NEW PROPOSED SENSOR FUNCTIONS

4.5 Sensor Data

4.5.1 Overview

The MGCU should be capable of gathering sensor data in the galley network group. This is accomplished via:

 Information provided by galley network members using the SENSOR_DATA messages.

The mechanism for accomplishing the sensor data gathering function is encapsulated into two separate messages. The SENSOR_DATA messages are information-delivery messages that define a sensed condition of a node. The SENSOR_CMD message is a mechanism for invocation of specific sensor commands in support of the aircraft data collection functions.

4.5.2 Commands Needed

Refer to Section XXXXXX, Message Table, for a complete message list.

Table Error! No text of specified style in document.-1 – **Diagnostic Messages**

Manage Manage	Device			
Message Name	Send	Receive		
SENSOR_CMD	MGCU_SENSOR	All		
SENSOR_DATA	GAIN	MGCU_SENSOR		

NEW PROPOSED SENSOR_DATA AND SENSOR_CMD INTERFACE MESSAGES

6.8 Sensor Data Monitoring

The GAIN should enable its sensor monitoring functionality only if the GAIN is able to communicate with the corresponding MGCU_SENSOR. MGCU_SENSOR state should be operational.

MGCU_SENSOR should send its possible messages only to operational GAINs with sensor data function.

6.8.1 SENSOR_CMD Message

6.8.1.1 Introduction

Only MGCU_SENSOR may send message SENSOR_CMD to any other node; i.e., MGCU or GAIN with desired sensor command.

6.8.1.2 Signals

Signal Name (Message "SENSOR_CMD")	Comments
SENSOR_CMD_Command	Command to be executed by the GAIN

6.8.1.3 Data Field Format

Data Length Code (DLC) = 8.

The content of the SENSOR_CMD message is shown in **Error! Reference** source not found..

Table Error! No text of specified style in document.-2 – SENSOR_CMD Message Format

Byte	Data	Designation	
	Sensor _CMD_Command MSB		
	Sensor _CMD_Command	Bits: 8	
	Sensor _CMD_Command	Coding: BIN	
0	Sensor _CMD_Command	Units: sensor num.	
U	Sensor _CMD_Command	Resolution: 1	
	Sensor _CMD_Command	0: All Sensors Range: 1-255	
	Sensor _CMD_Command		
	Sensor_CMD_Command LSB		
	Reserved	0	
	Reserved	0	
1	Reserved	0	
l '	Reserved	0	
	Reserved	0	
	Reserved	0	

Byte	Data	Designation
	Reserved	0
	Reserved	
2	Reserved	0
	Reserved	0
	Reserved	0
	Reserved	0
3	Reserved	0
	Reserved	0
4	Reserved	0
_	Reserved	0
	Reserved	0
5	Reserved	0
3	Reserved	0
	Reserved	0
_	Reserved	0
6	Reserved	0
	Reserved	0
7	Reserved	0
	1.0301700	· ·

The MGCU should be able to send the SENSOR_CMD at any time, except when the MGCU is in the 'Initialization' or 'Error' state.

The GAINs should be capable of receiving and processing the SENSOR_CMD at any time, in any state, except the 'Initialization' state.

A SENSOR_CMD could function as a broadcast message. Then every GAIN should send the sensor status when receiving a SENSOR_CMD with Device_Id set to 0. The Device_Id in the GAIN message should be set equal to the pin programming.

6.8.2 SENSOR_DATA Message

6.8.2.1 Introduction

Only GAIN may send message SENSOR_DATA to any other node; i.e., MGCU or GAIN.

6.8.2.2 Signals

Signal Name (Message "SENSOR_DATA")	Comments
SENSOR_DATA	Sensor data collected by GAIN

6.8.2.3 Data Field Format

Data Length Code (DLC) = Variable.

The content of the SENSOR_DATA message is shown in XXXXX Error! Reference source not found.

Table Error! No text of specified style in document.-3 – SENSOR_DATA Message Format

	Byte	Data	Designation
		Sensor _ID MSB	
		Sensor _ID	Bits: 8
		Sensor _ID	Coding: UCHAR
	0	Sensor _ID	Units: sensor num.
	U	Sensor _ID	Resolution: 1
		Sensor _ID Range: 1-255	
		Sensor _ID	
		Sensor _ID LSB	
	1	Sensor_Data	
\bigcirc	2	Sensor_Data	
	3	Sensor_Data	
	4	Sensor_Data	Sensor Data
	5	Sensor_Data	
	6	Sensor_Data	
	7	Sensor_Data	

The GAIN should be able to send the SENSOR_DATA at any time, except when the GAIN is in the 'Initialization' state.

The MGCUs should be capable of receiving and processing the SENSOR_DATA at any time, in any state, except the 'Initialization' state.

NEW PROPOSED SENSOR CONFIGURATION DATA

7.12 Sensor Data

This data block defines the needed parameters to define the sensors on a GAIN or MGCU. Each GAIN or MGCU may have a different number of sensors; therefore, a first parameter is needed to define the number of sensors contained in the GAIN or MGCU.

Table Error! No text of specified style in document.-4 – Configuration Data Block – Sensor Data (1)

Block Num.	Parameter Num.	Sub-Parameter Num.	Data	Designation
13	0	0	NUMBER_OF_SENSORS	Bits: 8 Coding: BIN Units: number of sensors Resolution: 1 Range: 0-255

Then, for each sensor, Si, the following parameter data block should be defined (where parameter number Si should be $1 \le Si \le NUMBER_OF_SENSORS$).

Engineering Units = (sensor_data_value * sensor_multiplier) + sensor_offset

COMMENTARY

Please note that the number of different sensors (i.e., value of Si) may be different for each GAIN or MGCU.

Table Error! No text of specified style in document.-5 – Configuration Data Block – Sensor Data (2)

Block Num.	Parameter Num.	Sub-Parameter Num.	Data	Designation
13	S _i	0	SENSOR_NUM BER	Bits: 8 Coding: BIN Units: sensor num. Resolution: 1 Range: 1-255 0: Not applicable

Block Num.	Parameter Num.	Sub-Parameter Num.	Data		Des	signation		
13	Si	1	SENSOR_TYP E	Bits: 8 Coding: Signed Units and Resolu	BIN value 0 1 2 3 4 5 6 7 8 7-255	hysical Unit as Physic Unit Reserved Temperature Pressure Rotational Speed Current Voltage Time Percent Percent Open Reserved	Unit Reserved	low.
13	Si	2	SENSOR_LOC ATION	Bits: 8 Coding: BIN SENSOR_LOC Code 0 1 2 3 4 5 6 7 8 9 10 11 12-255	ATION Coding Device star Valve Pump Cavity Compresso Fan Air inlet Air Exhaus Fan Stator Controller Refrigerant Tank Water Reserved	or t		
13	S _i	3	SENSOR_REP ORTING_MOD E	Bits: 8 Coding: BIN SENSOR_LOCATION Coding Code Reporting Mode 0 Never Reports 1 Reports on MGCU Request 2 GAIN Initiated Reports on Change 3 GAIN Initiated Reports at Reporting Rate 4-255 Reserved		Mode orts MGCU ted Reports ted Reports		

Block Num.	Parameter Num.	Sub-Parameter Num.	Data	Designation
13	S _i	3	SENSOR_REP ORTING_RATE	Bits: 32 Coding: Unsigned FLOAT Units: Multiplication Factor Resolution: 1 Range: (2-1/222)2-126 +127 0: Not applicable
13	S _i	3	SENSOR_MUL TIPLIER	Bits: 32 Coding: Signed FLOAT Units: Multiplication Factor Resolution: 1 Range: +/-(2-1/222)2-126+127 0: Not applicable
13	S _i	4	SENSOR_OFF SET	Bits: 32 Coding: Signed FLOAT Units: Multiplication Factor Resolution: 1 Range: +/-(2-1/222)2-126 +127 0: Not applicable