
# TZS-MAG-1600-A-User Manual

TZBOT
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# Function

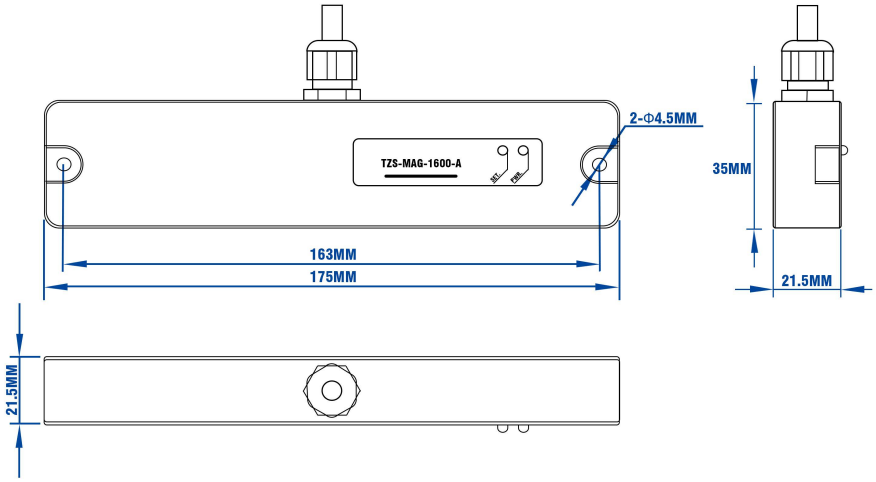
The TZS-MAG-1600-A can detect the intensity distribution of the magnetic field along the horizontal direction and accurately calculate the deviation between the center of the magnetic field by high-order fitting. The deviation information can be use to guide the AGV.

# Property

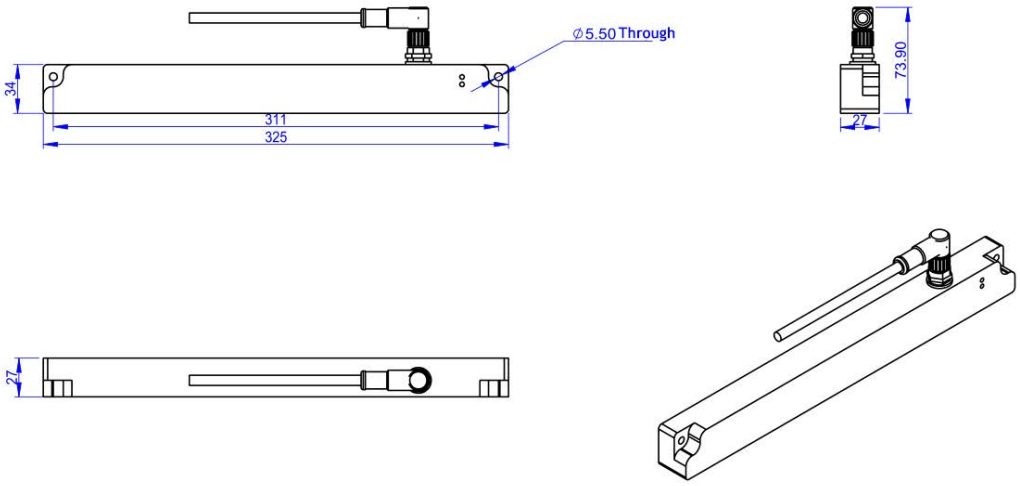
| | | | |
|---|---|---|---|
| Model | | TZS-MAG-1600-A | TZS-MAG-3000-A |
| Shell material | | Aluminum alloy | Aluminum alloy |
| Dimensions | | L182mmxW40mmxH21.5mm | L327mm xW27mm x H73.9mm |
| Weight | | Below 300g | Below 600g |
| Detect scope | | 160mm | 300mm |
| Detect schedule | | 20~60mm | |
| Detection accuracy | | 1mm | |
| Segmentation | | 0.1mm | |
| Feedback cycle | | 4ms、10ms、20ms、100ms | |
| Applicable tape width | | 30mm, 50mm | |
| Detect polarity | | N/S | |
| Fork identification number | | Left, middle, right | |
| Supply voltage | Input voltage | DC24V (DC9~36V) | |
| | Input current | Working current: <200mA | |
| Communication Interface | CAN | CAN custom data, data transmission rate: 0.125M ~ 1M bit/s | |
| | RS485 | Standard Modbus, data transmission rate: 9600bps ~ 115200bps | |
| | RS232 | Serial communication, data transmission rate: 9600bps ~ 115200bps | |
| Indicator light | PWR | Power indicator light, red, always on when powered on | |
| | RUN | Running indicator light, green, blinks when running, always on when magnetic stripe is detected | |
| Protection level | IP67 | Able to adapt to harsh environments such as oil (cutting fluid, etc.), dust, and humidity | |
| Environmental conditions | Temperature | Operating temperature -25°C~85°C (no freezing) | |
| | Humidity | 20~95%RH or less during use and storage (no condensation) | |
| Certification standards | | CE | |
| Appendix | | Cable: M12S-8P150 (standard) | Cable: M12B-8P150 (standard) |

# Installation

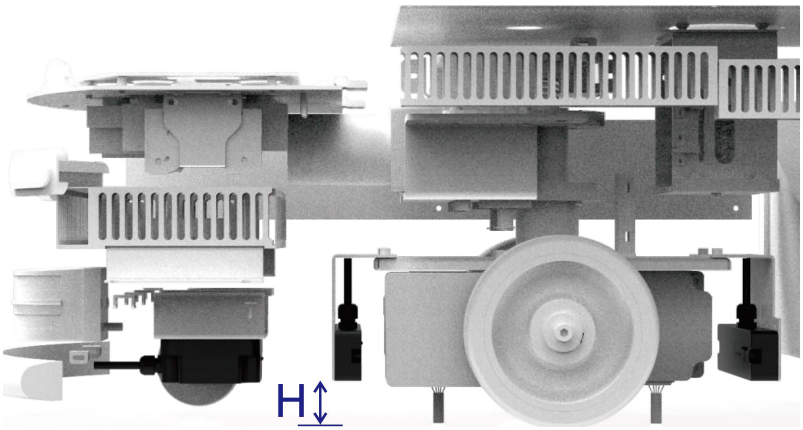
## TZS-MAG-1600-A




## TZS-MAG-3000-A

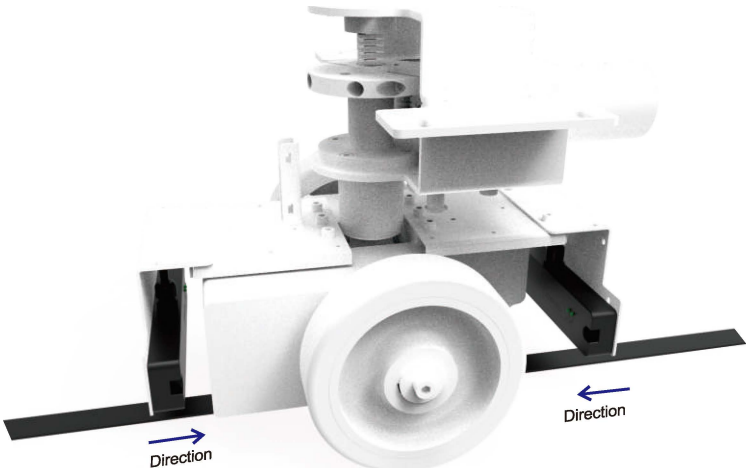



# Mount H



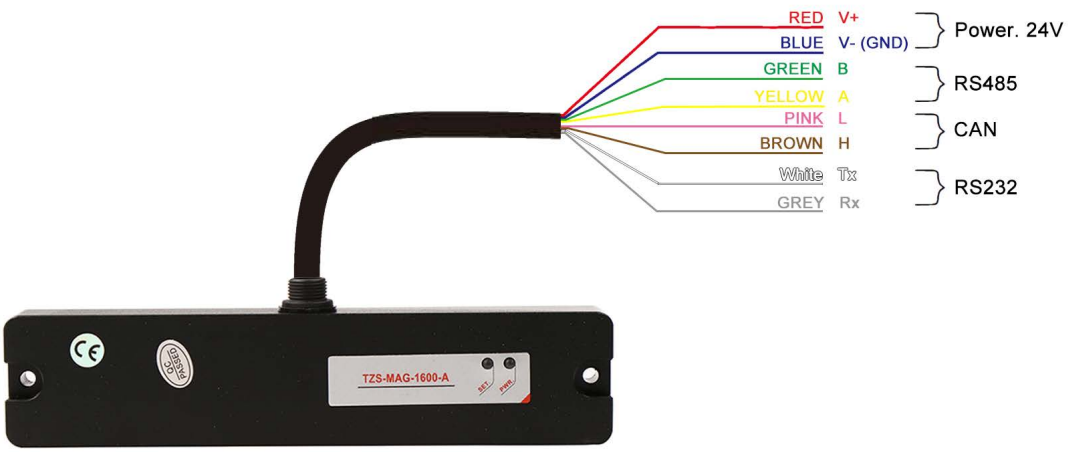

The bottom surface to the ground distance H should be around 35mm for best performance.

# Mount Direction




Standard Mount Direction should be Above. The front and rear sensor Direction should be opposite.You can change your mount direction, But you need to configure it right in AGVStudio.

# Pin Assignment



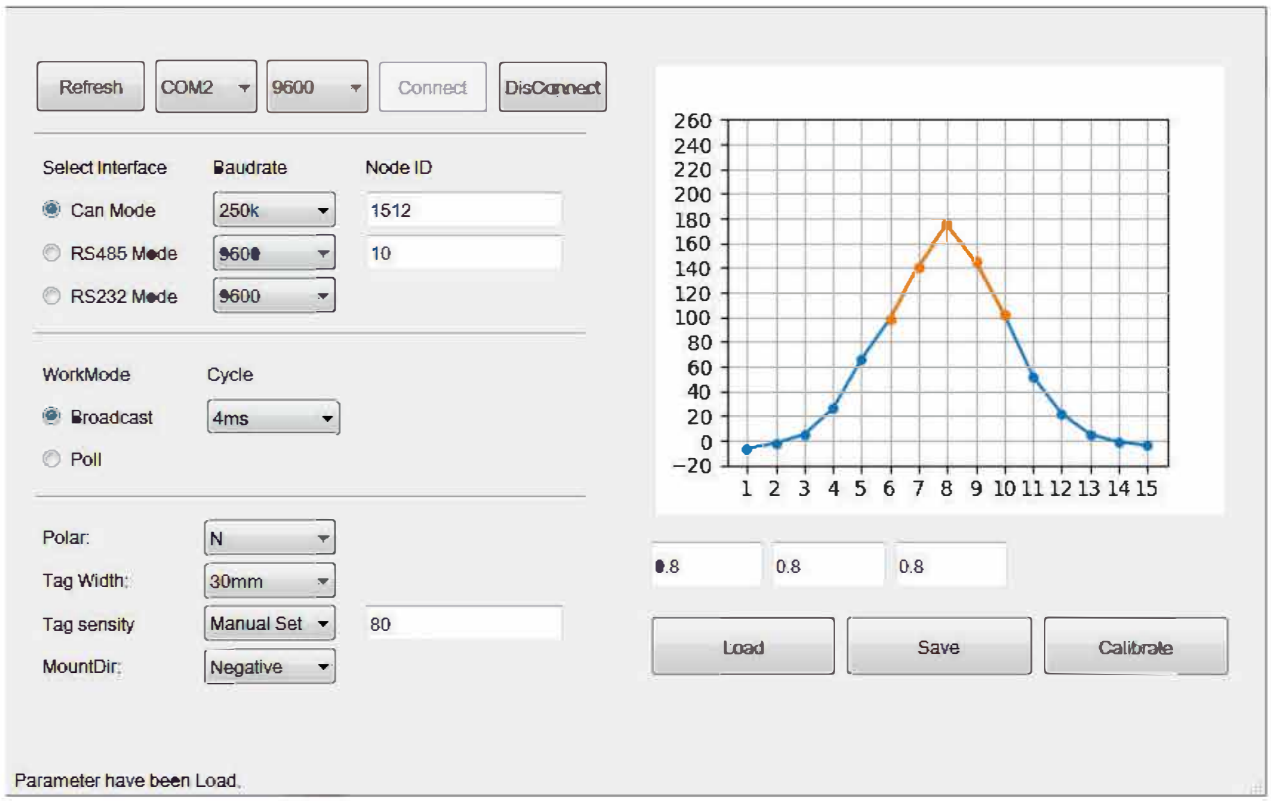

TZS-MAG-1600-A offer 2 ways to obtain the Sensor data, Rs485 / RS232 and Can.

# Software

Use the‘MagtoolCom.exe’ to configure the sensor.  MagToolCom is a free-installation software as below.

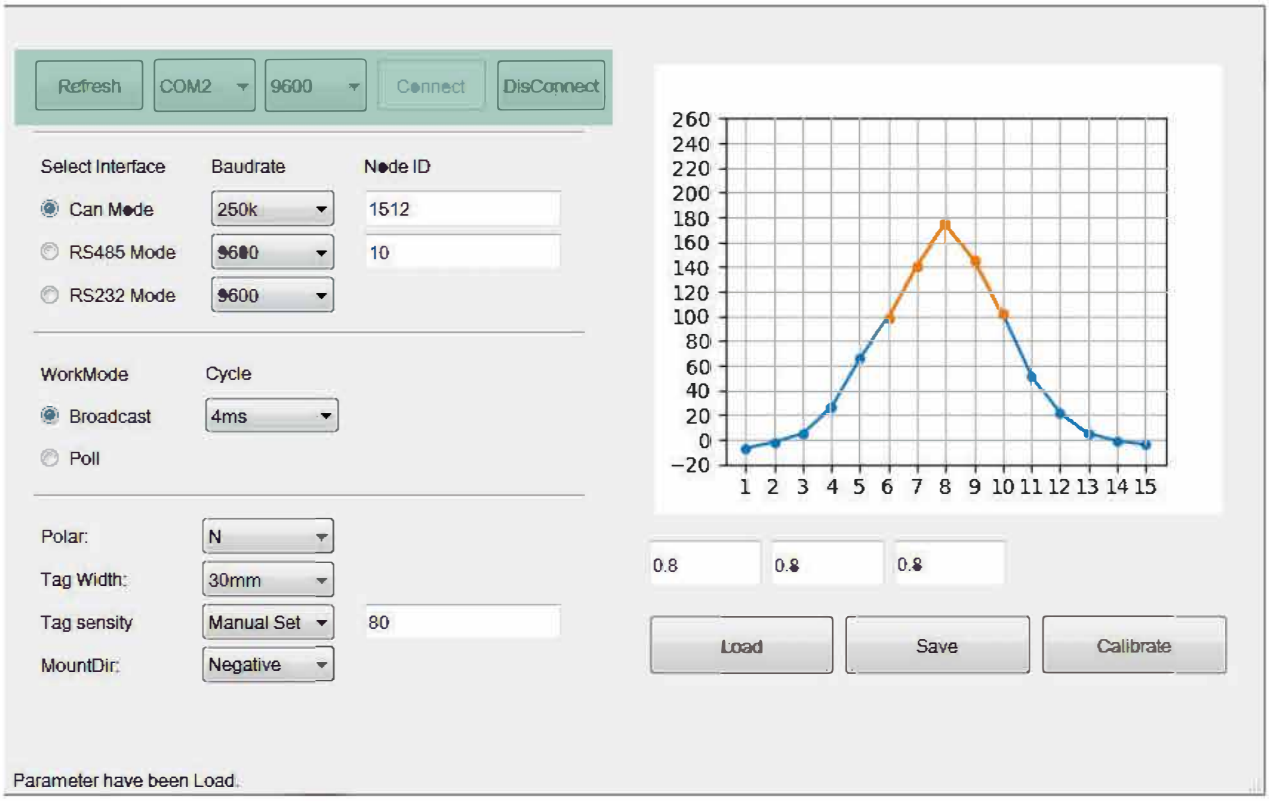
## Software ICON

## Software Interface



# Software

## Connection




We can connect to the sensor by Rs485 or Rs232. The default communicate parameter is as below

data bit : 8
parity bit : 1
parity mode : None
baud rate : 9600bps

Check your connect diagram if you can not connect to the sensor.

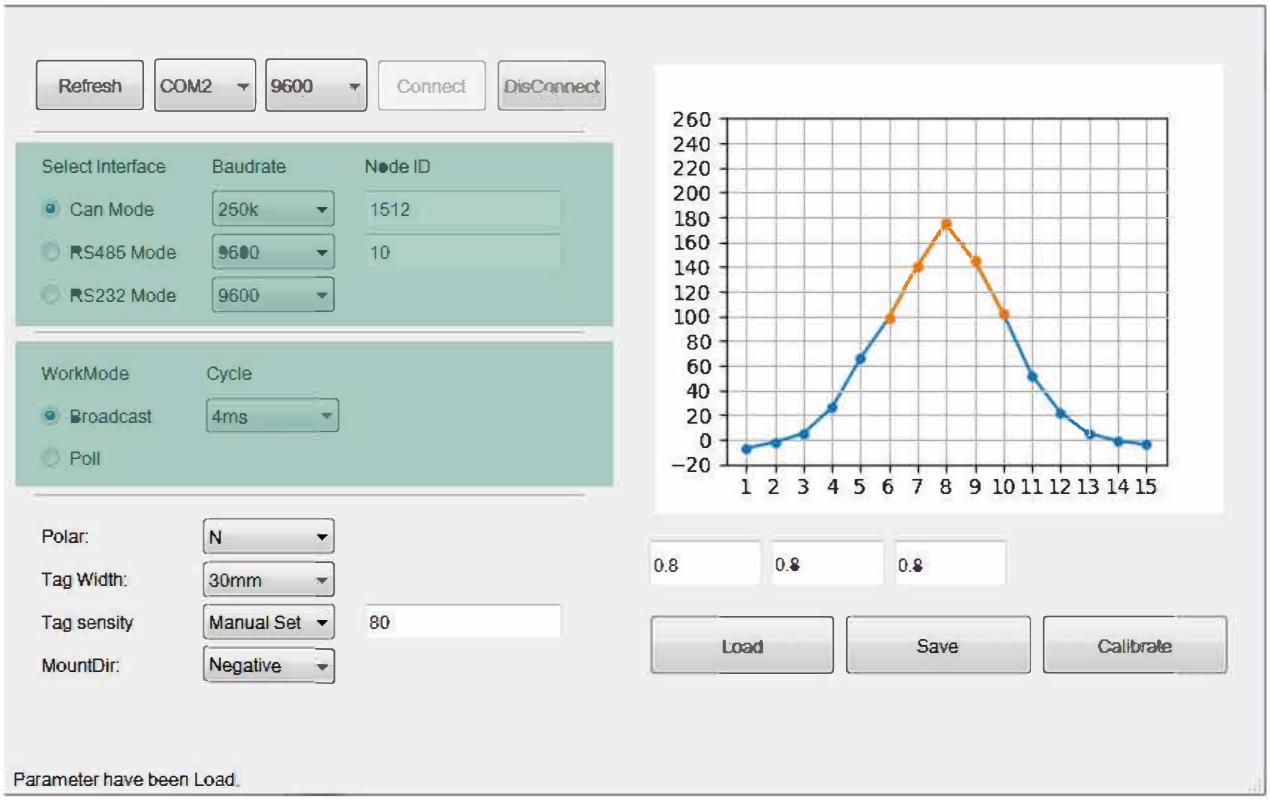
RS485 connection

RS232 connection

**Note:** You need to 'save' the configuration to the sensor by pressing Save button. You can also read out the configuration out of the sensor.

# Software

## Interface & work mode

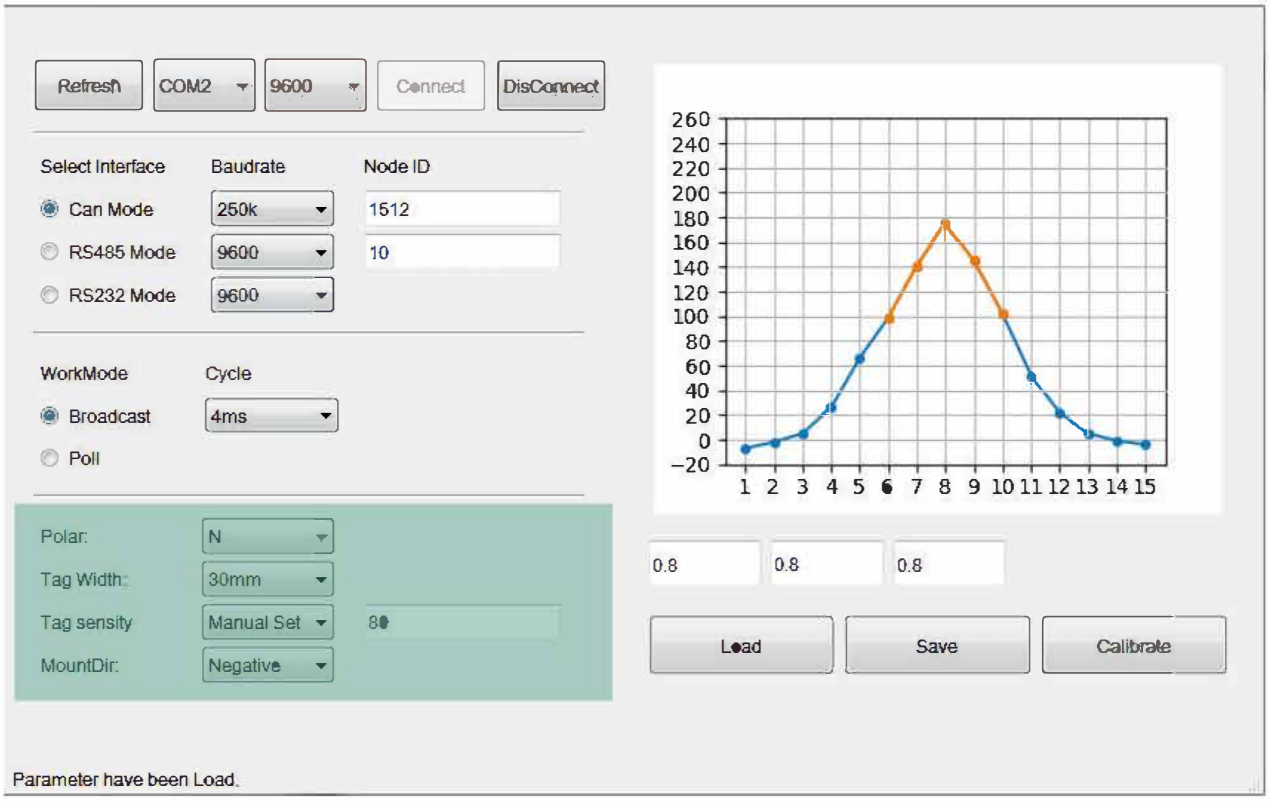



As what we show above. You can configure the sensor work mode to broadcast or Poll by Master. The respond interface can be one of Can or Rs485.

**Note:** You need to 'save' the configuration to the sensor by pressing Save button. You can also read out the configuration out of the sensor.

# Software

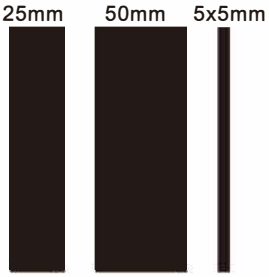
## Sensor key parameter




Polar:


Depends on which type of magnetic taps you use.

Tap Width:

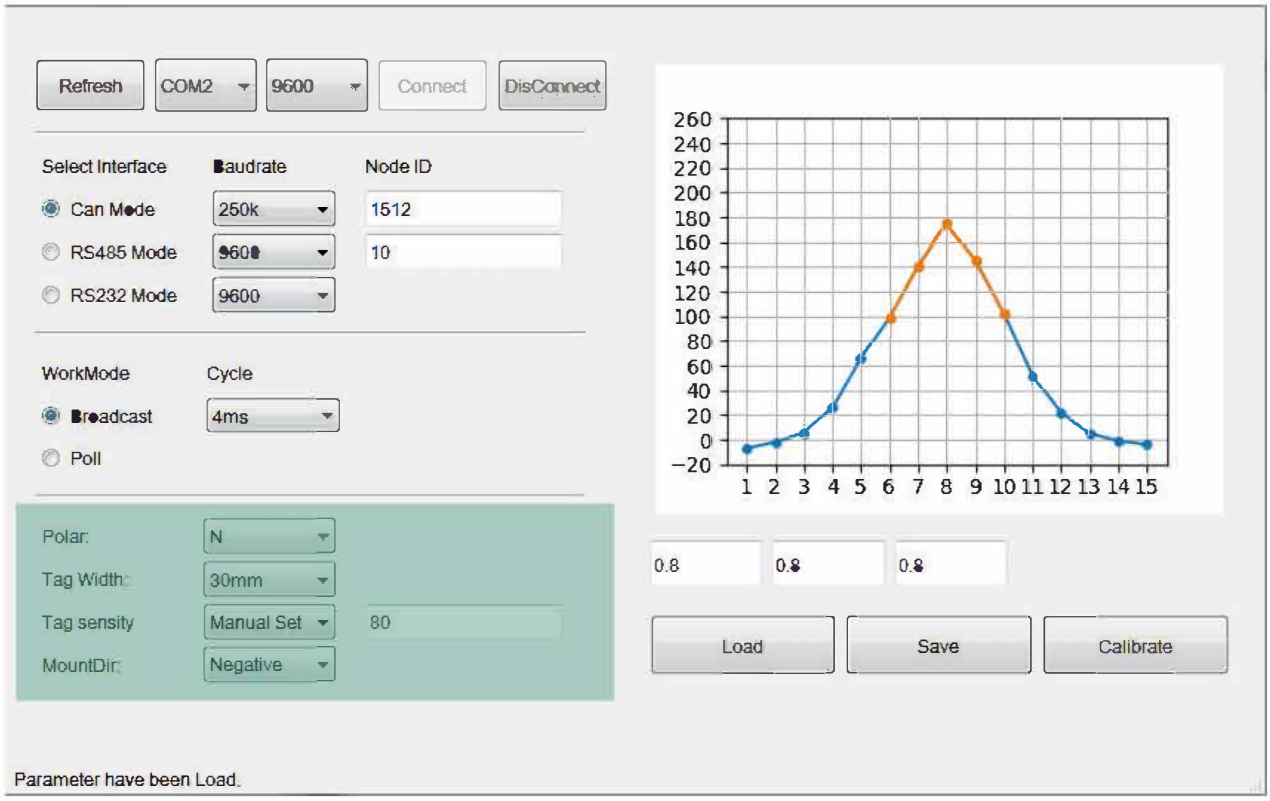



Depends on which type of magnetic taps you use.

**Note:** You need to 'save' the configuration to the sensor by pressing Save button. You can also read out the configuration out of the sensor.

# Software

Sensor key parameter

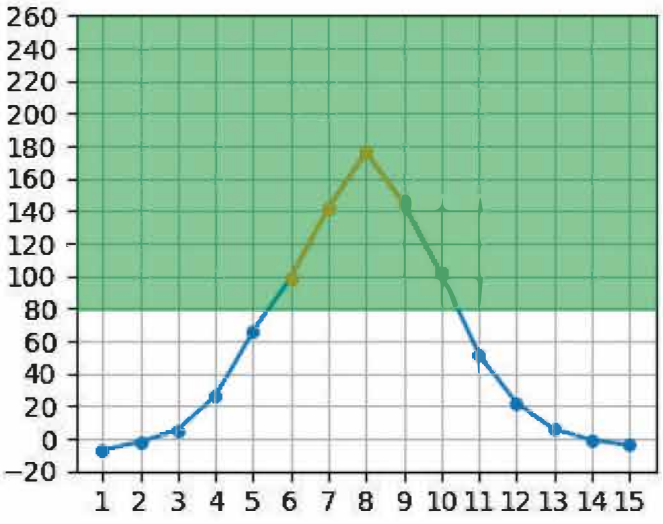



Tap Sensity:

The sensor use this value to recognize if there is Taps occurs when the actual density is greater than the configure value.

When you configure the value to be 80, Because the density of sensor cell (total 15 cells) 6~10 are greater than 80 and they will light up in the figure.

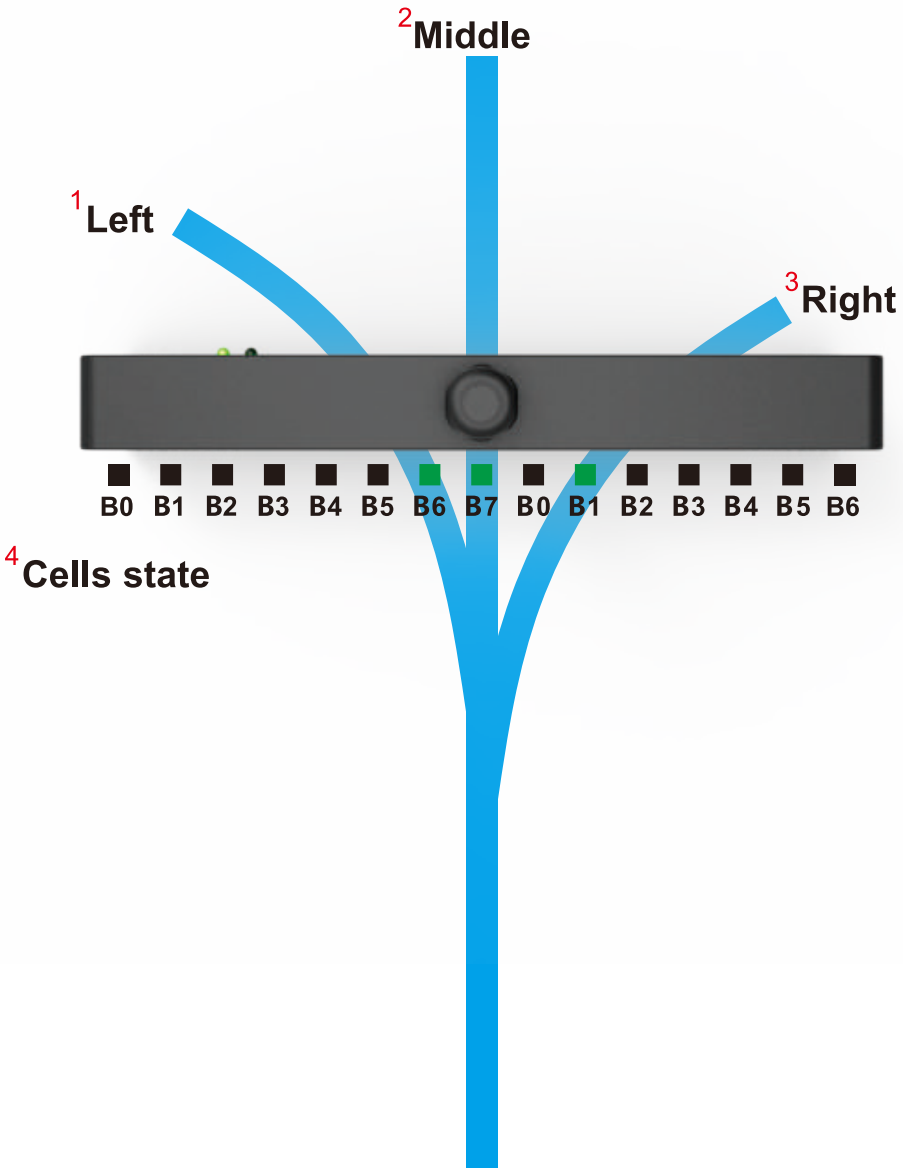
To note that the interval of the cell is 10mm. So you need to make sure the value you configure is reasonable. For example: If the tap is 30mm width. So cell 10 - cell 6 = 4 interval(within 40mm) is reasonable.




**Note:** You need to 'save' the configuration to the sensor by pressing Save button. You can also read out the configuration out of the sensor.

# CanData

Data on sensor




1. Left - The left fork Position;
2. Middle - The middle fork Position;
3. Right - The right fork Position;
4. Cells state - The sensor-cells'status, depends on the Tag sensity you configure.

# CanData

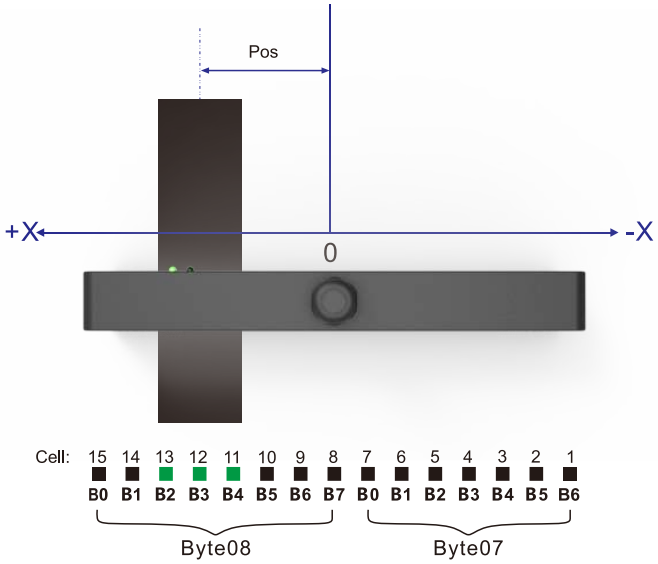
## Can Data payload

There are 8 bytes for the data. Can frame : DLC=8, RTR=DATA, IDE=STANDARD.

| Byte01 | Byte02 | Byte03 | Byte04 | Byte05 | Byte06 | Byte07 | Byte08 |
|---|---|---|---|---|---|---|---|
| H | L | H | L | H | L | H | L |
| [3]Right | | [2]Middle | | [1]Left | | [4]Cells state | |

## Pos data

It is 0.1mm/unit. For example 200 means the deviation is 20mm, when there is no taps detected, the data respond would be 0x8000;
Be care of the signs of the data. It base on the coordinate below.




Note : When there are no taps , all 3 pos data value is 0x8000. When only one fork, all 3 pos data are the same. When two forks, right and middle data are the same.

## Cells state

There are 15 cells in one sensor. So there total 15bits to express their states. As what you see above.

1. Left - The left fork Position;
2. Middle - The middle fork Position;
3. Right - The right fork Position;
4. Cells state - The sensor-cells'status, depends on the Tag sensity you configure.

# Rs485 Data

## Rs485 Data payload - BroadCast

There are 14 bytes for the data.

| Byte01 | Byte02 | Byte03 | Byte04 | Byte05 | Byte06 ~ Byte13 | Byte14 |
|---|---|---|---|---|---|---|
| 0xAA | 0x53 | 0x0B | 0x01 | NodeID | MagDatas | 0xAE |

| Byte06 | Byte07 | Byte08 | Byte09 | Byte10 | Byte11 | Byte12 | Byte13 |
|---|---|---|---|---|---|---|---|
| H | L | H | L | H | L | H | L |
| [3]Right | | [2]Middle | | [1]Left | | [4]Cells state | |

## Poll Mode - ModBus

Communicate parameters.

data bit : 8
parity bit : 1
parity mode : None
baud rate : 9600 / 19200 / 38400 bps

ModBus Function Supported: 04H
Address Range : 1000 ~ 1010A.

**DATA:**

| 1000 | 1001 | 1002 | 1003 | 1004~1010A |
|---|---|---|---|---|
| [3]Right | [2]Middle | [1]Left | [4]Cells state | Reserved |

1. Left - The left fork Position;
2. Middle - The middle fork Position;
3. Right - The right fork Position;
4. Cells state - The sensor-cells'status, depends on the Tag sensity you configure.

# Rs232 Data

## Rs232 Data payload - BroadCast

There are 44 bytes for the data.

| Byte01 | Byte02 | Byte03 | Byte04 | Byte05 | Byte06 ~ Byte35 | Byte36~Byte43 | Byte44 |
|---|---|---|---|---|---|---|---|
| 0xAA | 0x53 | 0x29 | 0x01 | 0x00 | Reserve | MagDatas | 0xAE |

| Byte36 | Byte37 | Byte38 | Byte39 | Byte40 | Byte41 | Byte42 | Byte43 |
|---|---|---|---|---|---|---|---|
| H | L | H | L | H | L | H | L |
| [4]Cells state | | [3]Right | | [2]Middle | | [1]Left | |

## Poll Mode

Request data by define data frame。

Request Data：

| Byte01 | Byte02 | Byte03 | Byte04 | Byte05 | Byte06 | Byte07 |
|---|---|---|---|---|---|---|
| 0xAA | 0x57 | 0x04 | 0x00 | 0x00 | 0x01 | 0xA1 |

Respond data:

The same as the broadcast data frame.

1. Left - The left fork Position;
2. Middle - The middle fork Position;
3. Right - The right fork Position;
4. Cells state - The sensor-cells'status, depends on the Tag sensity you configure.