

## 2GIG CANBUS J1939 PROTOCOL

The CANBUS J1939 tilt sensors communicate via the following standard protocol. The table below shows the options that can be selected, as well as the default output and input PGN. The sensor outputs the current (X), (Y), temperature (°C) reading, and output rate. The sensor will accept an input PGN which is used to zero the device, adjust the Node ID, and adjust the output rate frequency. The standard protocol, PGNs, and outputs can be modified for custom systems.

Specification	CANBUS J1939					
Baudrate (kbit/s)	20	50	125	250	500	1000
Node ID	1 to 255 (0x01 to 0xFF)					
Output	<b>PGN 65454 (0xFFAE)</b> 6 Data Bytes: <b>Bytes 0 – 1:</b> Signed 16-bit X-Axis Reading in hundredths of a degree (0.00), LSB first <b>Bytes 2 – 3:</b> Signed 16-bit Y-Axis Reading in hundredths of a degree (0.00), LSB first <b>Byte 4:</b> Signed 8-bit Internal Sensor Temperature Reading in Degrees Celsius <b>Byte 5:</b> Current Output Rate in Hertz (Hz)					
Input	<b>PGN 65455 (0xFFAF)</b> 8 Adjustable Data Bytes: <b>Bytes 0-4:</b> Reserved <b>Byte 5:</b> Zero out the device (1) or revert back to factory zero (2) <b>Byte 6:</b> Unsigned 8-bit adjustable Node ID from 1 – 255 <b>Byte 7:</b> Adjustable output rate in Hertz (Hz) (1 – 100)  <u><b>In order to program the device correctly, complete messages must be sent</b></u>					
Network Termination	A 120 Ohm resistor is required between CAN+ and CAN- (Resistor not included, but can be provided)					

**OUTPUT MESSAGE EXAMPLE**

Output PGN 65454 (0xFFAE) message with node ID of 15 (0xF)

29-bit ID	Data Byte 0	Data Byte 1	Data Byte 2	Data Byte 3	Data Byte 4	Data Byte 5
<b>0xFFAE0F</b>	X Byte LSB	X Byte MSB	Y Angle LSB	Y Angle MSB	Temperature	Output Rate

Example Angle Output

LSB = 0x94, MSB = 0x11  
 Angle = 0x1194  
 Decimal Value of 0x1194 = 4500  
 4500 / 100 = **45°**

Example Angle Output 2

LSB = 0x18, MSB = 0xFC  
 Angle = 0xFC18  
 Decimal Value = -1000  
 1000 / 100 = **-10°**

Example Outputs:

Byte 4 = 0x19 = **25°C**  
 Byte 4 = 0xE2 = **-30°C**  
 Byte 5 = 0x0A = **10 Hz**

**INPUT MESSAGE EXAMPLE**

Send input J1939 messages to the sensor with a node ID of 30 (0x1E)

29-bit ID	Data Byte 0	Data Byte 1	Data Byte 2	Data Byte 3	Data Byte 4	Data Byte 5	Data Byte 6	Data Byte 7
<b>0xFFAF1E</b>	0	0	0	0	0	Zero	Node ID	Output Rate

Relative zero the X and Y readings

**Message to Send:**

29-bit ID	Data Byte 0	Data Byte 1	Data Byte 2	Data Byte 3	Data Byte 4	Data Byte 5	Data Byte 6	Data Byte 7
<b>0xFFAF1E</b>	0	0	0	0	0	0x01	0	0

Change the Node ID to 0x03 and Output Rate to 20Hz

**Message to Send:**

29-bit ID	Data Byte 0	Data Byte 1	Data Byte 2	Data Byte 3	Data Byte 4	Data Byte 5	Data Byte 6	Data Byte 7
<b>0xFFAF1E</b>	0	0	0	0	0	0	0x03	0x14