



Au Gateway 1 (GW1) User Manual

Rev. B June, 2021

Au Gateway 1 (GW1) is an electric gauge gateway equipment. It connects traditional pulse-driven tachometers and speedometers through J1939 or J1708/J1587 or OBD2-CAN bus. It converts received digital format of "engine speed" and "vehicle speed" information to traditional style pulse signals. In turn, the pulse signals drive the traditional tachometers and speedometers. Overall, it offers a cost-effective gauge-driven solution for modern electric-controlled engines.



Figure 1 Au Gateway1 (GW1)

Features

- Nominal Power Supply: +12V or +24V DC
- Operating Electric current: 65mA typical, 250mA max
- Operating Temperature: -40°F to 185°F (-40°C to 85°C)
- TVS (Transient Voltage Suppressor) protection
- Size: 3-1/8"L x 1-11/16"W x 13/16" H (78mm x 42mm x 21mm)
- Enclosure Color: Black and Translucent Red
- One communication LED indicator
- Drive standard pulse-driven tachometers and speedometers
- Configurable tachometer pulse rate
- 12 editions to choose from for different electronic engines and equipment applications including SAE J1939 CAN network, J1708/J1587 network, or OBD2-CAN network
- OBD2-CAN Protocols: SAE J1979, SAE J1979-2; ISO15031, ISO 27145, ISO 15765;
- RS232 side DB9 female connector(115.2K baud rate): for data monitoring and device configuration.
- BUS side DB9 male connector : for power, network, and pulse output.
 - 1: GND (Black)
 - 2: Speedometer pulse output (Blue)
 - 3: Reference ground for tachometer and speedometer (Grey)
 - 4: Tachometer pulse output (White)
 - 5: Power supply (Red)
 - 6: CAN-L (Green)
 - 7: CAN-H (Yellow)
 - 8: J1708-B- (Brown)
 - 9: J1708-A+(Purple)

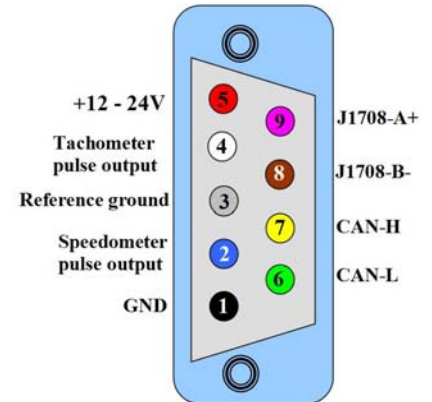


Figure 2 BUS side DB9 male connector pin-out

12 Editions of GW1

Product	Part #
J1939 bus to Tachometer pulse output	GW1-J1939-001
J1939 bus to Speedometer pulse output	GW1-J1939-002
J1939 bus to Tachometer and Speedometer pulse output	GW1-J1939-003
J1708/J1587 bus to Tachometer pulse output	GW1-J1708-001
J1708/J1587 bus to Speedometer pulse output	GW1-J1708-002
J1708/J1587 bus to Tachometer and Speedometer pulse output	GW1-J1708-003
OBD2-CAN bus to Tachometer pulse output	GW1-OBD2-001
OBD2-CAN bus to Speedometer pulse output	GW1-OBD2-002
OBD2-CAN bus to Tachometer and Speedometer pulse output	GW1-OBD2-003
J1939, J1708/J1587, and OBD2-CAN bus to Tachometer pulse output	GW1-COMBO-001
J1939, J1708/J1587, and OBD2-CAN bus to Speedometer pulse output	GW1-COMBO-002
J1939, J1708/J1587, and OBD2-CAN bus to Tachometer and Speedometer pulse output	GW1-COMBO-003

Hardware Connection for GW1

Au GW1 is a handheld gateway device. It can run independently without a computer.

On the RS232 side, Au Gateway 1 (GW1) can be connected to a computer through a USB to RS232 convert cable (part #: CBL-USB-01). Please note that PC toolset is used only for configuration purposes (e.g. "cylinder number" or "Hz vs. MPH"). Computer is not necessary during general use.



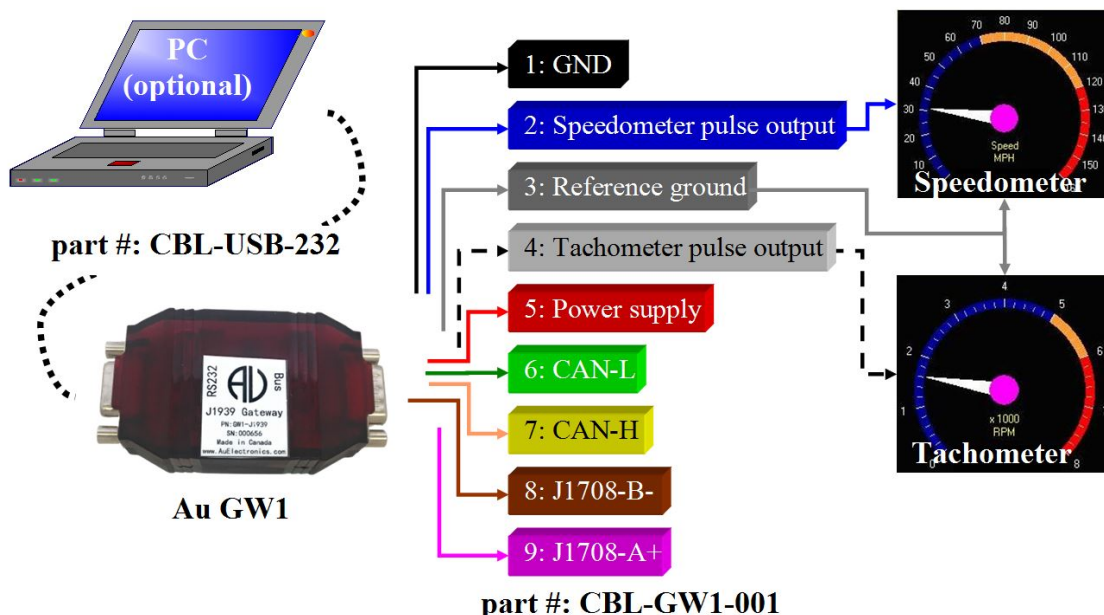


Figure 3 GW1 hardware connection

On the Bus side, a cable (part #: CBL-GW1-001) connects GW1 to power supply, J1939, J1708, OBD2-CAN bus, tachometer, and speedometer. **Note:** All devices must use the same reference ground.

Output signal - Engine RPM (for Tachometer)

For GW1-J1939-001 or GW1-J1939-003, Engine RPM is from the J1939 bus.

For GW1-J17089-001 or GW1-J1708-003, Engine RPM is from the J1708 bus.

For GW1-OBD29-001 or GW1-OBD2-003, Engine RPM is from the OBD2-CAN bus.

For GW1-COMBO-001 or COMBO-003, Engine RPM may come from either J1939, J1708, or OBD2-CAN bus. If multiple signals from different networks co-exist, the priority descends in the sequence of J1939 > J1708 > OBD2-CAN.

An amplitude of +5V square-wave pulse will output to engines with specific cylinder numbers.

The default factory setting of the tachometer pulse output rate for GW1 is four-cylinder engines (4 strokes).

The valid range of engine speed (input and output) is from 0 RPM to 8031.75 RPM (J1939) or from 0 RPM to 16383.75 RPM (J1708/J1587, OBD2-CAN).

Au GW1 can be configured in-field to specific cylinder numbers (1 to 12) for different tachometers using the Au GW1 Toolset. First, power up Au GW1, connect it to a PC through a USB to RS232 convert cable (part #: CBL-USB-232). Install the GW1 toolset software on the PC, then change the cylinder number (from 1 to 12) on the Au GW1 Toolset, as shown in the following picture.

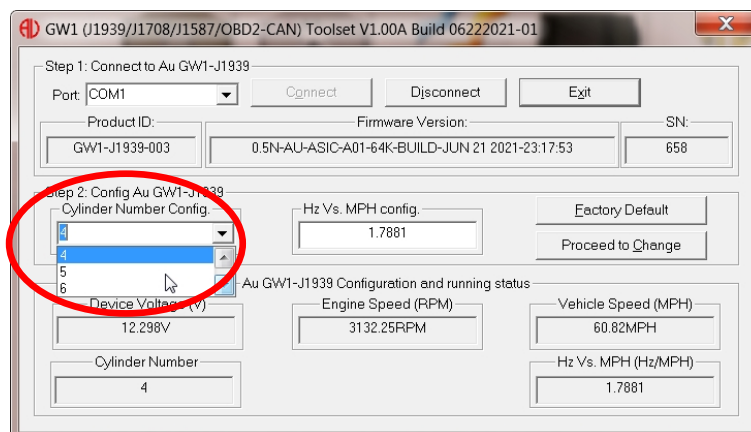


Figure 4 Configure cylinder number using GW1 Toolset

To download the Au GW1 toolset, please visit our website at https://www.auelectronics.com/downloads/software_gw1.zip.

Output signal - Vehicle Speed (for Speedometer)

For GW1-J1939-002 or GW1-J1939-003, Vehicle Speed is from the J1939 bus.

For GW1-J1708-002 or GW1-J1708-003, Vehicle Speed is from the J1708 bus.

For GW1-OB2-002 or GW1-OB2-003, Vehicle Speed is from the OB2-CAN bus.

For GW1-COMBO-002 or COMBO-003, Vehicle Speed may come from either J1939, J1708, or OB2-CAN bus. If multiple signals from different networks co-exist, the priority descends in the sequence of J1939 > J1708 > OB2-CAN.

An amplitude of +5V square-wave pulse will output at approximately 1.7881 Hz per MPH. For example, a 107.286 Hz ($60 \times 1.7881 = 107.286$) pulse output means a 60 MPH vehicle speed.

The default factory setting of the Speedometer pulse output rate for GW1 is "1.7881Hz/MPH".

Valid Vehicle Speed (input and output) is from 0.1 MPH to 155.96 MPH (J1939) from 0.1 MPH to 127.5 MPH (J1708/J1587) or from 0.1 MPH to 158.45 MPH (OB2-CAN).

GW1 can be configured in-field to a specific Hz vs. MPH for different speedometers.

To configure GW1 Hz vs. MPH, open the GW1 toolset software on the PC, then change the Hz vs. MPH value on the Au GW1 toolset as shown in Figure 5.

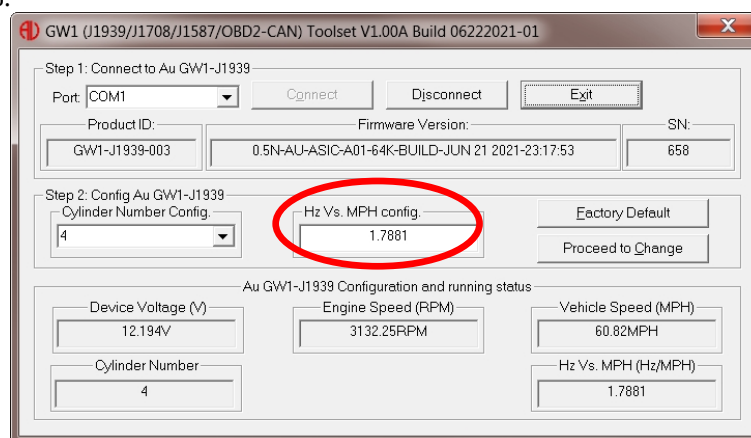


Figure 5 Configure Hz Vs. MPH using GW1 Toolset

License Upgrade

For Au J1939 GW1:

- J1939 GW1 with Tachometer pulse output (part# GW1-J1939-001) can upgrade to support both Tachometer and Speedometer pulse output (GW1-J1939-003). The part number for this license upgrade code is LIC-GW1-001
- J1939 GW1 with Speedometer pulse output (part# GW1-J1939-002) can upgrade to support both Tachometer and Speedometer pulse output (GW1-J1939-003). The part number for this license upgrade code is LIC-GW1-001
- J1939 GW1 with Tachometer pulse output (part# GW1-J1939-001) can also upgrade to support Combo GW1 (GW1-COMBO-001) that can take RPM signal inputs from either J1939, J1708, or OB2-CAN bus. The part number for this license upgrade code is LIC-GW1-003
- J1939 GW1 with Speedometer pulse output (part# GW1-J1939-002) can upgrade to support Combo GW1 (GW1-COMBO-002) that can take Vehicle Speed signal inputs from either J1939, J1708, or OB2-CAN bus. The part number for this license upgrade code is LIC-GW1-003
- J1939 GW1 with Speedometer and Tachometer pulse output (part# GW1-J1939-003) can upgrade to support Combo GW1 (GW1-COMBO-003) that can take Vehicle Speed and RPM signal inputs from either J1939, J1708, or OB2-CAN bus. The part number for this license upgrade code is LIC-GW1-003.

For Au J1708 GW1:

- J1708 GW1 with Tachometer pulse output (part# GW1-J1708-001) can upgrade to support Tachometer and Speedometer pulse output (GW1-J1708-003). The part number for this license upgrade code is LIC-GW1-001
- J1708 GW1 with Speedometer pulse output (part# GW1-J1708-002) can upgrade to support both Tachometer and Speedometer pulse output (GW1-J1708-003). The part number for this license upgrade code is LIC-GW1-001
- J1708 GW1 with Tachometer pulse output (part# GW1-J1708-001) can upgrade to support Combo GW1 (GW1-COMBO-001) that take RPM signal inputs from J1939, J1708, or OB2-CAN bus. The part number for this license upgrade code is LIC-GW1-003



- Ý J1708 GW1 with Speedometer pulse output (part# GW1-J1708-002) can also upgrade to support Combo GW1 (GW1-COMBO-002) that take Vehicle Speed signal inputs from either J1939, J1708, or OBD2-CAN bus. The part number for this license upgrade code is LIC-GW1-003
- Ý J1708 GW1 with Speedometer and Tachometer pulse output (part# GW1-J1708-003) can upgrade to support Combo GW1 (GW1-COMBO-003) that can take Vehicle Speed and RPM signal inputs from either J1939, J1708, or OBD2-CAN bus. The part number for this license upgrade code is LIC-GW1-003

For Au OBD2 GW1:

- Ý OBD2 GW1 with Tachometer pulse output (part# GW1-OB2-001) can upgrade to support both Tachometer and Speedometer pulse output (GW1- OBD2-003). The part number for this license upgrade code is LIC-GW1-001
- Ý OBD2 GW1 with Speedometer pulse output (part# GW1-OB2-002) can upgrade to support both Tachometer and Speedometer pulse output (GW1-OB2-003). The part number for this license upgrade code is LIC-GW1-001
- Ý OBD2 GW1 with Tachometer pulse output (part# GW1-OB2-001) can also upgrade to support Combo GW1 (GW1-COMBO-001) that can take RPM signal inputs from either J1939, J1708, or OBD2-CAN bus. The part number for this license upgrade code is LIC-GW1-003
- Ý OBD2 GW1 with Speedometer pulse output (part# GW1-OB2-002) can also upgrade to support Combo GW1 (GW1-COMBO-002) that could take Vehicle Speed signal inputs from either J1939, J1708, or OBD2-CAN bus. The part number for this license upgrade code is LIC-GW1-003
- Ý OBD2 GW1 with Speedometer and Tachometer pulse output (part# GW1-OB2-003) can upgrade to support Combo GW1 (GW1-COMBO-003) that can take Vehicle Speed and RPM signal inputs from either J1939, J1708, or OBD2-CAN bus. The part number for this license upgrade code is LIC-GW1-003

For Au Combo GW1:

- Ý Combo GW1 with Tachometer pulse output (part# GW1-COMBO-001) can upgrade to support both Tachometer and Speedometer pulse output (GW1-COMBO-003). The part number for this license upgrade code is LIC-GW1-002
- Ý Combo GW1 with Speedometer pulse output (part# GW1-COMBO-002) can upgrade to support both Tachometer and Speedometer pulse output (GW1-COMBO-003). The part number for this license upgrade code is LIC-GW1-002

The license upgrade flow chart for Au GW1 is showing in Figure 6.

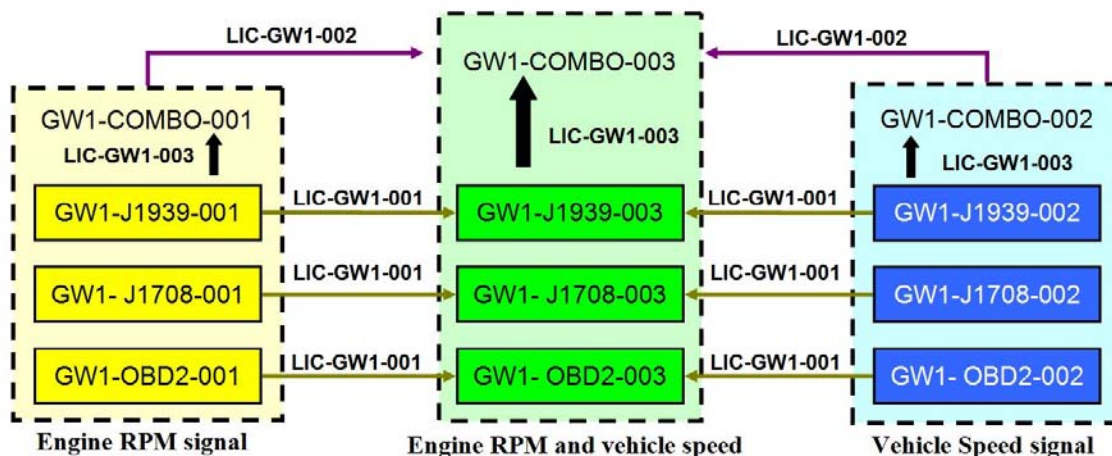


Figure 6 License Upgrade flow chart for 12 editions of Au GW1

To order a license upgrade code, please visit our website at <https://www.auelectronics.com/System-GW1-J1939.htm>. In the above link, a video demonstrates the license upgrade procedure.