

1. Fluxgate Magnetometer Module (FGM.A)

The FGM module manage the FGM instrument interfaces for commands and telemetry.

1.1 Initialization.

The FGM module initializes the FGM range settings to zero (namely "Full Scale"), sets the FGMH and FGML DMA channels to point to "TrashCan" and enables the FGM DMA logic.

1.2 Operation.

1.2.1 FGM Houskeeping Readback

The FGM module uses a 4Hz interrupt for reading back the FGM status byte contained in the FGM messages and shall provide these status bits to SOH.

1.2.2 DMA Channel Management

The module monitors at 4 Hz the FGMH and FGML DMA Channels, providing new DMA addresses within 1 second of the last channel swap, and providing a swap enable for each channel when the packet should complete at the next 1 second tick.

The algorithm for determining when to swap reads the rate code (3 bits) and uses a table lookup to find a mask of seconds. When the mask & seconds is zero, it is time to swap.

1.2.3 Fluxgate Magnetometer Engineering Telemetry

Every 125 msec, the module buffers 16-bit BX, BY, BZ points from the DCB registers and formats a CCSDS APID 405 packet for a possible transmission every 2 seconds. If requested by the TM module, the FGM module has a packet ready for delivery to the TM low speed output.

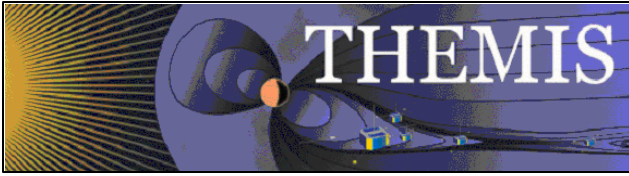
1.2.4 Spin Fit Data Generation

The FGM module provides 16-bit BX, BY, BZ points from the DCB registers when requested by the FIT module.

1.3 Commands.

The FGM module provides initialization, frequency control and range control for the FGM using the following commands:

- IFGEINIT Sends the Default CDI Sequence to FGE
- IFGECONF Sets Config. Byte to Mark all FGM Packets
- IFGEFREQ Sets FGE TML Sampling Rate. Codes [0 to 7]
- IFGERANGEX Sets FGE Range X, R = Range Value



-
- IFGERANGEY Sets FGE Range Y, R = Range Value
 - IFGERANGEZ Sets FGE Range Z, R = Range Value

The FGEINIT command sends the FGM Initial Configuration list. This list contains settings for the DACs etc on the FGE control circuit and also contains a "Start FGM" command.