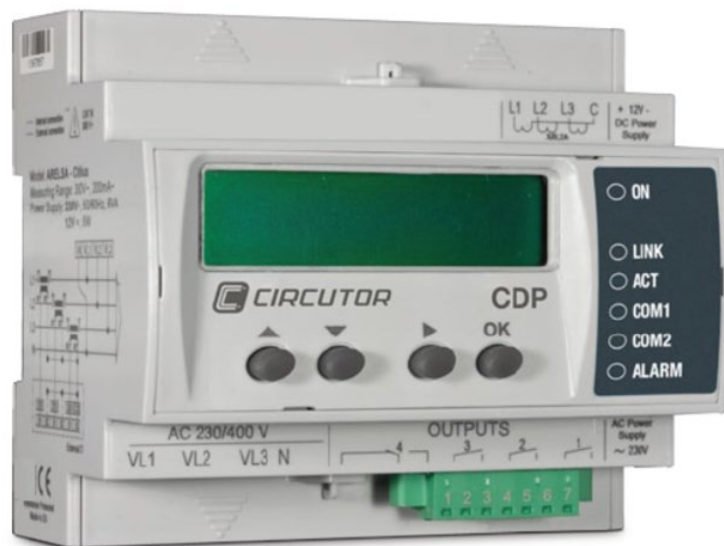




Connection and configuration of a CDP with HUAWEI inverters





APPLICATION NOTES (M028E1101-03-17A)




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>ATTENTION 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>Consult the instruction manual before using the unit 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.

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LOG OF REVISIONS

Table 1: Log of revisions.

Date	Revision	Description
12/17	M028E1101-03-17A	Original version

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

1.- INTRODUCTION

HUAWEI has several models of inverter that can be managed by the *Dynamic Power Controller* (called **CDP** from its acronym in Spanish).

For the **CDP** to correctly manage the inverter, both devices must be correctly interconnected and programmed to communicate properly.



This application note is not intended as a substitute for the CDP or inverter manual, but as further information for those wanting to interconnect both devices.

Even so, the instructions and manuals for each product should be consulted, each company being responsible for providing respective technical support.

The different versions of inverter that can be managed by the **CDP** are:

- ✓ HUAWEI SUN2000-8KTL
- ✓ HUAWEI SUN2000-12KTL
- ✓ HUAWEI SUN2000-17KTL
- ✓ HUAWEI SUN2000-20KTL
- ✓ HUAWEI SUN2000-23KTL
- ✓ HUAWEI SUN2000-28KTL
- ✓ HUAWEI SUN2000-33KTL-A
- ✓ HUAWEI SUN2000-36KTL
- ✓ HUAWEI SUN2000-42KTL

2.- PRELIMINARY CONSIDERATIONS

The **CDP's** configuration stores the nominal power value of the inverter to be controlled, and periodically sends it the power percentage that must be generated; therefore, when the **CDP** communicates with the HUAWEI inverter, it constantly sends it a regulation percentage.

In the event of operating with several three-phase cascaded inverters, the **CDP's** "Inverter Power" variable must be set to match the power sum for all the inverters, so that each inverter is sent the same regulation percentage.

In the event of single-phase inverters being used in three-phase installations, the total power for all inverters must be programmed: select the **three single phases** option in the "Phase" variable, and then, in the "**Number of inverters**" variable, enter the number of 3 single-phase inverter units available in the installation.

Example: if there are 6, 2kW single-phase inverters (2 in phase L1, 2 in phase L2 and 2 in phase L3), the following must be configured:

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

Whereas in the event of 3, 2kW single-phase inverters (1 inverter in each phase), configuration must be as follows:

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

3.- INVERTER

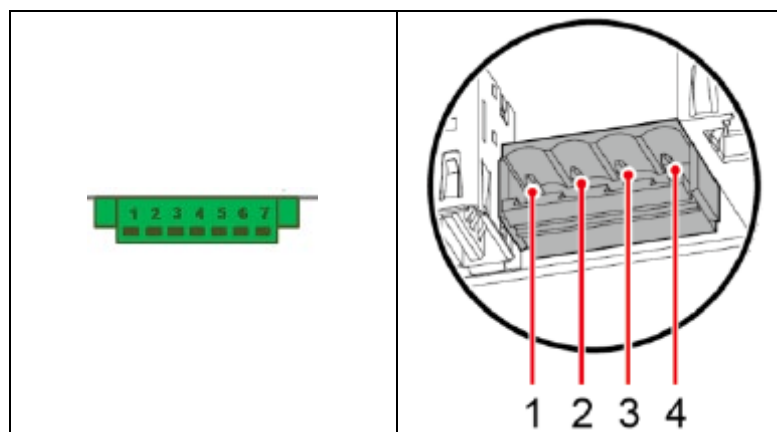
Communication between the **CDP** and inverter is via an RS-485 bus. This RS-485 bus allows up to 100 inverters to be connected, although the majority of domestic installations have between 1 and 3 inverters.

3.1.- SUN2000-36kTL : COMMUNICATION CABLE

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

Table 2: List of communication cable terminals.

CDP R2 channel communications connector		INVERTER OUT connector (RJ45)	
Terminal	Description	Terminal	Description
1	TxD+	1	RS485A, RS485 differential signal +
3	TxD-	3	RS485B, RS485 differential signal -



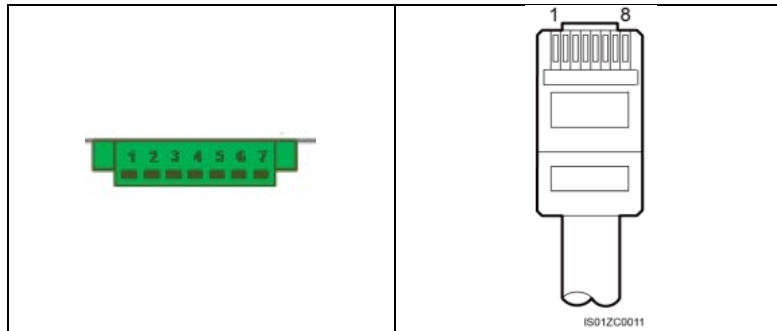
If several inverters are connected to the RS-485 bus, pins 2 and 4 must be wired from the first inverter to pins 1 and 3 on the next, etc., until reaching the last inverter on the bus.

3.2.- SUN2000-8kTL : COMMUNICATION CABLE

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

Table 3: Relación de bornes del cable de comunicaciones.

CDP Conector comunicaciones del canal R2		INVERSOR Conector OUT (RJ45)	
Terminal	Descripción	Terminal	Descripción
1	TxD+	1	RS485A, RS485 differential signal +
3	TxD-	2	RS485B, RS485 differential signal -



The cable must be connected according to the following diagrams. The communications cable must be connected to the inverter's "IN" terminal. In the event of several inverters, their communications cable must be connected from the first inverter's "OUT" terminal to the next inverter's "IN" terminal, as shown in **Figure 2** , and successively until reaching the last inverter, whose bus terminal resistance ("Match Resistance") must be set as activated.



Figure 1: Connection between a CDP and single inverter.

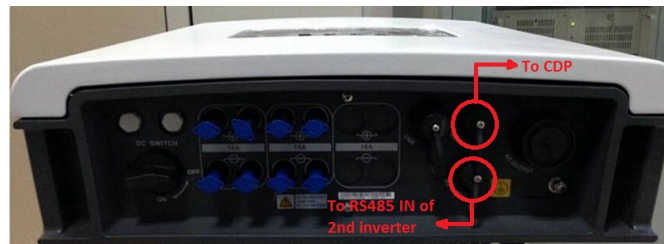


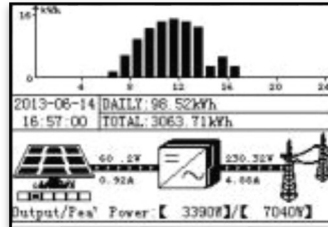
Figure 2: Connection between a CDP and several inverters.


The communications cable between inverters is a pin-to- pin cable with RJ45 connectors at both ends. This type of cable can be purchased at any computer

store, since it is of standard use in connecting a PC or any other device fitted with an ETHERNET port.

3.2.1. BUS TERMINAL ACTIVATION (“MATCH RESISTANCE”) ON THE FINAL BUS INVERTER

Step 1: On the default screen, press \leftarrow to access the main menu.



Step 2: Select  and press \leftarrow .



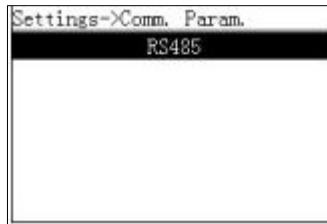
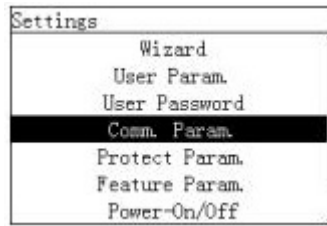
Step 3: Enter *User Name* and *Password*, using the \blacktriangle or \blacktriangledown keys, and press \leftarrow .



Note: Select *User Name: Advanced User*. The *Advanced User's* initial password is **000001**. If you forget your password, contact Huawei's technical help desk for a dynamic password that is valid for one day only. Change the password after logging in.

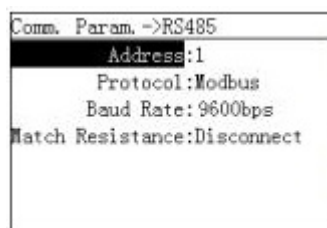
Note: After successful authentication, the system stores the authentication data for 30 seconds. If you exit the configuration page and log back in within 30 seconds, no user authentication is required.

Step 4: Select *Com. Param.* and press \leftarrow .




Step 5: On the *Com. Param.* screen, press \leftarrow .

Step 6: On the RS485 screen, change the *Match Resistance* parameter value to **Connect** and press \leftarrow



3.3.- INVERTER COMMUNICATIONS CONFIGURATION

The following describes how to configure the inverter using the display to ensure correct communication with the **CDP**.

	<p>For the inverter to start operating, the AC part must be connected to the mains. Please refer to the inverter's instruction manual to solve any questions.</p>
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The parameters to be configured are as follows:

- ✓ Peripheral number
- ✓ Protocol type

3.3.1. PERIPHERAL NUMBER CONFIGURATION

Follow the steps in section "3.2.1. BUS TERMINAL ACTIVATION (“MATCH RESISTANCE”) ON THE FINAL BUS INVERTER” to reach the RS485 screen.

```
Comm. Param. ->RS485
Address:1
Protocol:Modbus
Baud Rate:9600bps
Match Resistance:Disconnect
```

In the case of a single inverter:

- the peripheral number, Address, must be 01.

In the case of several inverters:

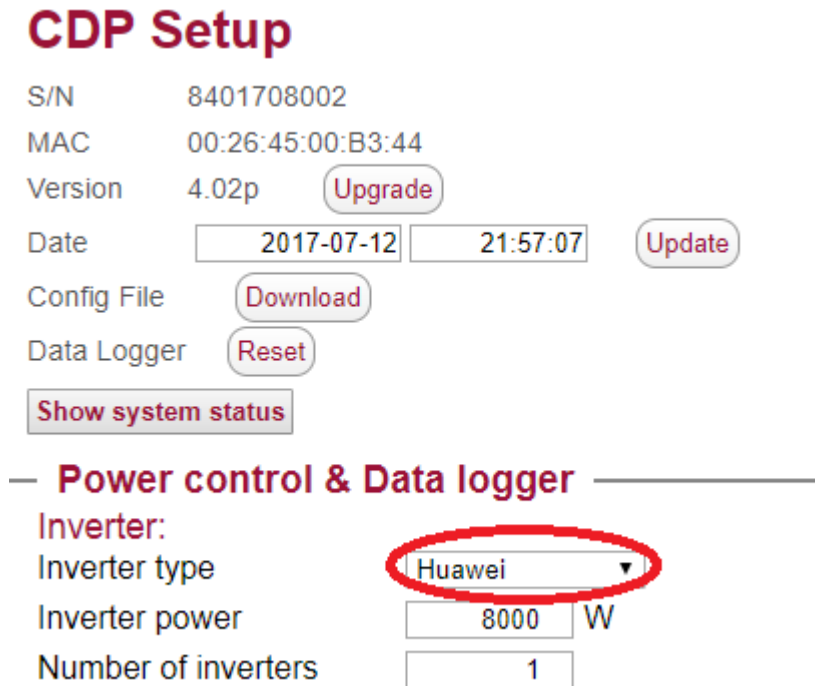
- when cascaded, both for single-phases connected to the same phase or three-phases connected to the same three-phase AC network (all connected to the same phase), consecutive numbers starting at 1 must be used.
- for multiple 3, single-phase inverter units connected to a three-phase network, each controlling one phase, configuration must be as follows:
 - Inverters connected to phase 1: peripheral numbers (Address) between 01-33.
 - Inverters connected to phase 2: peripheral numbers (Address) between 34-66.
 - Inverters connected to phase 3: peripheral number (Address) between 67-99.

4.- CDP CONFIGURATION

The **CDP** has a configuration web site 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"**

The **CDP** configuration window will then open (**Figura 3**).



CDP Setup

S/N 8401708002
 MAC 00:26:45:00:B3:44
 Version 4.02p
 Date
 Config File
 Data Logger

Power control & Data logger

Inverter:
 Inverter type ▾
 Inverter power W
 Number of inverters

Figura 3: CDP configuration web site.

In Inverter type, select the Huawei option.

	<p>For further details on configuring the CDP, please refer to the manual.</p>
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5.- REGULATION TEST

To ensure correct **CDP** management, we recommend regulation tests by varying consumption and changing the **CDP's** configuration. By way of **example**:

Suppose we have a 3000W inverter that is generating 1400W (this can be seen on the inverter's display or by using the SUN 2000 APP).

If we program the **CDP** to indicate that the inverter's power is now 6000W (instead of 3000W, which would be correct), the **CDP** would send a new signal to the inverter for it to modify its MPPT and the inverter would reduce its output by 50%.



At the end of the test, do not forget to reprogram the **CDP** with the inverter's initial power setting.

6.- 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.com

7.- 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.



- 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 surpassing the limits indicated in the technical and environmental features of this manual.
- **CIRCUTOR** 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:
 - 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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