## GARMIN GSD 41 DATA CONCENTRATOR UNIT - DESCRIPTION AND OPERATION

## 1. General

- A. The GSD 41 is a remote mounted Data Concentrator Unit (DCU) capable of interfacing with many different of discrete signals and line replaceable units (LRU) s.
  - (1) The GSD 41 contains interfaces for discrete inputs, ARINC 429 busses, RS-232 busses, RS-485 busses, and RS-422 busses.
  - (2) The GSD 41 also contains a 4 port high-speed data bus (HSDB) hub that can interface with any HSDB equipped G1000 LRU.
  - (3) The GSD 41 also can convert HSDB packets to ARINC 717 data for interface with an flight data recorder.
  - (4) The GSD 41 interfaces to the Garmin G1000 Integrated Avionics System through a HSDB to primary flight display (PFD) 1.
- B. For a general view of the GSD 41 (Refer to Figure 1).

## 2. Description

- A. The DCU (GSD 41) is in the tailcone between FS 356.99 and FS 384.22 and WL 93.52.
  - (1) The DCU receives electrical power from the DCU circuit breaker found on the avionics circuit breaker panel.
  - (2) The DCU acquires the data on a ARINC 429 bus from the Garmin Integrated Avionics Unit No.1 and sends the data on a ARINC 717 bus to the CV/DR.
  - (3) The DCU interfaces to the G1000 system through a HSDB to PFD 1.
- B. Garmin GSD 41 DCU.
  - (1) The Garmin GSD 41 data concentrator unit is a microprocessor-based input/output line replaceable unit (LRU) that moves data between airplane systems and the Garmin G1000 avionics system. Each Garmin GSD 41 data concentrator unit (DCU) receives from and sends signals to the Garmin G1000 avionics system through a HSDB interface.
  - (2) The Garmin GSD 41 data concentrator unit (DCU) has two circuit boards each with a connector.
    - (a) The first circuit board in the Garmin GSD 41 DCU has the processor, the power supply, four Ethernet controllers, all of the memory, and a FPGA. The FPGA processes approximately half of the discrete inputs and ARINC 429 I/O.
    - (b) The second circuit board in the Garmin GSD 41 DCU has 14 RS-485/RS-422 ports and a second FPGA to process the other half of the discrete inputs. The second circuit board also contains support for ARINC 429 and the ARINC 717 interfaces.
  - (3) The airplane has one Garmin GSD 41 DCU as optional equipment. Garmin GSD 41 DCU 1 is found in the tailcone on the aft avionics shelf.

## 3. Operation

- A. Garmin GSD 41 DCU.
  - (1) The Garmin GSD 41 DCU receives from and sends signals to third party LRUs and other airplane systems through ARINC 429, ARINC 717 (for flight data recording), RS-422/485, and discrete inputs. The Garmin GSD 41 data concentrator unit (DCU) receives from and sends signals to the Garmin G1000 avionics system through a HSDB connection. The Garmin GSD 41 DCU has 15 ARINC 429 inputs, eight ARINC 429 outputs, one ARINC 717 input and output, 14 RS-422/485 ports, 33 on-state low discrete inputs and 12 on-state high discrete inputs.
  - (2) The Garmin GSD 41 DCU can receive airplane system signals that use many different protocols (for example, ARINC 429 or discrete) and reformats the data to transmit on the HSDB bus to the Garmin G1000 avionics system components. The Garmin GSD 41 DCU transmits data from the Garmin G1000 avionics system components along the HSDB bus to the non-Garmin airplane systems.
  - (3) All data bus inputs and discrete interface inputs are electrically isolated and operate independently. If one input or output has failure, then the failure is isolated to that data bus or discrete interface and will only affect the equipment that use that bus or discrete interface.
  - (4) the GSD 41 converts HSDB packets to ARINC 717 data for interface with the cockpit voice and flight data recorder system (CV/DR). For an overview of the CV/DR refer to L-3 Communications FA2100 Cockpit Voice/Data Recorder System.