

USER'S MANUAL

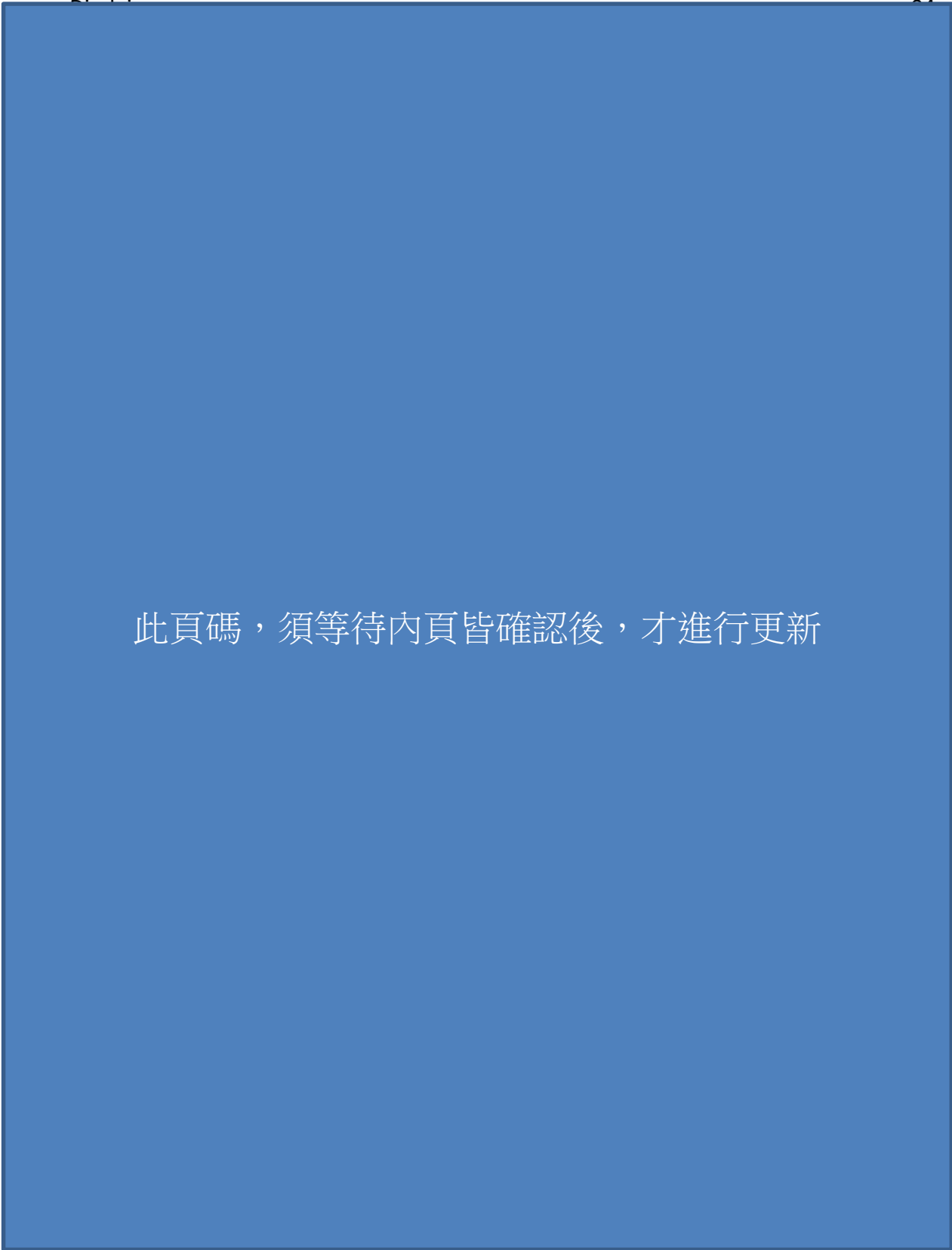
ECO-1000 ENERGY PACK

Industrial Supercapacitor



Table of Contents

Prefaces 04
Revision 04



此頁碼，須等待內頁皆確認後，才進行更新

2.1.2 Bottom View 55
2.2 Connector / Switch Definition 56
2.3 I/O Interface Descriptions 57

Chapter 3	System Setup	88
3.1	Set torque force to 3.5 kgf-cm to execute all the screwing and unscrewing	89
3.2	Disconnecting expansion module from computing module	89
3.3	Removing chassis top cover	91

此頁碼，須等待內頁皆確認後，才進行更新

Appendix WDT & GPIO	176
WDT Sample Code	177
GPIO Sample Code	178

Prefaces

Revision

Revision	Description	Date
1.0	Manual Released	2022/09/30

Disclaimer

All specifications and information in this User's Manual are believed to be accurate and up to date. C&T Solution Inc. does not guarantee that the contents herein are complete, true, accurate or non-misleading. The information in this document is subject to change without notice and does not represent a commitment on the part of C&T Solution Inc.

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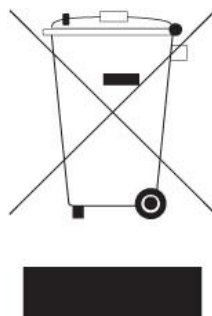
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Environmental Protection Announcement

Do not dispose this electronic device into the trash while discarding. Please recycle to minimize pollution and ensure environment protection.



Safety Precautions

Before installing and using the equipment, please read the following precautions:

- Put this equipment on a reliable surface during installation. Dropping it or letting it fall could cause damage.
- The power outlet shall be installed near the equipment and shall be easily accessible.
- Please turn off the system power and disconnect the power cord from its source before making any installation.
- Be sure both the system and the external devices are turned OFF. A sudden surge of power could ruin sensitive components.
- Make sure the equipment is properly grounded.
- When the power is connected, never open the equipment. The equipment should be opened only by qualified service personnel.
- Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
- Disconnect this equipment from the power before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
- Avoid dusty, humid, and extreme temperatures.
- Do not place heavy objects on the equipment.
- If the equipment is not used for a long time, disconnect it from the power to avoid being damaged by transient over-voltage.
- The storage temperature shall be above -30°C and below 85°C.
- The computer is provided with supercapacitor batteries. There is a risk of unforeseen error if incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.
- Do not let any conductive materials, including hands, touch the battery's conductive ports when they are fully charged to avoid high-voltage shock and short circuits.
- If one of the following situations arises, get the equipment checked to be service personnel:
 - The power cord or plug is damaged.
 - Liquid has penetrated the equipment.
 - Liquid has penetrated the equipment.
 - The equipment has been exposed to moisture.
 - The equipment does not work properly, or it cannot work according to the user's manual.
 - The equipment has been dropped and damaged.
 - The equipment has obvious signs of breakage.

Technical Support and Assistance

1. Visit the C&T Solution Inc website at <https://www.candtsolution.com> where you can find the latest information about the product.
2. Contact your distributor, our technical support team or sales representative for technical support if you need additional assistance. Please have following information ready before you call:
 - Model name and serial number
 - Description of your peripheral attachments
 - Description of your software (operating system, version, application software, etc.)
 - A complete description of the problem
 - The exact wording of any error messages

Conventions Used in this Manual



WARNING

This indication alerts operators to an operation that, if not strictly observed, may result in severe injury.



CAUTION

This indication alerts operators to an operation that, if not strictly observed, may result in safety hazards to personnel or damage to equipment.



NOTE

This indication provides additional information to complete a task easily.

Package Contents

Before installation, please ensure all the items listed in the following table are included in the package.

Item	Description	Q'ty
1	ECO-1000 Industrial energy pack system	1
2	Wall Mount Kit	1
3	Accessory Kit	1

Ordering Information

Model No.	Product Description
ECO-1000-8S	Portable Smart High-Density Industrial Supercapacitor Power Backup System, with 8x 370F
ECO-1000-16S	Portable Smart High-Density Industrial Supercapacitor Power Backup System, with 16x 370F
ECO-1000-8S-LCM	Portable Smart High-Density Industrial Supercapacitor Power Backup System, with 8x 370F, 1x LCM
ECO-1000-16S-LCM	Portable Smart High-Density Industrial Supercapacitor Power Backup System, with 16x 370F, 1x LCM

Chapter 1

Product Introductions

1.1 Overview

1.1.1 Introduction

The ECO-1000 Series is a self-sustaining, industrial supercapacitors that provides power backup solution for your edge computers and other IIoT devices. The ECO-1000 Series allow energy redundancy against unexpected power outages when computers are deployed at a remote and mobile environment in the rugged edge.

The ECO-1000 Series is an intelligent ruggedized supercapacitors that is programmable to match a specific power backup requirement based on the application's specification. When there is a sudden power shutdown from the main power source, user can program the ECO-1000 right on the hardware itself using its display module to set the ECO-1000 to backup power to the computer for an extended period of time. This provides the computer enough time to safely stop running applications and execute a proper shutdown to avoid data corruption.

With up to 16x High-Density Supercapacitors, the ECO-1000 is the leading industrial supercapacitor in capacity, with ultra-density energy that powers box PCs or other embedded systems for an extensive period of time. Moreover, the ECO-1000 has an outstanding max output of 200 Watt, allowing it to power various systems from fanless mini-PC, high-performance rugged PC, display panels, and panel PC. Moreover, the ECO-1000 rich functions such as Power Ignition Management, Remote Power On/Off, Delay Time Switch, Power Output Switch 12V/24V, and PC/CAR Mode Switch make the ECO-1000 configurable for numerous applications.

To ensure reliability and durability amid deployments at the rugged edge, the ECO-1000 Series is validated and certified with various standards including EN50155, EN50121-3-2, CE, and FCC Class A, UL. The ECO-1000 is capable withstands wide temperature environments ranging from -40°C to 65°C along with 20G of Shock and 5 Grms of Vibration resistance, ensuring safe operations amid extreme industrial deployments.

1.1.2 Key Features

- Extended Energy System for various Box/Panel PCs
- Maximum 16x High-Density Industrial Supercapacitor
- Maximum 200W output power
- 12 to 35 VDC wide range power input
- 12 or 24 VDC power output
- 2x DI + 2x DO with isolation
- -40°C to 65°C extended operating temperature
- Power ignition management



1.2 Hardware Specification

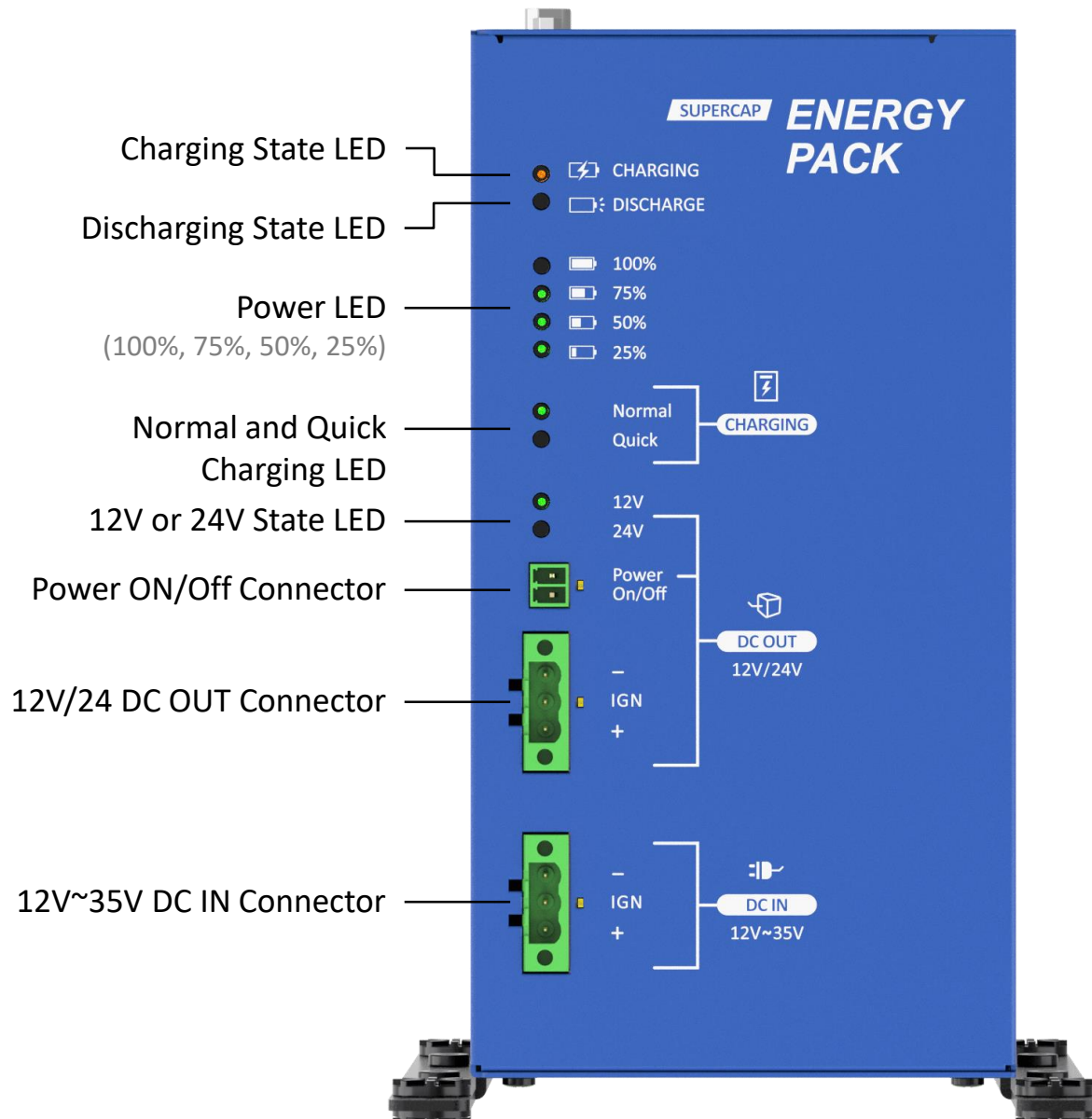
Model	ECO-1000-8S	ECO-1000-16S
Capacity	8x 370 Farads	16x 370 Farads
Power Specification		
Input Voltage	12 ~ 35 VDC	
Input Coonector	3-pin Terminal Block (V+, GND, IGN IN)	
Output Voltage	Charge mode: DC IN Voltage bypass (DC OUT = DC IN) Discharge mode: 12 or 24V	
Output Power	Maximum 100W output	Maximum 200W output
Output Coonector	3-pin Terminal Block (V+, GND, IGN Out)	
I/O		
COM	1x RS-232	
USB	1x USB	
DIO	2x DI + 2x DO with isolation	
Others	1x Remote Power On/Off 1x switch for 12V/24V, 1x PC/CAR Mode Switch, 1x Delay Time Switch	
Power Management		
Power Ignition Sensing	Power Ignition Management	
Power		
Power Protection	OVP (Over Voltage Protection) OCP (Over Current Protection) Reverse protection	
Environment		
Operating Temp.	-40°C to 65°C -20°C~65°C (Optional LCM)	
Storage Temp.	-30°C to 85°C	
Relative Humidity	10% to 95% (non-condensing)	
Vibration	5 Grms, 5 - 500 Hz, 0.5 hr/axis	
Shock	20G, half sine, 11ms	
Standards / Certification	CE, FCC Class A, EMC Conformity with EN50155, EN50121-3-2	
Physical		
Construction	Heavy Duty Metal	
Dimension	100 (W) x 192 (D) x 187.4 (H) mm	
Weight	1.8 kg	2.8 kg
Mounting	Wall Mounting, DIN Rail Mountung (Optional)	

* All specifications and photos are subject to change without notice.

1.3 System I/O

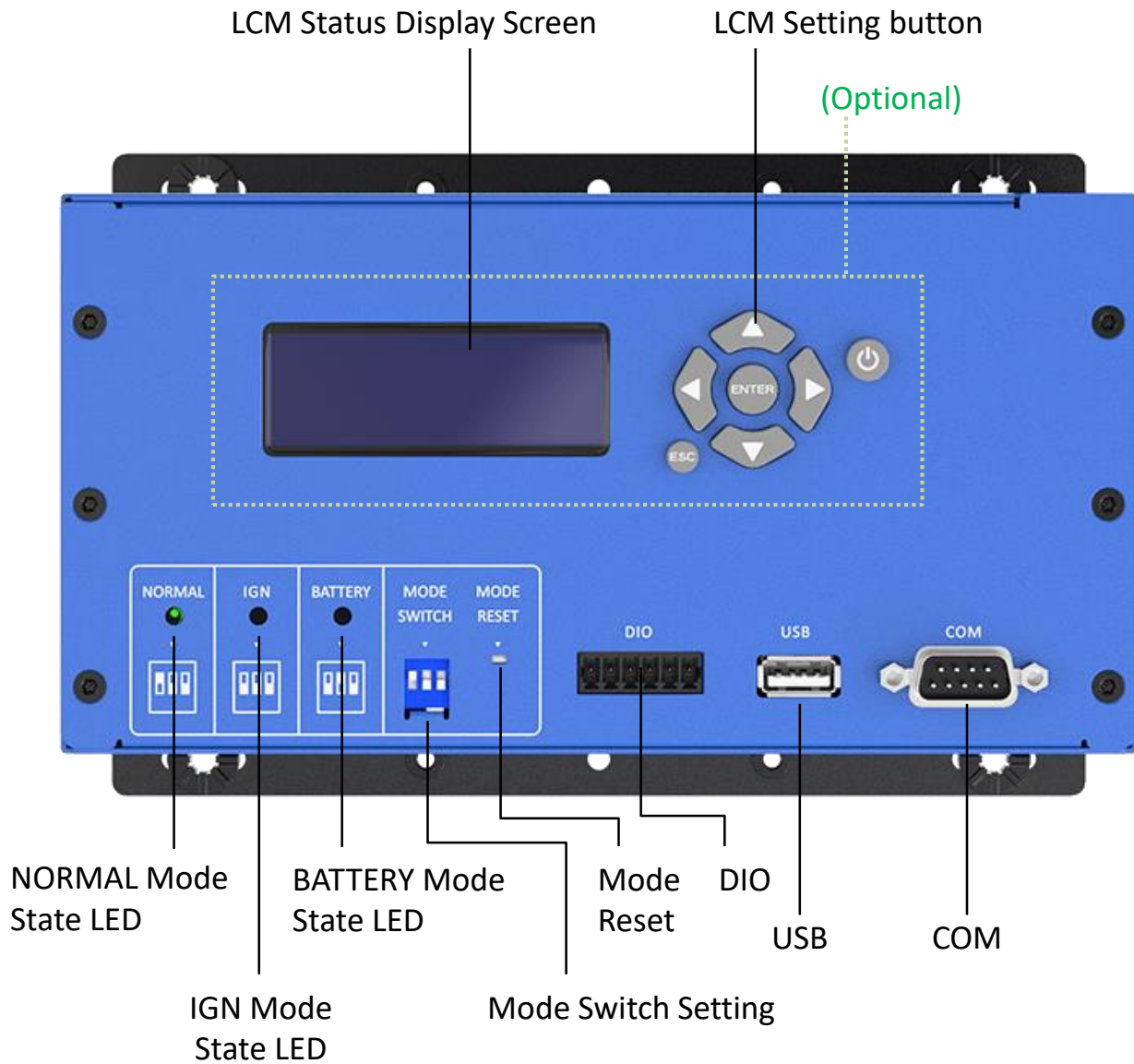
1.3.1 External I/O Mechanical Layout

Front View

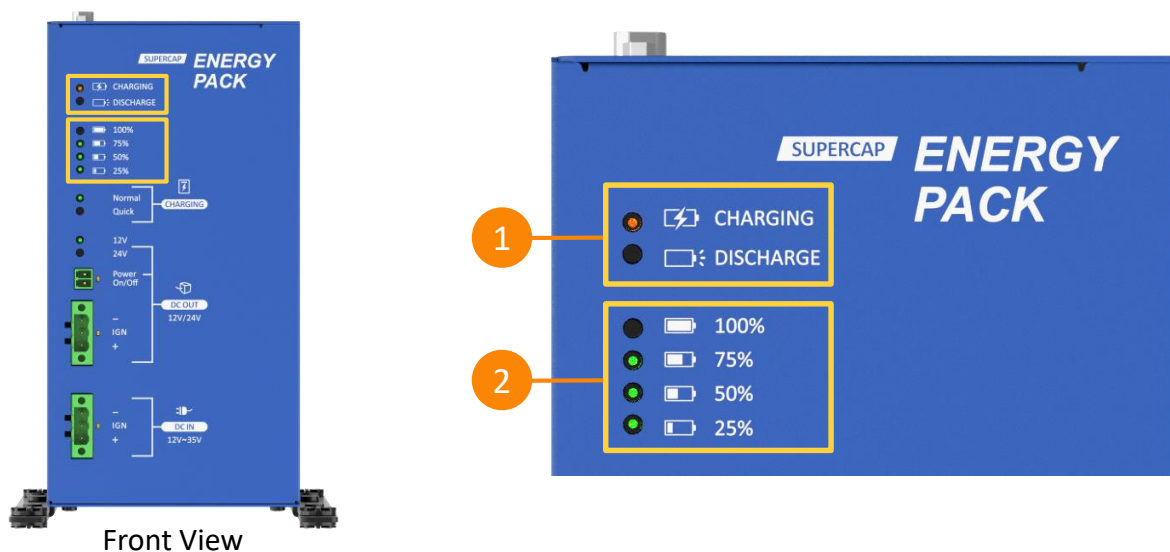


External I/O Mechanical Layout

Top View



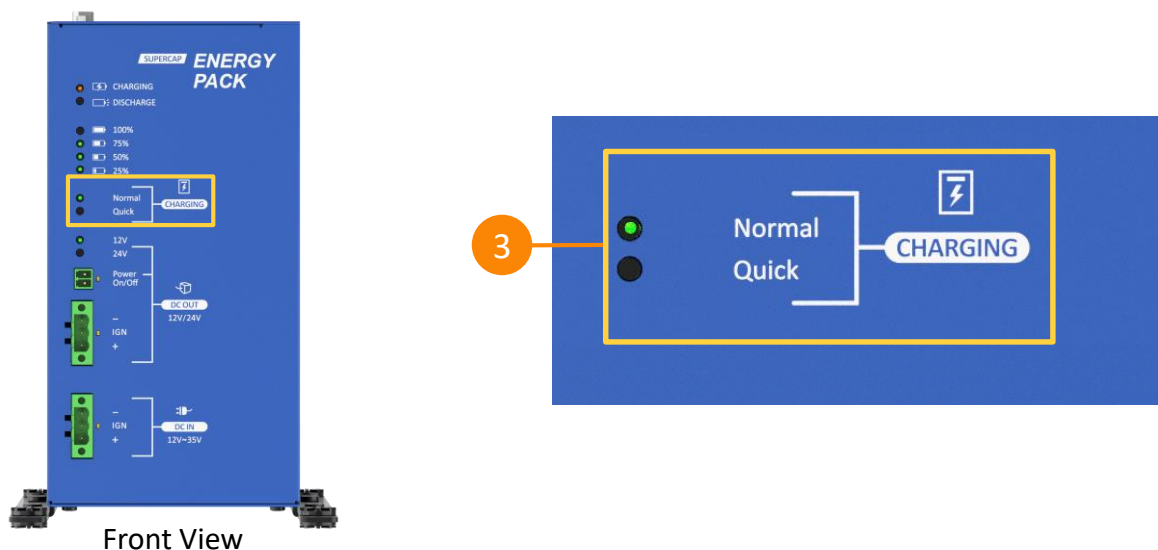
1.3.2 Charging/Discharging LED Status Supercapacitor Energy Level



No.	ECO-1000 Status	LED Color	LED Behavior	Status Description
1	Charging	● Orange	Solid	DC In Charging
			Flash	DC In Charging + DC OUT discharging
		● Green	Solid	Full
			Flash	Full + DC OUT discharging
	Discharge	● Blue	Solid	Not charging
			Flash	Not charging + DC Out discharging

No.	Supercapacitor Energy Level	LED Color	Supercapacitor Energy Level
2	100%	● Green	Energy level is at 100%
	75%	● Green	Energy level is between 75%~99%
	50%	● Green	Energy level is between 50%~74%
	25%	● Green	Energy level is between 25%~49%
		Off	Energy level is between 0%~24%

1.3.3 Charging Mode

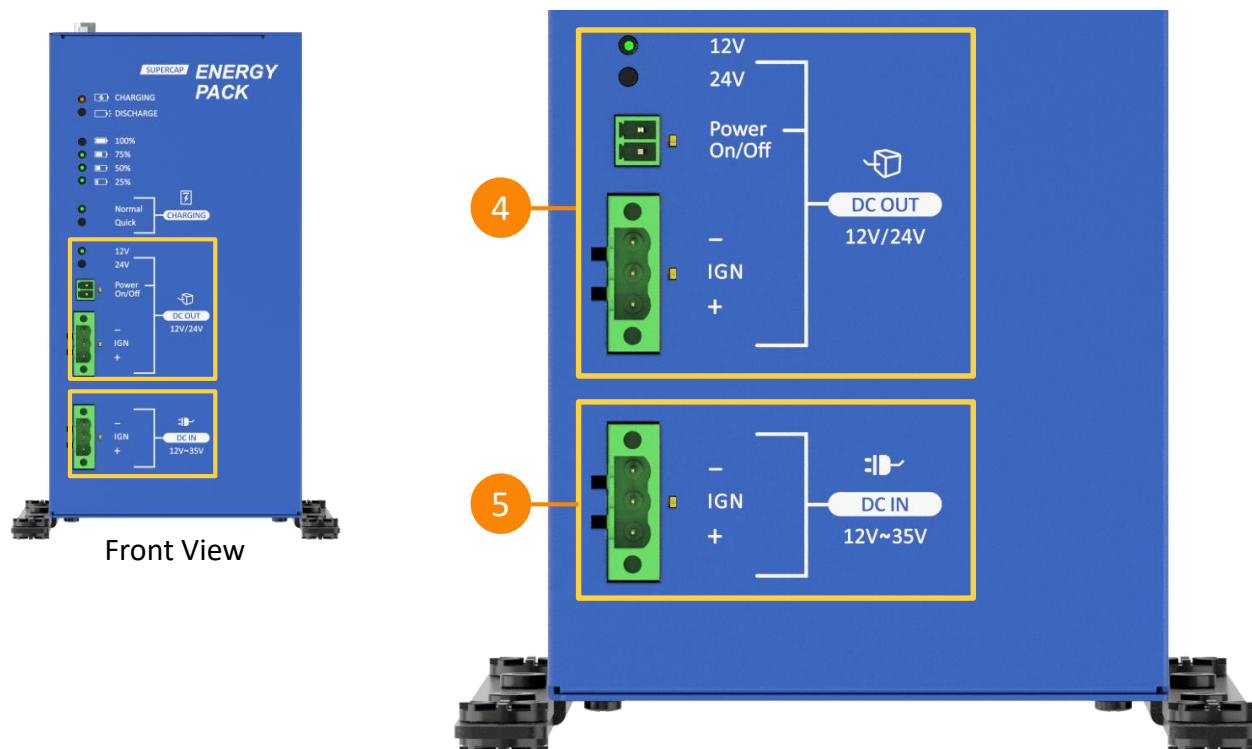


No.	Charging Mode	LED Color	Status Description
3	Normal	● Green	Normal Charge
	Quick	● Green	Quick Charge

Here are the recommended power adapters based on each charging mode and wattage

	Adapter			
Charging Mode	Watt	Voltage	Current	C&T P/N
Normal	60W	12V	5A	1-E09A06001
	120W	24V	5A	1-E09A12002
	220W	24V	9.2A	1-E09A22102
	280W	24V	11.67A	1-E09A22801
Quick	220W	24V	9.2A	1-E09A22102
	280W	24V	11.67A	1-E09A22801

1.3.4 DC Output and Input



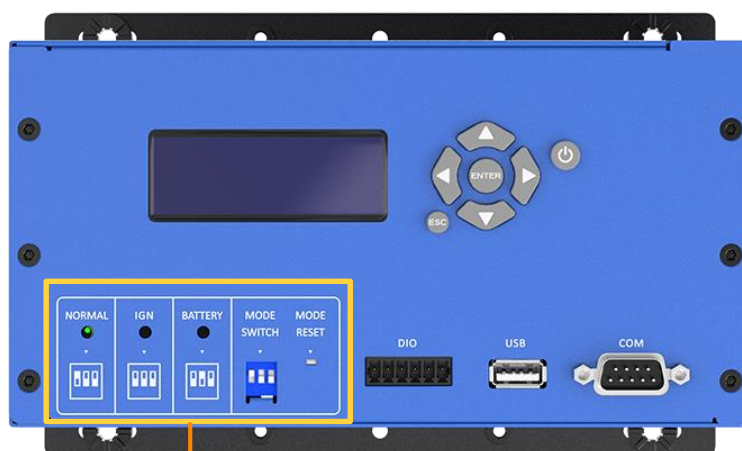
No.	DC OUT	LED Color	LED Behavior	Status Description
4	12V	● Green	-	12V Output
	24V	● Green	-	24V Output
	Power ON/Off	● Yellow	Blink Once	Send a power on/off signal
	12V/24 DC OUT	● Yellow	-	12V/24V output

No.	DC IN	LED Color	Status Description
5	12V~35V DC IN	● Yellow	12V~35V input

1.3.5 Mode Selection



Top View



6

No.	Mode Selection	LED Color / Other	Status Description
6	NORMAL	● Green	Normal Mode On
	IGN	● Green	IGN Mode On
	BATTERY	● Green	Battery Mode On
	MODE SWITCH		Mode Switch Setting
	MODE RESET		After adjusting the MODE SWITCH, please press the MODE RESET button to complete the setting, and the Mode configuration will restart. Note: - DC OUT will not discharge any power during Mode Switching (press the MODE RESET button) - Before changing the Operation Mode, all cables connected to the back-end system must be detached. Failure to do so might cause damage to the ECO-1000 and back-end system.

1.3.6 Connector Description



Top View

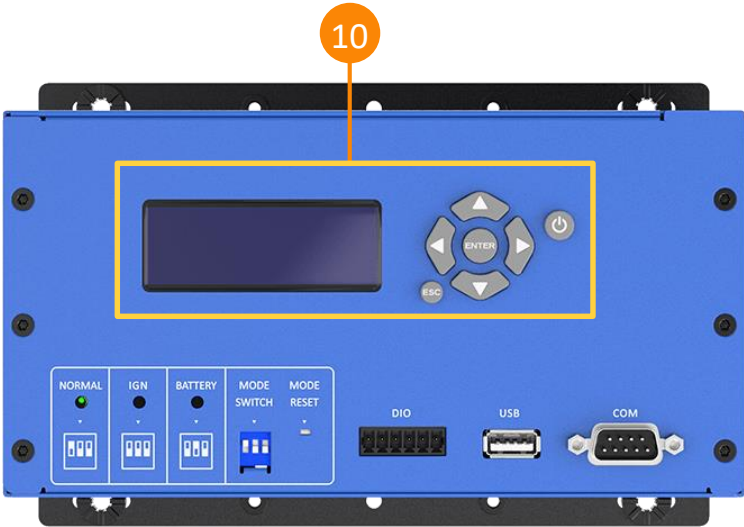


No.	I/O	Status Description														
7	DIO (2 in/2 Out)	The DIO In and Out send and receive Low/High signals to connected systems. DIO Guide GPIO CON : Digital Input / Output Connector Type: Terminal Block 6-pin, 3.5mm pitch <table><tr><th>Pin</th><th>Definition</th></tr><tr><td>1</td><td>DC power input (9V ~ 24V)</td></tr><tr><td>2</td><td>DIN1</td></tr><tr><td>3</td><td>DIN2</td></tr><tr><td>4</td><td>DOUT1</td></tr><tr><td>5</td><td>DOUT2</td></tr><tr><td>6</td><td>GND</td></tr></table>	Pin	Definition	1	DC power input (9V ~ 24V)	2	DIN1	3	DIN2	4	DOUT1	5	DOUT2	6	GND
Pin	Definition															
1	DC power input (9V ~ 24V)															
2	DIN1															
3	DIN2															
4	DOUT1															
5	DOUT2															
6	GND															
8, 9	USB/COM	The ECO-1000 remote management via its USB and COM ports can be connected with an external Laptop/Terminal Computer and controlled through its GUI tool. *There can only be one remote device connected through a USB or COM port for the remote management feature.														

1.3.7 LCM Description (Optional)



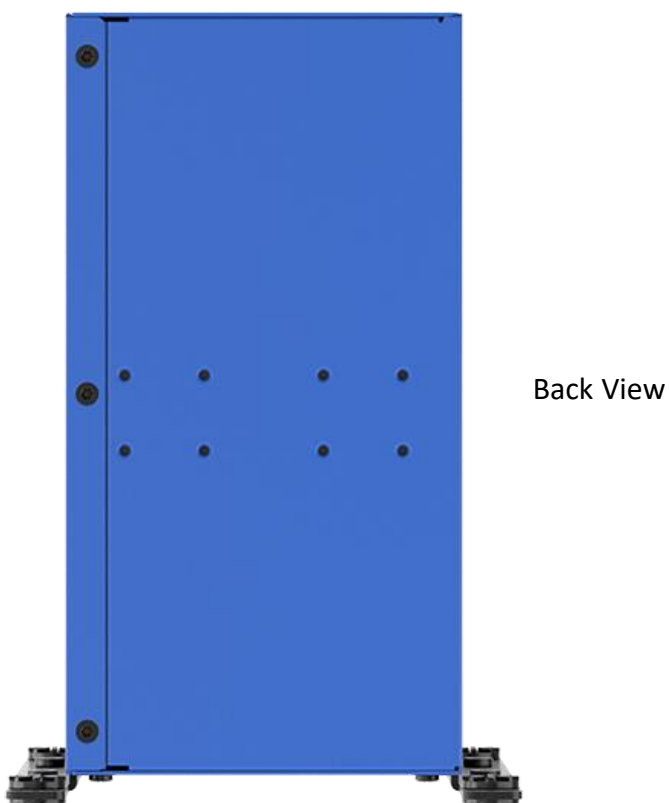
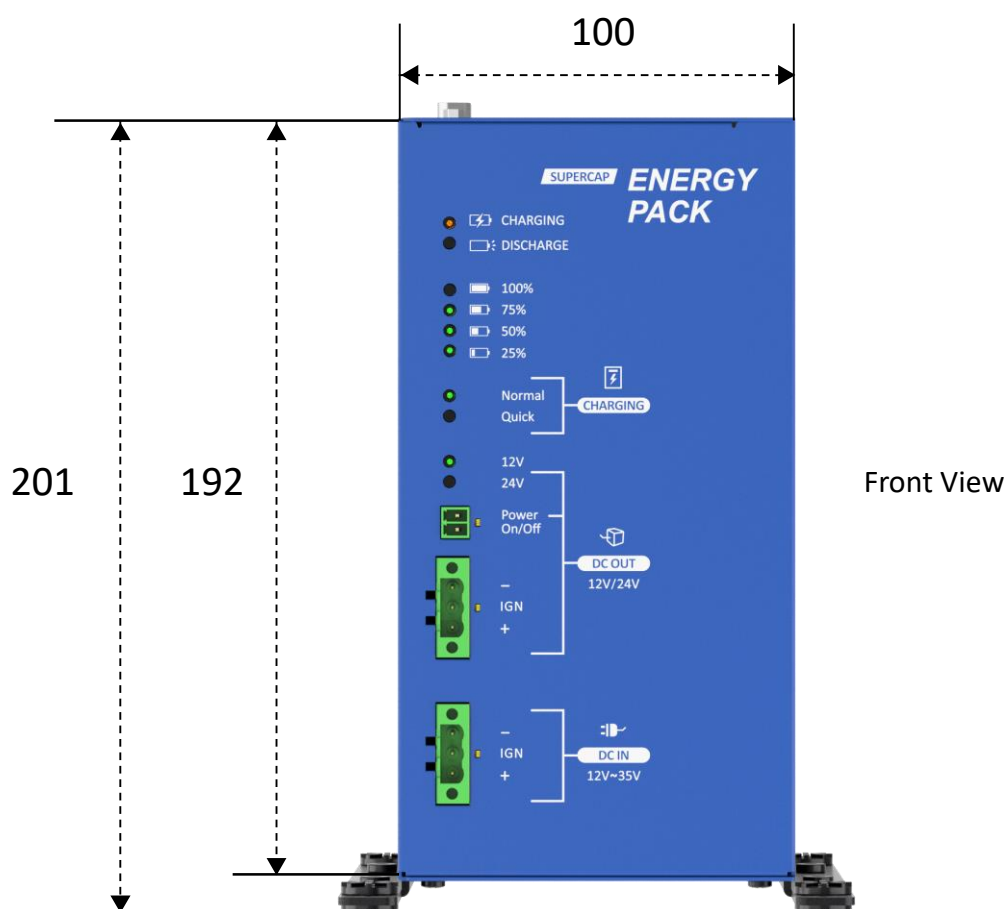
Top View



No.	item	Description
10	LCM	LCM Display Screen
	LCM Setting button	ENTER ENTER button (Select or Show Next Page)
		ESC ESC button (Show Previous Page)
		Up ↑ Up button
		Right → Right button
		Down ↓ Down button
		Left ← Left button
		Power ON/OFF LCM Display

1.4 Mechanical Dimensions

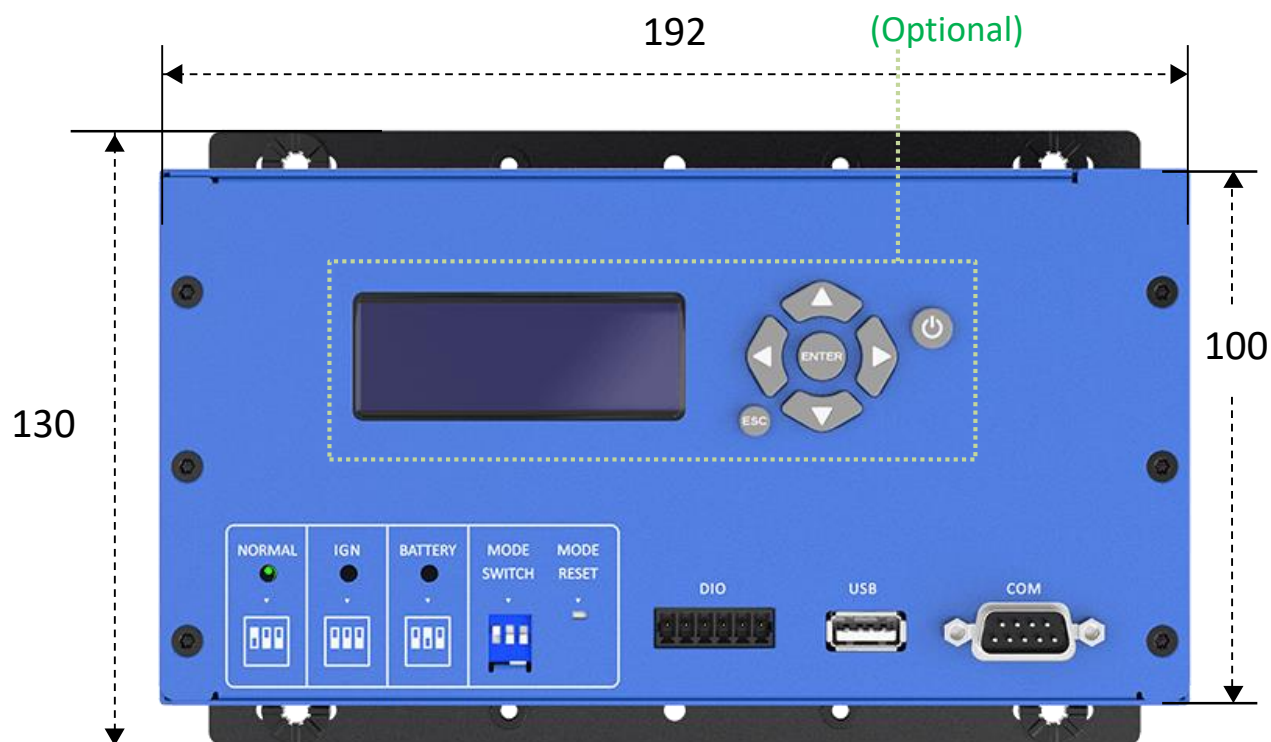
Unit: mm



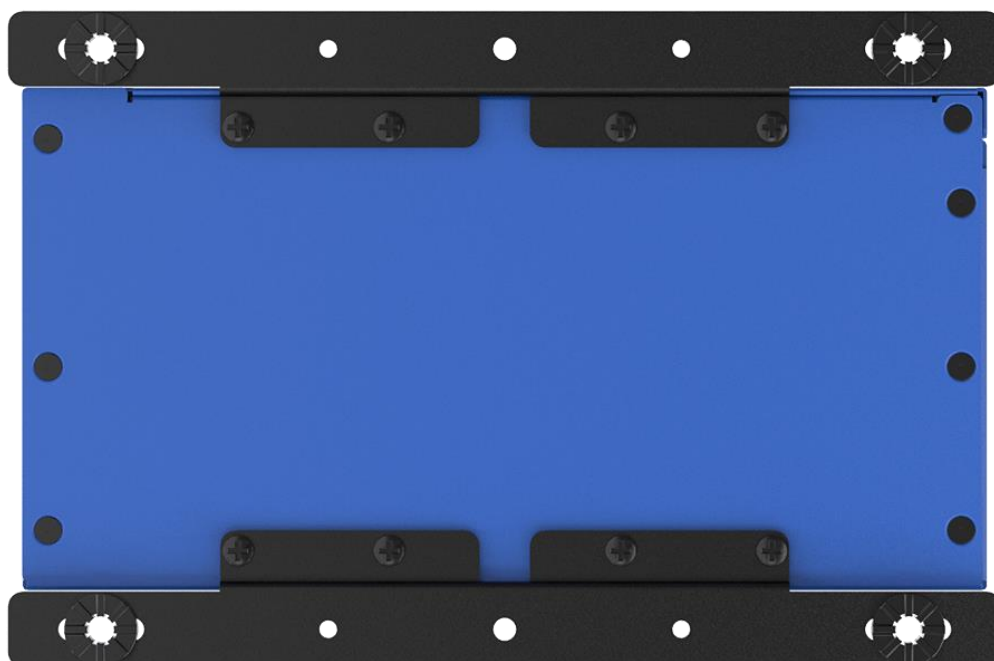
Mechanical Dimensions

Unit: mm

Top View



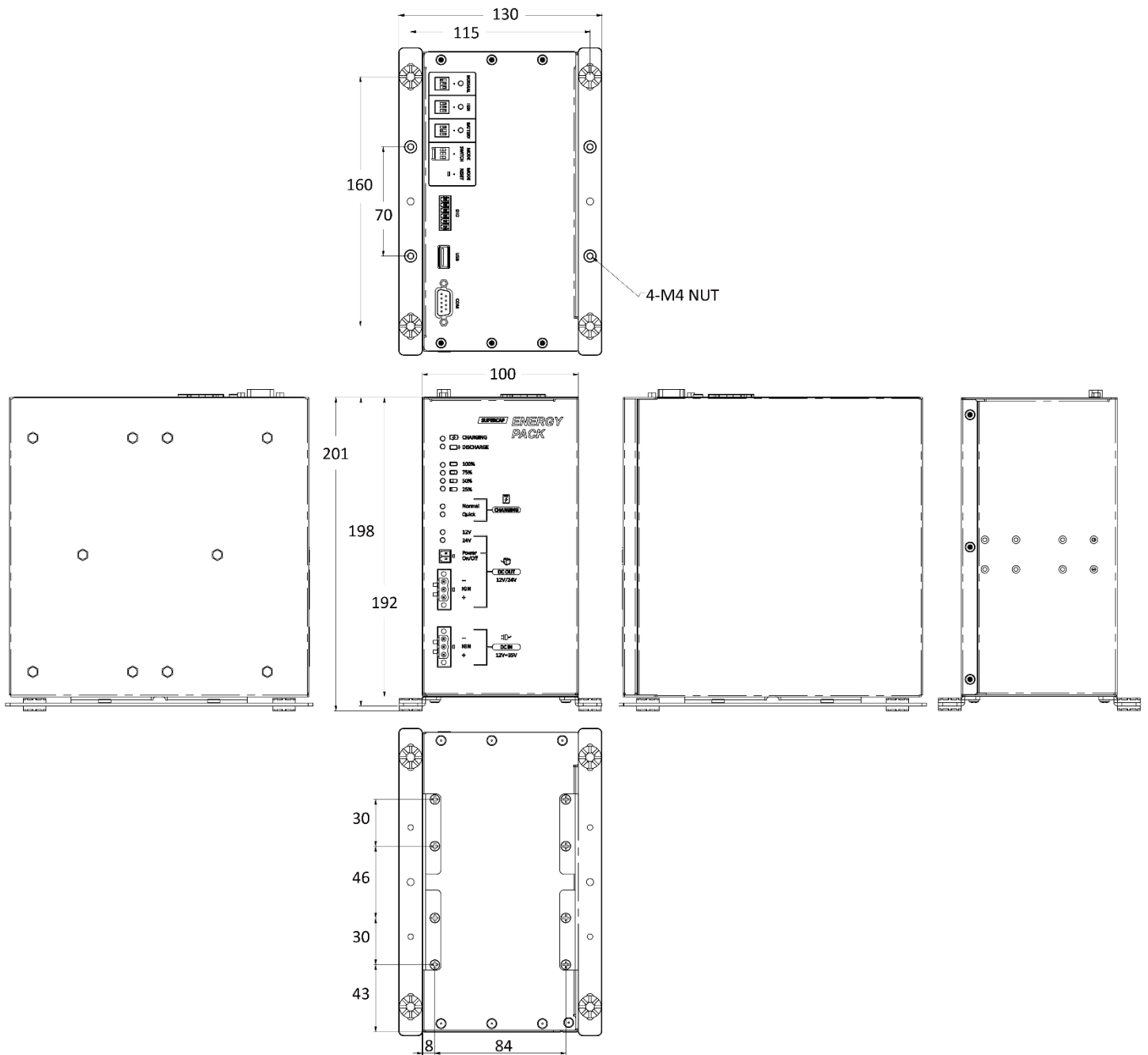
Bottom View



Mechanical Dimensions

ECO-1000-8/16S

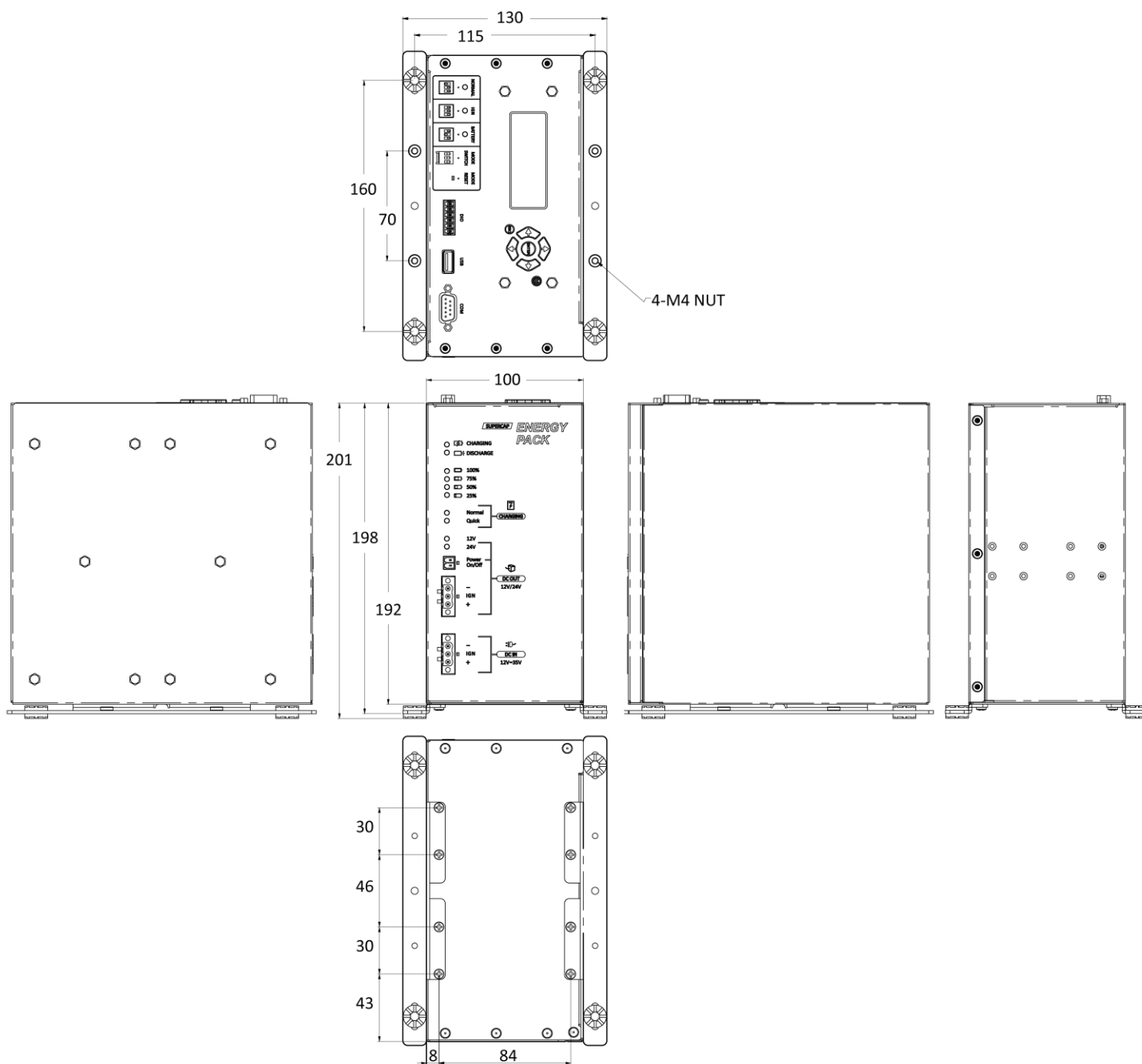
Unit: mm



Mechanical Dimensions

ECO-1000-8/16S-LCM (Optional)

Unit: mm



Chapter 2

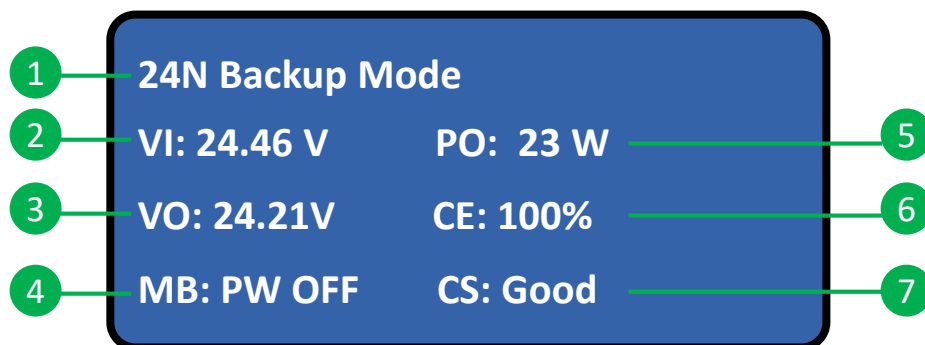
LCM / GUI Description

2.1 ECO-1000 Functions Guide

Category	Item	Standard		Optional	Operating Level	Note
		System	GUI	LCM		
Function	HMI Function			v		Status Overview, Hardware Monitor, Management
Setting	Mode Switch Setting	v			Low	Normal Backup Mode/Ignition Control Mode/Battery Mode
	Mode Reset Setting	v			Low	
	Delaytime Setting		v	v	Mid	Related Delaytime Setting
	Charging Mode Setting		v	v	High	Quick/Normal Mode Charging
	12/24V DC OUT Setting		v		High	DC Output 12V or 24V
	FAN Control Setting		v	v	Low	FAN PWM, FAN Q'ty
	Temp Sensor Setting				Low	Temp Sensor Q'ty
Status Indicator	ECO-1000 Model Indicator		v			ECO-1000-8S/ECO-1000-16S
	ECO-1000 Status Indicator	v				Charging, Discharging
	CAP Energy Level Indicator	v	v	v		25%, 50%, 75%, 100%
	12/24V DC-Out Indicator	v	v	v		12V, 24V
	Remote Power ON/OFF Indicator	v				
	DC OUT Voltage Indicator	v	v	v		
	DC IN Voltage Indicator	v	v	v		
	CAP Health Indicator		v	v		Test, Good, Normal, Low
Others	Temp		v	v		
	FAN Speed		v	v		FAN1, FAN2 RPM
	FW Version		v	v		
	FW Update		v	v	High	

2.2 LCM Display Description

2.2.1 LCM Home Page



The LCM Home Page will display the selected mode listed below.

- Backup Mode

LCM Home Page			
Num	Item	Description	Display
1	24N Backup Mode 24Q Backup Mode	ECO-1000 Working Mode DC Out Voltage	Backup Mode
2	VI / Discharge	Voltage In	12~35V
3	VO / Vout Off	Voltage Out	12/24V
4	MB	Back-End System Status	PW-OFF/PW-ON
5	PO	Back-End System Power Consumption	0~200 W
6	CE	CAP Energy	0~100 %
7	CS	SuperCAP Health	Good, Normal, Low/Test

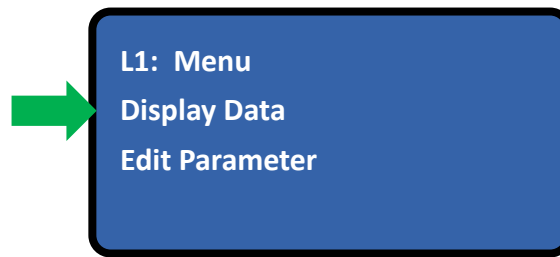
- IGN Mode

LCM Home Page			
Num	Item	Description	Display
1	24N IGN Mode 24Q IGN Mode	ECO-1000 Working Mode DC Out Voltage	IGN Mode IGN:OFF/ON
2	VI / Discharge	Voltage In	12~35V
3	VO / Vout Off	Voltage Out	12/24V
4	MB	Back-End System Status	PW-OFF/PW-ON
5	PO	Back-End System Power Consumption	0~200 W
6	CE	CAP Energy	0~100 %
7	CS	SuperCAP Health	Good, Normal, Low/Test

- Battery Mode

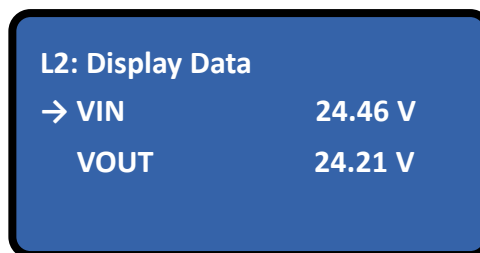
LCM Home Page			
Num	Item	Description	Display
1	24N Battery Mode 24Q Battery Mode	ECO-1000 Working Mode DC Out Voltage	Battery Mode
2	VI / Discharge	Voltage In	12~35V
3	VO / Vout Off	Voltage Out	12/24V
4	MB	Back-End System Status	PW-OFF/PW-ON
5	PO	Back-End System Power Consumption	0~200 W
6	CE	CAP Energy	0~100 %
7	CS	SuperCAP Health	Good, Normal, Low/Test

2.2.2 LCM Page 1



- LCM Page 1 - Menu

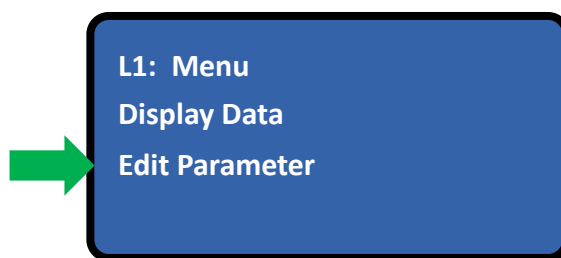
L1: Menu			
Num	Item	Description	Display
1	L1: Menu	Page	Menu
2	Display Data	ECO-1000 Status	
3	Edit Parameter	Configure Setting	



- LCM Page 2 - Display Data

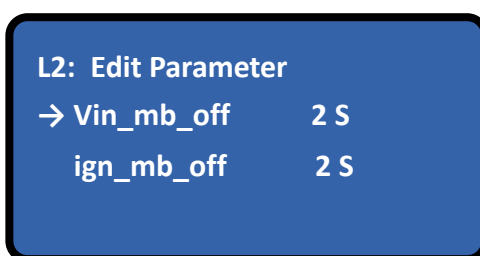
L2: Display Data		
Num	Item	Description
1	L2: Display Data	Page
2	VIN	Voltage In
3	VOUT	Voltage Out
4	POUT	Back-End System Power Consumption
5	CAP ENERG	CAP Energy
6	TMP SENSOR	Temperature
7	CAP STATE	SuperCAP Health
8	VI STATE	Voltage In Status
9	VO STATE	Voltage Out Status
10	MB STATE	Back-End System Status
11	IGN STATE	IGN Status
12	MAIN MCU	Firmware Version
13	LCM MCU	Firmware Version

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- LCM Page 1 - Menu

L1: Menu			
Num	Item	Description	Display
1	L1: Menu	Page	Menu
2	Display Data	ECO-1000 Status	
3	Edit Parameter	Configure Setting	



The LCM Home Page will display the selected mode listed below

- LCM Page 2 - Edit Parameter for Normal Mode

L2: Edit Parameter		
Num	Item	Description
1	Normal Mode L2: Edit Parameter	Page
2	Vo_On_Dly	Set a delay time before the ECO-1000 automatically provides DC-OUT power to the back-end system when receiving IGN-ON or DC-IN on signal. If the value is 9999(s), ECO-1000 will NOT provide DC-OUT power to the back-end system.
3	Vin_MB_Off	Set a delay time before the ECO-1000 automatically sends a power-off signal to the back-end system. If the value is 9999(s), ECO-1000 will NOT send a shutdown signal.
4	Vo_Off_Dly	Set a delay time before the ECO-1000 forces to cut off the DC-OUT power after sending a power-off signal to the back-end system. If the value is 9999(s), ECO-1000 will NOT send a shutdown signal.
5	MB_On_Pw	Set the wattage(W) level that defines the ON status of the back-end system. (The ECO-1000 will define the back-end system as alive/ON if the wattage (W) level is above the adjusted level.

L2: Edit Parameter		
Num	Item	Description
6	Vi_Off_Bz	Set a time length for the buzzer sound to beep when the main power source gets cut off. If the value is 0(s), the buzzer will not make a sound.
7	Backlight	Set a time length for the LCM display backlight to standby (stay ON). If the value is 9999(s), the LCM backlight will continuously standby (stay ON).
8	Chg_Mode	Current Charging Mode
9	All Set Default	Load default configuration

Note:

Set the delay time value to 9999(s) for the ECO-1000 to not execute the delay countdown of the selected mode.

- **LCM Page 2 - Edit Parameter for IGN Mode**

L2: Edit Parameter		
Num	Item	Description
1	IGN Mode L2: Edit Parameter	Page
2	IGN_On_Dly	Set a delay time before the ECO-1000 automatically provides DC-OUT power to the back-end system when receiving IGN-ON or DC-IN on signal. If the value is 9999(s), ECO-1000 will NOT provide DC-OUT power to the back-end system.
3	IGN_MB_Off	Set a delay time before the ECO-1000 automatically sends a power-off signal to the back-end system when receiving an IGN-Off signal. If the value is 9999(s), ECO-1000 will NOT send a shutdown signal.
4	Vin_MB_Off	Set a delay time before the ECO-1000 automatically sends a power-off signal to the back-end system. If the value is 9999(s), ECO-1000 will NOT send a shutdown signal.
5	Vo_Off_Dly	Set a delay time before the ECO-1000 forces to cut off the DC-OUT power after sending a power-off signal to the back-end system. If the value is 9999(s), ECO-1000 will NOT send a shutdown signal.
6	MB_On_Pw	Set the wattage(W) level that defines the ON status of the back-end system. (The ECO-1000 will define the back-end system as alive/ON if the wattage (W) level is above the adjusted level.
7	Vi_Off_Bz	Set a time length for the buzzer sound to beep when the main power source gets cut off. If the value is 0(s), the buzzer will not make a sound.
8	Backlight	Set a time length for the LCM display backlight to standby (stay ON). If the value is 9999(s), the LCM backlight will continuously standby (stay ON).

L2: Edit Parameter		
Num	Item	Description
9	Chg_Mode	Current Charging Mode
10	All Set Default	Load default configuration

Note:

Set the delay time value to 9999(s) for the ECO-1000 to not execute the delay countdown of the selected mode.

- **LCM Page 2 - Edit Parameter for BATTERY Mode**

L2: Edit Parameter		
Num	Item	Description
1	BATTERY Mode L2: Edit Parameter	Page
2	MB_On_Pw	Set the wattage(W) level that defines the ON status of the back-end system. (The ECO-1000 will define the back-end system as alive/ON if the wattage (W) level is above the adjusted level.
3	Vi_Off_Bz	Set a time length for the buzzer sound to beep when the main power source gets cut off. If the value is 0(s), the buzzer will not make a sound.
4	Backlight	Set a time length for the LCM display backlight to standby (stay ON). If the value is 9999(s), the LCM backlight will continuously standby (stay ON).
5	Chg_Mode	Current Charging Mode
6	All Set Default	Load default configuration

Note:

Set the delay time value to 9999(s) for the ECO-1000 to not execute the delay countdown of the selected mode.

2.3 GUI Setup

2.3.1 GUI Window

SuperCAP Power Backup Status

Select Connected COM Port

Current Model State

The screenshot shows the ECO-1000 GUI window with the following sections and data:

- Port:** COM6 (Selected), Connected (Green dot)
- Model:** ECO-1000-8S (Unselected), ECO-1000-16S (Selected)
- SuperCAP Power Backup Status:**
 - SCP Level: 45 %
 - SCP Health: Good
 - Temp 1/2 Sensor: 41 °C / N/A
 - Firmware Version: B.7
 - LCM Version: B.7
- DC In/Out Status:**
 - DC In Voltage: 24.14 V
 - DC Out Voltage: 23.93 V
 - Power Out: 0 W
 - DC In Status: (Green dot)
 - DC Out Status: (Green dot)
 - Back-End System Status: (Unselected)
- Timer and Fan RPM:**
 - Timer: 0 0
 - FAN 1 RPM: 8267
 - FAN 2 RPM: 8542
- Common Settings:**
 - System: PC Active Status (3), Determined by (W)
 - Charging Mode: Quick (Unselected), Normal (Selected)
 - Buzzer Setting (S): 1
 - LCM BackLight (S): 999
 - FAN Q'ty Setting: 2
 - Temp Q'ty Setting: 1
 - Temp Range Setting: 25 45
 - FAN PWM Setting: 40 55 65 75 85 90
- Operation Mode:**
 - Normal Backup: (Selected)
 - Ignition Control: (Unselected)
 - Battery Mode: (Unselected)
- Normal Backup Settings:**
 - Power Applied Setting:** Power On Delay (S): 1
 - Power Loss Setting:** Shutdown After (S): 3, Cut-off DC Out (S): 30
- Ignition Control Settings:**
 - IGN Control Settings:** IGN ON to DC Out Delay (S): 10, IGN OFF to SHDW After Delay (S): 3
 - IGN SHDW After Settings:** Cut-off DC Out (S): 30
 - Power Loss Setting:** Shutdown After (S): 3
- Battery Mode:** (Empty section)
- Update:** (Button)
- DC Out Voltage:** 12 V (Selected), 24 V (Unselected)
- Buttons:** Export Config, Load Config, Firmware Update, Load Default

2.3.2 GUI Status setting

- **Select Connected COM Port**

Port:   Select a port to connect

COM1
 COM2
 COM3
 COM4

Port	Description
COM X (COM1, COM2, COM3, etc...)	Select Connected COM Port

- **Current Model State**

Model:  ECO-1000-8S  ECO-1000-16S

Model ID	Indicator Color	Description
ECO-1000-8S	 ECO-1000-8S  ECO-1000-16S	Current Model ID
ECO-1000-16S	 ECO-1000-8S  ECO-1000-16S	

2.3.3 SuperCAP Power Backup Status

SCP Level 45 %	SCP Health Good	Temp 1/2 Sensor 41 °C / N/A	Firmware Version B.7	LCM Version B.7
-------------------	--------------------	--------------------------------	-------------------------	--------------------

ECO-1000 Status	Description
SCP Level	Supercapacitor Energy Level
SCP Health	Supercapacitor Health Status
Temp 1/2 Sensor	On Board Sensor Temperature
Firmware Version	ECO-1000's MCU Version
LCM Version	LCM's MCU Version

SCP Health Note:

1. Every 24 hours, the ECO-1000's MCU updates the daily supercapacitor health.
2. Accurate supercapacitor health monitoring is supported within -25°C to 40°C temperature environments.
3. SCP Health Status provides an estimation guide for supercapacitors replacements.

DC In Voltage 24.14 V	DC In Status ●	Timer 00
DC Out Voltage 23.93 V	DC Out Status ●	FAN 1 RPM 8267
Power Out 0 W	Back-End System Status ○	FAN 2 RPM 8542

DC In Voltage 24.14 V
DC Out Voltage 23.93 V
Power Out 0 W



ECO-1000 Status	Description
DC In Voltage	DC In Voltage Level
DC Out Voltage	DC Out Voltage Level
Power Out	Power Out Wattage Level

DC In Status ●
DC Out Status ●
Back-End System Status ○



ECO-1000 Status	Indicator Color	Description
DC In Status	Green/Blank	Power In Detection Indicator
DC Out Status	Green/Blank	Power Out Detection Indicator
Back-End System Status	Green/Blank	Back-End System ON Detection Indicator

Timer 00
FAN 1 RPM 8267
FAN 2 RPM 8542



ECO-1000 Status	Description
Timer	Delay Time Countdown
FAN 1 RPM	FAN 1 Speed (RPM)
FAN 2 RPM	FAN 2 Speed (RPM)

2.3.4 Operation Mode

Operation Mode

Normal Backup ☐Ignition Control ☐Battery Mode ☒

ECO-1000 Status	Indicator Color			Description
Normal Backup	Normal Backup ☒	Ignition Control ☐	Battery Mode ☐	Current Selected Mode
Ignition Control	Normal Backup ☐	Ignition Control ☒	Battery Mode ☐	
Battery Mode	Normal Backup ☐	Ignition Control ☐	Battery Mode ☒	

Note:

Before changing the Operation Mode, all cables connected to the back-end system must be detached. Failure to do so might cause damage to the ECO-1000 and back-end system.

• For Setting

Normal Backup
Power Applied Setting
Power On Delay (S) 1
Power Loss Setting
Shutdown After (S) 3
Cut-off DC Out (S) 30

Ignition Control
IGN Control Settings
IGN ON to DC Out Delay (S) 10
IGN OFF to SHDW After Delay (S) 3
IGN SHDW After Settings
Cut-off DC Out (S) 30
Power Loss Setting
Shutdown After (S) 3

Battery Mode

(Click Update button for config setting)

Update

Configuration

System
PC Active Status Determined by (W) [1~10] 3
Charging Mode ☐ Quick ☒ Normal
Buzzer Setting (S)[0~999] 1
LCM BackLight (S)[10~999] 999

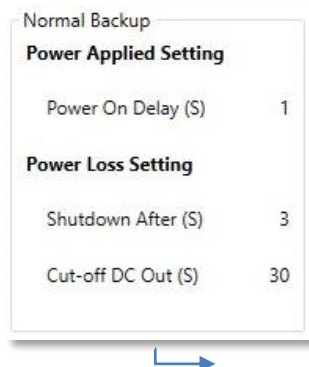
Fan Q'ty Setting [0~2] 2
Temp Q'ty Setting [0~2] 1
Temp Range Setting (°C)[10~50] Low 25 High 45
FAN PWM Setting (%) [45~100] 40 55 65 75 85 90

Normal Backup
Power Applied Setting
Power On Delay (S)[0~9999] 1
Power Loss Setting
Shutdown After (S)[0~9999] 3
Cut-off DC Out (S)[0~9999] 30

Ignition Control
IGN Control Settings
IGN ON to DC Out Delay (S)[0~9999] 10
IGN OFF to SHDW After Delay (S)[0~9999] 3
IGN SHDW After Settings
Cut-off DC Out (S)[0~9999] 30
Power Loss Setting
Shutdown After (S)[0~9999] 3

Battery Mode

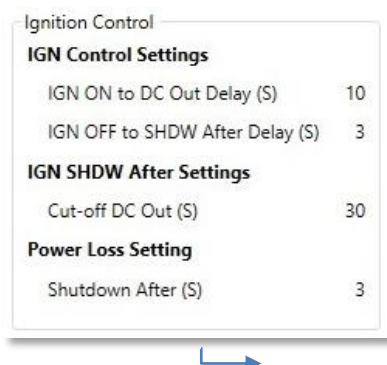
Update



Normal Backup Mode	Setting	Description
Power Applied Setting	Power ON Delay	Set a delay time before sending a power-off signal to the back-end system.
Power Loss Setting	Shutdown After	Set a delay time to send a power-off signal to the back-end system.
	Cut-off DC Out	Set a delay time before cutting off the DC-OUT power after sending a power-off signal to the back-end system.

Note:

Set the delay time value to 9999(s) for the ECO-1000 to not execute the delay countdown.



Ignition Control	Setting	Description
IGN Control Setting	IGN-ON to DC-Out Delay	Set a delay time before sending DC-OUT power to the back-end system when receiving IGN-ON or DC-IN signal.
	IGN-OFF to SHDW After Delay	Set a delay time before sending a power-off signal to the back-end system when receiving an IGN-Off signal.
IGN SHDW After Setting	Cut-off Out	Set a delay time before cutting off the DC-OUT power after sending a power-off signal to the back-end system.
Power Loss Setting	Shutdown After	Set a delay time to cut off DC-OUT power after sending the power-off signal to the back-end system.

Note:

Set the delay time value to 9999(s) for the ECO-1000 to not execute the delay countdown.

2.3.5 Common Settings

- System

PC Active Status Determined by (W)
 [1~10]

Charging Mode ☐ Quick
☒ Normal

Buzzer Setting (S)[0~999]

LCM BackLight (S)[10~999]

Setting	Description
PC Active Status Determined by	Set the wattage (W) level that defines the ON status of the back-end system. (The ECO-1000 will define the back-end system as alive/ON if the wattage (W) level is above the adjusted level.
Charging Mode	Set the charging mode based on the adapter's specifications. Please refer to the Adapter Configurations below.
Buzzer Setting (S)	Set the time length for the buzzer sound to beep when the main power source gets cut off. If the value is 0(s), the buzzer will not make a sound.
LCM Backlight (S)	Set a time length for the LCM display backlight to standby. If the value is 9999(s), the LCM backlight will continuously standby.

	Adapter			
Charging Mode	Watt	Voltage	Current	C&T P/N
Normal	60W	12V	5A	1-E09A06001
	120W	24V	5A	1-E09A12002
	220W	24V	9.2A	1-E09A22102
	280W	24V	11.67A	1-E09A22801
Quick	220W	24V	9.2A	1-E09A22102
	280W	24V	11.67A	1-E09A22801

Fan Q'ty Setting [0~2]

Temp Q'ty Setting [0~2]

Temp Range Setting (°C)[10~50] Low High

FAN PWM Setting (%) [45~100]

Setting	Description
FAN Q'ty Setting	Set the amount of Cooling FAN activated (max 2).
Temp Sensor Q'ty Setting	Set the amount of temperature sensor activated (max 2).
Temp Range Setting	Set a temperature range for FAN PWM adaptive control.
FAN PWM Setting	Set FAN speed power (0-100%) for FAN PWM adaptive control.

• DC Out Voltage

DC Out Voltage

☒ 12 V☐ 24 V[Export Config](#)[Load Config](#)[Firmware Update](#)[Load Default](#)

DC Out Voltage Setting	Description
12V	DC-OUT Voltage options for power delivery to the back-end system.
24V	

Note:

1. Please Unplug all cables connected to the back-end system before adjusting the DC-OUT Voltage level.
2. Please confirm that your back-end system supports the selected Voltage Level (12V or 24V).
3. Failure to comply with any of these steps correctly might damage the supercapacitor and the back-end system.

A window alert will appear when switching the DC-OUT voltage selection.

Warning! May affect VOUT 12V/24V changes. Please disconnect the DC-OUT device. Continue?

[Yes](#)[No](#)

Setting	Description
Export Config	Export file with ECO-1000's pre-selected settings and parameters.
Load Config	Import file with ECO-1000's pre-selected settings and parameters.
Firmware Update	Update ECO-1000's MCU/LCM Firmware.
Load Default	Reset ECO-1000 to its default configuration.

2.4 GUI/LCM Comparison table

2.4.1 Computer GUI Settings

ECO-1000

Port: COM6 Connected

Model: ☐ ECO-1000-8S ☒ ECO-1000-16S

SuperCAP Power Backup Status

SCP Level	45 %	SCP Health	Good	Temp 1/2 Sensor	41 °C / N/A	Firmware Version	B.7	LCM Version	B.7
-----------	------	------------	------	-----------------	-------------	------------------	-----	-------------	-----

DC In Voltage	24.14 V	DC In Status	Good	Timer	0 0
DC Out Voltage	23.93 V	DC Out Status	Good	FAN 1 RPM	8267
Power Out	0 W	Back-End System Status	Good	FAN 2 RPM	8542

Common Settings

System	3	FAN Q'ty Setting	2
PC Active Status Determined by (W)	Quick ☐ Normal ☒	Temp Q'ty Setting	1
Charging Mode	1	Temp Range Setting	25 45
Buzzer Setting (S)	999	FAN PWM Setting	40 55 65 75 85 90
LCM BackLight (S)			

Operation Mode

Normal Backup ☒ Ignition Control ☐ Battery Mode ☐

Normal Backup

Power Applied Setting

Power On Delay (S) 1

Power Loss Setting

Shutdown After (S) 3

Cut-off DC Out (S) 30

Ignition Control

IGN Control Settings

IGN ON to DC Out Delay (S) 10

IGN OFF to SHDW After Delay (S) 3

IGN SHDW After Settings

Cut-off DC Out (S) 30

Power Loss Setting

Shutdown After (S) 3

Battery Mode

Update

DC Out Voltage

☒ 12 V ☐ 24 V

Export Config Load Config Firmware Update Load Default

1

Normal Backup

Power Applied Setting

Power On Delay (S) 1

Power Loss Setting

Shutdown After (S) 3

Cut-off DC Out (S) 30

2

Ignition Control

IGN Control Settings

IGN ON to DC Out Delay (S) 10

IGN OFF to SHDW After Delay (S) 3

IGN SHDW After Settings

Cut-off DC Out (S) 30

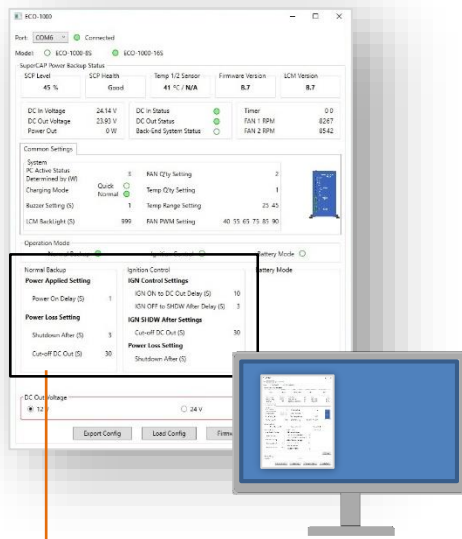
Power Loss Setting

Shutdown After (S) 3

Note: ECO-1000's GUI Settings software is downloadable on C&T's product page. Visit the ECO-1000 product page at www.candtsolution.com and download the GUI driver to install on your computer.

2.4.2 LCM Settings Name

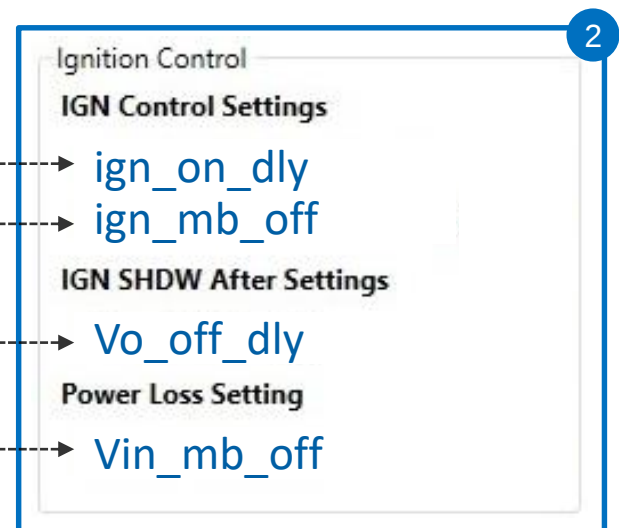
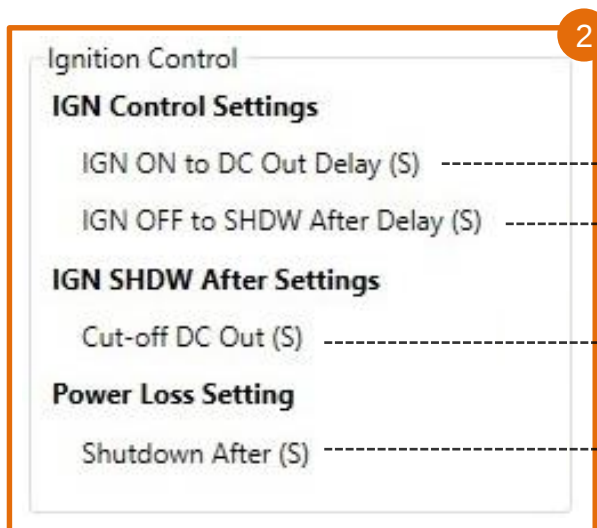
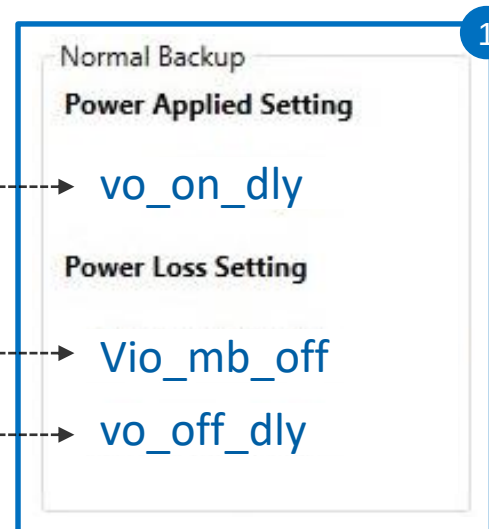
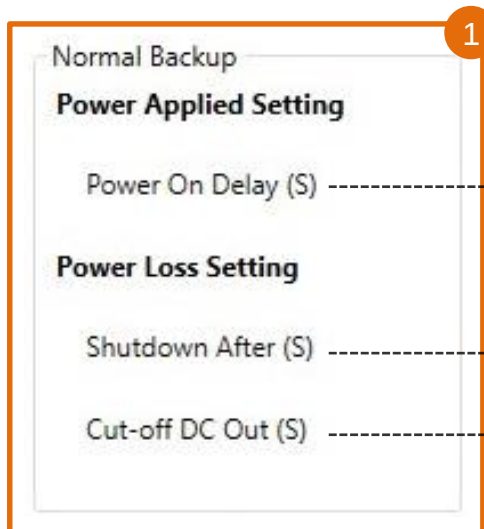
Attached below is how the Computer GUI settings are represented on the ECO-1000's LCM Display Setting.



Computer GUI Settings



LCM Display Settings



Chapter 3

System Setup

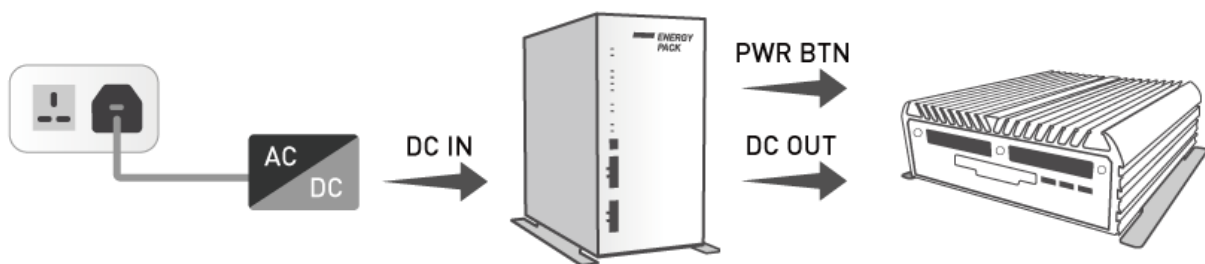
3.1 Mode Configuration

The ECO-1000 standalone supercapacitor can be configured into three operating modes:

- Normal Backup Mode
- Ignition Control Mode
- Battery Mode

When a power outage occurs, ECO-1000 can provide power redundancy with three power backup modes to allow the system to safely shutdown or extend the operating time. These three modes are mainly utilized for BOX PC, Panel PC, or other related industrial controllers and systems that can receive 12V/24V of power. The following sections show illustrations and descriptions for each connection mode.

3.1.1 Normal Backup Mode



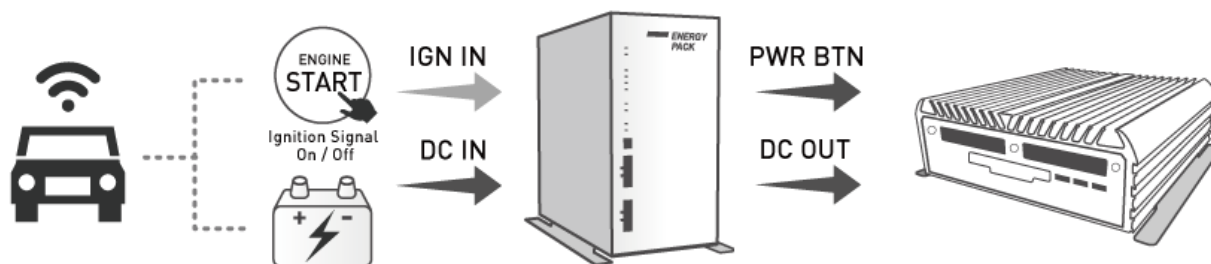
Normal Backup Mode

- ECO-1000's DC IN port receives power from a power adapter connected to an AC power plug.
- ECO-1000's DC OUT port sends power to the connected system.
- ECO-1000 connects to PWR BTN (power button) to send power ON/OFF signal.
- ECO-1000 automatically detects power outages and provides power backup.

ECO-1000 has a programmable delay time setting for power backup and a power button control (ON/OFF) of the connected system.

[Click Here To See Cable Routing Guide >>](#)

3.1.2 Ignition Control Mode



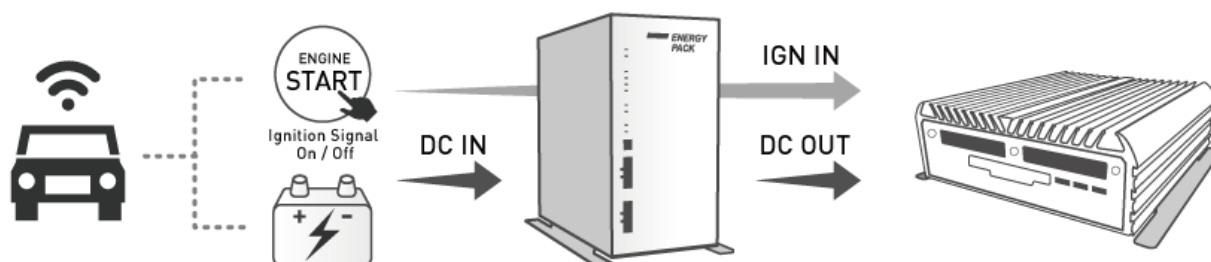
Ignition Control Mode

- ECO-1000's DC IN port receives power from an in-vehicle power supply.
ECO-1000 IGN port receives ignition signal from the vehicle.
- ECO-1000's DC OUT port sends power to the connected system.
ECO-1000 connects to PWR BTN (power button) to send power ON/OFF signal.
- ECO-1000 automatically detects power outages/ignition signal and provides power backup.

ECO-1000 has a programmable delay time setting for power backup and a power button/ignition control (ON/OFF) of the connected system.

[Click Here To See Cable Routing Guide >>](#)

3.1.3 Battery Mode



Battery Mode

- ECO-1000's DC IN port receives power from an in-vehicle power supply.
- Ignition Signal (IGN IN) connects directly to the system.
- ECO-1000's DC OUT port consistently delivers power to the connected system.

[Click Here To See Cable Routing Guide >>](#)

3.2 Compatible List

ECO-1000 Support Model List

Model		Series				Note
RCO	Fanless Mini Rugged Computers	1000	1000-EHL			
	Compact High-Performance Fanless Computers	3400	3600	3000-CFL	3000-CML	
	AI Edge Inference Computers	6000	6100	6000-CML		
BCO	Rich I/O Fanless Mini Computer	1000	2000			BCO-2000 w/ Customized Power Switch Cable, w/ 12V Adapter Only
ACO	EN50155 In-Vehicle Fanless Computers	6000	6000-CML			
VCO	Machine Vision Industrial Computers	6000	6100			
WCO	Waterproof Edge Computers	3400				w/ Customized M12 Power Switch Cable
PC/VIO	IP65 Modular Industrial Panel PC	100	400			
PC/MX	IP65 Modular Industrial Panel Display	MX200				w/ 1x PC System,
WIO	IP67 Waterproof Industrial Computer	200				w/ Customized M12 Power Switch Cable
SIO	IP67-IP69K Stainless Steel Industrial Panel PC	200				w/ Customized M12 Power Switch Cable

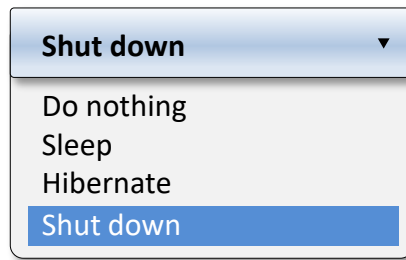
Model Series							
	RCO-1000		RCO-1000-EHL		RCO-3400		RCO-3600
	RCO-3000-CFL		RCO-3000-CML		RCO-6000		RCO-6100
	RCO-6000-CML		BCO-1000		BCO-2000		ACO-6000
	ACO-6000-CML		VCO-6000		VCO-6100		WCO
	WIO IP67 Rugged Industrial Panel PC		SIO IP67-IP69K Stainless Steel Industrial Panel PC		VIO IP65 Modular Industrial Panel PC or Touch Monitors		

*** Related Models Must Have Following Functions/Settings:**

1. DC In 12/24 Voltage Input
2. With Remote Power SW
3. With AT Mode
4. Windows Power Button Setting (Under Windows)

Power button settings

When I press the power button:

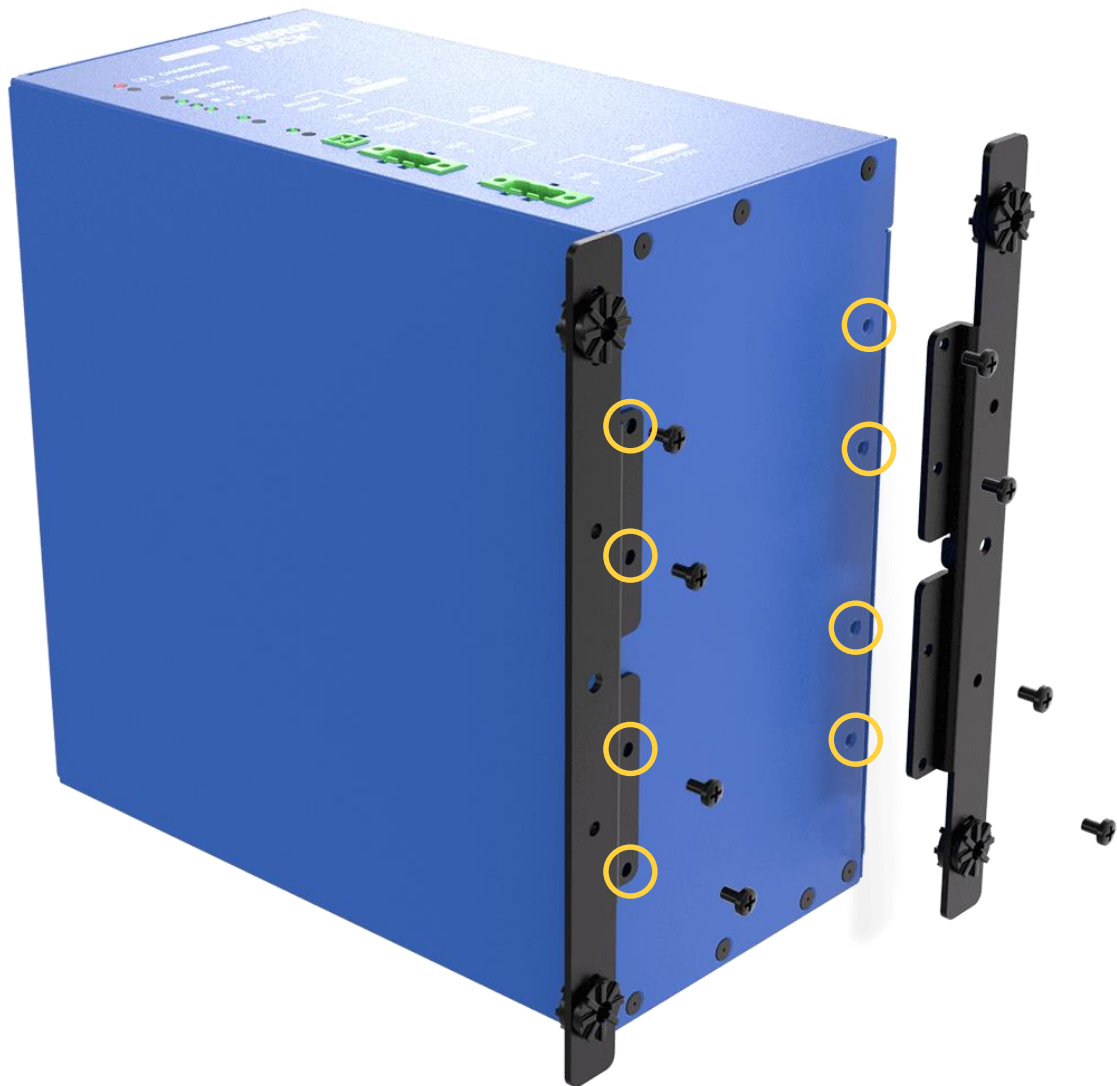


3.3 Installing wall mount kit

3.3.1 Wall Mounting

(Bottom View)

Lock the wall kit with 8 screws



3.3.2 DIN Rail Mounting (Optional)

(Back View)

Lock the wall din rail mount kit with 8 screws

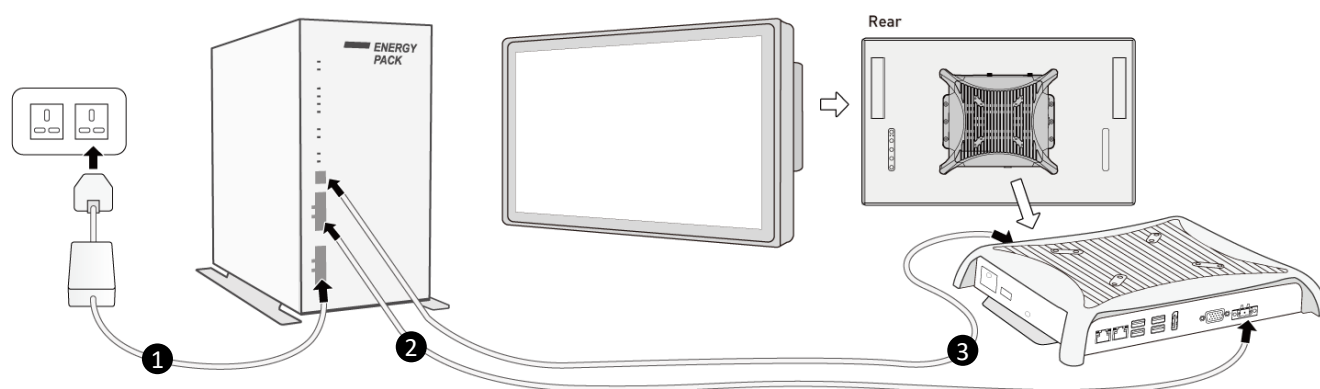


Chapter 4

Cable Routing Guide

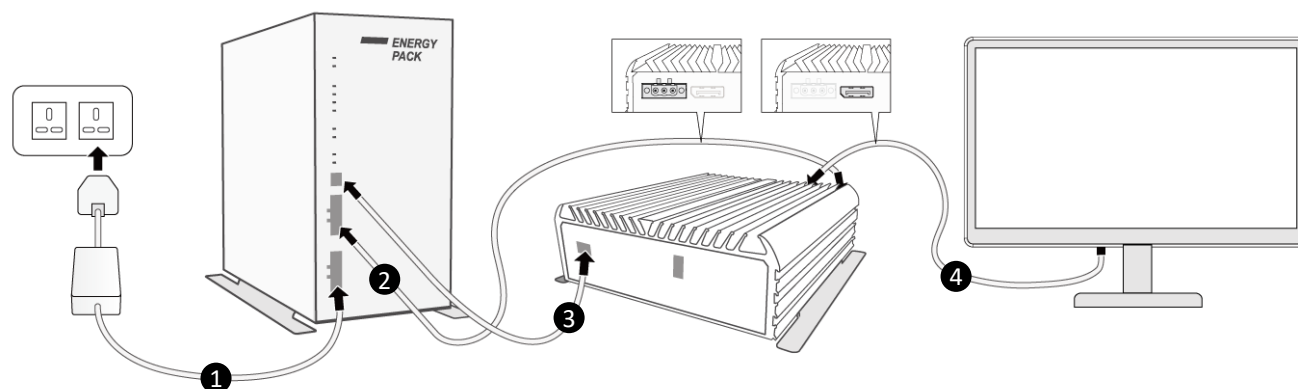
2.3 Normal Backup Mode

2.3.1 ECO-1000 → VIO-W224R/PC400



No.	item	No.	item
1	Power Adapter Cable	2	DC OUT Power Cable
3	Power Switch Cable		

2.3.2 ECO-1000 → RCO-1000-EHL → Display



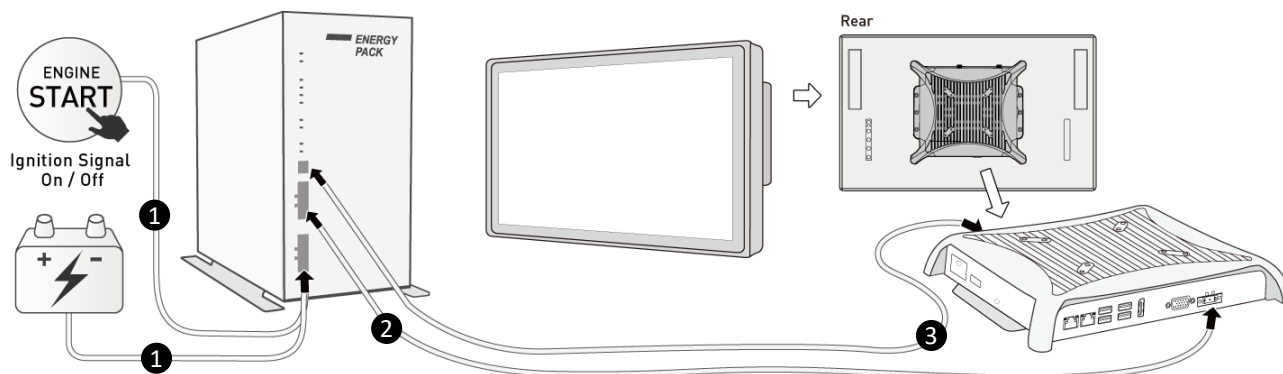
No.	item	No.	item
1	Power Adapter Cable	2	DC OUT Power Cable
3	Power Switch Cable	4	DP Cable

More references ([Download](#))

- ECO-1000 → RCO-1000-EHL → VIO-W224R/MX200
- ECO-1000 → RCO-3000-CFL → Display
- ECO-1000 → SIO-W224R
- ECO-1000 → RCO-6000-CML → Display

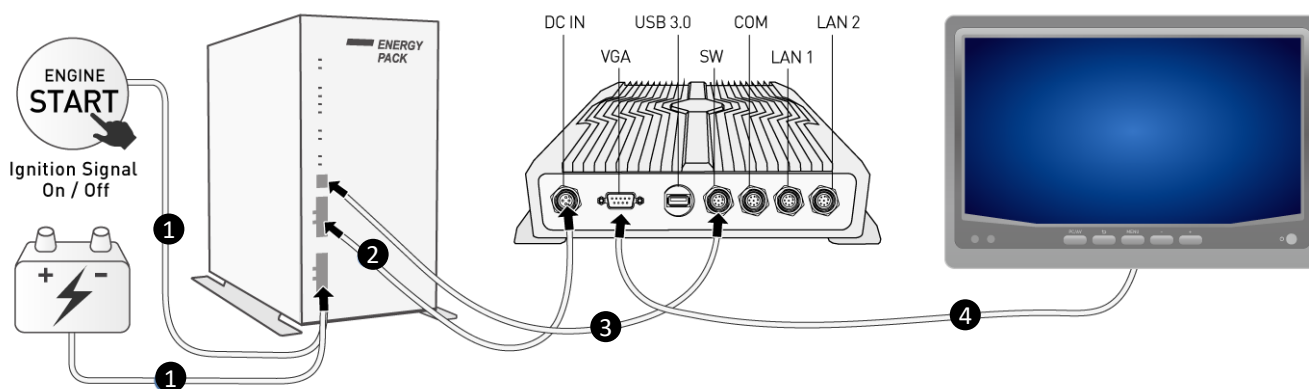
2.4 Ignition Control Mode

2.4.1 ECO-1000 → VIO-W215R/PC400



No.	item	No.	item
1	Power with IGN signal Y Cable	2	DC OUT Power Cable
3	Power Switch Cable		

2.4.2 ECO-1000 → WCO-3400 → Display



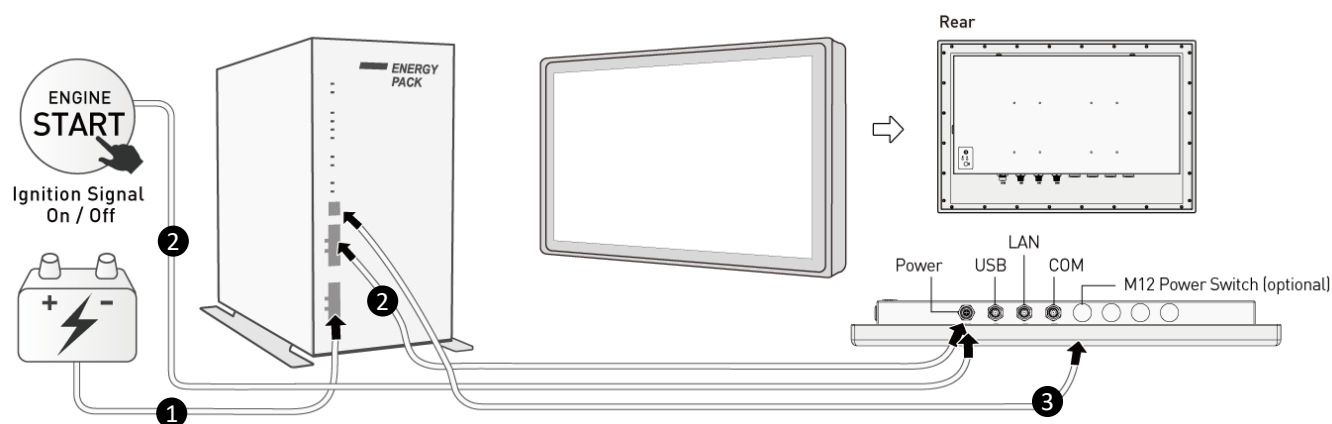
No.	item	No.	item
1	Power with IGN signal Y Cable	2	M12 Power Cable
3	M12 Power Switch Cable (Optional)	4	M12 VGA Cable

More references [\(Download\)](#)

- ECO-1000 → BCO-2000 → VIO-W215R/MX200
- ECO-1000 → BCO-1000 → Display
- ECO-1000 → SIO-W215R
- ECO-1000 → BCO-2000 → Display

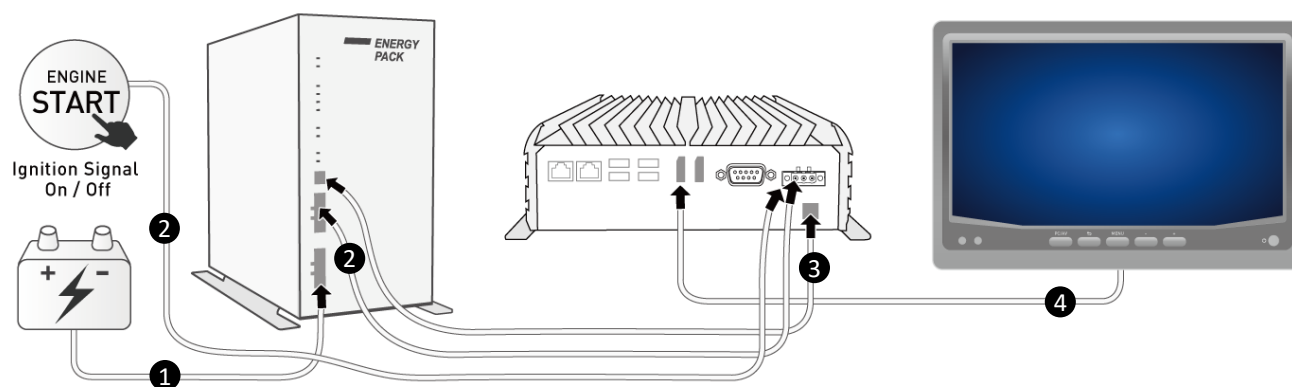
2.5 Battery Mode

2.5.1 ECO-1000 → SIO-W215R



No.	item	No.	item
1	Power Cable	2	M12 Power with IGN signal Y Cable
3	Power Switch Cable		

2.5.2 ECO-1000 → RCO-3400 → Display



No.	item	No.	item
1	Power Cable	2	DC OUT with IGN signal Y Cable
3	Power Switch Cable	4	DP Cable or VGA Cable

More references [\(Download\)](#)

- ECO-1000 → VIO-W215R/PC400
- ECO-1000 → WCO-3400 → Display
- ECO-1000 → RCO-1010G → Display
- ECO-1000 → ACO-6000-CML → Display

