



GLOBAL BRIDGE TECHNOLOGY

GBT10
OEM USER MANUAL

Table of Contents

1.	Product Overview.....	3
2.	Product Models.....	3
3.	External Interface.....	3
3.1	M12 Connector.....	3
3.2	USB-C Communication.....	4
4.	LED Indicators.....	4
4.1	Status LED.....	4
4.2	Power On LED.....	5
5.	WiFi & Bluetooth.....	5
5.1	WiFi.....	5
5.2	Bluetooth.....	5
6.	GPS.....	5
7.	Accelerometer.....	5
8.	Power Supply.....	5
9.	FCC Statement.....	6
9.1	Federal Communication Commission Interference Statement.....	6
9.2	FCC Caution.....	7
9.3	FCC Radiation Exposure Statement.....	7
9.4	OEM Notice.....	7

1. Product Overview

Global Bridge Technology Model GBT10 is an IOT (Internet of Things) Device that can be used to implement telematics application such as the Federal Motor Carrier Safety Administration (FMCSA) Hours of Service (HOS) requirements. It connects to vehicle's Electronic Control Module (ECM) based on CAN Bus. It supports J1939 and OBDII standards. Included RS485 Bus supports PROFIBUS DP, Modbus RTU and J1708/J1587 by appropriate firmware change. Digital I/Os, UART and USB-C can also interface with GBT10.

GT10 is designed based on Espressif Systems ESP32-S3-WROOM module and has integrated WiFi/BLE, Memory, SPI, UART and GPIO interfaces. It also has GPS module that has integrated Antenna to collect Location Data. An Accelerometer allows collection of Motion, Impact and Vibration data.

These Peripherals allow GBT10 to perform various functions with appropriate firmware. Some of these peripherals may not be installed if their function is not required without affecting the overall function, performance and regulatory (FCC) requirements.

GT10 also has a USB Type-C and BC1.2 charging port controller that can source 5V@3A power to charge external devices such as Phone, Tablet or a Computer.

2. Product Models

Without any change in Hardware and RF power output to the Base Model GBT10, with appropriate firmware change, various Models Numbers with different functions can be realized as shown below..

Base Model: GBT10

Derived Model: GBT10-XXXXX

XXXX: Upto 5-digit alphanumeric

1. GBT10-ELD for FMCSA HOS requirements.

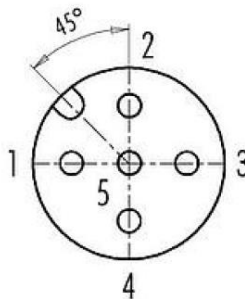
3. External Interfaces

3.1 M12 Connector

Depending on the required peripherals interface, M12 with 5, 6, 8 or 12 pins can be used. Check the user manual for correct pin connections for the particular model.

a. Power & CAN BUS Connector

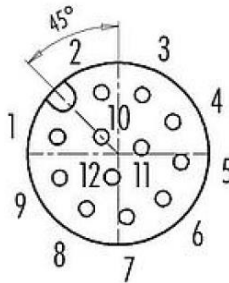
GBT10 uses a standard single 5 Pin M12, A-coded, Female connector for external CAN Bus interface & Power Input.



PIN	FUNCTION	DESCRIPTION
2	POWER IN	4 - 17V DC
3	POWER GROUND	0V
4	CAN HIGH	J1939/OBDII
5	CAN LOW	J1939/OBDII
1	DRAIN	CAN Bus Shield

b. Power, CAN & RS-485 BUS and D I/O Connector

If more interface pins are required for simultaneous access to multiple interfaces, 12 Pin M12, A-coded, female connector can be used.



PIN	FUNCTION	DESCRIPTION
1	POWER IN 1	4 - 17V DC for SYSTEM
2	POWER GROUND 1	Ground for SYSTEM
3	CAN HIGH	J1939/OBDII
4	CAN LOW	J1939/OBDII
5	DRAIN	CAN Bus Shield
6	RS-485 A	Differential Serial BUS
7	RS-485 B	Differential Serial Bus
8	POWER IN 2	+5V DC for RS-485
9	POWER GROUND 2	Ground for RS-485
10	DIGITAL OUTPUT	Open Drain Output
11	DIGITAL INPUT	12V DC
12	DIGITAL I/O	Ground for System

3.2 USB-C Communication

For Programming and Debugging, a USB-C connector is provided to communicate with USB 2.0 compliant equipment such as Personal Computer, Laptop and Smart Phone. This connector can't source USB power to the connecting devices. This port is not accessible by the end user.

4. LED Indicators

4.1 Status

It is a multi-colored LED to indicate various operating conditions of GBT10.

LED COLOR	LED STATE	INDICATION
Yellow	On	GPS Signal Unavailable

Blue	On	No communication with a paired Device
Red	On	No communication on CAN BUS
Green	On	System Normal
White	On	Over-the-Air (OTA) Firmware Update

If multiple malfunctions exist, the Status LED will cycle through all the conditions every five second interval.

4.2 Power On

This LED is Green when System Power is on.

5. WiFi & Bluetooth

GBT 10 incorporates WiFi and Bluetooth for communication with external devices.

5.1 WiFi

Features:

- Complies with 802.11b/g/n.
- Bit rate: 802.11n up to 150Mbps.-
- Center frequency range of operating channel: 2412 ~ 2484 MHz.
- WiFi RF Transmitter (TX) Power: 20.5dBm typical

5.2 Bluetooth

Features:

- Bluetooth LE: Bluetooth 5, Bluetooth Mesh.
- Speed: 125 Kbps, 500 Kbps, 1 Mbps, 2Mbps.
- Center frequency range of operating channel: 2412 ~ 2480 MHz.
- BLE RF Transmitter (TX) Power: 20dBm typical

6. GPS

GBT 10 incorporates GPS MODULE with an embedded antenna. Features:

- Multi-GNSS engine for GPS, GLONASS , BDS , Galileo and QZSS, ensuring fast and accurate fix in any environment.
- Sensitivity: -166 dBm during tracking and -147 dBm during acquisition.
- Integrated patch antenna or external antenna.

7. Accelerometer

GBT10 incorporates an accelerometer with $\pm 2g/\pm 4g/\pm 8g/\pm 16g$ dynamically selectable full scale and an embedded temperature sensor. It can be used to monitor

- Motion activated functions
- Free-fall detection
- Impact recognition and logging
- Vibration monitoring and compensation

8. Power Supply

GBT10 has a standard USB Type-C port controller functionality including Configuration Channel (CC) logic for 3-A and 1.5-A current advertisement. BC 1.2 integration provides the required electrical signatures

necessary for non-Type-C, legacy USB devices that use USB data line signaling to determine USB port current sourcing capabilities.

USB Operating Modes Table

PORT TYPE	SUPPORTS USB 2.0 COMMUNICATION	MAXIMUM ALLOWABLE CURRENT DRAWN BY PORTABLE EQUIPMENT (A)
SDP (USB 2.0)	YES	0.5
SDP (USB 3.0 and 3.1)	YES	0.9
CDP	YES	1.5
DCP	NO	1.5
TYPE-C	YES	3.0

Integrated protection features include

- Cycle-by-cycle current limit.
- Hiccup short-circuit protection.
- Under voltage lockout.
- VBUS overvoltage and overcurrent.
- CC overvoltage and overcurrent.
- Data line short-to-VBUS.
- Die over temperature protection. Two LEDs are provided to monitor the health of USB-C Power Source.
- Reverse Polarity Protection.
- Over current protection with a resettable fuse.
- Power line noise filtration.
- Transient Voltage Suppression with a 7000 W peak pulse power capability at 10/1000 μ s waveform, repetition rate (duty cycles):0.01 %.

Two LEDs indicate various fault and warning conditions.

Fault and Warning Conditions

FAULT	THERMAL WARNING	EVENT
 ON (RED)		Overcurrent on OUT
 ON (RED)		Overvoltage on BUS
 ON (RED)		Overvoltage on the data lines
 ON (RED)		Overvoltage on CC lines
 ON (RED)		Overcurrent on CC lines when supplying VCONN
	 ON (RED)	External over temperature detection

9. FCC Statement

9.1 Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful

interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

9.2 FCC Caution

Any change or modification not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause Undesirable operation.

9.3 FCC Radiation Exposure Statement

This product complies with the US portable RF exposure limit set forth for an uncontrolled environment and are safe for intended operation as described in this manual. The further RF exposure reduction can be achieved if the product can be kept as far as possible from the user body or set the device to lower output power if such function is available.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

This equipment should be installed and operated with a minimum distance of 20cm (8 in) between the radiator and your body.

9.4 OEM Notice

This device is intended only for OEM integrators under the following conditions:

1. The transmitter module may not be co-located with any other transmitter or antenna.

As long as 1 condition above is met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end product for any additional compliance requirements required with this module installed.

IMPORTANT NOTE

In the event that these conditions can't be met (e.g. certain tablet, laptop or mobile phone configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can't be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.