



ARM Processor with the 621 co-operative multi-tasking high-performance kernel  
 Two auxiliary digital inputs  
 High speed differential data interface  
 Set to zero position and reset factory zero  
 Dynamic CAN Packet Speed (faster packet rate while moving)

Part Number	<b>AZEI-002</b>	Rotation Encoder to CAN bus
Accessories	ABB-MB14	Mounting Bolt with black cap
	DT04-6P-E005	6 Pole mating connector
	DT06-08SA	8 Pole mating connector

Length	139 mm [5 1/2"]	
Height	83 mm [3 1/2"]	
Depth	56 mm [2 1/4"]	
Material	Cast Aluminum	
Operating Temperature	-40°C to 85°C	
Voltage (Power)	6.5 - 38 VDC	
Auxiliary Inputs:		
Threshold voltage	3.2 V+/-5%	
Input Resistance	20 KΩ	
Supported Encoders	Zettlex IncOder	Netzer SSI Encoder
Serial Format	SPI / SSI / ASI	SSI1 - SSI9 , SSI2&7 SSI6(CRC) - Recommended
Data Sampling	10 to 22 bits	(per revolution)
Protocols	CAN / J1939 / CANOpen	
Baud Rate	250 kbit/s	

## AZEI-002 - J1939 Output

Source Address (SA): 0x51 (81)

### Encoder Status

Transmission rate: 50 mS.  
 Data Length: 8 bytes  
 PDU format PF: 0xFF (255)  
 PDU specific PS: 0x10 (16)  
 Default priority: 7  
 Parameter group number PGN: 0xFF10 (65296)

### Auxiliary Inputs Status

Transmission rate: On any input state change or 50 mS.  
 Data Length: 8 bytes  
 PDU format PF: 0xFF (255)  
 PDU specific PS: 0x11 (17)  
 Default priority: 7  
 Parameter group number PGN: 0xFF11 (65297)

Start byte[bit] <sup>1</sup>	Length bits	Description	Format	Units	Value
0[0]	24	Absolute Encoder Position	byte 0 – MSB, byte 2 – LSB (Big Endian)	mDeg	0 ... 359999
3[0]	24	Rotation Speed	byte 3 – MSB, byte 5 – LSB (Big Endian)	mDeg/S	0 ... 2 <sup>24</sup> - 1
6[0]	6	Controller State			Proprietary
6[6]	2	ZPD (Zero Point Default) <sup>2</sup>			0 – Zero Point is set by user 1 – Zero Point is at Factory Default 2 – Error 3 – Not Applicable
7[0]	6	Status			0 – Startup/Default 1 - Position Reading Complete 2 - Zero Set Complete 3 - Zero Reset Complete 4 - Communication Parity Fault 5 - Position Invalid/Detection Fault 6 - Unsupported Request 62 - Encoder is not detected
7[6]	2	Unused			

Start byte[bit] <sup>1</sup>	Length bits	Description	Format	Units	Value
0[0]	2	Input 0 (Sensor 1) state			0 – Off 1 – On 2 – Error 3 – Not Applicable
0[2]	2	Input 1 (Sensor 2) state			0 – Off 1 – On 2 – Error 3 – Not Applicable
0[4]	60	Unused			

<sup>1</sup> Data bytes in the message are numbered from 0 to 7

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<sup>2</sup> For detailed description refer to Zettlex incOder documentation

### Zettlex incOder Zero Point Set & Reset

To prevent accidental modification of Zero Point (datum from which angle is measured) the unit should be “unlocked” before accepting the request. The procedure is described below:

1. Transmit first unlocking message:

PGN	SA	DATA							
		Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
0xFF00	0x54	0x55	0x55	0x55	0x55	0x55	0x55	0x55	0x55

2. Transmit second unlocking message:

PGN	SA	DATA							
		Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
0xFF00	0x54	0xAA	0xAA	0xAA	0xAA	0xAA	0xAA	0xAA	0xAA

3. Transmit the control request message:

PGN	SA	DATA							
		Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
0xFF00	0x54	Command	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Command values:

- 2 – Zero Point Set
- 3 – Zero Point Reset

All three messages should be transmitted in sequence from the source address 0x54 (84). After the first unlocking message is received the one second time window is opened. Other messages should be received within this time window or the timeout will occur and the receiver will reset.

### J1939 Glossary / Abbreviations

- PDU Protocol Data Unit
- PF Protocol Data Unit Format , 8-Bit Feld Identifier
- PS Protocol Data Unit Specific, 8-Bit Feld Identifier
- PGN Parameter Group Number
- SA Source Address