

Off Grid Solar Inverter Remote LCD Panel(Model #: MCRLCD) User's Manual



For Solar Inverter Models:

M3024NC

M3048NC

M3048BP

M5000H-48BP

M6048DUL

M12048DUL

etc

Version 1.0 (PN:MCRLCD220509)

Manufacturer Information

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Please record the Sigineer Power unit's model and serial number in case you need to provide this information in the future. It is much easier to record this information now than try to gather it after the unit has been installed.

Order Number: _____

Model Number: _____ **/ Serial Number:** _____

1 Important Safety Information

Save This Manual! Read this manual before installation, it contains important safety, installation and operating instructions. Keep it in a safe place for future reference.

All wiring must follow the National Electric Code, Provincial or other codes in effect at the time of installation, regardless of suggestions in this manual.

MISTAKES TO AVOID

1 Don't use this remote LCD panel on other equipments, it is designed only to work with Sagineer Power solar inverters produced after 2022 May.

2 Don't use any third-party communication cables on the panel.

3 Don't cut off the cable when the panel is energized.

2 Introduction

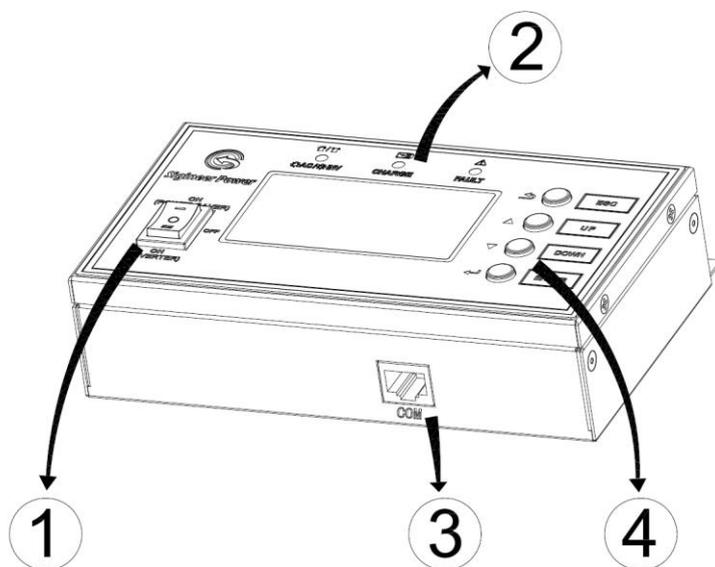
2.1 General Information

Thank you for purchasing the MCRLCD remote LCD panel.

It works with Sagineer Power solar inverters and is a remote extension of the LCD on the inverter front panel.

It works exactly as the box LCD.

2.2 Design



1. ON/OFF Power Switch	2.LED Status Indicator	3.Communication Port
4. Function Buttons		

2.3 Unpacking and Inspection

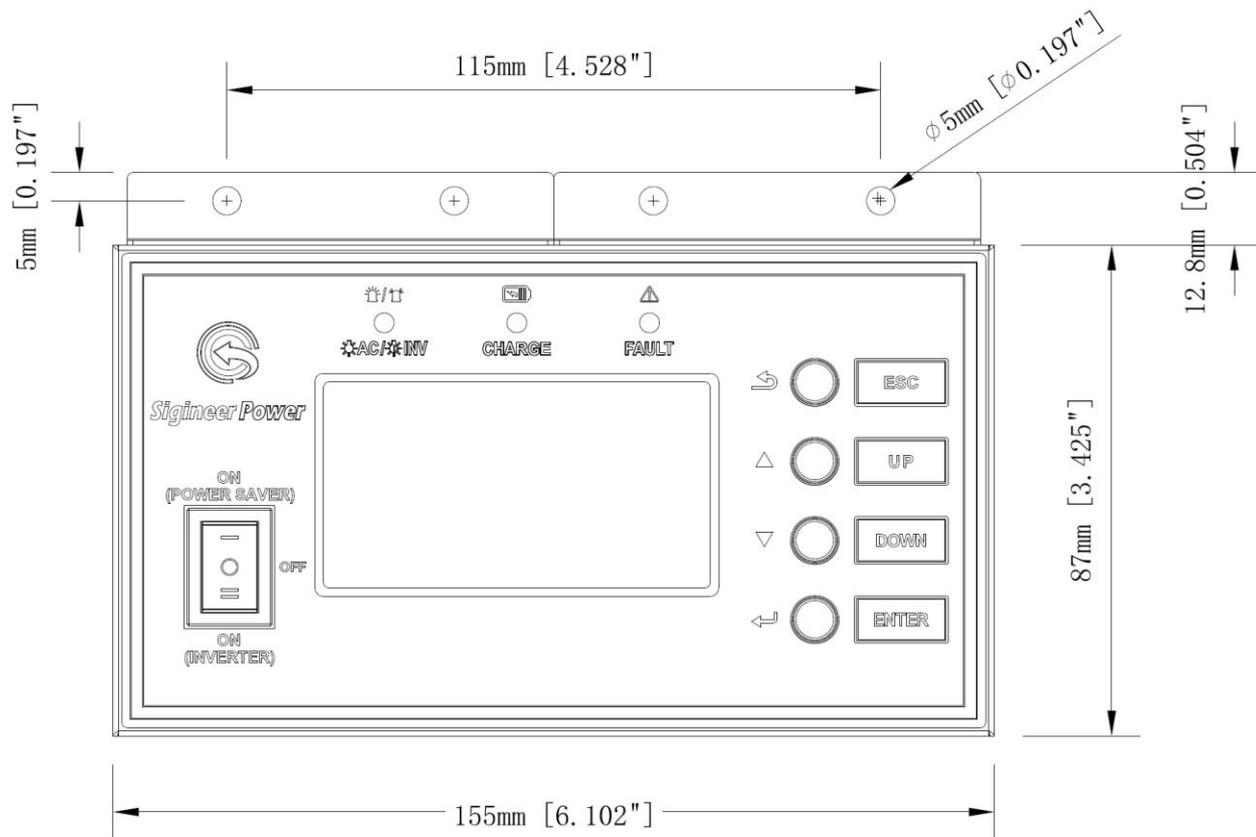
Unit x1

User manual x 1

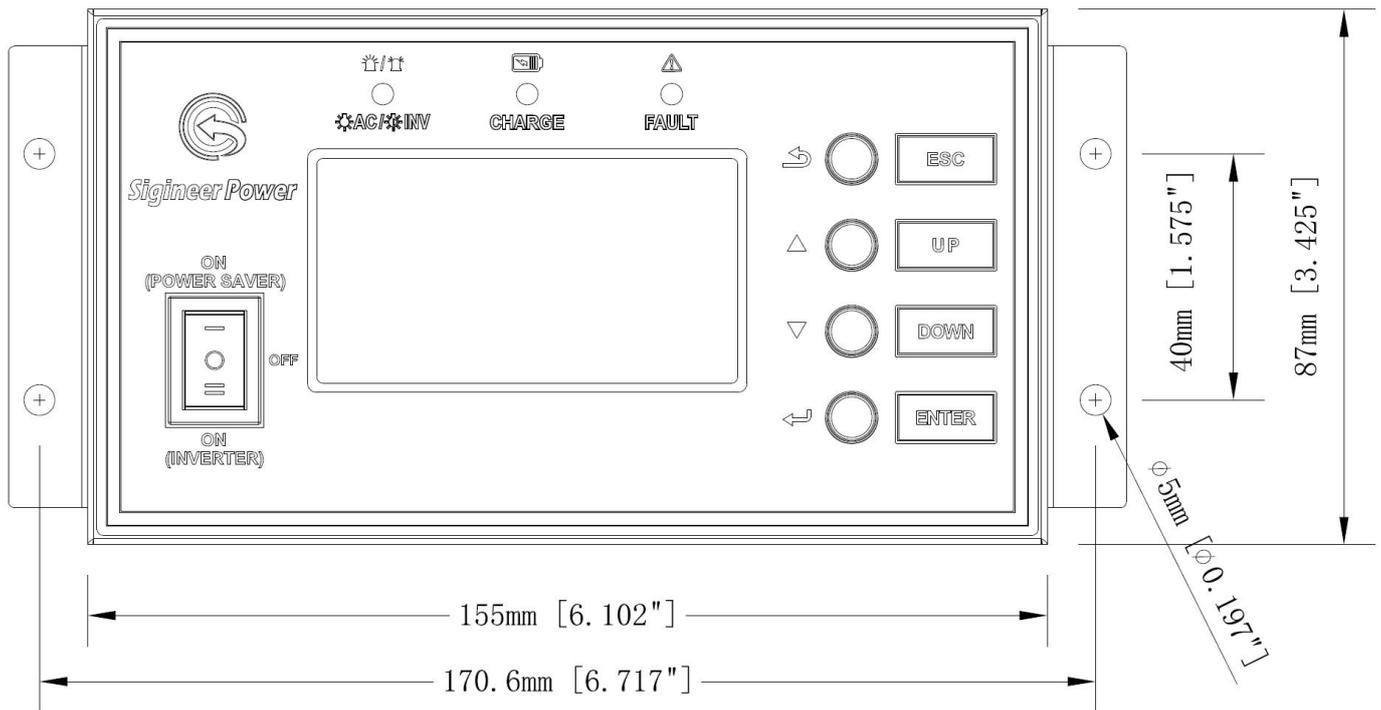
Communication cable(20m/65.6ft) x 1

2.4 Installation

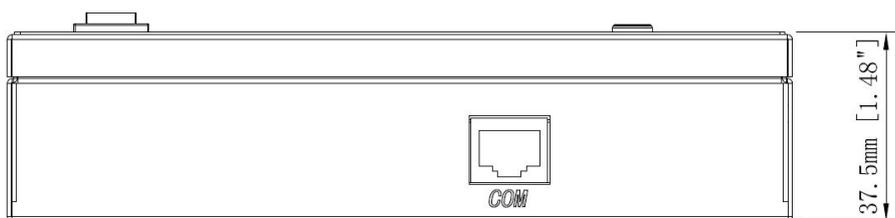
There are two pieces of flanges which can be flexibly installed either on the panel top or two sides.



Surface Mounting with Flange on the Top

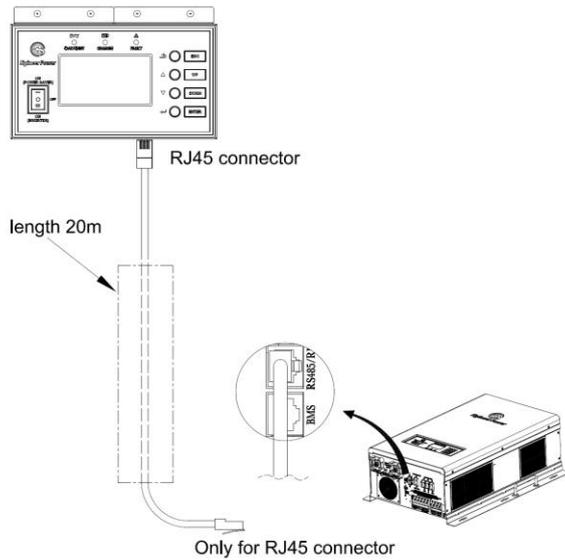


Flush Mounting with Flange on the Sides



2.5 Connecting to Inverter

The package contains the Remote LCD and a 20m(65.6 ft) RJ45 cable. Use the RJ45 cable to connect the Remote LCD ‘COM’ port and the inverter ‘RS485’ port.



2.6 LCD & Specification Setup

Power ON/OFF

Once the unit has been properly installed and the batteries are connected well, simply press On/Off switch (located on the button of the case) to turn on the unit.

NOTE : When the Remote LCD is running, the inverter power switch should stay as “OFF”.

The operation and display panel area includes three LED indicators, four function keys and a LCD display. It shows very rich operating info.

1 LCD display 2 Status indicator 3 Charging indicator 4 Fault indicator 5 Function buttons

LED Indicator	Operation Status		
AC / INV	Green	Solid On	Output is powered by utility in AC mode.
		Flashing	Output is powered by battery or PV in battery mode.
CHG	Green	Solid On	Battery is fully charged.
		Flashing	Battery is being charged.
FAULT	Red	Solid On	Fault occurs in the inverter.
		Flashing	Warning condition occurs in the inverter.

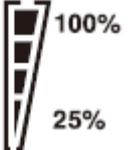
	Button	Description
	ESC	To exit setting mode
	UP	To go to previous selection
	DOWN	To go to next selection
	ENTER	To confirm the selection in setting mode or to enter setting mode

Icon	Description
AC Input Information	
	AC input icon
	Indicate AC input power, AC input voltage, AC input frequency, AC input current
	Indicate AC power loads in bypass
PV Input Information	
	PV input icon
	Indicate PV power, PV voltage, PV current, etc
Output Information	
	Inverter icon
	Indicate output voltage, output current, output frequency, inverter temperature
Load Information	
	Load icon
	Indicate power of load, power percentage of load
	Indicate overload happened
	Indicate short circuit happened
Battery Information	
	Indicate battery level by 0-24%, 25-49%, 50-74% and 75-100% in battery mode and charging status in line mode.
	Indicate battery voltage, battery percentage, battery current
	Indicate SLA battery
	Indicate lithium battery
	Indicate charging source priority: solar first, solar and utility, or only solar
Other Information	
	Indicate output source priority: solar first, utility first, SBU mode or SUB mode
	Indicate warning code or fault code
	Indicate a warning or a fault is happening
	Indicate it's during setting values
	Indicate the alarm is disabled

In AC mode, battery icon will present Battery Charging Status

Status	Battery voltage	LCD Display
Constant Current mode / Constant Voltage mode	<48V	4 bars will flash in turns.
	48 ~ 50V	Bottom bar will be on and the other three bars will flash in turns.
	50 ~ 52V	Bottom two bars will be on and the other two bars will flash in turns.
	> 52V	Bottom three bars will be on and the top bar will flash.
Floating mode. Batteries are fully charged.		4 bars will be on.

CC&CV Charge Mode	Battery Voltage @ Load >50%	Battery Voltage @50%> Load > 20%	Battery Voltage @ Load < 20%	Icon
<48V	< 41.2V	< 43.6V	<44.8V	
48-50V	41.2-43.2V	43.6-45.6V	44.8-46.8V	
50-52V	43.2-45.2V	45.6-47.6V	46.8-48.8V	
>52V	> 45.2V	> 47.6V	>48.8V	

Load Information				
OVER LOAD		Indicates overload.		
 	Indicates the load level by 0-24%, 25-49%, 50-74% and 75-100%.			
	0%~24%	25%~49%	50%~74%	75%~100%
				
Mode Operation Information				
	Indicates unit connects to the mains.			
	Indicates unit connects to the PV panel.			
BYPASS		Indicates load is supplied by utility power.		
	Indicates the utility charger circuit is working.			
	Indicates the DC/AC inverter circuit is working.			
SOL.FIRST BAT.FIRST UTI.FIRST		These three signs indicate the output priority. SOL.FIRST indicates solar first. BAT.FIRST indicates battery first. UTI.FIRST indicates utility first.		
Mute Operation				
	Indicates unit audible alarm is disabled.			

LCD SETTING

The inverter LCD allows users to virtually change all of its specs. It will enter setting mode if the ENTER button is held for 3 seconds. Press “UP” or “DOWN” button to select setting programs, and then press “ENTER” button to confirm the selection or ESC button to exit.

Program 01: Power Priority for AC Loads

01 UEI: Utility Priority (Default)

In this mode, the utility will provide power to the AC loads as the first power source. Solar and battery energy will provide power to the loads only when utility power is not available. This mode works for applications with cheap utility power or using battery in power outages.

01 SOL: Solar Priority

In this mode, the solar energy provides power to the loads as the first power source. If solar energy is insufficient, battery energy will be consumed. Utility power will engage when one of below conditions happens:

- 1 Solar energy is not available (No PV production).
- 2 Battery voltage drops to either low-level warning voltage or the setting point in program 12 (DC to AC Transfer Voltage in “SOL Priority”).

Once the solar power is lost, the utility will have higher priority than battery. This mode can be regarded as “SUB”(Solar>Utility>Battery).

In this mode, the inverter will transfer between DC and AC as per the settings of program 12 and 13. Users can set it to utility priority to stop the cycling.

01 SbU: SBU Priority

As indicated by the abbreviation, the power priority comes as solar>battery>utility. Solar energy provides power as the first priority. If solar energy is insufficient, battery energy will be consumed. Utility provides power to the loads only when battery voltage drops to either low-level warning voltage or the setting point in program 12(DC to AC Transfer Voltage in “SBU Priority”). When solar is gone in SBU mode, the power priority becomes battery>utility, battery priority is higher than utility priority.

In this mode, the inverter will transfer between DC and AC as per the settings of program 12 and 13. Users can set it to utility priority to stop the cycling.

01 SUB Priority

Solar energy provides power to the loads as the first priority. If solar energy is not sufficient to power all connected loads, solar and utility will power loads at the same time.

Battery provides power to the loads only when solar energy is not sufficient and there is no utility.

Program 02: Maximum Charging Current

M3024NC model: default 40A, 10A~140A Settable
M3048NC model: default 40A, 10A~120A Settable
M3048BP model: default 40A, 10A~120A Settable
M5000H-48BP model: default 60A, 10A~140A Settable

M6048DUL model: default 80A, 10A~140A Settable
M12048DUL model: default 80A, 10A~180A Settable

(If Li is selected in program 5, this program can't be set up)

The MPPT charger will stop when charging is completed. To activate the charger, the battery voltage must drop at least 2 voltages below the lower value in program 19 and 20.

Program 03: AC Input Voltage Range

03 APL: Appliance Mode

In Appliance Mode, the acceptable AC input voltage range is

M3024NC/M3048NC/M3048BP	65-140Vac ± 7V
M5000H-48BP	90~280Vac±7V
M6048DUL/M12048DUL	154-272Vac±7V

03:UPS

In UPS Mode, the acceptable AC input voltage range:

M3024NC/M3048NC/M3048BP	95-140Vac ± 7V
M5000H-48BP	170~280VAC±7V
M6048DUL/M12048DUL	184-272Vac±7V

03: GEN

In Generator Mode, the acceptable AC input voltage range:

M3024NC/M3048NC/M3048BP	65-140Vac ± 7V
M5000H-48BP	90~280VAC±7V
M6048DUL/M12048DUL	No such setting available.

Note: When the inverter is connected to a generator, the generator should be more than twice the inverter nominal power.

Program 04: Power Saving Mode Enable/Disable

04: SdS

When the power saver mode is disabled, the inverter will output full voltage, and the idle power is about 50-60 watts.

04: SEN

If the power saver mode is enabled, the output of inverter will be off when connected load is low or not detected.

The threshold for load detection is 100W. The idle power in power saver mode is about 30 watts.

Program 05: Battery Type

05: AGN

AGM Battery (Default) : CV :56.4V, Float 54V.

05: FLd

Flood Battery: CV :58.4V, Float 56V.

05: USE

User-Defined

If “User-Defined” is selected, battery charge voltage and low DC cut-off voltage can be set up in program 19, 20 and 21. This setting works for GEL batteries etc.

05: US2

User-Defined 2

This US2 setting is designed for the inverter to work with lithium battery without communication via BMS. As floating charging is not required for lithium batteries, in US2 mode, the program 19&20 will be interlocked and set to the same value whenever one of them is changed.

Compared with USE, the charger in US2 will immediately reduce charging current when the preset voltage in 19 is reached.

NOTE: The US2 will not optimally charge the lithium battery due to the lack of BMS communication. The battery capacity icon bar doesn't reflect the actual battery capacity; it is converted from battery voltage. For more details, please refer to page 13.

When the inverter is in US2, it could not correctly display the accurate SOC of the lithium batteries.

The displayed SOC is converted from battery voltage. The SOC will change only when the battery voltage changes big enough.

Due to the ripple current from the utility charger, when “US2” is set for charging lithium batteries, it is recommended to set the max utility charging current at 30% of the nominal charge current.

05: LI

Lithium

This setting only works when inverter communicates with lithium battery BMS built with the same protocol. The program is set to “LI”, the LCD will show a hidden program of 36 about BMS protocol types.

There are many lithium battery BMS communication protocols, L01, L02 to L99.

For Sagineer Power LFP power walls, the protocol is L01.

When the battery type set as “LI”, the maximum charge current can be modified by the user.

Note: When the communication fails, the inverter will cut off output.

RS485 communication protocol is L01 to L50.

The CAN communication protocol is L51 to L99.

Program 06: Automatic Overload Restart

06: LFd

Disabled.

06: LFE

When this feature is enabled, the inverter will attempt to restart 3 times after overloads, if it still fails to start the load after 3 attempts, it will show warning code 07.

Program 07: Automatic OverTemp Restart

Program 08: AC Output Voltage

The AC output voltage between hot and neutral can be set to 208V, 220V, 230V and 240V for M5000H-48BP and 100/110/120Vac for M3048BP.

Program 09: AC Output Frequency

The AC Output Frequency can be set to 50Hz or 60Hz.

Program 10: Number of 12V Batteries Connected In Series

The default value is 4. This program is only a reminder about the 12V battery quantity.

Program 11: Maximum Utility Charging Current

Model #	Default Value	Resettable Range
M3024NC	30A	0-60A
M3048NC	30A	0-40A
M3048BP	30A	0-40A
M5000H-48BP	30A	0-80A
M6048DUL	30A	10-60A
M12048DUL	30A	10-100A

The solar charger has higher priority than the utility charger, if the max charging current and utility charger is set to the same value, the solar charger will still work.

If setting value in Program 02 is smaller than that in Program 11, the final charging current is set according to Program 02 for utility charger.

Program 12 DC to AC Transfer Voltage

The setting works when program 01 is in “SBU Priority” or “Solar Priority” Mode.

Model #	Default Value	Resettable Range
48V models	46V/50%	44V~51.2V/6%-95%

The battery SOC will be displayed when BMS communication is established.

Half for 24Vdc model.

Program 13 AC to DC Transfer Voltage

The setting works when program 01 is in “SBU Priority” or “Solar Priority” Mode.

Model #	Default Value	Resettable Range
48V models	54V/95%	48V~58V/10%-100%

The battery SOC will be displayed when BMS communication is established.

Half for 24Vdc model.

Program 14 Charge Power Source Priority

14:CSO

Solar Priority

Solar energy will charge battery as the first priority.

Utility will charge battery only when solar energy is not available (lost).

14:SNU

Solar and Utility (Default)

Solar energy and utility will both charge battery.

14:OSO

Solar Only

Solar energy will be the only charger source no matter utility is available or not.

But when the battery voltage drops below the setting of 21(Low DC Cut-off Voltage) , the utility power will be used to force a charging cycle to avoid battery over discharging.

If this off grid solar inverter is working in DC to AC invert mode, only solar energy can charge the battery. Solar energy will charge battery if it's available and sufficient.

Program 15 Alarm On/Off Control

Program 16 Backlight On/Off Control

When off is set, the LCD will go dim after 60 seconds left unattended.

Program 17 Beeps once between AC and DC Transfer

Program 18 Overload Bypass

When enabled, the unit will transfer to line mode if overload occurs in battery mode.

Program 19 C.V. Charging Voltage

Model #	Default Value	Resetable Range
48V Models	56.4V	48V~58.4V

If user-defined setting (USE/US2) is selected in program 5, this program can be set up.

When the battery is charged to CV setting, the voltage must drop by 2 volts to activate the charger.

Program 20 Float Charging Voltage

Model #	Default Value	Resetable Range
48V Models	54V	48V~58.4V

If user-defined setting (USE/US2) is selected in program 5, this program can be set up

Program 21 Low Battery Cut-Off Voltage

Model #	Default Value	Resetable Range
48V Models	42V/20%	40V~48V/5%-50%

The battery SOC will be displayed when BMS communication is established.

After User-defined (USE/US2) setting is selected in program 5, this program can be set up

Low DC cut-off voltage will be fixed to setting value regardless of load percentage.

When low DC Cut-Off voltage is reached:

1. If battery is the only power source, inverter will shut down.
2. If PV energy and battery power are available, inverter will charge battery without AC output.
3. If PV energy, battery power and utility are all available, inverter will transfer to line mode and provide output power to loads and charge the battery at the same time.

When low battery voltage protection occurs and qualified PV or AC power inputs, the inverter will automatically charge and invert DC to AC when the battery voltage reach 54V Or 10% more SOC than low battery cut off in Lithium mode).

To make it work, the power switch must remain in the original “ON” position.

When the Program 12: DC to AC Transfer Voltage value is already set, the Program 21: Low Battery Cut-Off Voltage value must be lower than that. When the two values conflicts, the value in program 21 will automatically revert back.

Program #	Description	ICON
01 Power Priority for AC Loads	Utility Priority	OPPF UTI ^{UTIL.FIRST} 001 ^o
01 Power Priority for AC Loads	Solar Priority	OPPF SOL ^{SOL.FIRST} 001 ^o
01 Power Priority for AC Loads	SBU Priority	OPPF SBU ^{BAT.FIRST} 001 ^o
01 Power Priority for AC Loads	SUB Priority	OPPF SUB ^{SOL.FIRST UTIL.FIRST} 001 ^o
02 Maximum Charging Current	Max PV+Utility Charging Current	CHCI 60 ^A 002 ^o
03 AC Input Voltage Range	Appliance Mode (Default)	ACV APL 003 ^o
03 AC Input Voltage Range	UPS Mode	ACV UPS 003 ^o
03 AC Input Voltage Range	Generator mode	ACV GEN 003 ^o
04: Power Saving Mode	Saving mode disable (Default)	SAVE DIS 004 ^o
04: Power Saving Mode	Saving mode enable	SAVE ENA 004 ^o
05 Battery Type	AGM Battery (Default)	BATT AGM 005 ^o
05 Battery Type	Flood Battery	BATT FLD 005 ^o
05 Battery Type	User-Defined	BATT USE 005 ^o
05 Battery Type	User-Defined 2	BATT US2 005 ^o
05 Battery Type	Lithium	BATT LI 005 ^o
06 Automatic Overload Restart	Restart Disable (Default)	LDRS DIS 006 ^o
06 Automatic Overload Restart	Restart Enable	LDRS ENA 006 ^o
07 Automatic OverTemp Restart	Restart Disable (Default)	OTRS DIS 007 ^o
07 Automatic OverTemp Restart	Restart Enable	OTRS ENA 007 ^o
08 AC Output Voltage	230V (Default)	OUTV 230 008 ^o

09 AC Output Frequency	50Hz (Default)	OUTF 50 009 ^o
10 Number of 12V Batteries Connected In Series	The default value is 4 for 48V model, and 2 for 24Vdc model.	BATN 4 010 ^o
11 Maximum Utility Charging Current	10A to Max(default 30A)	ACI 30 ^A 011 ^o
12 DC to AC Transfer Voltage	Default 46.0V, 44.0V~51.2V resettable,	b2AC 46.0 ^V 012 ^o
12 DC to AC Transfer Voltage	Lithium mode: default 40%, 5%~50% resettable	b2AC 50 [%] 012 ^o
13 AC to DC Transfer Voltage	Default 54.0V, 48.0V~58.0V resettable,	AC2b 54.0 ^V 013 ^o
13 AC to DC Transfer Voltage	Li mode: default 80%, 60%~100% resettable	AC2b 95 [%] 013 ^o
14 Charger Power Source Priority	Solar Priority	CGPR ^{SOL} C50 014 ^o
14 Charger Power Source Priority	Solar and Utility (Default)	CGPR ^{SOL-UTI} 5NU 014 ^o
14 Charger Power Source Priority	Solar Only	CGPR ^{only SOL} 050 014 ^o
15 Alarm On/Off Control	Audible Alarm on (default)	bUZZ ON 015 ^o
15 Alarm On/Off Control	Audible Alarm off(Mute)	bUZZ OFF 015 ^o
16 Backlight On/Off Control	Backlight on (default)	LEdb ON 016 ^o
16 Backlight On/Off Control	Backlight off	LEdb OFF 016 ^o
17 Beeps once between AC and DC Transfer	Alarm on (default)	ALAN ON 017 ^o
17 Beeps once between AC and DC Transfer	Alarm off	ALAN OFF 017 ^o
18 Overload Bypass	Bypass Disable (default)	bYP dI 5 018 ^o
18 Overload Bypass	Bypass enable	bYP ENA 018 ^o
19 C.V. Charging Voltage	48V model: default 56.4V, 48.0V~58.4V Settable	CV 56.4 ^V 019 ^o
20 Float Charging Voltage		FLEV 54.0 ^V 020 ^o
21 Low Battery Cut-Off Voltage	Without BMS communication	CUEV 42.0 ^V 021 ^o
21 Low Battery Cut-Off Voltage	With BMS communication	CUEV 20 [%] 021 ^o

LCD Display Setting

The LCD display information will be switched in turns by pressing “UP” or “DOWN” key. The selectable information is switched in below order: input voltage, output voltage, load percentage, PV input voltage, MPPT charging current, MPPT charging power, battery voltage, output voltage, output frequency, load percentage, load in VA, load in Watt, DC discharging current, main CPU Version and second MCU Version.

Setting Information	LCD display
① AC Input voltage ② Output voltage ③ Load percentage ④ PV input voltage ⑤ Battery voltage ⑥ Warning or Fault code (Default Display Screen)	
① AC Input frequency ② Output frequency ③ Load power in VA ④ PV energy sum in KWH ⑤ Battery percentage ⑥ Warning or Fault code	
① AC Input current ② Output current ③ Load percentage ④ PV input current ⑤ Battery charging current ⑥ Warning or Fault code	
① AC input power in Watts ② Inverter temperature ③ Load power in Watts ④ PV energy sum in KWH ⑤ Battery percentage ⑥ Warning or Fault code	
Firmware Version of Inverter PCB and MPPT PCB (CPU1: 040-00-b21; CPU2:041-00-b21)	
Time (15:20:10, December 15, 2018)	

The LCD will display different inverter status when the up or down button is pressed.

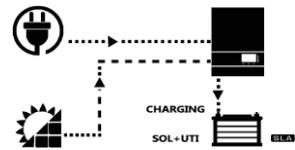
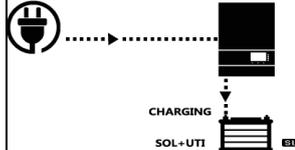
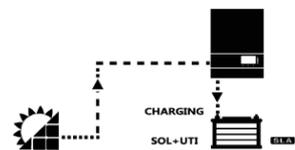
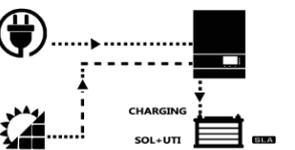
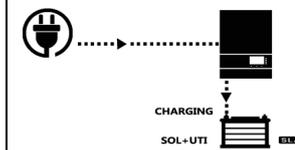
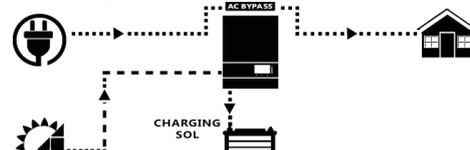
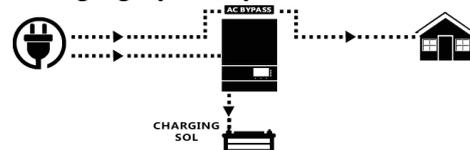
The last page of LCD shows the software version of the inverter PCB. There are 8 digits.

If the MPPT PCB is not activated, it will display 000-00-000.

When the LCD is switched to a new page, the LCD will return to the default home screen in 5 minutes without operation.

When the LCD enters the setting page, the LCD will return to the default home screen in 2 minutes without operation.

Operating Mode Description

Operation mode	Description	LCD display	
Standby mode / Power saving mode Note: *Standby mode: The inverter is not turned on yet but at this time, the inverter can charge battery without AC output. *Power saving mode: If enabled, the output of inverter will be off when connected load is too low or not detected.	No output is supplied by the unit but it still can charge batteries.	Charging by utility and PV energy. 	Charging by utility 
		Charging by PV energy 	No charging 
Fault mode Note: *Fault mode: Errors are caused by inside circuit error or external reasons such as over temperature, output short circuited and so on.	PV energy and utility can charge batteries.	Charging by utility and PV energy 	Charging by utility 
		Charging by PV energy 	No charging 
Line Mode	The unit will provide output power from the mains. It can also charge the battery at line mode.	Charging by PV energy 	Charging by utility 
		No battery connected	

Battery Mode	The unit will provide output power from battery and PV power.	Power from battery and PV energy
		Power from battery only

The inverter is built with automatic PV and utility power wakeup feature.

When the power switch is in power off, and qualified PV input, the PV charger will be activated, and the rest part of the inverter will remain powered off.

In this mode, the utility power can only illuminate the LCD, it can't charge batteries.

When the inverter shuts off due to low battery voltage, and the switch is kept on "on" position, the inverter will use qualified utility power or PV power to charge batteries and wake up at "cold start voltage" to discharge the battery to provide AC output.

If the inverter is set in SOL or SUB, the automatic wake up feature will charge battery close to "Utility to Battery switch" voltage, and then cut off utility charger, switch to DC to AC model.

The M5000H-48BP inverters can be stacked up to 6 pcs to expand output power in 230Vac or create 230/400Vac three phase.

The M3048BP can be stacked up to 6 pcs to expand output power in 120Vac or create 120/208Vac three phase.

When they are stacked, all the inverters will share the loads evenly. Each will be ready output full power even the load is under nominal power, none of them will go into power saver mode.

This is designed to handle sudden loads fluctuations.

Note:

When there is more than one inverter paralleled in one phase, if the slave unit shut off, the rest inverters in the system will continue operate.

If the master unit shuts off, all the rest inverters will shut off.

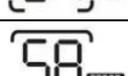
4 Maintenance & Troubleshooting

This troubleshooting guide contains information about how to troubleshoot possible error conditions while using the M3048BP and M5000H-48BP Solar Power Inverter/Chargers.

The following chart is designed to help you quickly pinpoint the most common inverter failures.

Indicator and Buzzer

Fault Code	Fault Event	Icon on
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01	Fan lock	
02	Over temperature	
03	Battery voltage is too high	
04	Battery voltage is too low	
05	Output short circuited	
06	Output voltage is too high.	
07	Overload time out	
08	Bus voltage is too high	
09	Bus soft start failed	
51	Over current or surge	
52	Bus voltage is too low	
53	Inverter soft start failed	
55	Over DC voltage in AC output	
56	Battery connection is open	
57	Current sensor failed	
58	Output voltage is too low	
60	Negative power fault	
61	PV voltage is too high	61-
62	Internal communication error	62-
80	CAN fault	
81	Host loss	

Warning Indicator

Warning Code	Warning Event	Audible Alarm	Icon flashing
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01	Fan is locked	Beep 3 times every second	01 [△]
02	Over temperature	Beep once every second	02 [△]
03	Battery is over-charged	Beep once every second	03 [△]
04	Low battery	Beep once every second	04 [△]
07	Overload	Beep once every 0.5 second	07 [△]
10	Output power derating	Beep twice every 3 seconds	10 [△]
12	Solar charger stops due to low battery	Beep once every second	12 [△]
13	Solar charger stops due to high PV voltage	Beep once every second	13 [△]
14	Solar charger stops due to overload	Beep once every second	14 [△]
15	Parallel input utility grid different	Beep once every second	15 [△]
16	Parallel input phase error	Beep once every second	16 [△]
17	Parallel output phase loss	Beep once every second	17 [△]
18	Buck over current	Beep once every second	18 [△]
19	Battery disconnect	No beep	19 [△]
20	BMS communication error	Beep once every second	20 [△]
21	PV power insufficient	Beep once every second	21 [△]
22	Parallel forbidden without battery	Beep once every second	22 [△]
25	Parallel inverters' capacity different	Beep once every second	25 [△]
33	BMS communication loss	Beep once every second	33 [△]
34	Cell over voltage	Beep once every second	34 [△]
35	Cell under voltage	Beep once every second	35 [△]
36	Total over voltage	Beep once every second	36 [△]
37	Total under voltage	Beep once every second	37 [△]
38	Discharge over current	Beep once every second	38 [△]

39	Charge over current	Beep once every second	39 [△]
40	Discharge over temperature	Beep once every second	40 [△]
41	Charge over temperature	Beep once every second	41 [△]
42	Mosfet over temperature	Beep once every second	42 [△]
43	Battery over temperature	Beep once every second	43 [△]
44	Battery under temperature	Beep once every second	44 [△]
45	System shut down	Beep once every second	45 [△]

TroubleShooting

Problem	LCD/LED/Buzzer	Explanation	What to do
Unit shuts down Automatically during startup process.	LCD/LEDs and buzzer will be active for 3 seconds and then complete off.	The battery voltage is too low . (<1.91V/Cell)	1.Re-charge battery. 2.Replace battery.
No response after power on.	No indication.	1.The battery voltage is far too low. (<1.4V/Cell) 2.Battery polarity is connected reversed.	1. Check if batteries and the wiring are connected well. 2.Re-charge battery. 3.Replace battery.
Mains exist but the unit works in battery mode.	Input voltage is 0 on the LCD and green LED is flashing.	Input protector is tripped.	Check if AC breaker is tripped and AC wiring is connected well.
	Green LED is flashing.	Insufficient quality of AC power. (Shore or Generator)	1. Check if AC wires are too thin and/or too long. 2. Check if generator (if applied) is working well or if input voltage range setting is correct. (UPS→Appliance)
	Green LED is flashing.	Set “Battery First” or “Solar First” as the priority of output source.	Change output source priority to Utility first.
When it’s turned on, internal relay is switching on and off repeatedly.	LCD display and LEDs are flashing	Battery is disconnected.	Check if battery wires are connected well.
Buzzer beeps continuously and red LED is on.(Fault code) Buzzer beeps once every second, and red LED is flashing. (Warning code)	Fault code 01	Fan fault.	1.Check whether all fans are working properly. 2.Replace the fan.
	Fault code 02	Internal temperature of component is over 100°C.	1.Check whether the air flow of the unit is blocked or whether the ambient temperature is too high. 2.Check whether the thermistor plug is loose.
	Fault code 03	Battery is over-charged.	Restart the unit, if the error happens again, please return to repair center.
		The battery voltage is too high.	Check if spec and quantity of batteries are meet requirements.
	Warning code 04	The battery voltage/SOC is too low.	1.Measure battery voltage in DC input. 2.Check battery SOC in LCD when use Li battery. 3.Recharge the battery.
Fault code 05	Output short circuited.	Check if wiring is connected well and remove abnormal load.	

Fault code 06/58	Output abnormal (Inverter voltage is over 150Vac or below 40Vac).	1.Reduce the connected load. 2. Restart the unit, if the error happens again, please return to repair center.
Fault code 07	The inverter is overload 110% and time is up.	Reduce the connected load by switching off some equipment.
Fault code 08	Bus voltage is too high.	1.If you connect to a lithium battery without communication, check whether the voltage points of the program 19 and 21 are too high for the lithium battery. 2. Restart the unit, if the error happens again, please return to repair center.
Fault code 09/53/57	Internal components failed.	Restart the unit, if the error happens again, please return to repair center.
Warning code 15	The input status is different in parallel system.	Check if AC input wires of all inverters are connected well.
Warning code 16	Input phase is not correct.	Change the input phase S and T wiring.
Warning code 17	The output phase not correct in parallel.	1.Make sure the parallel setting are the same system(single or parallel; 3P1,3P2,3P3). 2.Make sure all phases inverters are power on.
Warning code 20	Li battery can't communicate to the inverter.	1.Check whether communication line is correct connection between inverter and battery. 2.Check whether BMS protocol type is correct setting.
Fault code 51	Over current or surge.	Restart the unit, if the error happens again, please return to repair center.
Fault code 52	Bus voltage is too low.	
Fault code 55	Output voltage is unbalanced	
Fault code 56	Battery is not connected well or fuse is burnt.	If the battery is connected well, please return to repair center.
Fault code 60	Negative power fault	1. Check whether the AC output connected to the grid input. 2. Check whether Program 8 settings are the same for all parallel inverters 3. Check whether the current sharing cables are connected well in the same parallel phases. 4. Check whether all neutral wires of all parallel units are connected together. 5. If problem still exists, contact repair center.
Fault code 80	CAN fault	1. Check whether the parallel communication cables are connected well.
Fault code 81	Host loss	2. Check whether Program 23 settings are right for the parallel system. 3. If problem still exists, contact repair center

Note: To restart the inverter, all power sources need to be disconnected. After the LCD screen light is off, only use the battery to restart the inverter.

5 Warranty

We warrant this product against defects in materials and workmanship for a period of one year from the date of purchase and will repair or replace any defective M Series Inverter when directly returned, postage prepaid, to manufacturer. This warranty will be considered void if the unit has suffered any obvious physical damage or alteration either internally or externally and does not cover damage arising from improper use such as plugging the unit into an unsuitable power sources, attempting to operate products with excessive power consumption requirements, reverse polarity, or use in unsuitable climates.

WARRANTY DOES NOT INCLUDE LABOR, TRAVEL CHARGES, OR ANY OTHER COSTS INCURRED FOR REPAIR, REMOVAL, INSTALLATION, SERVICING, DIAGNOSING OR HANDLING OF EITHER DEFECTIVE PARTS OR REPLACEMENT PARTS. THE WARRANTOR

ASSUMES NO LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND.
LOSS OR DAMAGE: Loss or damage in transit is the responsibility of the carrier. Any claim should be filed with the delivering transport company. Invoice, Bill of Lading and Delivery receipt with damage noted therein must accompany any claims for freight damage. Claims for shortage and lost shipments must be made in writing to the shipper within 3 days of the receipt of shipment. Claims not reported within this time frame will not be honored.

This warranty does not apply to and we will not be responsible for any defect in or damage to:

- a) the product if it has been misused, neglected, improperly installed, physically damaged or altered, either internally or externally, or damaged from improper use or use in an unsuitable environment; violations of the warnings in the manual will invalidate the warranty.
- b) the product if it has been subjected to fire, water, generalized corrosion, biological infestations, or input voltage that creates operating conditions beyond the maximum or minimum limits listed in the product specifications including high input voltage from generators and lightning strikes;
- c) the product if repairs have been done to it other than by us or its authorized service centers;

※Errors and omissions reserved. Specifications in this manual are subject to change without prior notice.

SAVE THIS MANUAL!

**READ THIS MANUAL BEFORE INSTALLATION, IT
CONTAINS IMPORTANT SAFETY, INSTALLATION AND
OPERATING INSTRUCTIONS. KEEP IT IN A SAFE PLACE
FOR FUTURE REFERENCE.**

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