KACO" is compatible with various models of the KACO NEW ENERGY brand. To check compatible models, see the **CDP-0** or **CDP-G** product web site.

**2.- POWADOR 12.0 TL3 INT INVERTER**

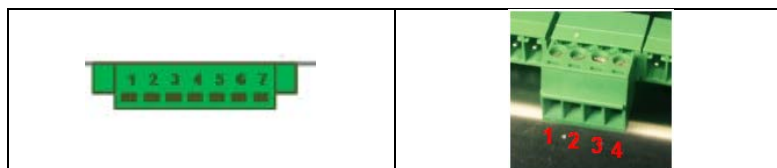
The **CDP** and the inverter communicate via an RS-485 bus. This RS-485 bus can connect up to 31 inverters, although the number of inverters in the vast majority of domestic installations ranges from 1 to 3.

**2.1.- COMMUNICATION 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 Inverter connector	
Terminal	Description	Terminal	Description
1	A+	3	B
3	B-	4	A



### 2.1.1. CONNECTION OF ONE INVERTER

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

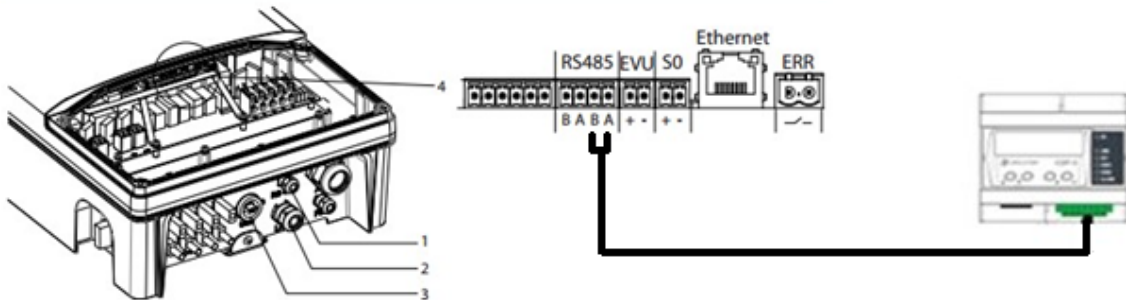


Figure 1: Connection between a CDP and one inverter.

Must also be enabled (via software) the bus termination resistor, see **2.2.2 INVERTER END OF BUS CONFIGURATION**.

### 2.1.2. CONNECTION OF SEVERAL INVERTERS

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

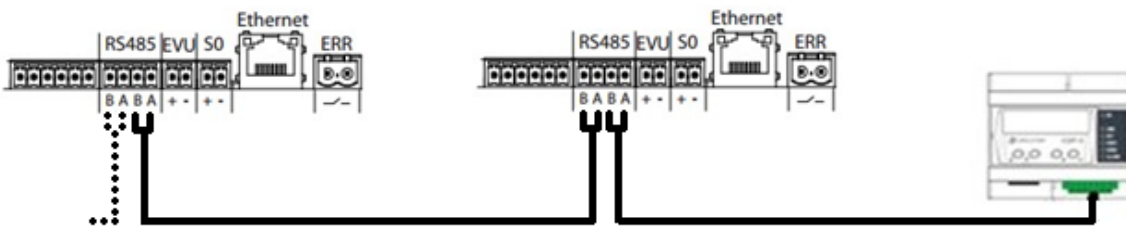


Figure 2: Connection between a CDP and several inverters.

If you want to use more than one inverter, connect pins 1 and 2 of the first inverter with pins 3 and 4 of the next inverter, and so on until the last inverter. The last inverter must be configured as terminal as shown in the **Figure 3**.

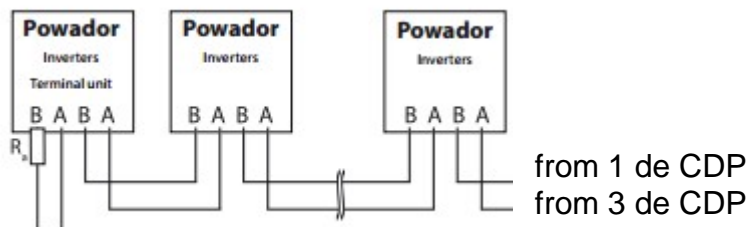


Figure 3: Connection between a CDP and several inverters.

	<p>With the KACO NEW ENERGY is possible to connect several single-phase inverters for single-phase network and / or several three-phase inverters for three-phase network, you can not connect single-phase inverters in three-phase networks.</p>
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Must also be enabled (via software) the bus termination resistor, see **2.2.2 INVERTER END OF BUS CONFIGURATION**.

## 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 side 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 parameters to be configured are:

- ✓ Peripheral number
- ✓ Inverter end of bus

### 2.2.1. PERIPHERAL NUMBER CONFIGURATION.

To configure any parameter of the KACO NEW ENERGY inverter, use the buttons located at the right of the display on the front panel of the unit.

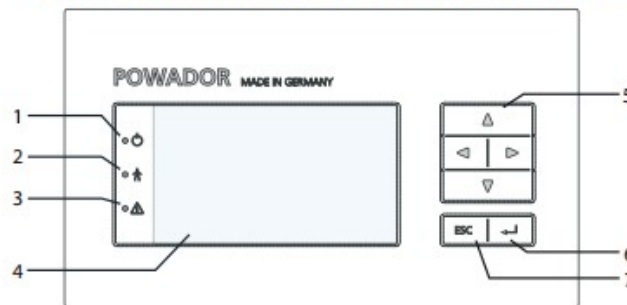


Figure 4: KACO NEW ENERGY inverter.

Table 3: KACO NEW ENERGY inverter.

Number	Description
1	Operating LED
2	Grid feed LED
3	Fault LED
4	Display LCD
5	4-way button
6	OK button
7	ESC button

Assign a unique RS-485 bus address for each inverter.

Here are the steps to follow:

1. Press ► button to display the main menu of the unit.
2. Go to menu **Settings** using the button ▼ and enter this menu with the ► button.
3. Access the submenu **Interface** using the button ► .
4. Enter the **Address RS485** option and put a peripheral number that is not being used by any other device in the bus.
5. Return to the main screen b pressing repeatedly the **ESC** button.



## 2.2.2 INVERTER END OF BUS CONFIGURATION

If the inverter is a terminal unit, last device of bus, activate **Bus termination**. Here are the steps to follow:

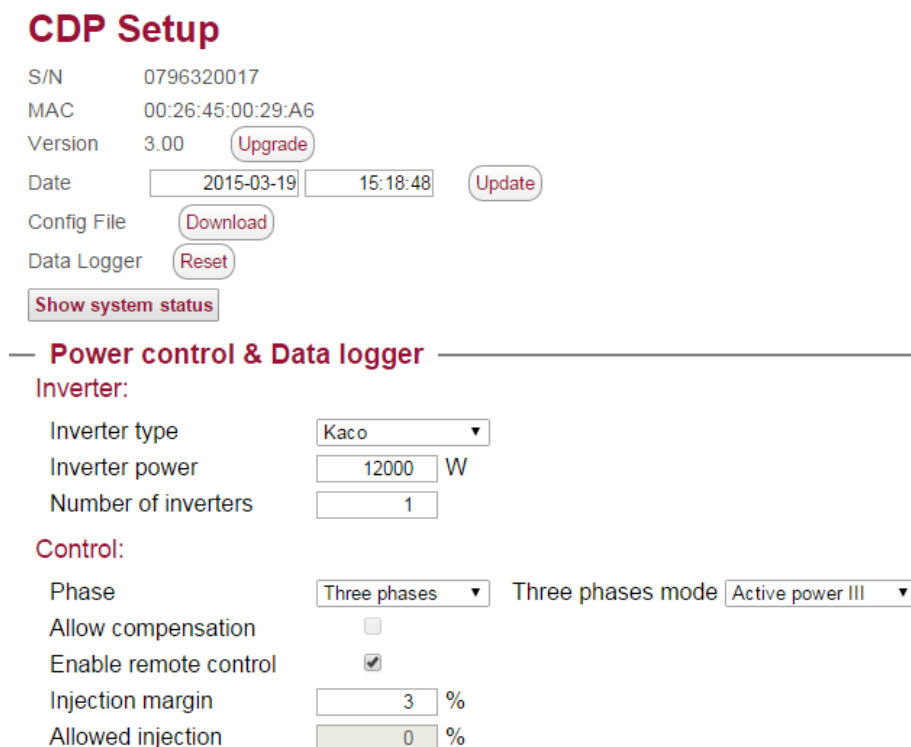
1. Press ► button to display the main menu of the unit.
2. Go to menu **Settings** using the button ▼ and enter this menu with the ► button.
3. Access the submenu **Interface** using the button ► .
1. Enter the **Bus termination** option and set to ON mode by buttons ▼ and ▲ .
4. Return to the main screen b pressing repeatedly the **ESC** button.

## 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 5**).



**CDP Setup**

S/N 0796320017  
 MAC 00:26:45:00:29:A6  
 Version 3.00 [Upgrade](#)  
 Date 2015-03-19 15:18:48 [Update](#)  
 Config File [Download](#)  
 Data Logger [Reset](#)  
[Show system status](#)

---

**Power control & Data logger**

**Inverter:**

Inverter type   
 Inverter power  W  
 Number of inverters

**Control:**


Phase  Three phases mode   
 Allow compensation   
 Enable remote control   
 Injection margin  %  
 Allowed injection  %

**Figure 5: CDP configuration web site.**

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

**Table 4: Parameters to be configured in the CDP.**

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

	<p><b>Consult the manual for more information on how to configure the CDP.</b></p>
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## 4.- COMMUNICATIONS TEST AND REGULATION

### 4.1.- COMMUNICATIONS TEST

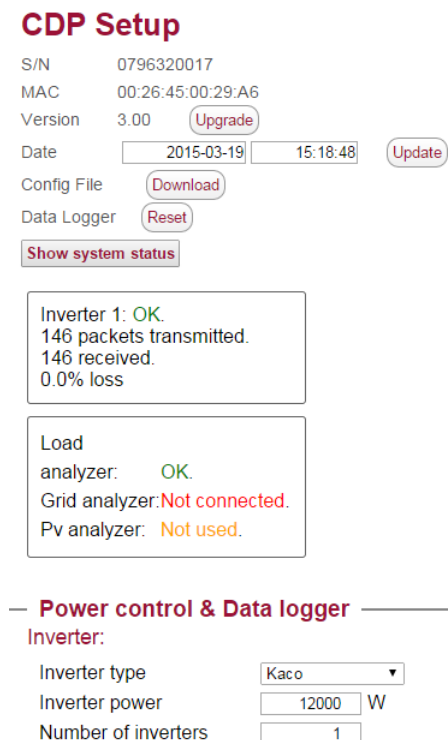
Check the communication between the inverter and the **CDP**, through the COM1 LED of the **CDP**:

- ✓ A flashing (or steady) LED means communication has been correctly established.  
The flashing rate is one flash per second (if there is one inverter) and 1/n if there are several inverters (where "n" is the number of inverters connected).
- ✓ If the COM1 LED is off, it means the **CDP** is not communicating with the inverter. In this case check the communication cables and the inverter communication configuration.

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 6**:



**CDP Setup**

S/N 0796320017  
 MAC 00:26:45:00:29:A6  
 Version 3.00   
 Date     
 Config File   
 Data Logger

Inverter 1: **OK**.  
 146 packets transmitted.  
 146 received.  
 0.0% loss

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

— **Power control & Data logger** —

Inverter:

Inverter type   
 Inverter power  W  
 Number of inverters

**Figure 6: 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 can also be seen on the inverter display.

Now we 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 unit.

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

	<ul style="list-style-type: none"> <li>• 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.</li> <li>• 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 surpassing the limits indicated in the technical and environmental features of this manual.</li> <li>• <b>CIRCUTOR</b> accepts no liability due to the possible damage to the unit 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"> <li>- Overvoltages and/or electrical disturbances in the supply;</li> <li>- Water, if the product does not have the appropriate IP classification;</li> <li>- Poor ventilation and/or excessive temperatures;</li> <li>- Improper installation and/or lack of maintenance;</li> <li>- Buyer repairs or modifications without the manufacturer's authorisation.</li> </ul> </li> </ul>
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