BATTERY MONITORING

HAWKER®
Advanced Battery Interface (ABI)

OWNER'S MANUAL

HAWKER®

www.hawkerpowersource.com

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

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DESCRIPTION

The HAWKER® ABI™ advanced battery interface consists of a display powered by the battery via the truck cables. It reads, in real time and wirelessly, data from the BBWC4 battery monitoring device, HAWKER FLEX® Li3, HAWKER FLEX® TPPL, and HAWKER FLEX® Elite TPPL batteries, displaying alerts, alarms, SoC (State of Charge), and other useful parameters to optimize the operation of the battery.

Features

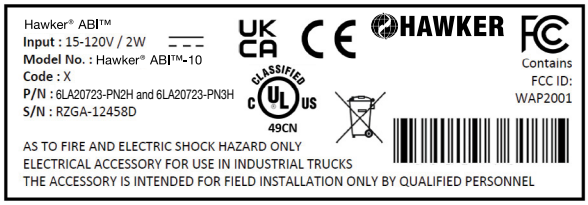
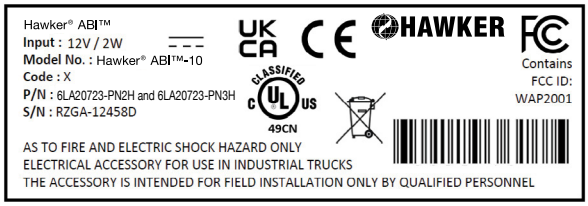
- Available for Flooded, HAWKER FLEX® TPPL, HAWKER FLEX® Elite batteries
  - HAWKER® ABI™ advanced battery interface PN2H with CAN
- Available for HAWKER FLEX® Li3 and HAWKER FLEX® Elite batteries
  - HAWKER® ABI™ advanced battery interface PN3H
- Touch screen display
- Multiple communication channels
  - CAN-BUS to BBWC4 & Battery BMS
  - Bluetooth to BBWC3 and later versions
- Adjustable SoC Warning and providing an audible buzzing alarm for HAWKER FLEX® Li3, HAWKER FLEX® TPPL, and HAWKER FLEX® Elite batteries

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

Technical Specifications

Item	Description
Input Voltage	15V to 120V (PN2H) 12V (PN3H)
Nominal Battery Voltage	24V-96V (PN2H)
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 PN3H J1939 for PN2 (BBWC4 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 PN2H **Model: 6LA20723-PN2H**	
Information PN3H **Model:6LA20723-PN3H**	
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 HAWKER® ABI™ advanced battery interface has a Touch Screen TFT 4.3 inch.

Figure 1: Main Screen

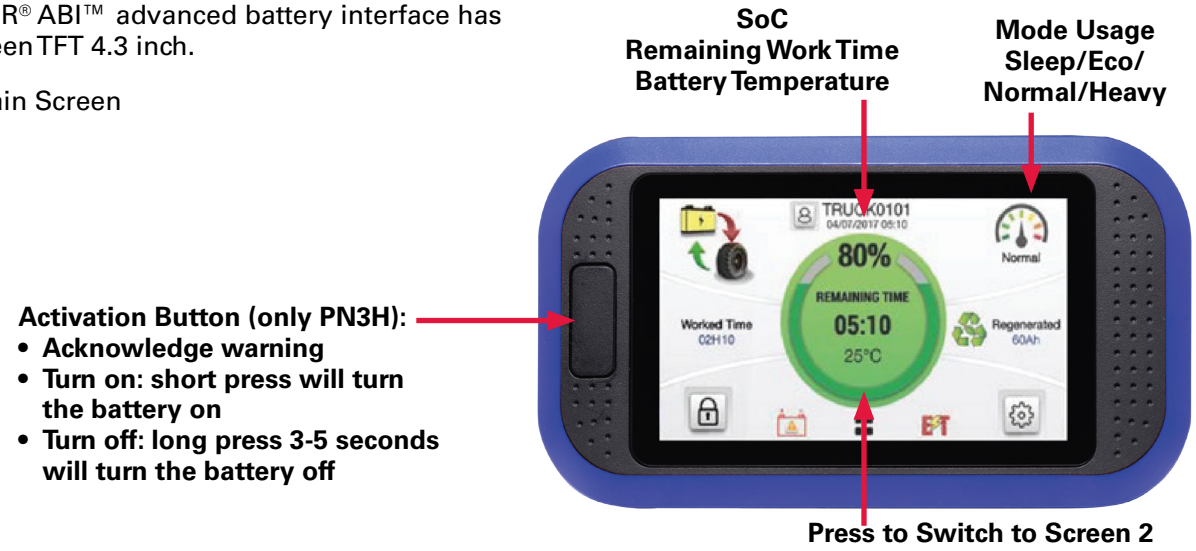
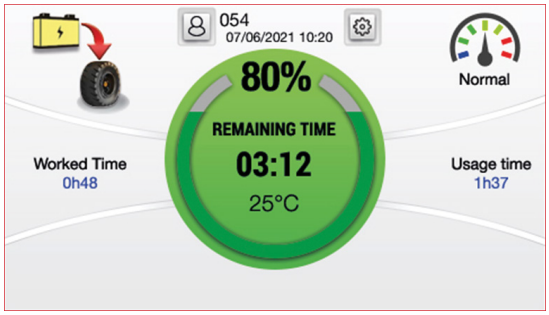


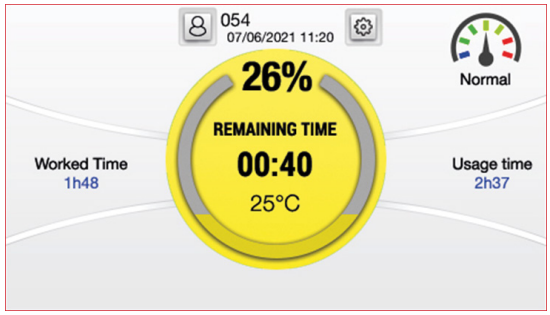
Figure 1

Color-Coded Modes

Discharge Mode

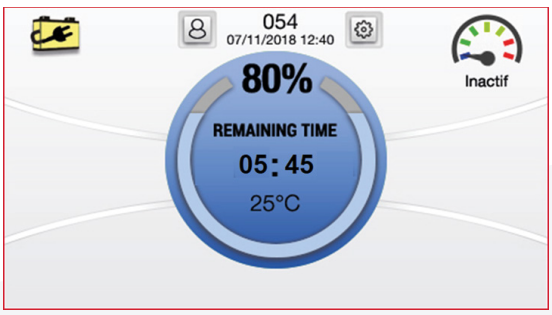


Warning SoC



Alert SoC

Charging Mode



DISPLAY DESCRIPTION & SETTINGS

Battery Errors for PN3H HAWKER FLEX® Li3 and HAWKER FLEX® Elite TPPL 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).

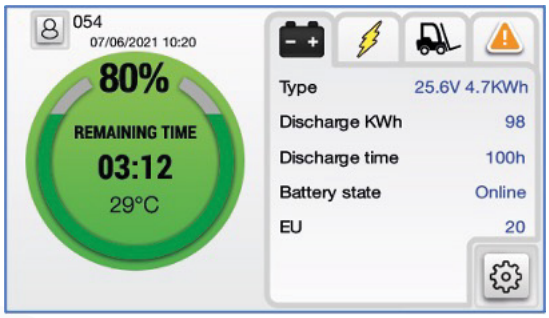
Icon to acknowledge fault.

Overload current warning (90% of the max limit)

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

Screen 2

Battery details

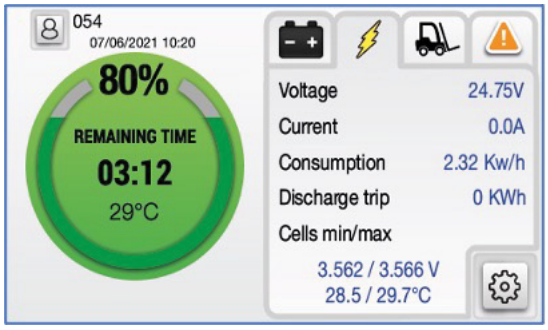


- Type: Nominal battery voltage & kWh
- Total discharge kWh since the start
- Total discharge time since the start
- Battery status: Offline (traction off)/Online (traction on)/Error
- EU: Equivalent Battery Unit = One cycle of 80% of the rated battery capacity

DISPLAY DESCRIPTION & SETTINGS

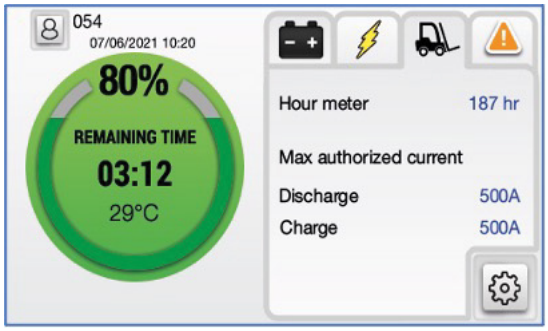
Screen 2 (cont.)

Cycle/trip details



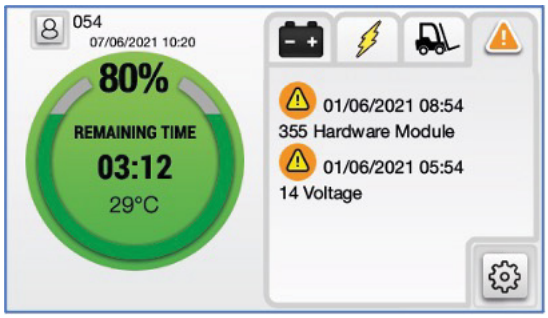
- Real time battery voltage
- Real time current
- Average consumption (trip)
- Discharged kWh (trip)
- Real time cells voltage min and max
- Real time cells temperature min and max

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

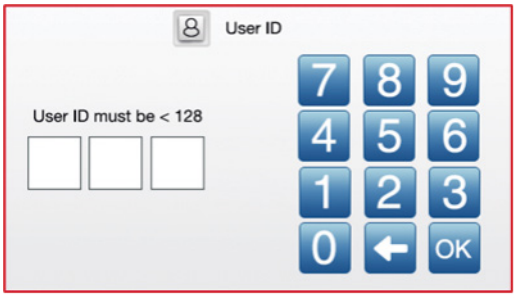


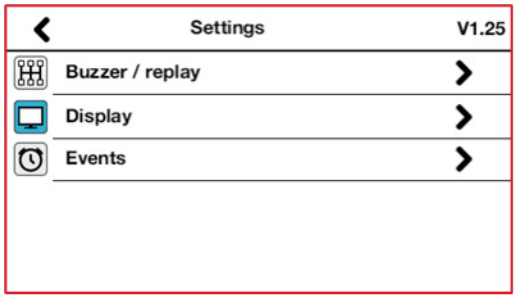
- Warning/alert with date and ID; refer to user manual if needed

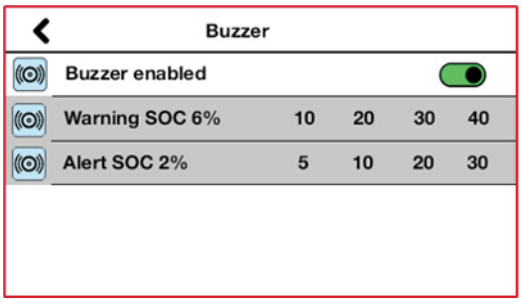
Screen 2 (cont.)

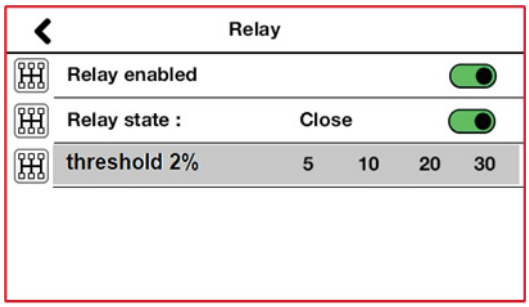
Password protection and SoC/Relay manual settings

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

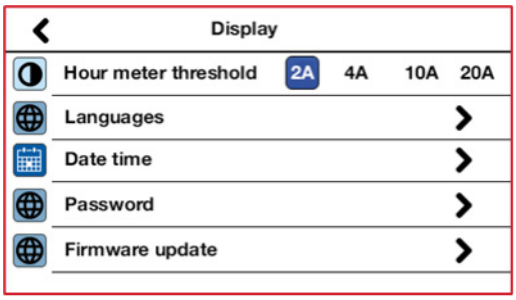


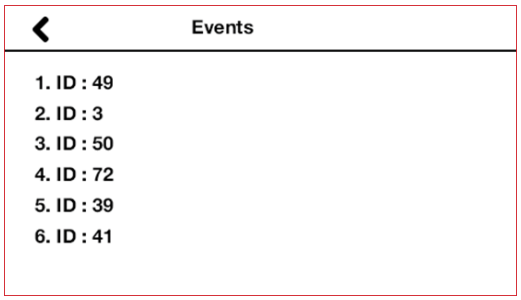






General settings are not password protected (i.e. language, time, etc.).





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
	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 HAWKER FLEX® Li3, HAWKER FLEX® TPPL, and HAWKER FLEX® Elite batteries* batteries or BBWC3 & BBWC4 battery monitoring device (BBWC Report suite or HAWKER® MOD-ifi™ smart device app).

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
HAWKER FLEX® TPPL	30% SoC	20% SoC
HAWKER FLEX® Elite TPPL	10% USoC	5% USoC
HAWKER FLEX® Li3	4% USoC**	2% USoC**

*Applies to North American version only; please contact your HAWKER® 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%	**PN3H** – USoC threshold to activate buzzer warning 1 beep every 30 sec CDI settings are used, when installed
	Alert Level	2%	**PN3H** – 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%	**PN3H** – 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 HAWKER® ABI™ advanced battery interface in bootloader mode
Pairing	Auto Pairing		Enable/Disable: Auto pairing with the BBWC3/BBWC4/Later versions
	Manual Pairing		Manual selection of a BBWC battery monitoring device. Automatically stored for next power-up
Events			See the latest error codes (ID) records by the BMS – **PN3H**

DIMENSIONS AND INSTALLATION

Dimensions

HAWKER® ABI™ advanced battery interface dimensions (mm)

Figure 2: Dimensions of a HAWKER® ABI™ advanced battery interface PN2H

Mechanical Installation

Install the HAWKER® ABI™ advanced battery interface 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.

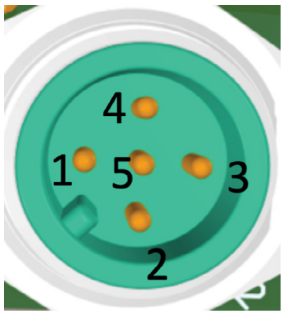
The bracket can be assembled in various ways to allow a multitude of mounting configurations.

Configurations for mounting the bracket

Electrical Installation

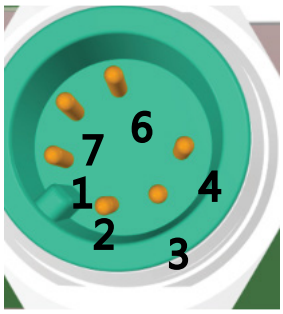
HAWKER® ABI™ advanced battery interface cable specifications

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

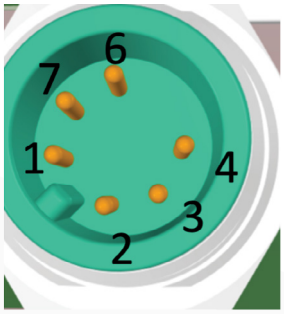
M12A-04PMMP-SF8001	Pin	Description	PN2H Power Supply cable 6LA20737
	1	Reserved	
	2	Reserved	
	3	Relay* (common)	
	4	Relay (NC)	
	5	Not used	

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

Communication via CAN according to the following pin-out.

M12A-06BFFM-SR8D02	Pin	Description	PN2H 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.

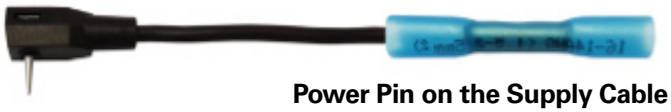
M12A-06PMMP-SF8001	Pin	Description	PN3H CAN cable 6LA20750
	1	12V (2W)	
	2	Push button (shorted to GND)	
	3	CANL	
	4	CANH	
	6	GND	
	7	GND	

PN2H HAWKER® ABI™ advanced battery interface Flooded and TPPL Batteries

HAWKER® ABI™ advanced battery interface part number 6LA20723-PN2H for Flooded and HAWKER FLEX® TPPL batteries required:

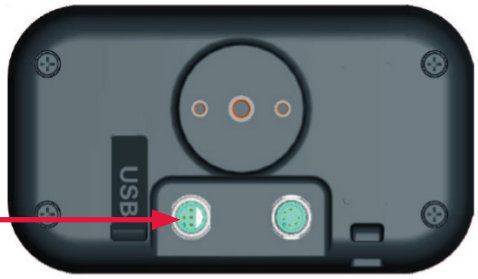
- Power cable 2m/4m = 6LA20737-L2 or 6LA20737-L4
- Metal fixation PN 6LA20738

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.



Power Pin on the Supply Cable

Plug the male connector into the right female socket situated on the rear side of the HAWKER® ABI™ .



Rear of HAWKER® ABI™ PN2H

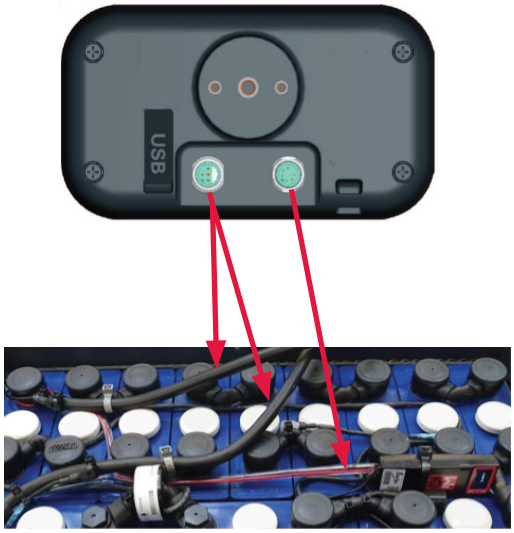
PN2H HAWKER® ABI™ advanced battery interface Flooded and TPPL Batteries (cont.)

Turn the "fastening screw" on the connector to lock the supply cable to the HAWKER® ABI™ advanced battery interface.

Power the HAWKER® ABI™ advanced battery interface 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 HAWKER® ABI™ advanced battery interface to the CAN on the BBWC battery monitoring device and later versions.
- **Only compatible with fixed batteries (No battery change)**

BBWC battery monitoring device & HAWKER® ABI™ advanced battery interface settings
- The BBWC battery monitoring device must be set with a CAN ID of 255
- Deactivate the BLE option on the HAWKER® ABI™ advanced battery interface
- HAWKER® ABI™ advanced battery interface must be at least at firmware 1.25B



CAN connection to PN2H

PN3H HAWKER® ABI™ advanced battery interface for HAWKER FLEX® Li3 and HAWKER FLEX® Elite TPPL Batteries

HAWKER® ABI™ part number PN3H for HAWKER FLEX® Li3 and HAWKER FLEX® Elite TPPL 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 HAWKER FLEX® Li3-BMS

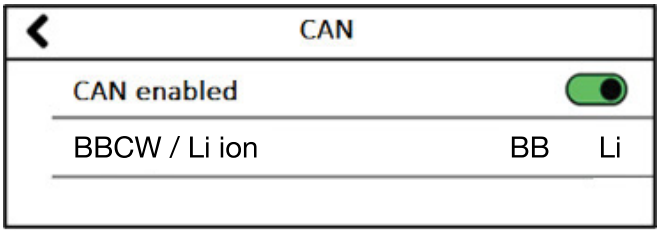
Connection to HAWKER FLEX® Elite TPPL-BMS

Communication

There are two modes of communication (Wireless and CAN) available on the HAWKER® ABI™ advanced battery interface:

Wireless-Bluetooth®
- Connect to the BBWC3/BBWC4/Later versions

CAN (Controller Area Network)
- For PN3H - CANopen Cia 418
- Interface with battery via BMS (HAWKER FLEX® Li3 & HAWKER FLEX® Elite TPPL batteries)
- For PN2H - BBWC4 firmware version J1939 V7.9-15 or higher
- Not compatible with CANopen firmware

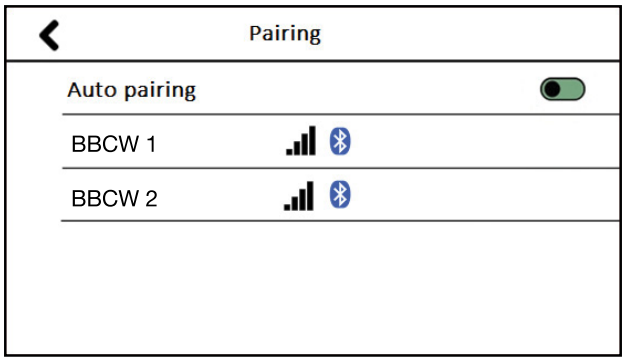


Handshake with BBWC battery monitoring device (3, 4 and later versions) & flooded, HAWKER FLEX® TPPL batteries

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

*Applies to North American version only; please contact your HAWKER® 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 BBWC device connected to the traction battery, which is powering the HAWKER® ABI™.
- Auto pairing requires movement/operation of truck with current >5A.
- This synchronizes current & shock sensor. It can take 1 to 5 minutes.
- Refer to BBWC4 owner's manual to configure via BBWC Report or HAWKER® MOD-ifi™ smart device app.



Handshake with BBWC4 CAN battery monitoring device & HAWKER FLEX® Li3 and HAWKER FLEX® Elite TPPL batteries*

No Pairing Required
- Refer to BBWC4 or CDI owner's manual to configure via BBWC Report or HAWKER® MOD-ifi™ smart device app. The SoC and relay limits will override any pre-configuration in the HAWKER® ABI™ advanced battery interface smart battery dashboard.

*Applies to North American version only; please contact your HAWKER® representative for more details

Part Numbers

<table>
<tr><th>HAWKER® ABI™ for HAWKER FLEX® TPPL/Flooded</th><th>HAWKER® ABI™ for HAWKER FLEX® Li3/ HAWKER FLEX® Elite TPPL</th></tr>
<tr><td>6LA20723-PN2H</td><td>6LA20723-PN3H</td></tr>
<tr><td> </td><td> </td></tr>
<tr><td colspan="2">
Metal Brackets
6LA20738</td></tr>
<tr><td>
Power Supply Cable for PN2H
6LA20737-L2 (2m)
6LA20737-L4 (4m)</td><td>No extra power supply</td></tr>
<tr><td>
CAN Cable for PN2H
6LA01159-L2 (2m)
6LA01159-L4 (4m)</td><td>
CAN Cable for PN3H
6LA20750-L2 (2m)
6LA20750-L4 (4m)

CAN Splitter for PN3H
GL0000761-0000</td></tr>
</table>

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 BBWC device by clicking on the BLE icon

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

NOTES

NOTES

www.hawkerpowersource.com

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AM-HABI-OM Rev AA 1124