

Protocol Description ASC DiSens ECO CAN

Table 1:

MessageIDs for messages sent by sensor							
Message Type (4 Bit)	Node ID (7 Bit)	1. Cmd Byte	Parameter / Values (7 or 8 Byte)				Description
0x01	0x01		float (ACC)				Measurement Data x-axis: Acc
0x02	0x01		float (ACC)				Measurement Data y-axis: Acc
0x03	0x01		float (ACC)				Measurement Data z-axis: Acc
0x04	0x01		uint8_t				Reply to Get Sensor ID
0x04	0x01	0x12	uint8_t				Reply to Get Baudrate
0x04	0x01	0x14	uint8_t				Reply to Get Sample Frequency
0x04	0x01	0x16	uint8_t				Reply to Get Data Format ACC
0x04	0x01	0x18	uint8_t				Reply to Get Measurement Range
0x0D	0x01	NodeID	State				Heart beat every 1s with Node ID and Operation State (Measurement started / stopped)
0x0E	0x01	0xFF	0x01	0xFF	0xFF		Invalid Command Received Indication

Table 2:

MessageID and message structure received by the sensor									
Message Type (4 Bit)	Node ID (7 Bit)	1. Cmd Byte	2. Cmd Byte	Parameter / Values (max 6 Byte)			Description		
xxxX	xxx xxxx								
0x0F	0x01	0x10					Start Methods		
			0x01				Start measurement immediately / State Running (default)		
			0xFF				Stop Measurement / State stopped		
							Set settings		
			0x20	0x01	1 - 127				Set Node ID / Sensor ID (default 0x01)
			0x20	0x02	uint8_t				Set Baudrate
			0x20	0x02	0x01				20
			0x20	0x02	0x02				50
			0x20	0x02	0x03				100
			0x20	0x02	0x04				125
			0x20	0x02	0x05				250
			0x20	0x02	0x06				500 (default)
			0x20	0x02	0x07				1000
			0x20	0x03	0 or 1				turn on/off termination resistor (default on: 0x01)
			0x20	0x22	uint8_t				Set Sample Frequency
			0x20	0x22	0x01				3.906 Hz
			0x20	0x22	0x02				7.813 Hz
			0x20	0x22	0x03				15.625 Hz
			0x20	0x22	0x04				31.25 Hz
			0x20	0x22	0x05				62.5 Hz
			0x20	0x22	0x06				125 Hz
			0x20	0x22	0x07				250 Hz
			0x20	0x22	0x08				500 Hz
			0x20	0x22	0x09				1000 Hz (default)
			0x20	0x22	0x0A				2000 Hz
			0x20	0x22	0x0B				4000 Hz
			0x20	0xE1	uint8_t				Set Data Format ACC Raw
			0x20	0xE1	0x01				Raw (20bit, without scaling and offset correction)
			0x20	0xE1	0x02				m/s ² [SI-Unit] (default)
			0x20	0xE1	0x03				g
			0x20	0xE3	uint8_t				Set Measurement Range
						0x01			2g / 10g
						0x02			4g / 20g
						0x03			8g / 40g (default)
					0xE4		float		Set g-Value (default 9.8065)
				0x30					Get settings
				0x30	0x02				Get Baudrate
				0x30	0x22				Get Sample Frequency
				0x30	0xE1				Get Data Format ACC Raw
				0x30	0xE4				Get g-Value
	0x40					Calibration Data Acc			
	0x40	0x01	uint16_t			Calibration data x-offset (raw code)			
	0x40	0x02		uint32_t		Calibration data x-scale factor (code / g)			
	0x40	0x03	uint16_t			Calibration data y-offset (raw code)			
	0x40	0x04		uint32_t		Calibration data y-scale factor (code / g)			
	0x40	0x05	uint16_t			Calibration data z-offset (raw code)			
	0x40	0x06		uint32_t		Calibration data z-scale factor (code / g)			
	0x50	0x01				Save Settings to Flash and Restart			
	0x50	0x02				Reset Settings to Factory Settings			

Protocol-Description:

In table 1 and 2 all available CAN messages for ASC DiSens CAN are listed. The CAN message ID (11 bits) is built in combining the command (4 bits) and the node ID (7 bits). The data field contains maximum 8 bytes of data (standard CAN). Some messages need more information than only the message ID, so the first, second or even third byte of the data field is used to specify a command in more detail or to transmit parameters etc. The message IDs are parted in two sections. First, messages, which are sent by the sensor and second messages, which are received by the sensor. Each message, which is sent to the sensor has the command 0x0F (upper 4 bit) combined with the node ID (lower 7bit). As the length of the node ID is 7 bits, upto 127 different nodes can be addressed on the CAN bus.

Examples:

**Send Start Measurement Command
with NodeID 0x01**

11 bits CAN Message		Data Field		
Command	Node ID	1. Cmd	2. Cmd	...
4 bits	7 bits	8 bits	8 bits	
0x0F	0x01	0x10	0x01	
b00001111	b0000001	0x10	0x01	
	only 7(!) bits!!!			
b0000'0111'1000'0001				
Full Message in Hex				
	0x0781	0x10	0x01	

**Send Stop Measurement Command
with NodeID 0x05**

11 bits CAN Message		Data Field		
Command	Node ID	1. Cmd	2. Cmd	...
4 bits	7 bits	8 bits	8 bits	
0x0F	0x05	0x10	0x01	
b00001111	b0000101	0x10	0x01	
	only 7(!) bits!!!			
b0000'0111'1000'0101				
Full Message in Hex				
	0x0785	0x10	0x01	

Measurement Data Acc x-Axis from NodeID 0x01

11 bits CAN Message		Data Field		
Command	Node ID	...		
4 bits	7 bits	float (32 bits)		
0x01	0x01			
b00000001	b0000001			
	only 7(!) bits!!!			
b0000'0000'1000'0001				
Full Message in Hex				
	0x0081	float (32 bits)		

Measurement Data Acc y-Axis from NodeID 0x01

11 bits CAN Message		Data Field		
Command	Node ID	...		
4 bits	7 bits	float (32 bits)		
0x02	0x01			
b00000010	b0000001			
	only 7(!) bits!!!			
b0000'0001'0000'0001				
Full Message in Hex				
	0x0101	float (32 bits)		

Hearbeat from NodeID 0x01 (1 per sec)

11 bits CAN Message		Data Field		
Command	Node ID	Node ID	State	...
4 bits	7 bits			
0x0D	0x01	0x01	0x01	
0x0D	0x01	0x01	0xFF	
b00001101	b0000001			
	only 7(!) bits!!!			
b0000'0110'1000'0001				
Full Message in Hex				
	0x0681	0x01	0x01	
	0x0681	0x01	0xFF	

Sensor is measuring:
Sensor is stopped: