XBB PP-CAN-FD

User manual with safety and installation instructions

Product	XBB PP-CAN-FD, programmable CAN and CAN FD gateway
Type designation	PP-CAN-FD
Article number	IDAB-2024-0116-1/25
Hardware version	Ver 2.4
Type approval	E5*10R06/03*0772*00
Manufacturer	Innoware Development AB, Hyttvägen 13, 733 38 Sala, Sweden
Document	2026-11-07, revision 02

The short safety instructions supplied in the package refer to this document. This document is the complete instructions.

Part 1: Safety information

Read this entire part before starting installation. The product is connected to the vehicle's electrical system and to its CAN bus. Incorrect installation can cause a fire in the vehicle wiring.

> **Installation requires knowledge of vehicle electrics.** It is carried out by an installer who is competent in dimensioning cable cross section and fuses in vehicle installations, and who can assess the connected equipment against the applicable vehicle regulations. The product must not control or power safety-critical vehicle systems.

1.1 Warnings

> **WARNING** Contains electronics. Must be recycled. Must not be disposed of with household waste.

1.2 The fuse, and how to dimension it

This is the most important section of the whole instructions.

The supply to the relay socket shall be protected by an automotive blade fuse, ATO or ATC or equivalent. **The maximum permitted fuse rating is 25 A.**

A maximum value is not a recommendation. The fuse is dimensioned for the cable you run, not for the maximum value. If you run a 5 A reversing light on thin cable and fit 25 A because that is the figure in the instructions, the fuse protects neither the cable nor the output in any meaningful sense.

> **The fuse protects the cable.** It does not protect the load and it does not protect the product. That is the principle this whole section rests on.

Dimension correctly, in this order:

1. **Find the current of the load from its own data.** Rated current according to the manufacturer, and for incandescent lamps, motors and compressors also the inrush current, which is higher.
2. **Select the cable cross section** for that current, for the length of the cable and for the conditions where it is run. Use the cable manufacturer's data on current carrying capacity, and remember that it falls at high ambient temperature and when cables are bundled. On long runs the voltage drop decides, not the current.
3. **Select the fuse for the cable.** It shall trip before the cable is damaged, and it shall carry the normal current of the load including inrush without tripping unnecessarily. Never above 25 A.
4. **Place the fuse as close to the supply tapping point as possible.** The cable between the tapping point and the fuse is unprotected.
5. **Install with the power off on a parked vehicle, and fit the fuse last.**

Measure afterwards, not before. When everything is installed and fused you can read the actual current on the output in the XBB Configurator app and check that it matches what you expected. If it does not, dimension again.

> **WARNING** Never connect the load and switch on the power to measure the current before the cable cross section and the fuse have been selected. The circuit is then unprotected, and that is exactly the situation the fuse exists to prevent.

The fuse in the supply also protects the output cables

All current to both outputs passes through the supply fuse on pin 2. **That fuse is therefore the only protection for every cable you run from an output**, unless you fit a separate protection.

That gives two ways of doing it right:

Either the supply fuse is dimensioned for the thinnest cable connected to either output. If you run 0.5 square millimetres to a small load, the fuse is selected for that cable, not for the product's 10 A and not for the maximum of 25 A.

Or you fit a separate fuse in the branch of the output, dimensioned for that cable. The supply fuse may then be larger, but never above 25 A.

Electrically there is no minimum conductor cross section. A relay coil drawing 100 mA manages with 0.5 square millimetres, provided the fuse is selected for that cable. What decides the protection is that the fuse protects the thinnest conductor, not that the conductor is thick.

Mechanically it is another matter. A thin conductor in a vehicle is exposed to vibration, chafing and pull at connectors. Select the cross section with that in mind as well, and secure and strain relieve the wiring properly.

If the vehicle installation does not already have a fused circuit for the relay socket, a fuse holder shall be fitted on the supply conductor, pin 2, before the socket.

Never run the product without a correctly dimensioned fuse in the supply.

1.3 The current warning in the app is advisory

The product measures the current on each output and shows it in the app. If the current exceeds about 12 A on an output, a flashing warning is shown.

> **WARNING** The warning is informative only. **The product does not interrupt and does not limit the current when the warning is shown.** It continues to supply current to the load.

If you get the warning, either reduce the load or distribute it. See section 2.7 on parallel connection.

The protection against overcurrent lies in the thermal shutdown of the output circuit and in the external fuse, not in the measurement.

1.4 Mounting and location

The product is mounted in a standard 7-pin relay socket according to DIN 72552. **The socket shall be mechanically secured** to a solid base with screw, bolt or cable tie to a firm fixing point, so that the product cannot move or be damaged by vibration.

Correct mechanical fixing is also required for the built-in accelerometer to work.

Mounting in the engine compartment is permitted, provided the product is placed protected from direct water jets and from splash from below. The product is encapsulated to withstand that environment.

But the location in the engine compartment is decisive. The permitted ambient temperature range is **-30 to +80 degrees Celsius**, and an engine compartment routinely exceeds +80 degrees close to certain components.

Mount	Do not mount
In the fuse box	Near the exhaust manifold or exhaust system
On the bulkhead or inner wing	Near the turbocharger
In a place with air movement and distance from heat sources	Directly on or next to the engine block

The product must not be exposed to direct water jets or to heavy dust. It is not intended for use under water or in explosive atmospheres.

Connection in the vehicle. Connect power and ground only to the battery, power and ground points designated by the vehicle manufacturer. Install the peripheral equipment that the product controls according to that equipment's own instructions.

1.5 Electrical data for the installation

Item	Value
Vehicle electrical system	12 V, negative ground
Rated voltage	12 V DC, negative ground
Operating range	9 to 36 V DC
Outputs	Two, 10 A each
Fuse in the supply	Selected for the thinnest connected cable, maximum 25 A
Ambient temperature	-30 to +80 degrees Celsius

The product is type approved for vehicles with a 12 volt electrical system and negative ground, approval E5*10R06/03*0772*00. The operating range states what the electronics operate within.

1.6 Conformity and disposal

The product meets the applicable EU requirements. The declaration of conformity is available at **xbb.se/docs**

The product contains electronics and must not be disposed of with household waste. At end of life, take it to an approved recycling facility for electronic waste in accordance with the WEEE Directive and local regulations.

Part 2: User manual

2.1 What the product does

PP-CAN-FD is a programmable gateway for permanent installation in vehicles. It connects to the vehicle CAN bus, interprets the vehicle signals according to a configuration you choose, and controls two outputs accordingly.

It also acts as master unit for other XBB products, which it reaches over a 2.4 GHz radio link.

Typical use is control of auxiliary lights and accessories, where a load is to follow a vehicle function such as high beam or ignition.

The product is shaped like a relay and is fitted in an existing relay socket. It takes its supply, its inputs and its outputs through the same seven pins.

2.2 Connections

Pin	Function
1	CAN-L
2	9 to 36 V DC
3	CAN-H
4	Analog input
5	Output 2, 10 A
6	Ground
7	Not used
8	Output 1, 10 A

The pin numbers are marked on the enclosure. Check the connection against the marking on the product before running the cables.

2.3 Technical data

Item	Value
Standby current	3 to 5.4 mA
Operating current with CAN communication	15 mA
Frequency band	2402 to 2480 MHz
Maximum transmitted power	+4 dBm
Enclosure material	PA66
Weight	40 grams
Connection	7-pin relay socket DIN 72552
Functions	CAN, CAN FD, 2.4 GHz radio link, voltage monitoring, three-axis accelerometer, analog input, two outputs 10 A, fully programmable

2.4 Getting started

Download the app. XBB Configurator is available on the App Store and Google Play. Create an account according to the instructions in the app. Registration is required to meet EU requirements, among them on cyber security. Data retrieved from the vehicle may contain personal data, but does not always.

Fit the relay socket according to section 1.4 and fuse the supply according to section 1.2.

Connect the vehicle's CAN conductors to the correct pins according to section 2.2.

The product is supplied with a factory test configuration that checks all hardware functions. If you tap the unit you see the accelerometer value in real time in the app.

2.5 Connecting to the product

The product is visible over the radio link **only for about ten minutes after power on**. If more time has passed, interrupt and reconnect the supply by pulling and refitting the fuse.

In the app you can pair the product with your phone. Once paired, only that phone has access, and the link is encrypted.

About the radio link and your data. A radio link could in principle be used to track units. Here it is used only to transfer data between the phone, the product and connected modules.

2.6 Configuration

Remove the test configuration in the app and switch on the vehicle ignition. Then select a configuration that suits your vehicle model. After uploading, check that the desired signals and functions work as intended.

Be particularly careful if the signal IGNITION is part of the configuration. Check that it follows the vehicle's ignition cycle. It is the signal that puts the product into sleep mode and switches off the CAN communication with the vehicle.

If the signal SYSTEM_ACTIVE is included, it shall count down to zero when the ignition has been switched off. That eventually switches off the CAN communication, so that the product does not disturb the vehicle when it is switched off.

The configurations are written in the programming language **TSharkRex**. You can write your own at **xbb-code.com**, for example by starting from an existing one and adapting it.

2.7 The outputs

Each output supplies up to 10 A and the current is shown continuously in the app.

If you need to drive a load that exceeds the capacity of one output you can connect both outputs to the same load, so that they share the current. The two output stages are identical.

Read section 1.3 on the current warning before using the outputs close to their limit.

2.8 Connecting more modules

Up to three XBB products can be connected to PP-CAN-FD at the same time.

Add the desired module in the app, for example a PowerUnit. If you have fitted a PowerUnit in the engine compartment to switch on auxiliary lights when the high beam is on, select the signal HIGHBEAM for the intended output on the PowerUnit. If you only want to use the product's own outputs, connect the load there instead.

Check the signal strength between the units by reading the RSSI value under the tab of each module in the app.

2.9 During use

The product can remain in the vehicle CAN bus permanently.

Remove the product during over-the-air software updates of the vehicle's own systems, and if the vehicle is to be left unused for a longer period, for example two weeks or more.

The system only needs to be installed once, since the product retains its settings. After a power interruption it reconnects the whole system within two to four seconds.

Support

Innoware Development AB, Hyttvägen 13, 733 38 Sala, Sweden **support@xbb.nu** — **www.xbb.se**

Edition	Date
Revision 01, translation of the Swedish original revision 04 of 2026-08-13	2026-08-26
Revision 02, 1.4: Connection in the vehicle	2026-11-07