U1LiFePRO™
Quick Start Guide

M-12V40-U1

M-24V20-U1

Designed & Manufactured by
inventus POWER

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Applicable Models

Model	Part No. (SMBus/CANopen)	Part No. (RS485/CANopen)
M-12V40-U1	57575-101	N/A
M-24V20-U1	N/A	57623-001

Document Information

Release Date	Revision	Scope of Change
2023-02-23	V2.4	Minor edits to version 2 release

Technical Support

If you have any technical questions regarding the U1LiFePRO™ battery, please contact our technical support team at:

Phone: +1.877.423.4242

E-mail: tech_support@inventuspower.com

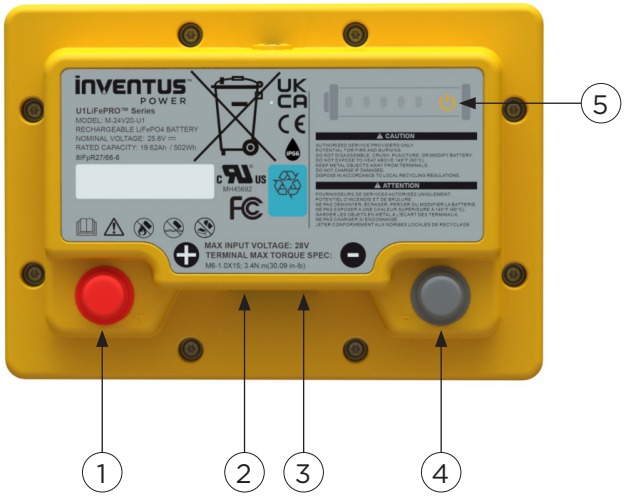
Quick Start Guide

Please read the detailed User Manual first and refer to this guide as another quick resource.

Before installation or maintenance of your batteries, the following equipment is required:

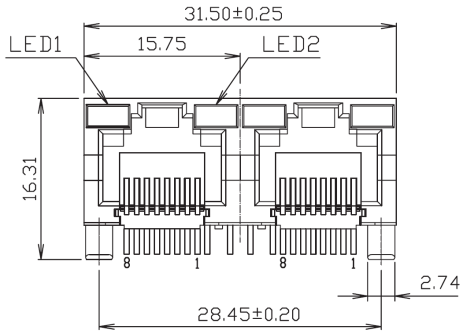
- Rubber gloves
- Safety goggles or other eye protection
- Insulated Torque Wrench / Philips Screwdriver
- Voltmeter

Mechanical Features



#	Description
1	Positive Terminal
2	Signal Connector #1
3	Signal Connector #2
4	Negative Terminal
5	Battery State of Charge Indicator

If in doubt, please consult with **Inventus Power Technical Support (tech_support@inventuspower.com)** on further instructions on the signal cable connections to the host system.



RIA Connector P/N: AJT35I8821-030

Battery Terminal Torque Rating

Model	Terminal Type	Wrench Size	Torque (Nm)
M-12V40-U1 M-24V20-U1	ISO M6 x 1.0 x 16mm Bolt	10mm	3.4 ± 0.5 Nm

Wake-Up & Ship Mode

TO **WAKE UP** THE BATTERY FROM SHIP MODE

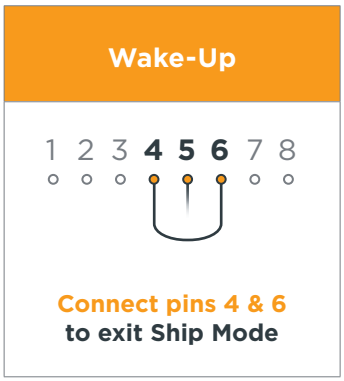
Press the SOC button for 5 seconds

We recommend to place the battery in Ship Mode when it is not used to prevent self-consumption current drain and extend storage life.

TO PLACE IN **SHIP MODE**

Press the SOC button for **20 seconds**

Battery can also receive a wake up signal from the signal connector by shorting pin 6 (VGND) to pin 4 (VINTLK) to wake up battery from Ship Mode.

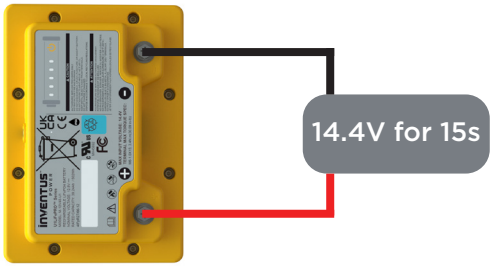


Wake from Shutdown Mode

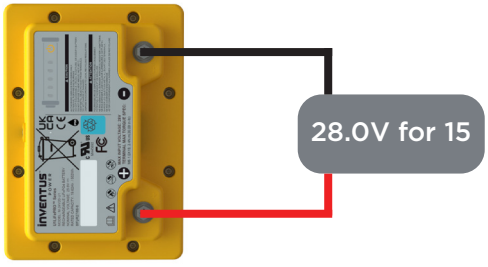
To exit Shutdown Mode, apply battery charge voltage pulse to the positive and negative terminals for >15 seconds.

Note: Many intelligent chargers sense voltage at the battery terminals prior to applying charge voltage and thus will not wake the battery from Shutdown Mode. In this case, it is recommended to use a power supply set to the appropriate charge voltage to wake the battery from Shutdown Mode.

M-12V40-U1



M-24V20-U1



Power and Communication Cables

Power cables are not included with the battery unless a integration kit is purchased. Choose the appropriate power cable size based on the system load requirements. Refer to ampacity table in User Manual when selecting power cables. If your application requires communication, please use any off-the-shelf cable that is compatible with RIA Connector P/N: AJT3518821-030.

Charging

Many types of lead acid chargers are compatible with our U1LiFePRO™ batteries and safely charge between 0°C to 55°C (32°F to 131°F). The charger maximum voltage output should match the maximum charge voltage of the battery system and should not exceed constant voltage as shown in the table below. It is recommended to charge the battery prior to installation. Consult with Inventus Power for recommendation on selecting a battery charger.

Charge Voltage / Current

Model	M-12V40-U1	M-24V20-U1
Charge Voltage	14.4 VDC	28.0 VDC
Recommended Charge Current	20A (0.5C)	10A (0.5C)
Maximum Charge Current	40A (1.0C)	20A (1.0C)

Pin Definition

Pin Definition (M-12V40-U1)

Pin #	Symbol	Description
1	SMBUS	SMBDAT; leave floating when using CAN
2	SMBUS	SMBCLK; leave floating when using CAN
3	*not used*	
4	VINTLK	For charging, connect VGND to VINTLK
5	VWAKE	For discharging, connect VGND to VWAKE
6	VGND	Ground Reference
7	VCANH_BATT	CAN High (Battery)
8	VCANL_BATT	CAN Low (Battery)

Pin Definition (M-24V20-U1)

Pin #	Symbol	Description
1	A-RS485	RS485 Data A; leave floating when using CAN
2	B-RS485	RS485 Data B; leave floating when using CAN
3	*not used*	
4	VINTLK	For charging, connect VGND to VINTLK
5	VWAKE	For discharging, connect VGND to VWAKE
6	VGND	Ground reference
7	VCANH_BATT	CAN High (Battery)
8	VCANL_BATT	CAN Low (Battery)

Connecting the Battery

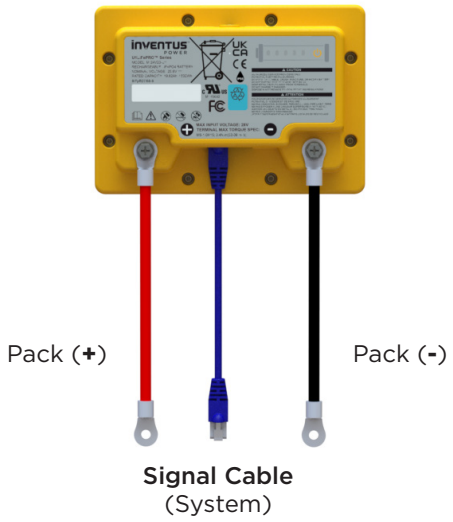
1. Remove power to the vehicle/device prior to installation of the U1LiFePRO™ battery.
2. Remove all other batteries from the system prior to replacing them with U1LiFePRO™ batteries.
3. Remove the protective battery terminal covers from the terminals. Retain these covers in the event that you need to remove or move the battery at some future time.
4. Attach the negative cable from the device to the negative terminal on the battery.
5. Attach the positive cable from the device to the positive terminal on the battery.
6. Attach the signal communications cable to the RJ45 ports if needed.
7. If the battery charger is integrated with the device drawing power from the U1LiFePRO™ battery, then please follow manufacturers recommended sequence for each battery connection.
8. It is recommended to fully charge and fully discharge the battery system upon initial connection to properly calibrate the SOC.

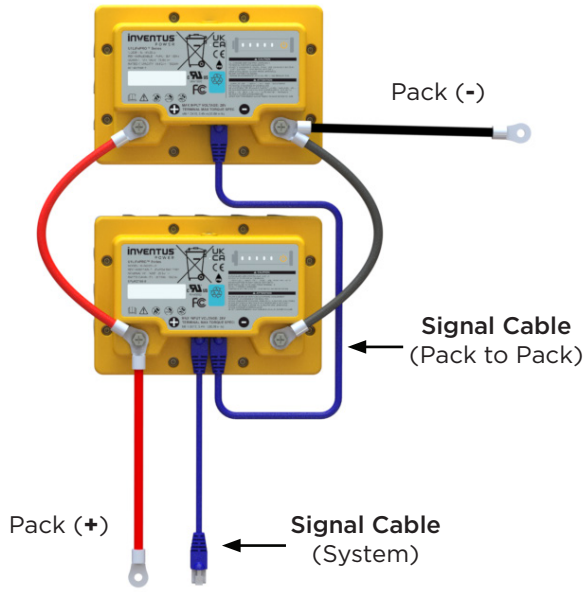
Please contact Inventus Technical Support if the system requires more than 10 batteries.

Parallel connections

The PROformance batteries can be connected in parallel to increase your energy requirements. You may connect up to 10 batteries for the M-12V40-U1 and M-24V20-U1 models. These batteries cannot be connected in series. Refer to wiring diagram below.

Single Install	Parallel Connection





Battery Modes

Sleep Mode	Charge Mode	Discharge Mode
		
Disconnect pins 4, 5 & 6 to put into Sleep Mode	**Connect pins 4 & 6 to enter Charge Mode**	**Connect pins 5 & 6 to enter Discharge Mode**

Mode Name	VWAKE	VINTLK	Action	Mode Description
Sleep	Off (Open)	Off (Open)	Disconnect pins 4, 5, and 6 to enter Sleep Mode	Low power mode, MOSFETs open
Charge	Off (Open)	**On (Low)**	Connect pins 4 and 6 to enable charging	Charge allowed*, MOSFETs closed
Charge	**On (Low)**	**On (Low)**	Connect pin 6 to pins 4 and 5 to enable charging	Charge allowed*, MOSFETs closed
Discharge	**On (Low)**	Off (Open)	Connect pins 5 and 6 to allow discharging	Discharge allowed**, MOSFETs closed
Ship	Off (Open)	N/A	Press the SOC button and hold for 20 sec	Low power mode, MOSFETs open
Shutdown	N/A	N/A	Apply charge voltage to exit Shutdown	Lowest power mode, MOSFETs open

LED Status

LED Indicator Status	SOC
	**80 – 100%**
	**60 – 79%**
	**40 – 59%**
	**20 – 39%**
	**10 – 19%**
	**<10%**

Note: CAN lines in the battery pack DO NOT have internal termination resistance. It is recommended to properly terminate the system and battery CAN Bus lines following the CAN Bus termination standards. For any technical questions about properly adding termination resistance, please contact technical support at tech_support@inventuspower.com.