

AGV-TMR360C (MAGNETIC MARKER)



AGV Magnetic Guide Sensors

DESCRIPTION

AGV-TMR360C is a magnetic guide sensor specially designed for magnetic marker navigation. Its large detection height, high frequency response, and wide coverage length allows AGV-TMR360C tracking 3 magnetic markers position information simultaneously with excellent protection against EM interference as well as magnetic material interference. Incorporating tunneling magnetoresistance (TMR) technique, AGV-TMR360C sensors are designed to provide excellent temperature characteristics, good consistency, high sensitivity and low power consumption performance.

FEATURES AND BENEFITS

- Magnetic marker navigation
- Detection height over 200 mm
- 5 mm detection accuracy
- 5 ms response time
- 1000 mm coverage length
- Superior protection against EMI
- Superior protection against magnetic material interference
- IP67 ingress protection

APPLICATIONS

Magnetic marker navigation

AGV-TMR360C (CAN)

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SPECIFICATIONS

Parameters	Value
Supply voltage	10 Vdc ~ 30 Vdc
Supply current	100 mA
Communication type	RS232, CAN
Circuit protection	reverse polarity protection, overload protection, surge suppression
Output signal	Position info
Detectable markers	up to 3
Accuracy	5 mm
Detection height	50 mm~250 mm
Effective coverage length	0~950 mm
Response time	5 ms
Dimensions	1088 mm*32 mm*50 mm
Potting material	AB glue
Housing material	Metal, Epoxy Resin
Ingress Protection	IP67

RS-232, CAN COMMUNICATION PROTOCOL

RS-232 protocol is customizable to communicate with host computer

CAN is based on customizable protocol, details as follows:

Interface	CAN BUS 2.0A
Node ID	1~127 (default 4)
Baud rate	125 kbps, 250 kbps, 500 kbps, 800 kbps, 1000 kbps (default)
Transfer rate	50Hz, 80Hz, 100Hz (default), 125Hz, 200Hz (active reporting mode only)
Frame type	standard
Frame format	Data frame
Communication protocol	CAN customizable(default)

1. Customizable CAN Protocol

Customizable CAN protocol include two modes: active reporting and passive tracking. The active reporting mode allows automatically broadcasting navigation data messages from sensor at a set rate. Instead, in the passive tracking mode, the host sends the data request message, and the slave responses and returns the navigation data messages.

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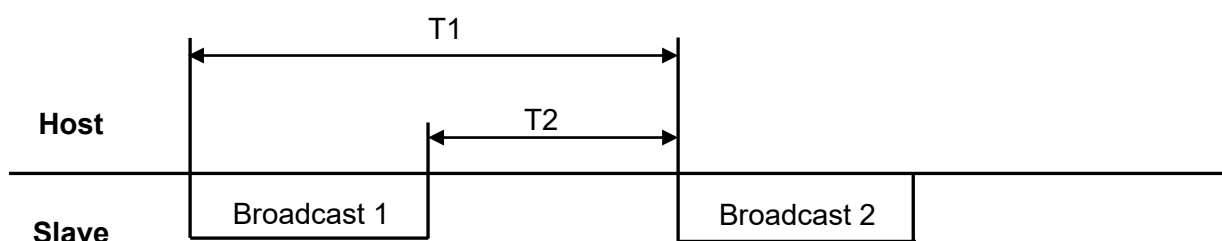
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1) Active reporting mode

Active mode message

CAN-ID		Data field (DLC=8)							
Uint8_t	Uint8_t	Uint8_t	Uint8_t	Uint8_t	Uint8_t	Uint8_t	Uint8_t	Uint8_t	Uint8_t
CAN-ID	Slave ID	marker quantity high byte	marker quantity low byte	1# marker position high byte	1# marker position low byte	2# marker position high byte	2# marker position low byte	3# marker position high byte	3# marker position low byte
return code									
0X580 01		00	00	FF	FF	FF	FF	FF	FF

Frame sequence of active mode



Frame sequence and data transfer rate correlation

Data transfer rate	50 Hz	80 Hz	100 Hz	125 Hz	200 Hz
T1	20 ms	12.5 ms	10 ms	8 ms	5 ms
T2	<20 ms	<12 ms	<10 ms	<8 ms	<5 ms

Note: T1 and T2 are baud rate dependent, T2<T1.

2) Passive tracking mode

Host sends data request

CAN-ID		Data field (DLC=2)	
Uint8_t	Uint8_t	Uint8_t	Uint8_t
01		4D	04
slave ID		data request byte	data request byte

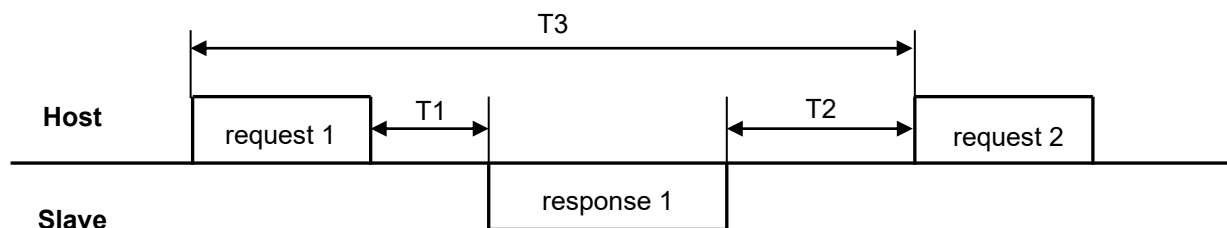
Slave returns navigation data

CAN-ID		Data field (DLC=8)							
Uint8_t	Uint8_t	Uint8_t	Uint8_t	Uint8_t	Uint8_t	Uint8_t	Uint8_t	Uint8_t	Uint8_t
CAN-ID	Slave ID	marker quantity high byte	marker quantity low byte	1# marker position high byte	1# marker position low byte	2# marker position high byte	2# marker position low byte	3# marker position high byte	3# marker position low byte
return code									
0X580 01		00	00	FF	FF	FF	FF	FF	FF

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Frame sequence of passive mode



Frame configuration

Baud rate	125 kbps	250 kbps	500 kbps	800 kbps	1000 kbps
T1	< 1 ms	< 1 ms	< 1 ms	< 1 ms	< 1 ms
T2	> 3 ms	> 4 ms	> 4 ms	> 4 ms	> 4 ms
T3	≥ 5 ms	≥ 5 ms	≥ 5 ms	≥ 5 ms	≥ 5 ms

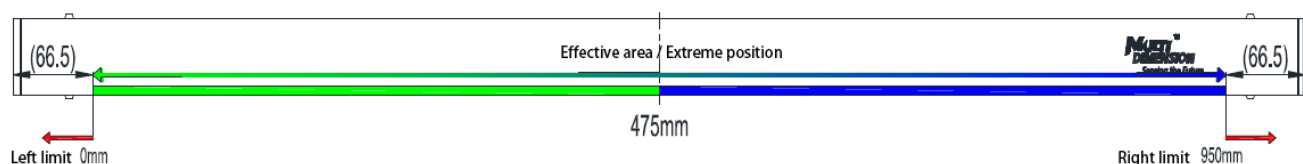
Note:

- ① T1 is the minimum response time
- ② T3 is the minimum data request time interval

CAN COMMUNICATION DATA INSTRUCTION

The detection channels of AGV-TMR360C sensor are defined as the figure below

E.g. one marker, position at 500 mm



1. Active reporting mode

CAN-ID	Data field (DLC=8)							
0581	00	01	01	F4	FF	FF	FF	FF
0581=0580 01 01 is slave ID	marker quantity=1		1# marker position is at 500 mm of sensor		2# marker is null null status shows FFFF by default		3# marker is nul null status shows FFFF by default	

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2. Passive tracking mode

Host sends data request

CAN-ID	Data field (DLC=2)	
01	4D	04
01 is slave ID	data request byte	data request byte


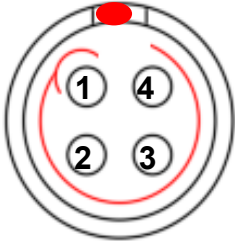
Slave returns navigation data

CAN-ID	Data field (DLC=8)							
0581	00	01	01	F4	FF	FF	FF	FF
0581=0580 01 01 is slave ID	marker quantity=1		1# marker position is at 500 mm of sensor		2# marker is null null status shows FFFF by default		3# marker is null null status shows FFFF by default	


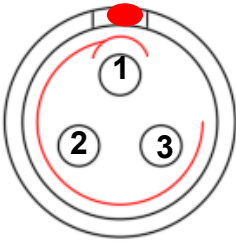
Note: MDT provides magnetic marker set, and the minimum distance of the adjacent magnetic marker is 400 mm

PIN CONFIGURATION

JLT-FZNR16-04SS

Photo	Schematic	
		1- 232_TX
		2- Supply positive (+)
		3- 232_RX
		4- Supply negative (-)

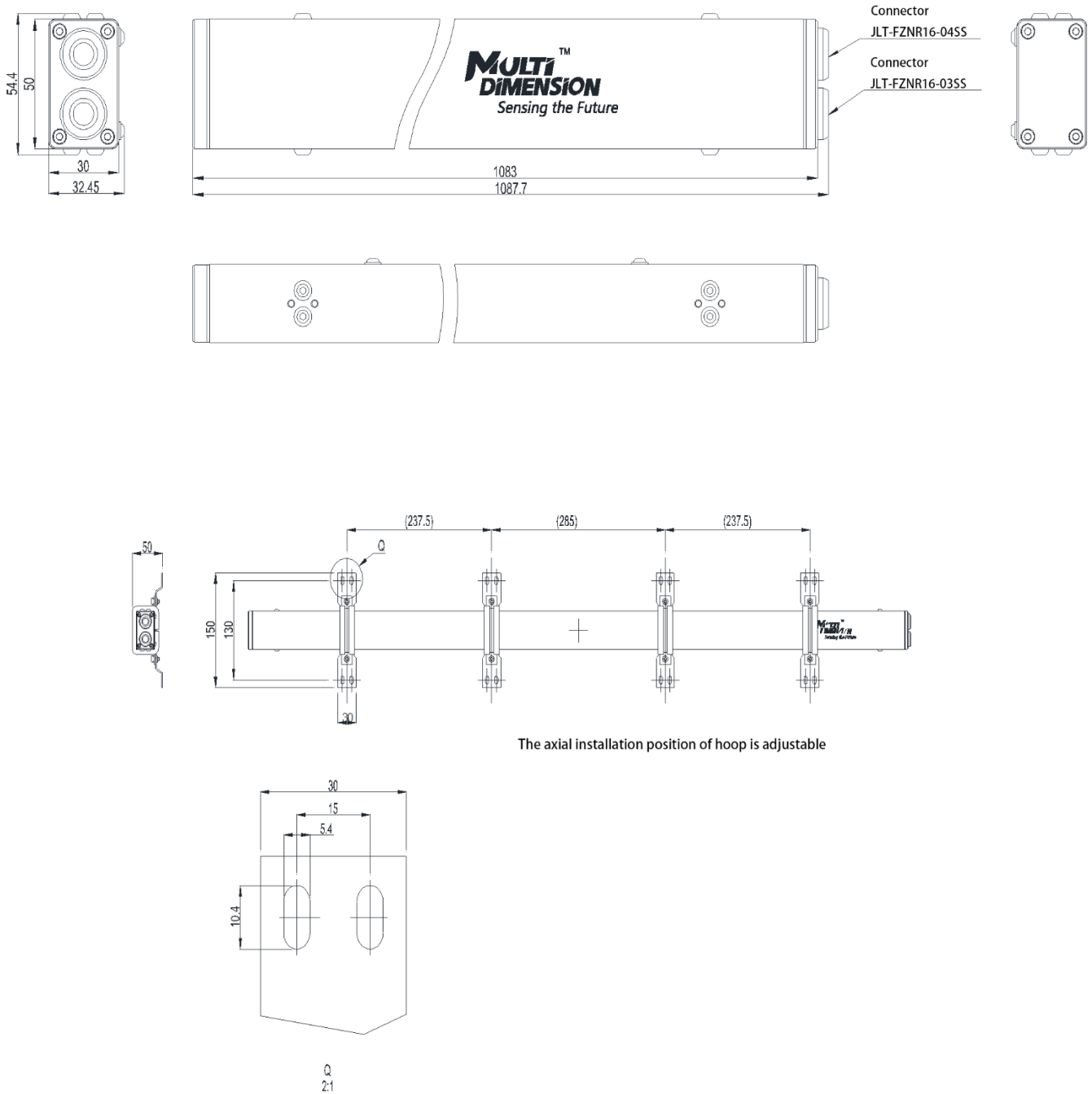
JLT-FZNR16-03SS

Photo	Schematic	
		1- CAN_GND
		2- CAN_H
		3- CAN_L

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DIMENSIONS (mm)



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APPENDIX A:

Host software operation manual

Host software requires LabVIEW Run-Time Engine 2013 (not included)

Please download it from NI website or through the link below:

<http://www.ni.com/download/labview-multicore-analysis-and-sparse-matrix-toolkit-2013/4033/en/>

Download and Installation:

1. Download host software package from AGV-TMR360C page of MDT official website <http://www.dowaytech.com/sensor/agv.html>, then click the link with green down arrow like the screenshot below to start downloading.



2. Start host program

Extract the downloaded file, and click the file of  in the extracted folder to start host program of AGV-TMR360C.

Host interface setting and operation:

1. Select AGV-TMR360C from drop-down menu, then click Start button below to enter the RS-232 and CAN setting interface
2. Menu instruction
 - 2.1 System
 - 2.1.1 Demo: Enter product function demonstration interface
 - 2.2 Communication
 - 2.2.1 Serial Conn: Connect serial port for RS-232
 - 2.2.2 Serial Discon: Disconnect serial port for RS-232

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2.3 Parameter

2.3.1 Read: Read parameters from sensor to computer

2.3.2 Write: Write parameters from computer to sensor

2.4 Zero adjustment (Please operate in zero magnetic field environment)

2.4.1 Zero-point calibration

2.4.2 Load zero-point info

3. Main interface instruction

3.1 Serial port connection: Set proper connection port

3.2 CAN: Set CAN parameters: address, baud rate, transfer rate, and protocol. Default setting:

CAN ID	Baud rate	Transfer rate	Reporting mode
01	1000 kbps	100 Hz	active

Click "Write" after input, power off and restart sensor to activate setting.

3.3 Choose active or passive reporting mode for CAN module

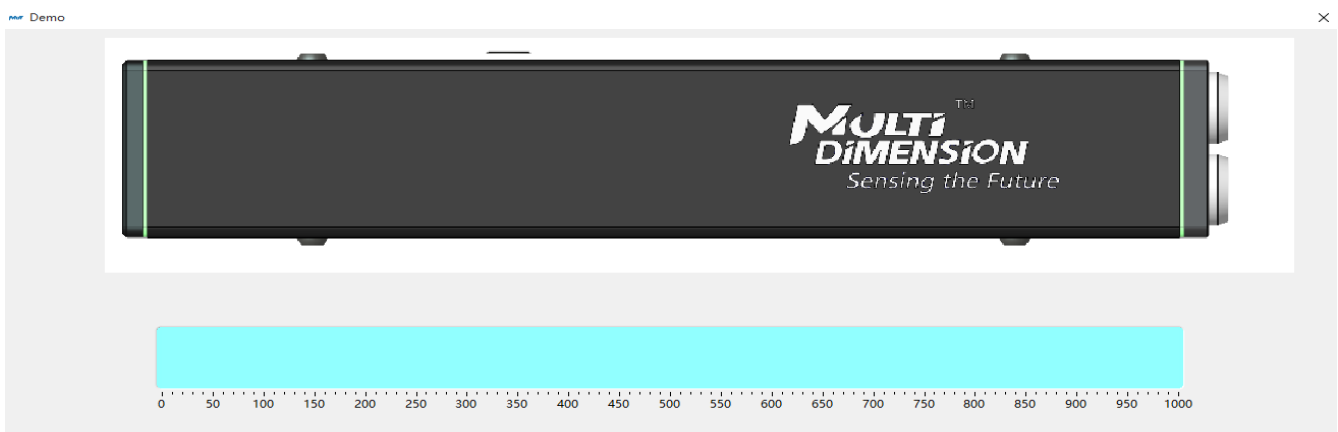
3.4 Sensor Parameter: Load current sensor parameter by clicking "Read"

3.5 Status bar: Current connection status of sensor

4. Demo instruction

Enter demonstration interface by clicking "Demo" (see 2.1.1)

4.1 Static status (no magnetic tape detected):

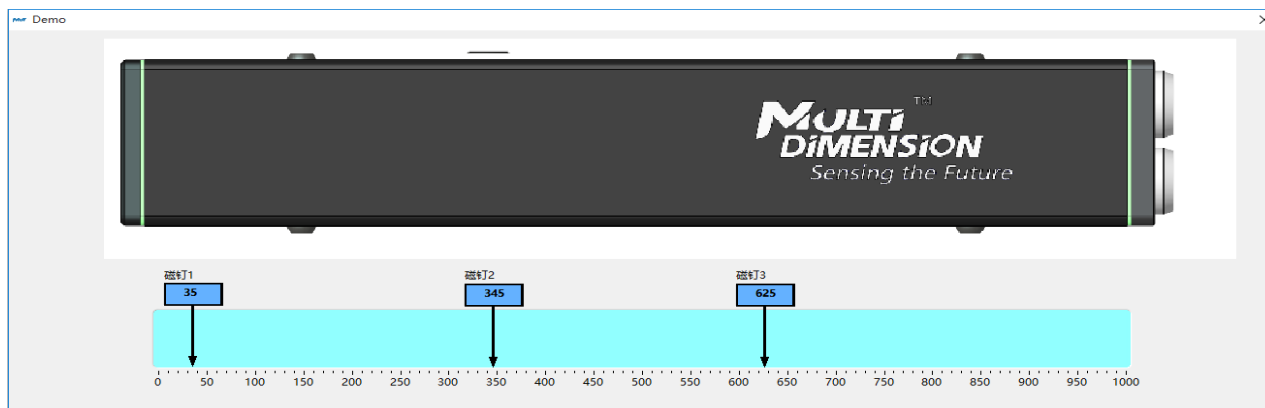


Note: The cyan strip indicates the status of 0~1000 mm absolute position

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4.2 Dynamic status (3 markers detected)



Note: Three arrows indicate the absolute position of present three markers

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