

Installation and Operation Manual

HY-MDL/HY-MDL-3



For our home energy independence.

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Company Profile

Huayu New Energy is dedicated to be a world's leading "Safe & Smart Solar Energy" supplier for homeowners.

"For our home energy independence" is a vision deserved for all people who truly trust clean energy is the future for our children, whatever you're from rich families or low-income families.

Since the establishment of Huayu New Energy, we specialize in R&D of Safe Module-Level Solar Solution and Smart Energy Storage Solution which are controlled by Huayu Portal Management Platform with over 10 languages, these innovative technologies are developed to configure a Smart Distributed Solar System with bidirectional flow of energy which no doubt is the basic infrastructure of our future Energy Internet.

Featured with "Renewable, Distributed, Interconnected, Open & Intelligent", Energy Internet is a must for human beings in 21st century to realize a de-monopolistic & de-centralized sustainable power supply system across the globe. Huayu New Energy was born to be the leader of "Safe & Smart" distributed energy solution and play an irreplaceable role for the most exciting renewable energy revolution in human history.

Till today, we have delivered thousands of Huayu microinverters(300-2000W)and Huayu storage inverters(3-12kW)for global families and small businesses in Europe, North America, LATAM, South East Asia, Middle East and Africa.

Together with us, to be a part of game changer for "Safe & Smart Energy" via "Honesty, Trust, Teamwork & Sharing".

1. Introduction

1.1 Prefix

Dear customer, thank you for choosing the HY-MDL/HY-MDL-3 communication monitoring data logger for Huayu micro inverters. We hope you will find our products meet your need for renewable energy. Meantime, we appreciate your feedback regarding our products.

1.2 How to Use this Manual

This manual provides detailed product information and installation instructions for the HY-MDL/HY-MDL-3 monitoring data logger. Please read through this manual before installation and operation.

WARNING

This indicates a situation where failure to follow instructions may be a safety hazard or cause equipment malfunction. Use extreme caution and follow instructions carefully.

1.3 Safety Instruction

WARNING

PLEASE READ THIS MANUAL BEFORE INSTALLATION. ANY DAMAGE TO THE PRODUCT DUE TO NOT FOLLOWING THIS MANUAL IS NOT COVERED BY THE WARRANTIES.

BESIDES THE CABLE CONNECTORS, NOTHING INSIDE THE MONITORING DATA LOGGER SHOULD BE MODIFIED.

ALL INSTALLATION SHOULD FOLLOW THE LOCAL ELECTRIC CODES.

HY-MDL/HY-MDL-3 DOES NOT INCLUDE COMPONENTS THAT CAN BE SERVED BY CUSTOMERS.

PLEASE CONTACT AUTHORIZED SERVICE AGENTS FOR ANY SERVICE WORK.

2. FCC Compliance

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by the party responsible for compliance may void the user's authority to operate the equipment.

3. Installation

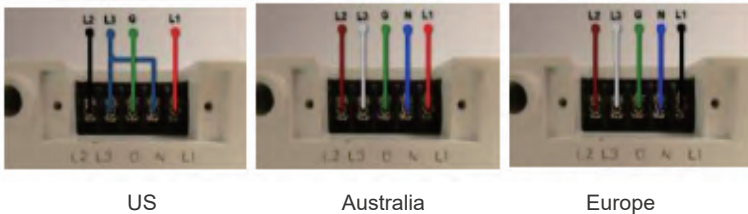
Check the HY-MDL/HY-MDL-3 shipping box for the following items:

- HY-MDL/HY-MDL-3 Communications Monitoring Data Logger
- AC Power Cord
- HY-MDL/HY-MDL-3 Installation and Operation Manual

For HY-MDL, there are three types of AC power code for three major regions of the world.

Region	Accessory Part Number
North America	HY-MDL-PC-NA
Europe	HY-MDL-PC-EU
Australia	HY-MDL-PC-AU

For HY-MDL-3, the wires are connected following the marks on the data logger.



Other Parts and Tools

- Ethernet cable
- USB devices, such as USB disk, USB keyboard, USB mouse, USB scanner, etc

Ethernet cable is used to connect the HY-MDL/HY-MDL-3 to an Ethernet router or hub. There is a web server built inside HY-MDL/HY-MDL-3, which can be visited by type in the HY-MDL/HY-MDL-3 IP address on a web browser. If the HY-MDL/HY-MDL-3 is connected to the internet directly or through a router, users may also visit the HY-MDL/HY-MDL-3 through a website.

USB devices can be connected to the HY-MDL/HY-MDL-3 through the USB connector. Multiple types of USB devices are supported by HY-MDL/HY-MDL-3, including USB disk, USB keyboard, USB mouse, USB scanner, etc.



Figure 1 HY-MDL/HY-MDL-3 Front View



Figure 2 HY-MDL/HY-MDL-3 Side View

4. User Interface

4.1 Main Interface

HY-MDL/HY-MDL-3 takes approximately 1-2 minutes to start up after power has been turned on. After start-up, the system will enter the main interface as shown in Figure 3 (all three numbers will read "0" at start-up for the first time).



Figure 3 HY-MDL/HY-MDL-3 Main Display

Figure 3 shows the HY-MDL/HY-MDL-3 main interface. The main interface is arranged in three horizontal rows, which consist of the tool bar at the top, the display area in the middle, and the status bar at the lower part of the screen. The tool bar contains 7 buttons: Save/Clear (Backup/Restore Factory Defaults), Summary Display (Summary Display Interface), Today's Energy (Current Day Power Generation), 7-Day's Energy (Power Generation Over the Past 7 Days), Monthly Energy (Power Generation Over Each Month), Yearly Energy (Power Generation Over Each Year), and Settings. These buttons are used to display their respective content in the middle display area. The display area shows the power-time curve for the current day as well as a power generation bar chart. The status bar shows the device status, IP address, and current date.

4.2 Interface Overview

If the main interface is idle for 2~3 sec., it will switch to a numeric summary interface, which is described as below: The screen is divided into three parts. The upper part shows Today's Energy (Current Day Power Generation), the lower right corner shows Lifetime (Total Power Generation Since Device Started Recording), and the lower left corner shows CO2 reduction (Reduction In Carbon Dioxide Emissions). Touching any part of the screen will bring up the main interface.

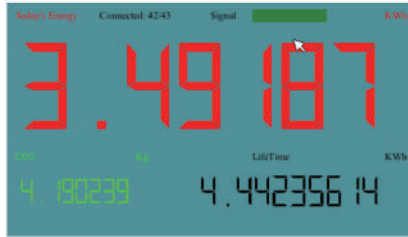


Figure 4 HY-MDL/HY-MDL-3 System Summary Display

4.3 Energy Functions

A menu bar locates on the top of the screen. Different screen pages on energy and power can be called by pressing on these menu buttons.

4.3.1 Today's Energy

Pressing this button will display the power-time curve screen (see Figure 5). The x-axis represents the time (4:00-20:00), and the y-axis represents Huayu micro inverters output power (kW). The total output energy (kWh) is displayed on the upper left corner. The real-time output power (kW) and today's total energy generated (kWh) are displayed on the upper right corner. Part of the curve can be magnified by drawing a box on the curve using finger or touch pen. Pressing the Today's Energy button again cancels the enlarged display and restores the original display.

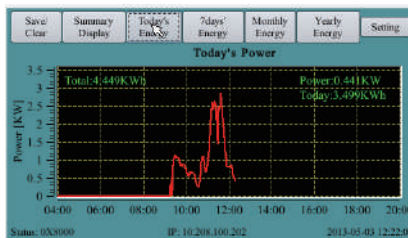


Figure 5 Today's Power

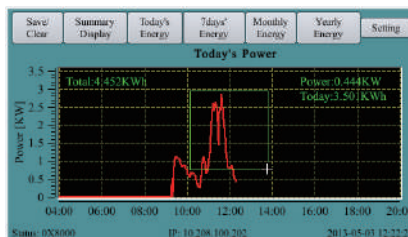


Figure 6 Drawing a Box on Today's Power

4.3.2 Last 7 Days' Energy

Pressing this button will bring up a bar chart showing power generation over the past 7 days (see Figure 7). The x-axis represents the date and the last one corresponds to today. The y-axis represents the amount of energy generated (kWh) during the day.

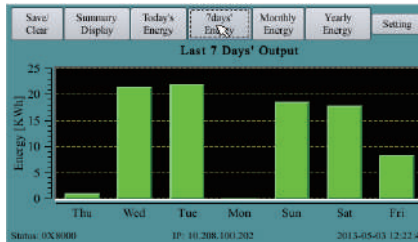


Figure 7 Last 7 Days' Energy

4.3.3 Monthly Energy

Pressing this button will bring up a bar chart showing power generation over each month for the last 12 months (see Figure 8). This display is similar to the Last 7 Days' Energy display. The x-axis represents months and the current month is in the last. The y-axis represents the amount of energy generated (kWh) in the month.

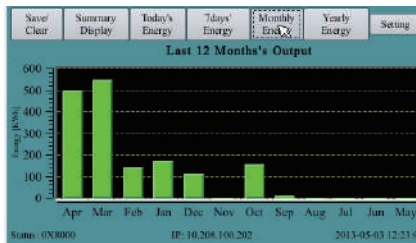


Figure 8 Monthly Energy

4.3.4 Yearly Energy

Pressing this button brings up a bar chart showing power generation over each year for the past 20 years (see Figure 9). This display is also similar to the Last 7 Days' Energy display. The x-axis represents the years and the current year locates in the last. The y-axis represents the amount of energy generated (kWh) in the year.

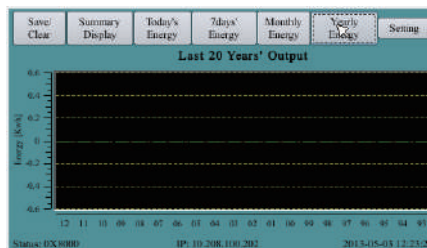


Figure 9 Yearly Energy

4.4 Setting

Pressing the Setting button will bring up the settings dialog.

4.4.1 IP Setting

HY-MDL/HY-MDL-3's IP address may be manually set in the Ethernet settings tab (Figure 10). They may also be obtained through DHCP (requires a system restart after setting). If the IP address must be changed, double click on the address box to bring up a small keypad on the screen.

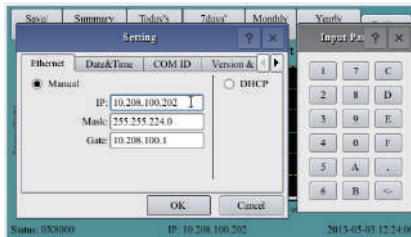


Figure 10 IP Setting

4.4.2 Date & Time Setting

The Date & Time settings tab (Figure 11) is used to set the date, time, and time zone. HY-MDL/HY-MDL-3 support all the five time zone of North America. For other parts of the world, the time zone "World" may be chosen.

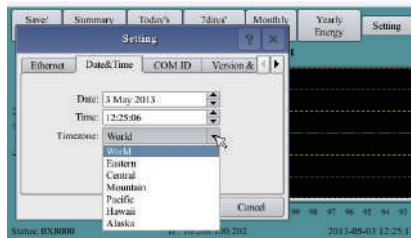
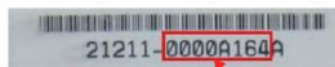


Figure 11 Date & Time Setting

4.4.3 Communication Address Setting

The communications address settings tab (Figure 12) is used to set the power line communication address of the micro inverters linked to the device. One HY-MDL/HY-MDL-3 monitoring data logger can monitor up to 255 micro inverters. Inverter-0 on the address list corresponds to the total output of all inverters connected to the monitoring data logger.

Address settings can be input using either the small input panel on the touch-screen or an external USB keyboard. The communication address of a micro inverter consists of the 8 hex characters (0~F) on the Huayu micro inverter bar code before the last letter for country. Another way to input the micro inverter communication address is through an internal web portal (see Section 5).



Microinverter Address

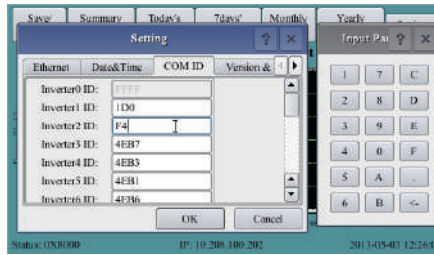


Figure 12 Communication Address Setting

4.5 Backup/Clear Data

When a USB flash disk is inserted, press the Save/Clear button to call up the following dialog box (see Figure 13).

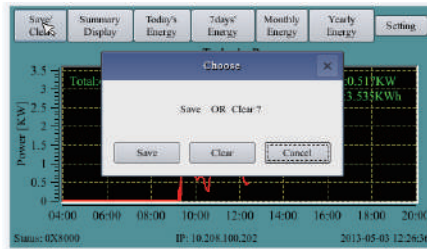


Figure 13 Backup/Clear Data

Press the Save button, and press "Yes" on the confirmation window that appears to compress and backup all collected data to the USB flash disk. The document will automatically use the backup date for its name.

Press the Reset button, and press "Yes" on the confirmation window that appears to clear all collected data. The device settings will not be changed.

4.6 Status Bar

The bottom field on all display pages consists of the status bar, which displays the device's operating status, the current IP address, and the current date and time. "OK" means that the device is operating normally. A 16-bit error code will be displayed in the form of a hex number if there happens to be a malfunction. The meaning of the error code is listed as the following table.

Error code	Error
Bit-0	DC over voltage
Bit-1	DC under voltage
Bit-2	hardware error
Bit-3	Inverter over voltage
Bit-4	Frequency over
Bit-5	Frequency under
Bit-6	AC voltage RMS over
Bit-7	AC voltage RMS under

Bit-8	Peak AC voltage over
Bit-9	AC current RMS over
Bit-10	Peak AC current over
Bit-11	Temperature over
Bit-12	ADC error
Bit-13	GFDI fault indicator
Bit-14	Relay error (for some model)
Bit-15	PLC Communication Error

5. Web Interface

The HY-MDL/HY-MDL-3 information can be accessed through two web pages. The first one is a web server inside the HY-MDL/HY-MDL-3 monitoring data logger. The second one is a web server provided by Huayu, which access requires internet service.

MICROVIEWER monitoring w/ built-in HY-MDL/HY-MDL-3

The local web portal built inside HY-MDL/HY-MDL-3 can be accessed through home network without internet service. If there is internet service, however, remote monitoring can be accessed through Huayu Portal from anywhere at anytime.

To access the web portal inside HY-MDL/HY-MDL-3, user only needs to type in the IP address of HY-MDL/HY-MDL-3 on a web browser (please see Section 4.4.1 for configuring the IP address of HY-MDL/HY-MDL-3). The administration page for inverter address can be accessed by <http://.../module.cgi> (for example <http://10.208.100.202/module.cgi>)



Figure 14 MICROVIEWER Monitoring

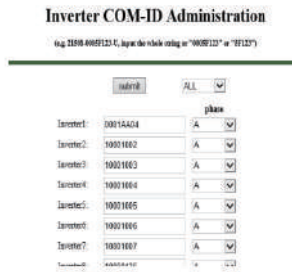


Figure 15 Inputting Inverter S/N through A Webpage

6. Specification

Communications Interface	HY-MDL	HY-MDL-3
Communication with Microinverter	Power Line Communication	
Ethernet	10/100 auto-sensing, auto-negotiation	
USB	USB 2.0 interface, auto-sensing, auto-negotiation	
Monitoring Capacity	255 micro inverters	
Human Interface		
Display	5-in LCD touch screen	7-in LCD touch screen
Power Requirements		
AC Inlet	100 - 240 Vac, 50/60 Hz	
Power Consumption	5 watts maximum	8 watts maximum
Mechanical Data		
Dimensions (WxHxD)	6.69" x 4.33" x 1.46"	7.83" x 6.34" x 1.81"
Weight	150g	720g
Ambient Temperature Range	-40°C to +55°C (-40° to 131°F)	
Cooling	Natural convection – no fans	
Enclosure Environmental	Indoor - NEMA 1	
Features		
Standard Warranty Term	1 year	
Compliance	UL 60950-1 2nd Edition Rev Dec 19, 2011 CSA C22.2 2nd Edition Rev Dec 19, 2011 FCC Part 15 Class B AS/NZS 60950.1:2011 Inc A1 AS/NZS CISPR 22: 2009+A1:2010 EN 60950-1:2006+A11:2009+A1:2010+A12:2011 EN 55022:2010 EN 61000-3-2:2006+A1:2009+A2:2009 EN 61000-3-3:2008 EN 55024:2010 EMC Directive 2004/108/EC	

Huayu Portal - Mobile App



Add: No.456 Xingning Road, Ningbo 315100, P.R.China

Tel: +86-574-8925 8801

E-mail: info@huayu-energy.com

Website: www.huayu-energy.com