

TEMP & HUM Monitoring Cable

ZS-MT-2

Product Manual



Producer: Zhe Lee

Modification time:2024.2.26



TEMP & HUM Monitoring Cable

■ Summary

ZS-MT-2 is suitable for grain silos, bungalows, or other types of grain warehouses within 4-13m. It can monitor both temperature and humidity simultaneously. It contains two steel wires inside, which are used for both signal transmission and tensile resistance. The accuracy of temperature and humidity sensors can reach 2% (10-90% RH), and the temperature accuracy can reach 0.2 °C (-10 to 85 °C). If the ZSTC temperature monitoring system is used, temperature and humidity can be used to calculate the equilibrium moisture (EMC) in grains

<u>Characteristic</u>	<u>Advantage</u>
<ul style="list-style-type: none"> ■ Only two lines are needed for communication ■ Temp&hum accuracy is not affected by wire length ■ single cable can support to 100 temp&hum sensors ■ Tensile strength >500KG ■ Use range from 30 ° to 90 ° ■ Programmable temp&hum sensor ■ IP67 waterproof and dustproof 	<ul style="list-style-type: none"> ■ It can have temperature and temp&hum sensors at the one cable ■ Humidity accuracy reaches 2% ■ Temperature accuracy reaches 0.2 ■ Up to 500m from the collector ■ Multiple temp&hum cables can be connected in parallel ■ It can be connected to the collector in parallel with temperature cable.



■ Summary

**ZS-MT-2 TEMP&HUM Monitoring Cable
Parameter table**

Monitoring Range	-30°C-90°C	Inner core material	Two steel wires
Supply Voltage	3-5.5VDC (Power supply for collector)	Output core	2-wire (1-wire)
Temperature accuracy Humidity accuracy	0.4 °C/0.2 version can be customized 2%RH	Waterproof performance	Do not immerse in water but prevent condensation
Maximum outer diameter of cable section	23mm	Installation method	plug-in mounting/U-blot / Flange
Waterproof grade	IP57	Sensor convert time	2S/1sensor
Output signal	1-wire	Service life	Temperature and humidity sensor>3 years (typical value)
Tensile resistance	>500KG	Customizati on cycle	20 days
Sheath material	HDPE	Dust explosion-proof grade	Ex iaD 20 T85°C
Maximum length	100 meter	Intrinsically safe explosion-proof grade	Ex ib IIB T6 Gb Ex ia IIC T6 G
Maximum number of sensors	100sensors	Connected devices (digital signal type only)	TEMP & HUM collector
Maximum length of extension cable	500 meter	Power consumption	1.5MA (5VDC) /1sensor

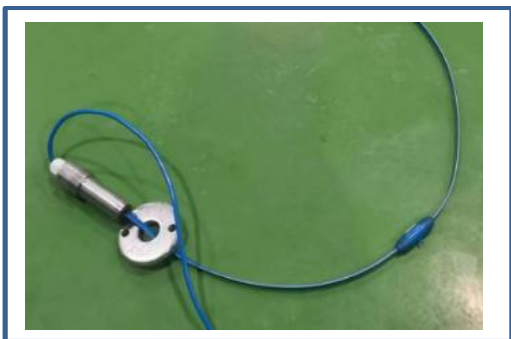
■ Product picture



Overall picture



TEMP&HUM cable



Version using flanges

■ TEMP&HUM sensor

The humidity sensor is manufactured by Swiss SHT Company (convert I2c signal to 1-WIRE signal, and add 2 eeproms to store level and cable num values). The temperature sensor is manufactured by Maxim Company in the United States.

■ Sensor protection

The outermost layer uses waterproof filter film, the inner layer is wrapped with molecular filter film, and the humidity detection port uses Swiss original filter film. Except for the humidity detection port, all PCB circuit boards are coated with glue.

■ Installation method

Plug-in mounting/U-blot / Flange

■ Wirerope

There are two steel wire ropes inside, which serve both signal transmission and tensile purposes.

■ Food grade

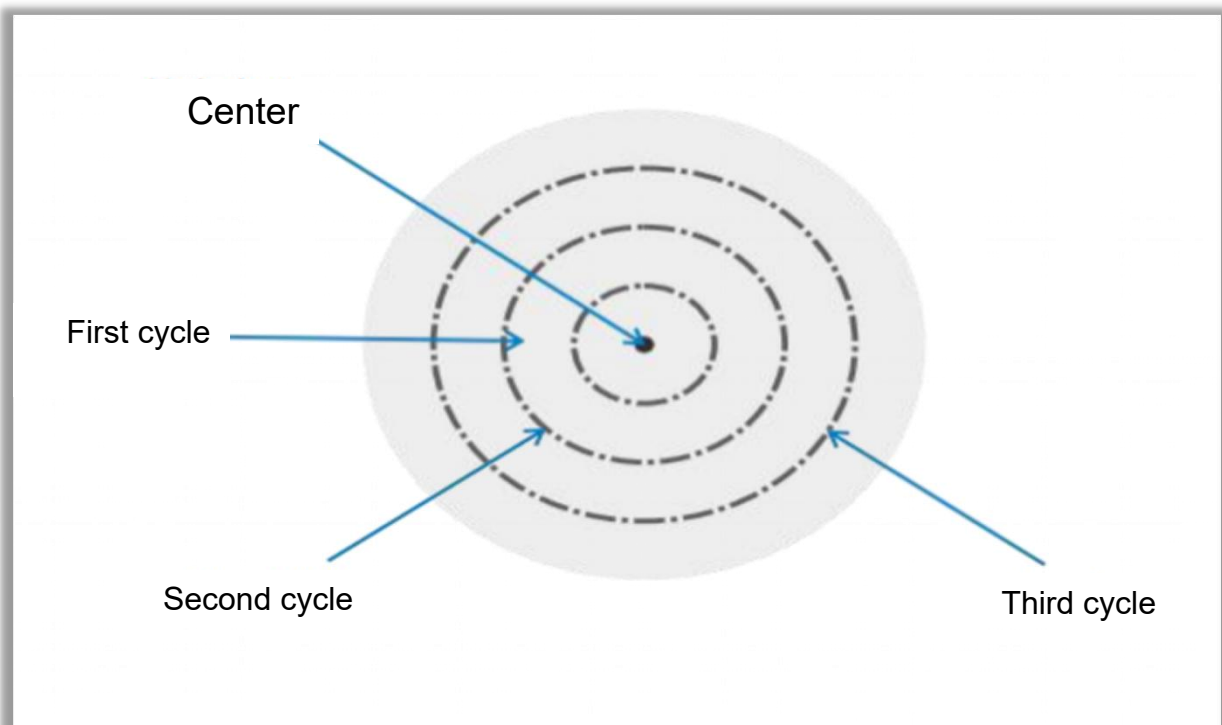
HDPE material is used for outer sheath

■ TEMP&HUM can be mixed

A TEMP&HUM cable can have both temperature sensors and TEMP&HUM sensors. It can also transmit signals to the temperature collector together with other temperature cables.

■ Suggestions on the design of num of cables in the silo

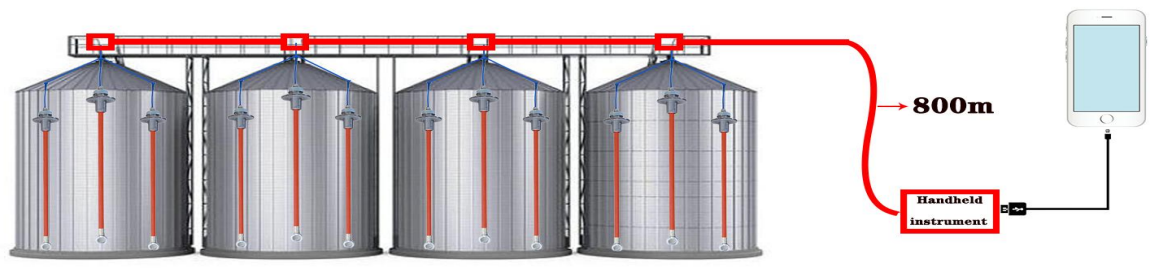
Silo diameter (m)	Cable Quantity	Center Quantity	First cycle		Second cycle		Third cycle	
			Quantity	Interval angle(m)	Quantity	Interval angle(m)	Quantity	Interval angle(m)
4	1	1	-	-	-	-	-	-
6	1	1	-	-	-	-	-	-
8	3	-	3	2.3	-	-	-	-
10	3	-	3	2.5	-	-	-	-
12	4	1	3	3.3	-	-	-	-
14	6	1	5	4.7	-	-	-	-
16	7	1	6	5.6	-	-	-	-
18	8	1	7	6	-	-	-	-
20	11	-	3	2.5	8	7.5	-	-
22	12	-	3	2.8	9	8.2	-	-
24	13	-	3	3	10	9	-	-
26	17	1	6	5.3	10	10.5	-	-
28	19	1	6	6.6	12	10.6	-	-
30	22	-	3	2.6	7	7.5	12	12.8
36	29	-	3	2.5	10	8.5	16	14.5
40	34	1	5	5.6	10	11.3	18	17



■ Application scenario

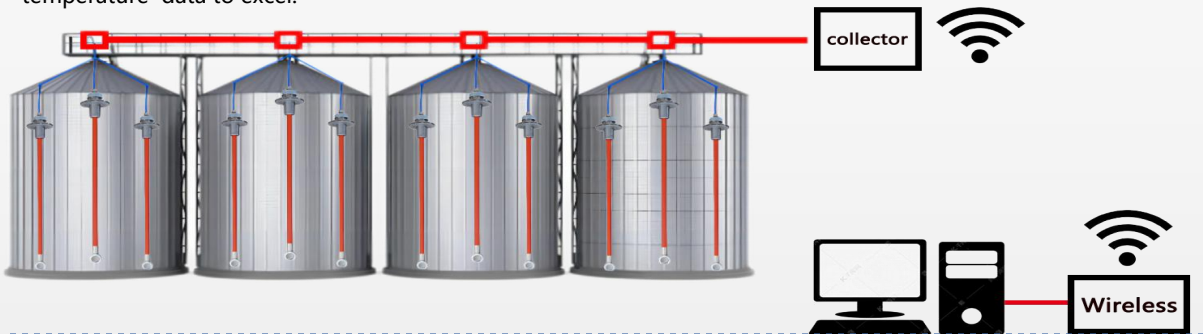
1、Handheld

Handheld version is an economical grain bin temperature monitoring solution. It only needs an Android phone to connect with the handheld to read the connected grain bin temperature cable connected of the silo. Hand held can support more than 800 meter extension cables and 200 grain bin temperature sensors readings. You can extend the grain bin temperature cable anywhere in the factory and read it with an Android phone. The android application can record the temperature value and display the number of each sensor of the cable in the silo. The android application can also connect to PC wirelessly to display real-time temperature data or historical temperature data on PC or export temperature records in Excel format through the software.

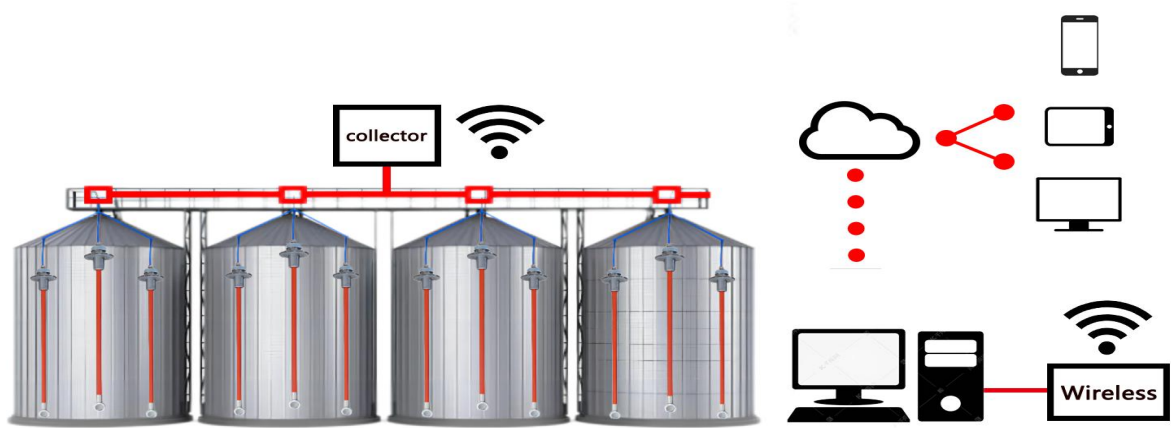


2、PC OR CLOUD MONITORING

PC monitoring version is to collect the temperature in the silo by wireless. The temperature of silos is displayed graphically on the PC. It can store temperature data for more than 3 years / monitored regularly / can show high and low temperature / graphically display the historical temperature / draw temperature-time curve / export historical temperature data to excel.



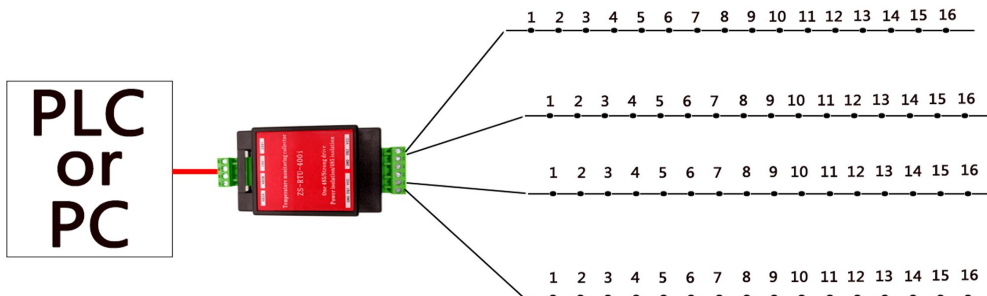
CLOUD monitoring VERSION is an upgraded version of PC monitoring version. It can view the temperature of silo anywhere in the world. It has two ways: mobile app viewing and website viewing. It has branch office structure. If user have a head office account, you can view the real-time temperature and historical temperature data of each branch.



■ Application scenario

3、 Provide communication Protocol

If you do not need to use our software, we can provide standard protocols. The temperature collector (ZS-RTU series) uses the MODBUS-RTU communication protocol and has two 485 ports. While monitoring by PC, can access the temperature data to PLC, configuration screen or configuration software. Our wireless can send temperature data over 5KM to the office by wireless way. In addition, we have directly output MODBUS-TCP protocol version. (RJ45)



■ Installation method (reference)

plug-in mounting



Flange



Producer: Zhe Lee

Providing some pictures and sorting out data:

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Business Department-Sun Haiyang
-Sun Zhengjie
Factory director-Sun Hening
R&D Department-Wang Daochuan
A&D Department -Sun Tianning
Installation Team-Sun Bowei

Important notes and disclaimers

Due to the continuous improvement of the product, this specification may be changed, and the latest version shall prevail. Users of this product need to pay attention to the product dynamics on the official website, so that users can get the latest information of this product in a timely manner. The pictures and diagrams used in this specification are for illustration of the functions of this product and are only for reference.

The measurement data in this specification are all measured by our company at room temperature and are only for reference. Please refer to the actual measurement for details. Langfang Zhaosui

Thermometric Cable Co., Ltd. reserves the right of final interpretation and modification of all contents in this specification