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ASTUS QC25 - HARDWARE USER GUIDE

Rev. 0

2021-12-06

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DOCUMENT HISTORY

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1 Copyright Notice and Disclaimer

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2 Support

If you have any questions, you may contact Astus Support:

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Email: support@astus.com

Or visit our web site: www.astus.com

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Canada

3 Product Description

The Astus QC25 is an advanced telemetry tracking device with embedded GPS/GNSS and mobile cellular communication capabilities. It possesses the following features:

- Powered from 12V or 24V vehicle (8 to 33Vdc)
- Delivered with one of the following cellular modem:
  - QC25 WW BLE (worldwide): LTE 4G Cat-M1/NBIoT and 2G fallback
  - QC25 NA1 BLE (North America): LTE 4G-Cat1 and 3G fallback
  - QC25 EU1 BLE (Europe): LTE 4G-Cat1 and 2G fallback
- GNSS module with simultaneous GPS and Glonass satellite tracking
- One I/O that can be set as an input (0 – 32 Vdc) or output (set to GND when enabled)
- 1 x CAN interface for connection to the vehicle OBD2 or J1939 bus.
- 1 x CAN interface for connection to a second bus (vehicle or future Astus expansion devices)
- Internal 500 mA Li-ion battery (optional)
- Works from -40 Celsius to +85 Celsius[1]
- OBD2 main connector
- Auxiliary connector (optional)

[1] Within the enclosure.

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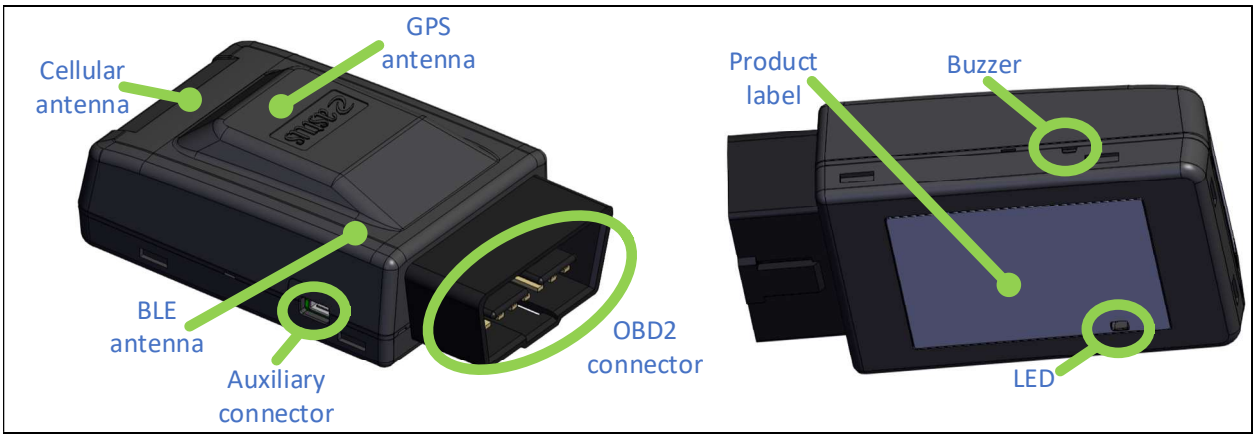

Figure 1 - Main Elements of the QC25

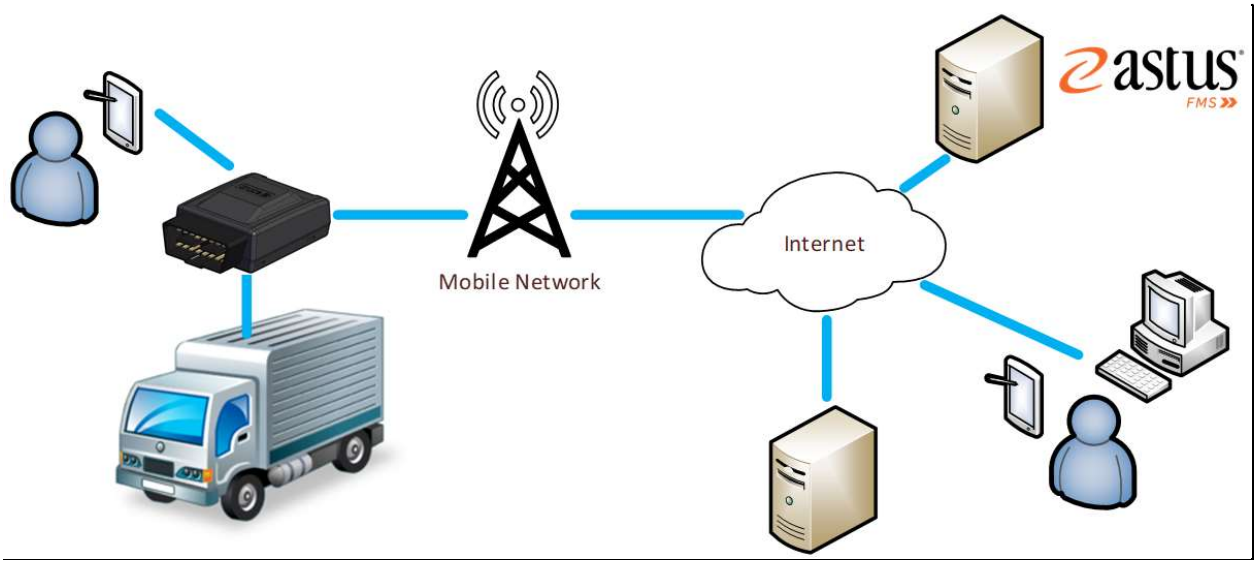

Figure 2 - Astus Telematic Architecture

1. The QC25 collects telemetry, diagnostic and localization data from vehicle.
2. The Data is communicated over a cellular network then the internet to Astus servers.
3. The Astus server analyses module data and presents real-time information, reports and alerts.
4. The fleet owner/operator consults information from Astus application or Web portals. Alternately, other computer systems may obtain data from Astus Web services.

4 Installation

4.1 Safety and General Considerations

1. Do not connect the QC25 directly to the vehicle's OBD2 port or install the product in a location if it interferes with the driving or safety of the driver and passengers.
2. The QC25 must be kept away from any source of heat, high humidity or possible liquid spills (eg coffee). The ambient temperature should be in the range -20 Celsius to +60 Celsius when the QC25 is equipped with a battery and -40 Celsius to +70 Celsius without the battery.
3. Do not fix the QC25 on harnesses, hoses, pipes or heater ducts.
4. Do not fix the QC25 near radios or the vehicle’s audio system where it can create interferences.
5. For optimal GPS reception, position the QC25 so that its GPS antenna (Figure 1) faces the sky. Avoid metal surfaces above the antenna.

4.2 Connecting directly to the vehicle’s OBD2 port

1. Make sure the vehicle’s engine is turned OFF (vehicle’s key removed from the keyhole) for at least 2 minutes.
2. Connect the QC25 to the vehicle’s OBD2 port.

Figure 3 - OBD2 from vehicle (example)

Do not connect the QC25 directly to the vehicle's OBD2 port if it interferes with the driving or the safety of the driver and the passengers. See section 4.3 for other installation options.

3. Secure the QC25 to the OBD2 connector using a tie wrap.

Figure 4 - Suggested place (in green) to hold back with a tie wrap

4.3 Use of a connection harness

An Astus harness can be used if:

- The vehicle does not have an OBD2 port.
- The direct connection to the OBD2 port is not secure.
- The QC25 must be hidden.
- The QC25 must be installed in a more optimal area.
- To connect a 2nd CAN to the QC25.
- To use the I/O of the QC25.

ETL-1700-0083 (Universal OBD2 Y harness)

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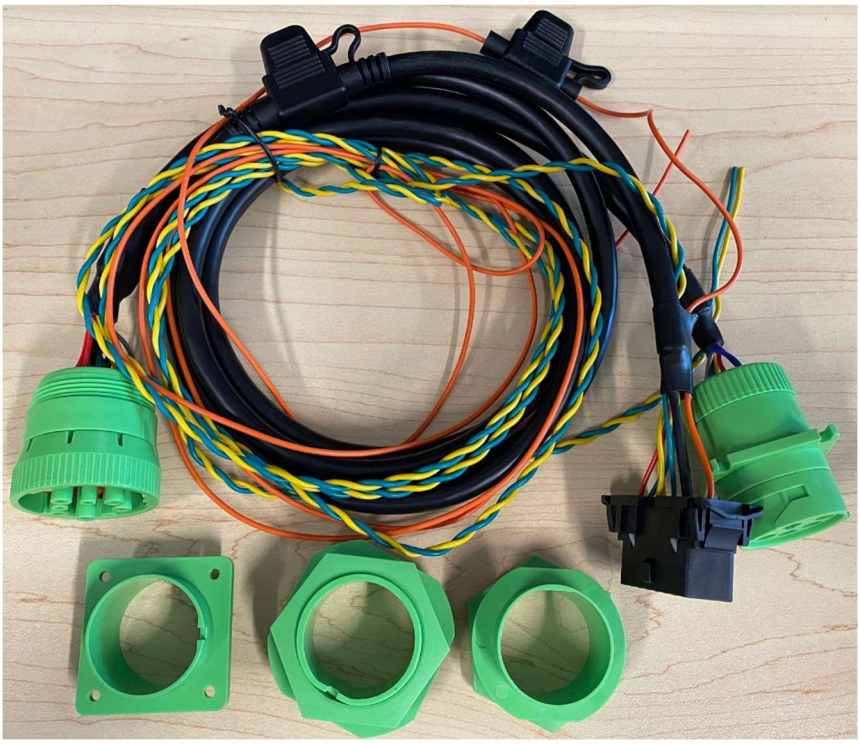
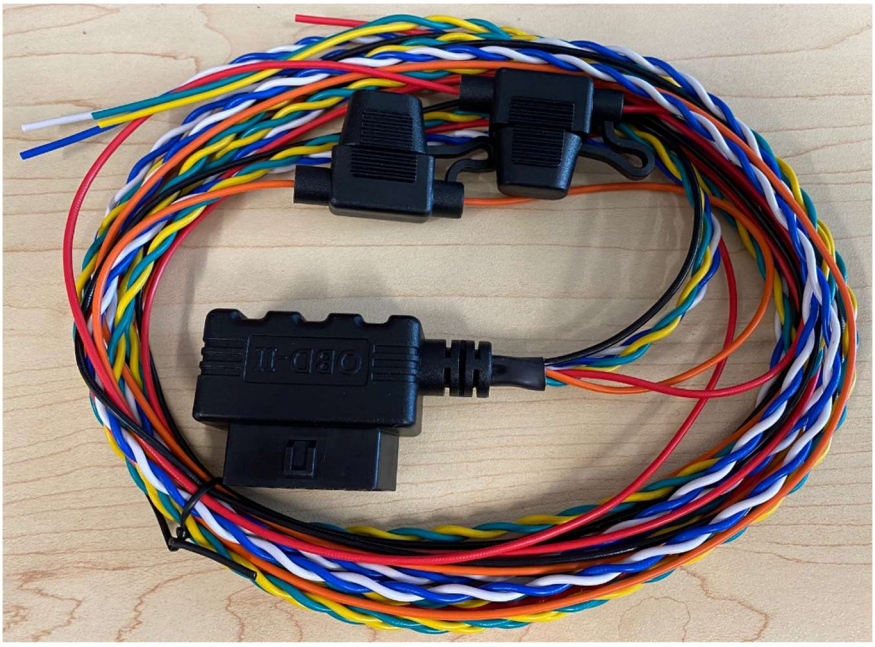
ETL-1700-0084 (Universal J1939 Y harness)



Harness ETL-1700-0090 (OBD2 to wires harness)



4.4 Connecting the 2nd CAN

Connecting the 2nd CAN is only possible with harnesses described in Section 4.3.
The 2nd CAN must be enabled in the QC25 (usually shipped pre-configured).

1. Connect the yellow[2] wire from the harness to the CAN High signal from the vehicle.
2. Connect the green[3] wire from the harness to the CAN Low signal from the vehicle.
3. When connecting the wires, use a soldering iron and use heat shrink tubes or electrical tape to protect the connections.

4.5 Connecting the I/O

Connecting the I/O is only possible with harnesses described in Section 4.3.
The I/O must be enabled in the QC25 (usually shipped pre-configured).

1. Connect the orange wire from the harness to the signal (if set as an input) or to the accessory to control (if set as an output).
2. When connecting the wire, use a soldering iron and use a heat shrink tube or electrical tape to protect the connection.

5 Testing the installation

If the malfunction indicator light (MIL) or the check engine light turns ON while testing the installation, please stop the engine, remove the QC25 and contact the Support for further information.

1. Connect the QC25 to the vehicle's OBD2 port or to the Astus harness.
2. Start the engine.
3. On the QC25, locate the bi-color LED.
4. The QC25 should establish the CAN bus connection, connect to the remote Astus server and obtain valid GPS positions in 5 minutes or less. The LED should then flash in green 4 times in 4 seconds. See the following table below for all possible LED patterns.

[2] 2nd CAN pair is yellow/green for harnesses ETL-1700-0083 and ETL-1700-0084.
[3] 1rst CAN pair is yellow/green and 2nd CAN pair is white/blue for ETL-1700-0090.

Pattern	Description
OFF	The QC25 has
Flash red 4x / 4 sec	SIM card not detected.
Flash red 2x / 4 sec	No cell carrier detected
Flash red 1x / 4 sec	Cell carrier detected, no data connection
Flash green 1x / 8 sec	Not in route, not connected
Flash green 1x / 4 sec	Try to connect
Flash green 2x / 4 sec	Connected to the Astus remote server
Flash green 3x / 4 sec	Same as above + GPS position is valid
Flash green 4x / 4 sec	Same as above + CAN bus connection established

After 5 minutes of operation, the LED will automatically turn OFF. To re-enable the LED, disconnect the QC25 from the vehicle's OBD2 port or from the harness, then re-connect.

6 Regulatory Information

6.1 FCC

6.1.1 Compliance Statement - Part 15.19

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, and
2. this device must accept any interference received, including interference that may cause undesired operation.

Warning - Part 15.21

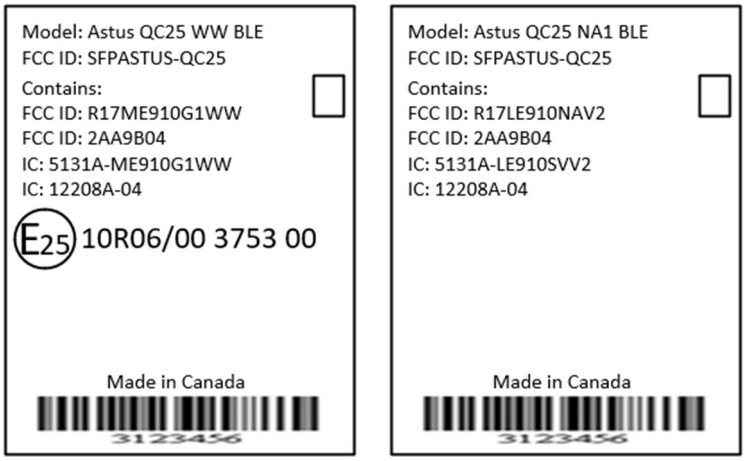
Any changes or modifications to this equipment not expressly approved by Astus Inc. may cause harmful interference and void the user's authority to operate this equipment.

FCC Interference Statement - Part 15.105.b

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 instruction, 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 interference by one or more of the following measures:

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



6.2 IC

6.2.1 Compliance Statement

Notice: This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:

1. this device may not cause harmful interference, and
2. this device must accept any interference received, including interference that may cause undesired operation.

Industry Canada ICES-003 Compliance Label: CAN ICES-3 (B) / NMB-3 (B)

For product QC25 WW BLE, contains IC: 5131A-ME910G1WW and 12208A-04
For product QC25 NA1 BLE, contains IC: 5131A-LE910SVV2 and 12208A-04

6.2.2 Déclaration de conformité

Avis: Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

1. L'appareil ne doit pas produire de brouillage, et
2. L'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Étiquette de conformité à la NMB-003 d'Industrie Canada: CAN ICES-3 (B) / NMB-3 (B).

Pour le produit QC25 WW BLE, contient IC: 5131A-ME910G1WW et 12208A-04
Pour le produit QC25 NA1 BLE, contient IC: 5131A-LE910SVV2 and 12208A-04

6.3 European ECE Approval

6.3.1 Compliance Statement

The following products complies with the ECE Regulation R10

- QC25 EU1 BLE
- QC25 WW BLE

Approval E-Mark No: E25 10R06/00 3753 00

6.3.2 Déclaration de conformité

Les produits suivants sont conformes avec ECE règle 10 :

- QC25 EU1 BLE
- QC25 WW BLE

Approbation marquage E No: E25 10R06/00 3753 00