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Symptom/Vehicle Issue: Security Gateway (SGW) Module Theory and Operation

Discussion: The SGW module is designed to block any messages from aftermarket components and/or malicious software which requests an action or output from a module and/or the vehicle. If these types of messages are received by the SGW from these sources, the SGW will not set any fault codes, or provide any indication the messages were blocked. The SGW will allow "View Only" access to any aftermarket components and/or software. The SGW is essentially the network Firewall.

The Data Link Connector (DLC) and Radio are considered the "Public" side of the network, and the CAN C and CAN Interior High Speed (IHS) are considered the "Private" side. The SGW divides these networks. The SGW receives signals, processes the signals, and then transmits the signals. There are no hardwired links from the DLC and Radio, to the CAN C or CAN IHS. Anytime a signal requesting an operation to be performed is received from the DLC or the Radio, the SGW will need to authenticate the requestor and the command. Once the signal is authenticated the SGW will send the request to the CAN C or CAN IHS.

Potential Failure Modes Related to the SGW

If the SGW is not communicating, or if there is a wiring issue between the SGW and the Radio (the public side), the Radio may appear to be inoperative. Since the SGW is not communicating there are no bus signals transmitted to the radio. The radio will not receive the wake-up commands and will remain powered off, or roughly 5 minutes after the failure, the radio will turn off due to not receiving signals. When the topology is viewed in wiTECH 2.0, all modules will be shown as not communicating (RED) if the SGW is not communicating.

If the failure is on the private side of the network (CAN IHS, the amp side), the radio will be on and there will be no audio output. If the vehicle is not equipped with an amp, there will be sound, but the radio will turn off after about 5 minutes.

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Note: Radio's not powering up or shutting off may not be radio issue. Thorough diagnostics should be conducted to ensure the root cause of failure is identified. Failure to complete a thorough diagnosis may lead to improper repairs.

On the BG (2018 500L) / Atlantis Architecture vehicles, the Fused Battery + is shared between the DLC pin 16 and the SGW. If the fuse is open, the SGW will be inoperative. Due to no power supply on pin 16 at the DLC there will be no communication possible with wiTECH 2.0 (The radio will also not power up). Current available information indicates the Powernet and Compact US Wide (CUSW) platforms will have separate fused circuits

When logged into wiTECH 2.0 and the MicroPOD II/vehicle is not identified, verify if the light on the micro pod is illuminated/flashing. Reference the MicroPOD II light sequences below for the status of establishing connection and making the vehicle visible on wiTECH 2.0:

- No light - The MicroPOD II has not powered up
- Solid Green Light - The MicroPOD II has power. If the solid green light remains and never starts flashing, verify if the MicroPOD II is configured for wiTECH 1.0.
- Fast Flashing Green Light - Looking for internet connection.
- Slow Flashing Green Light - Internet found, establishing connection to the wiTECH 2.0 server.
- Railroad Green / Red - the MicroPOD II has connected to the wiTECH 2.0 server and is accessible when logging in to wiTECH 2.0.

The CAN C, CAN C2, and the CAN IHS modules will not set fault codes due to an inoperative SGW. As far as these networks are concerned, during normal operation they do not rely on any information from the SGW. If the modules on the CAN C, CAN C2, and CAN IHS require information from the radio, they will set loss of com faults for the radio if the SGW fails.

The SGW only reports one Diagnostic Trouble Code (DTC) for a given CAN bus type without indicating whether the issue is on the private side or the matching public side. The SGW is capable of distinguishing between the BUS

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CAN C and CAN IHS faults with separate DTC's for each. There is also a separate DTC for the Chassis CAN C bus on Atlantis vehicles. Also, the SGW does not diagnose and will never report DTC's for the diagnostic busses to the OBD Port.

Module Replacement Guidelines

When a SGW is replaced, out of the box it will have a default calibration, which is locked down. The SGW should essentially be non-functional. There will be minimal communication with the Radio. wiTECH 2.0 may read the bus messages but will not be able to complete requested functions as normal. The SGW will need to be programmed with a replacement routine in wiTECH 2.0. When replacing a SGW, please follow the service procedures outlined in TechConnect/Service Library. Once the SGW has had the replacement routine completed, operation should return to normal.

Anytime the SGW is programmed (whether from manufacturing or during a service replacement) the calibration files will be taken from the wiTECH 2.0 server and written to the SGW. In the rare event the calibration files are wrong, or if a sales code is incorrect, there may be some obvious, and not so obvious vehicle issues. In the event the wrong file is loaded for the wrong vehicle platform (Powernet to Powernet, but files for a WK are loaded to an LA), vehicle operation will be close, but some vehicle specific information will not be communicated properly between modules and certain features may no longer work correctly. If the wrong file is loaded for a different communication architecture (Powernet to Atlantis for example), nothing should work. Not only will there be configurations based on the specific vehicle platform, but there may be up to 3 configurations per platform based on the type of radio. Before replacing components on the vehicle, please verify vehicle repair history, and try to verify with the customer when the issues started to occur.

Future Security Measures

The SGW is one of many security measures Stellantis is implementing to protect the safety and security of the Stellantis product line up. There will be more security measures implemented with the product line up in the next few years. The security measures are planned to be released in phased roll outs and could be software and/or hardware upgrades. Please ensure to review service information for the latest diagnostic information, Special Tools or Equipment Required Diagnostic.

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