Battery Monitoring
Truck iQ™ Smart Battery Dashboard

OWNER'S MANUAL

CE UKCA c(UL)us LISTED

UL Listing applies in the
United States and to certain
models only.

EnerSys
Power/Full Solutions

www.enersys.com

CONTENTS

DESCRIPTION

The Truck iQ™ smart battery dashboard consists of a display powered by the battery via the truck cables. It reads, in real time and wirelessly, data from the Wi-iQ® 3 and Wi-iQ® 4 battery monitoring device, NexSys® iON, NexSys® TPPL and NexSys® TPPL with the Accelerated Throughput Package (ATP) batteries, displaying alerts, alarms, SoC (State of Charge), and other useful parameters to optimize the operation of the battery.

Features

- Available for Flooded, NexSys® TPPL, NexSys® TPPL with ATP batteries
  - Truck iQ™ smart battery dashboard PN2 with CAN
- Available for NexSys® iON and NexSys® TPPL with ATP* batteries
  - Truck iQ™ smart battery dashboard PN3
- Touch screen display

- Multiple communication channels
  - CAN-BUS to Wi-iQ®4 & Battery BMS
  - Bluetooth to Wi-iQ®3 and later versions
- Adjustable SoC Warning and providing an audible buzzing alarm for NexSys® ION , NexSys® TPP and NexSys® TPPL with ATP* batteries
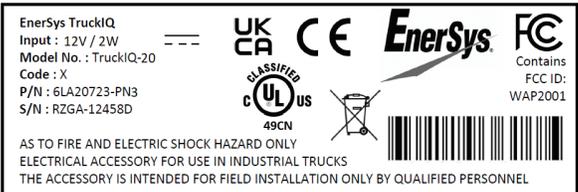
*Applies to North American version only; please contact your EnerSys® representative for more details.

Technical Specifications

Item	Description
Input Voltage	15V to 120V (PN2) 12V (PN3)
Nominal Battery Voltage	24V-96V (PN2)
Operating Temperature	32–160°F (0–70°C)
Voltage Accuracy	0.1V
Altitude	<2,000m (<6,561ft)
Power Consumption	2 Watt
Wireless Interface	Bluetooth BLE
Wireless Range	Up to 5m (16ft) (BLE)
CAN Communication	CANOpen for PN3 J1939 for PN2 (Wi-iQ®4 and later versions)
Protection	Over Voltage Reverse Polarity Protection
Packaging	UL 94V-0 Pollution level 3 protection (dusty environment) IP-54 Enclosure

Technical Specifications (cont.)

Item	Description
Information PN2 **Model: TruckiQ-10**	EnerSys TruckIQ Input : 15-120V / 2W Model No. : TruckIQ-10 Code : X P/N : 6LA20723-PN2 S/N : RZGA-12458D UK CA CE EnerSys FCC Contains FCC ID: WAP2001 c(UL)us CLASSIFIED 49CN AS TO FIRE AND ELECTRIC SHOCK HAZARD ONLY ELECTRICAL ACCESSORY FOR USE IN INDUSTRIAL TRUCKS THE ACCESSORY IS INTENDED FOR FIELD INSTALLATION ONLY BY QUALIFIED PERSONNEL
Information PN3 **Model: TruckiQ-20**	EnerSys TruckIQ Input : 12V / 2W Model No. : TruckIQ-20 Code : X P/N : 6LA20723-PN3 S/N : RZGA-12458D UK CA CE EnerSys FCC Contains FCC ID: WAP2001 c(UL)us CLASSIFIED 49CN AS TO FIRE AND ELECTRIC SHOCK HAZARD ONLY ELECTRICAL ACCESSORY FOR USE IN INDUSTRIAL TRUCKS THE ACCESSORY IS INTENDED FOR FIELD INSTALLATION ONLY BY QUALIFIED PERSONNEL
Compliance	Certified by UL® to UL 583 Radio Spectrum (Directive 2014/53/EU - RED) FCC ID: T7V4561HM (Panasonic industrial 802.14.4 modem – 2,405-2,475GHz) FCC ID: WAP2001 (Cypress BLE PRoC – 2,402-2.48GHz) CE/UKCA EU Declaration of Conformity • EMC Regulations 2016(S.I 2016/1091) • Directive 2014/30/EU Electromagnetic Compatibility BS EN 12895 : 2015/A1 : 2019 • Directive 2011/65/EU RoHS • Radio Equipment Regulations 2017 (S.I. 2017/1206) • Directive (2014/53/EU) ETSI EN 301 489-1 V2.1.1 (2017) ETSI EN 301 489-17 V3.1.1 (2017) ETSI EN 300 328 V2.2.2 (2019)

DISPLAY DESCRIPTION & SETTINGS

Main Screen

The Truck iQ™ smart battery dashboard has a Touch Screen TFT 4.3 inch.

Figure 1: Main Screen

SoC
Remaining Work Time
Battery Temperature

Mode Usage
Sleep/Eco/
Normal/Heavy

Activation Button (only PN3):
- **Acknowledge warning**
- **Turn on: short press will turn the battery on**
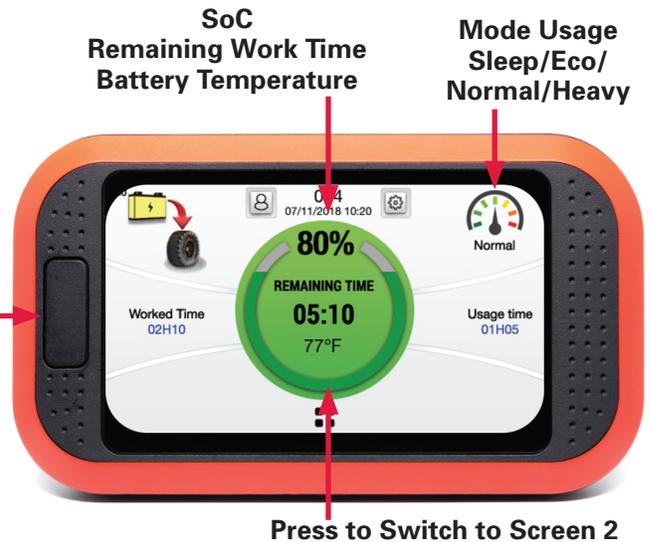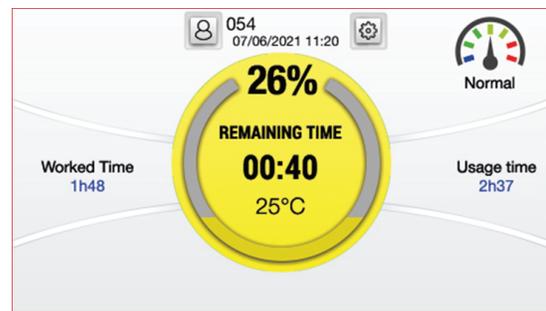- **Turn off: long press 3-5 seconds will turn the battery off**

Press to Switch to Screen 2

Figure 1

Color-Coded Modes

Discharge Mode	Warning SoC

Alert SoC	Charging Mode

Battery Errors for PN3 NexSys® iON and NexSys® TPPL with ATP* batteries

Time with discharged current > current threshold menu (2A). Reset when on charger.

Active warnings (Level >=3).

Time spent since the start of the discharge. Traction ON (can be idle or worked time).
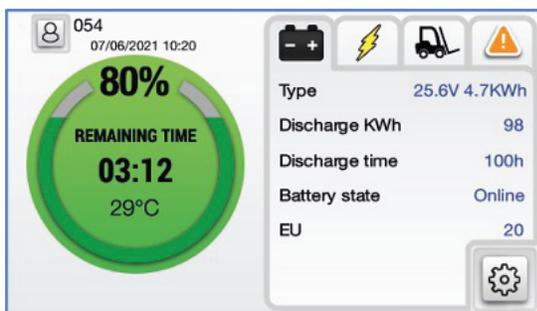
Icon to acknowledge fault.

Overload current warning (90% of the max limit)

*Applies to North American version only; please contact your EnerSys® representative for more details.
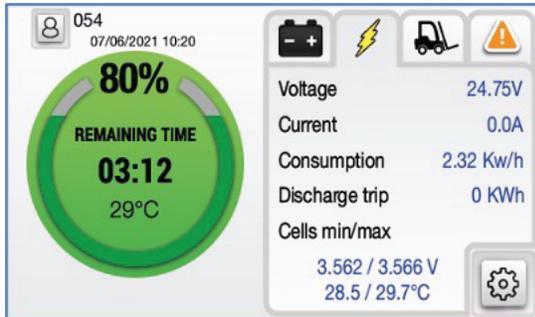
Screen 2

Battery details

- Type: Nominal battery voltage & kWh
- Total discharge kWh since the start
- Total discharge time since the start
- Battery status: Offline (traction off)/Online (traction on)/Error
- EU: Equivalent Battery Unit = One cycle of 80% of the rated battery capacity
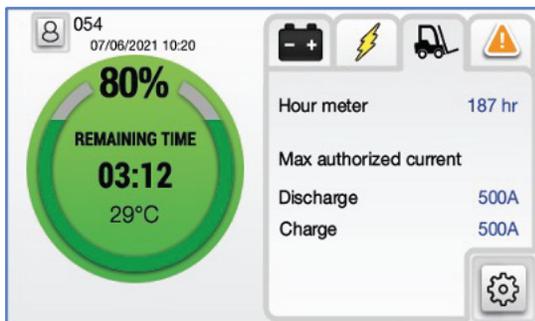
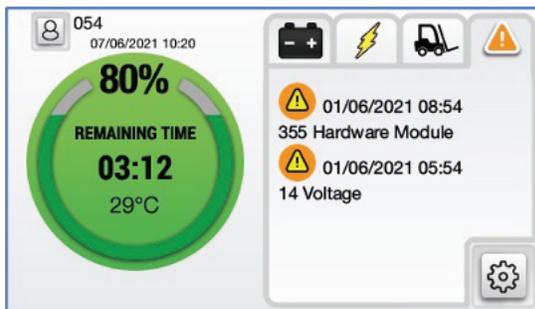## Screen 2 (cont.)

Cycle/trip details

- Real time battery voltage
- Real time current
- Average consumption (trip)
- Discharged kWh (trip)
- Real time cells voltage min and max
- Real time cells temperature min and max

Truck information

- Truck hour meter: counting the time the truck is driving with discharger current > 2A
- Overload discharge: max discharge current allowed, change over the SoC and battery temperature
- Overload charge: max charge/reinjection current allowed, change over the SoC and battery temperature
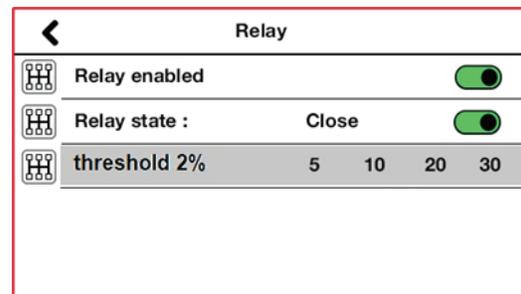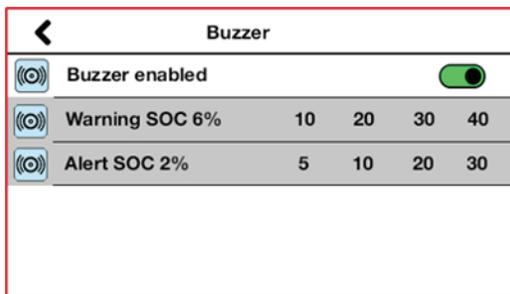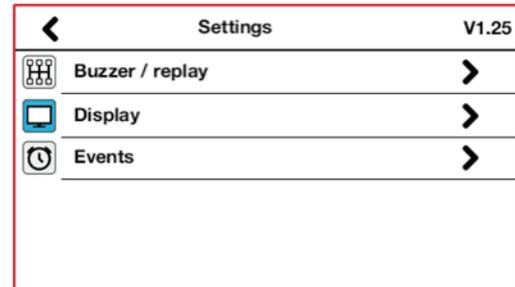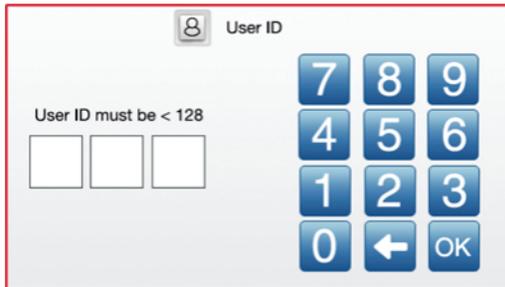
Active warning

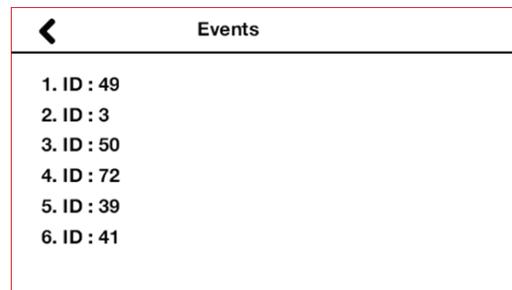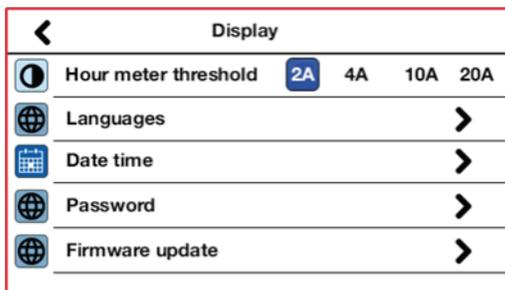- Warning/alert with date and ID; refer to user manual if needed

Screen 2 (cont.)

Password protection and SoC/Relay manual settings

SoC/Relay threshold can be adjusted and set directly on the password protection display.

General settings are not password protected (i.e. language, time, etc.).

Warnings and Settings

Battery Warnings

Icon	Description	Stop Condition
	Warning activated	Check on screen 1
	High temperature	Stop and cool down the battery
	Low water level	Top up the battery
	Cells unbalanced	Stop, charge, and equalize the battery
E⚡T	Energy throughput too high	Stop and cool down the battery

Buzzer and Relay Settings

Buzzer and Relay Settings are using threshold pre-configured in the NexSys® ION, NexSys® TPPL and NexSys® TPPL with ATP* batteries or Wi-iQ®3 & Wi-iQ®4 battery monitoring device (Wi-iQ® Report suite or E Connect™).

Syncing of warning/alert settings is not done via Bluetooth connection.

Default Value of the Buzzer vs Battery Type		
Battery Type	**Warning SoC**	**Alert SoC**
Flooded	30% SoC	20% SoC
NexsSys® TPPL	30% SoC	20% SoC
NexSys® TPPL with ATP*	10% USoC	5% USoC
NexSys® ION	4% USoC**	2% USoC**

*Applies to North American version only; please contact your EnerSys® representative for more details
**Are not adjustable

Menu Settings

Option	Setting		Description
Bluetooth	BLE ON	ON/OFF	Enable/Disable BLE option
CAN	CAN ON	ON/OFF	Enable/Disable CAN option
Buzzer	Buzzer ON	ON/OFF	Enable/Disable Buzzer option
	Warning Level	4%	**PN3** – USoC threshold to activate buzzer warning 1 beep every 30 sec CDI settings are used, when installed
	Alert Level	2%	**PN3** – USoC threshold to activate buzzer alert 1 beep every sec CDI settings are used, when installed
Relay	Relay Enabled	Enable	Enable/Disable: Allow the truck to know when the battery is at low SoC and when the battery will shut down (Early warning signal 10 seconds before to open the battery traction contactor)
	Alert State	Closed	Choose between closed or opened state for below SoC Threshold
	SoC Threshold	10%	**PN3** – Choose the USoC threshold to activate relay (5/10/20/30%) CDI alerts are used, when installed
Display	Current Threshold	2A	Current threshold for hour meter (worked time, consumption)
	Language	English	Language (English, German, French, Spanish, Italian, or Portuguese)
	Date/Time	Date/Time	Change date and time
		Region	Choose region (automatically change temperature and date, time displaying for US)
	Password		Define custom/user password
	Firmware Update		Restart the Truck iQ™ smart battery dashboard in bootloader mode
Pairing	Auto Pairing		Enable/Disable: Auto pairing with the Wi-iQ®3/Wi-iQ®4/Later versions
	Manual Pairing		Manual selection of a Wi-iQ® battery monitoring device. Automatically stored for next power-up
Events			See the latest error codes (ID) records by the BMS – **PN3**

Dimensions

Truck iQ™ smart battery dashboard dimensions (mm)

Figure 2: Dimensions of a Truck iQ™ smart battery dashboard PN2

TRUCK - IQ
SCALE: 1
28.03.18

SCALE 0.333

SCALE 0.333

163.09

30.7

92.07

56.52

19.29

USB

39.86

Mechanical Installation

Install the Truck iQ™ smart battery dashboard fixing bracket on the most suitable part of the truck. The device should be mounted in a position that will protect it from collision with external obstructions.

The bracket can be assembled in various ways to allow a multitude of mounting configurations.

Configurations for mounting the bracket

11

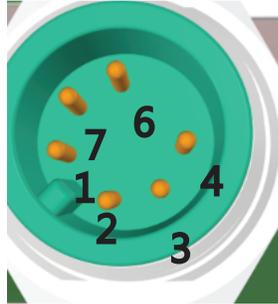# Electrical Installation

Truck iQ™ smart battery dashboard cable specifications

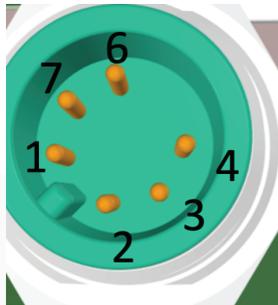The cable provides a relay (NC) option, according to the following pin-out.

M12A-04PMMP-SF8001	Pin	Description	PN2 Power Supply cable 6LA20737
	1	Reserved	
	2	Reserved	
	3	Relay* (common)	
	4	Relay (NC)	
	5	Not used	

*Relay: 62.5VA/60W – 2A – 250VAC/220VDC

Communication via CAN according to the following pin-out.

M12A-06BFFM-SR8D02	Pin	Description	PN2 CAN cable 6LA01159
	1		
	2		
	3	CANL	
	4	CANH	
	6	GND	
	7	GND	

The cable provides power (12V, 2W), and communication via CAN according to the following pin-out.

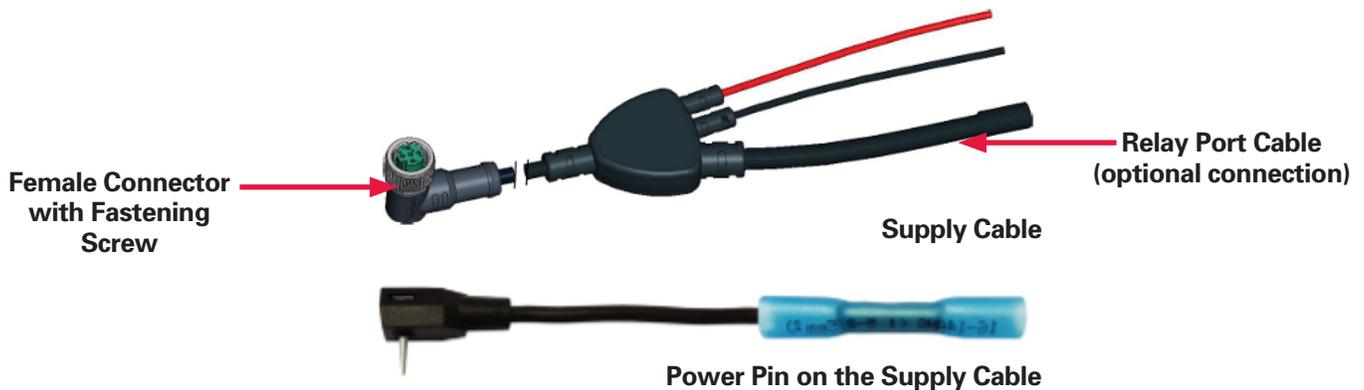| M12A-06PMMP-SF8001	Pin	Description	PN3 CAN cable 6LA20750
	1	12V (2W)	
	2	Push button (shorted to GND)	
	3	CANL	
	4	CANH	
	6	GND	
	7	GND	

PN2 Truck iQ™ Smart Battery Dashboard Flooded and NexSys® TPPL Batteries
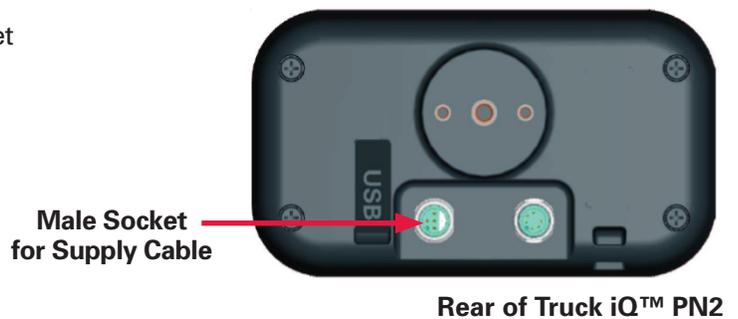
Truck iQ™ smart battery dashboard part number 6LA20723-PN2 for Flooded and NexSys® TPPL batteries required:
• Power cable 2m/4m = 6LA20737-L2 or 6LA20737-L4
• Metal fixation PN 6LA20738

Connect the supply cable pins on the +VBAT and –VBAT on the battery or on the truck side. If the battery on the truck is not fixed, (see supply cable and power pin on the supply cable images on the next page). Nominal battery voltage: 24V–96V.

Female Connector with Fastening Screw

Relay Port Cable (optional connection)

Supply Cable

Power Pin on the Supply Cable

Plug the male connector into the right female socket situated on the rear side of the Truck iQ™.

Male Socket for Supply Cable

Rear of Truck iQ™ PN2

PN2 Truck iQ™ Smart Battery Dashboard Flooded and NexSys® TPPL Batteries (cont.)

Turn the "fastening screw" on the connector to lock the supply cable to the Truck iQ™ smart battery dashboard.

Power the Truck iQ™ smart battery dashboard by connecting the traction battery to the truck.

To use the CAN capability, the following is required:
- CAN cable 2m/4m = 6LA01159-L2 or 6LA01159-L4
- Connect the CAN cable from the Truck iQ™ smart battery dashboard to the CAN on theWi-iQ® battery monitoring device and later versions.
- **Only compatible with fixed batteries (No battery change)**

Wi-iQ® battery monitoring device & Truck iQ™ smart battery dashboard settings
- The Wi-iQ® battery monitoring device must be set with a CAN ID of 255
- Deactivate the BLE option on the Truck iQ™ smart battery dashboard
- Truck iQ™ smart battery dashboard must be at least at firmware 1.25B

CAN connection to PN2

PN3 Truck iQ™ for NexSys® ION and NexSys® TPPL with ATP* batteries

Truck iQ™ part number 6LA20723-PN3 for NexSys® ION and NexSys® TPPL with ATP* batteries requires:
- Cable 6LA20750-L2 or 6LA20750-L4
- Metal fixation PN 6LA20738

Connect the device directly on the right 6-pin connector for power and CAN communication. The left connector is not used.

Connection to Nexsys® ION-BMS

Connection to NexSys® TPPL ATP-BMS

Communication

There are two modes of communication (Wireless and CAN) available on the TRUCK IQ™ smart battery dashboard:

Wireless-Bluetooth
- Connect to the Wi-iQ®3/Wi-iQ®4/Later versions

CAN (Controller Area Network)
- For PN3 - CANopen Cia 418
- Interface with battery via BMS (NexSys® ION & NexSys® TPPL with ATP* batteries
- For PN2 - Wi-iQ®4 firmware version J1939 V7.9-15 or higher
- Not compatible with CANopen firmware

CAN		
CAN enabled		⬤
WiiQ / Li ion	Wi	Li

Handshake with Wi-iQ® battery monitoring device (3, 4 and later versions) & flooded, NexSys® TPPL batteries

Manual Procedure
- Navigate to: 1) Settings 2) I/O 3) Pairing 4) Disable Auto pairing
- Click BLE icon and select the correct Wi-iQ® battery monitoring device that appeared with the associated battery serial name

*Applies to North American version only; please contact your EnerSys® representative for more details
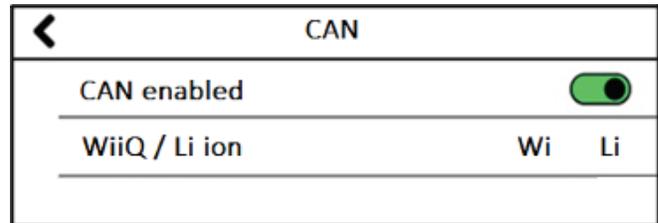
Auto Pairing
- Navigate to: 1) Settings 2) I/O 3) Pairing 4) Enable Auto pairing.
- The device will pair automatically with the Wi-iQ® device connected to the traction battery, which is powering the Truck iQ™.
- Auto pairing requires movement/operation of truck with current >5A.
- This synchronizes current & shock sensor. It can take 1 to 5 minutes.
- Refer to Wi-iQ®4 owner's manual to configure via Wi-iQ® Report or E Connect™.

Pairing		
Auto pairing		⬤
WiiQ 1	📶	ᛒ
WiiQ 2	📶	ᛒ

Handshake with Wi-iQ®4 CAN battery monitoring device & NexSys® ION NexSys® TPPL with ATP* batteries

No Pairing Required
- Refer to Wi-iQ®4 or CDI owner's manual to configure via Wi-iQ® Report or E Connect™. The SoC and relay limits will override any pre-configuration in the Truck iQ™ smart battery dashboard.
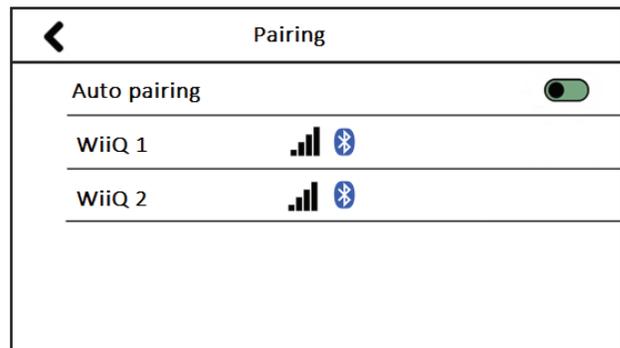
*Applies to North American version only; please contact your EnerSys® representative for more details

Part Numbers

Truck iQ™ for Nexsys® TPPL/Flooded	Truck iQ™ for Nexsys® ION/Nexsys® TPPL ATP
6LA20723-PN2	6LA20723-PN3
Metal Brackets 6LA20738	
Power Supply Cable for PN2 6LA20737-L2 (2m) 6LA20737-L4 (4m)	No extra power supply
CAN Cable for PN2 6LA01159-L2 (2m) 6LA01159-L4 (4m)	**CAN Cable for PN3** 6LA20750-L2 (2m) 6LA20750-L4 (4m) **CAN Splitter for PN3** GL0000761-0000

Common Errors

Issue	Solution
Device freezes	Reboot device Firmware version should be at least 1.25B
Screen turns black	Reboot device Firmware version should be at least 1.25B
BLE connection issues	Navigate to 1) Settings 2) I/O 3) Pairing • Disable Auto pairing and enable it again • Scan the device Or • Leave the Auto pairing disabled and select the appropriate Wi-iQ(R) device by clicking on the BLE icon

Technical support: Refer to our website
www.enersys.com to find your local contact.

EnerSys World Headquarters
2366 Bernville Road
Reading, PA 19605, USA
Tel: +1-610-208-1991
+1-800-538-3627

EnerSys EMEA
EH Europe GmbH
Baarerstrasse 18
6300 Zug, Switzerland

EnerSys Asia
152 Beach Road
#11-08 Gateway East Building
Singapore 189721
Tel: +65 6416 4800

www.enersys.com

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