



NCS-TT106A series
Intelligent analog temperature transmitter
User manual

Warning

1. It is forbidden to disassemble the temperature module by user.
2. Please check if the supply voltage of temperature transmitter meets the power supply voltage requirements in the manual.

Company Introduction

Microcyber Corporation established as a high-tech enterprise by the Shenyang Institute of Automation Chinese Academy of Sciences, mainly engages in advanced industrial control systems, equipments, instruments and chips for industrial process automation control solutions in the research, development, production and application. Microcyber undertakes a number of national scientific and technical key task and “863” project, and has Liaoning Province networked control systems engineering research center.

Microcyber successfully developed the first domestically certified fieldbus protocol master stack, the first nationally certified fieldbus instrument, and the first domestic safety instrument certified by German TÜV, and co-hosted with other units It has formulated the first domestic industrial Ethernet protocol standard EPA and the first industrial wireless communication protocol standard WIA-PA, which have become IEC international standards.

The products and technologies of Microcyber have won two second prizes of National Science and Technology Progress Award, one National Science and Technology Invention Award, one first prize of Science and Technology Progress of Chinese Academy of Sciences, and one first prize of Liaoning Province Science and Technology Progress. The products are exported to Europe and the United States, etc. In developed countries, top companies in the industry such as Emerson in the United States, Rotork in the United Kingdom, and Bifold in the United Kingdom have adopted Microcyber 's key technologies or key components in their products, and have successfully completed more than 200 large-scale automation engineering projects.

Microcyber passed the Authentication of ISO 9001 Quality System, and has an outstanding innovative R&D team, plentiful practical experiences of design of the Automatic engineering, a leading product series, a huge market network, a strict quality management system and an excellent enterprise culture. All these further a solid foundation of entrepreneurship and sustainable development for Microcyber.

Carrying the ideals of employees, creating customer value and promoting enterprise development.

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1 OVERVIEW

The NCS-TT106A series temperature modules, including head mounted NCS-TT106A and din rail mounted NCS-TT106A-R1, are the new generation of intelligent temperature modules and indispensable on-site device in process control. This device integrates rich functional modules, which can achieve both general detection functions and complex control strategies.

NCS-TT106A adopts digital technology and can be applied to various thermal resistance and thermocouple sensors. It has a wide range, simple interface between on-site and control room, and can greatly reduce installation, operation, and maintenance costs.

The NCS-TT106A series temperature module supports 4-20mA analog current signal output and can be widely used in industries such as petroleum, chemical, power, and metallurgy.

2 INSTALLATION

2.1 Size

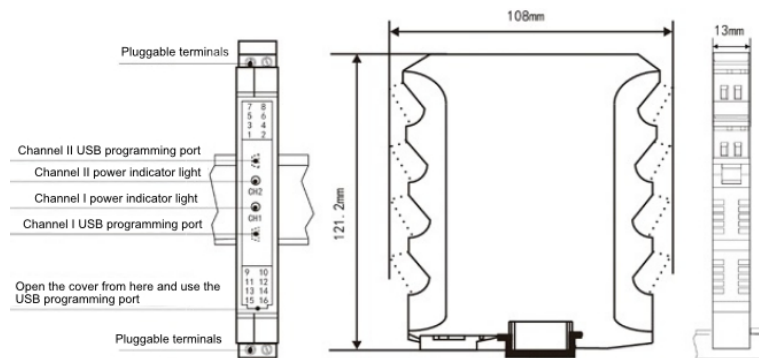
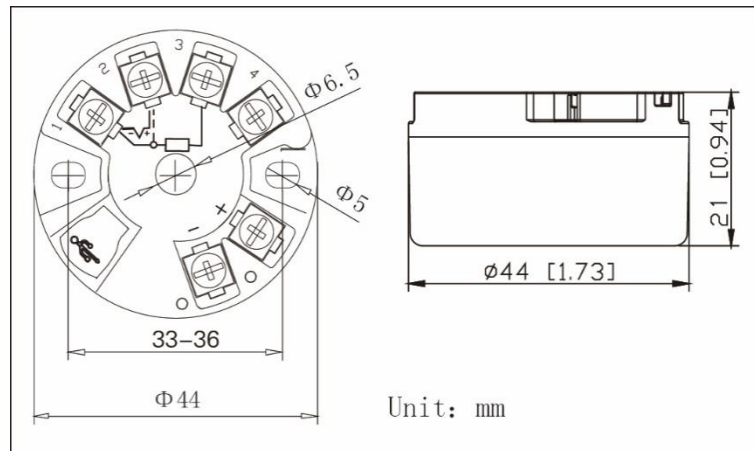
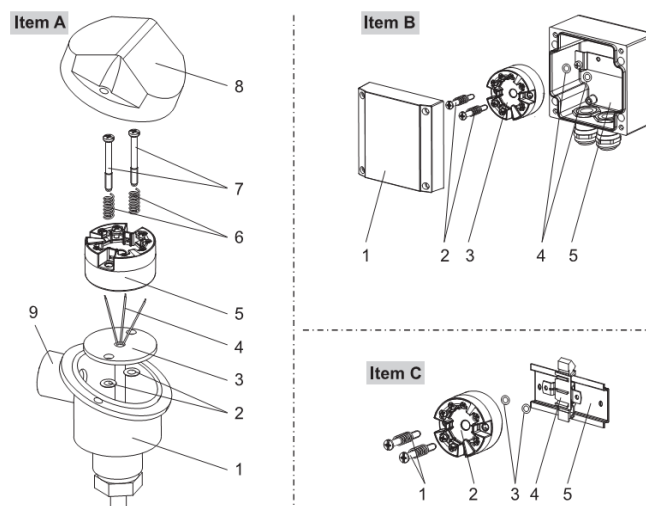


Figure 2.1 Temperature Module Dimensions (unit:mm)

2.2 Installation

Fix the temperature module to the temperature housing or din rail through the positioning holes using two screws.



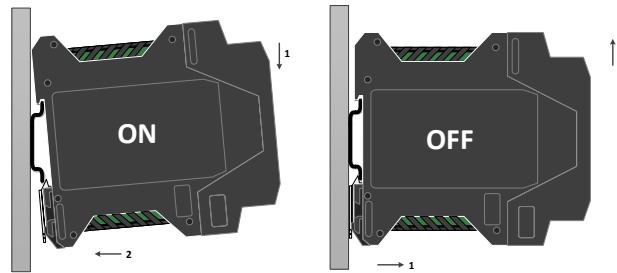


Figure 2.2 Installation diagram of temperature module

2.3 Wiring

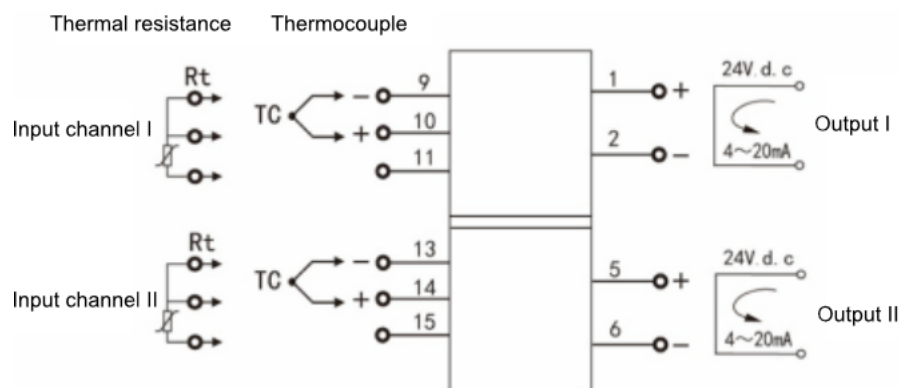
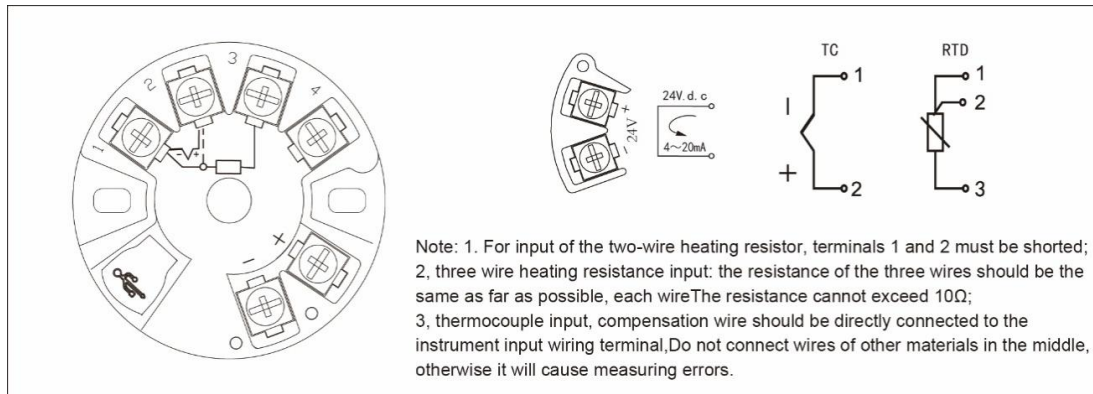


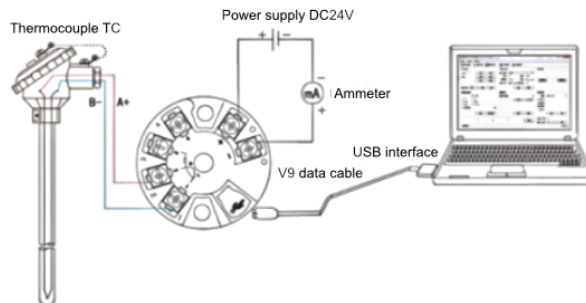
Figure 2.3 Temperature Module Wiring Diagram

The power supply of the intelligent temperature module shares a pair of cables with the 4-20mA current signal. Do not share conduit or open wire slots with the power lines of other devices, and keep away from high-power devices.

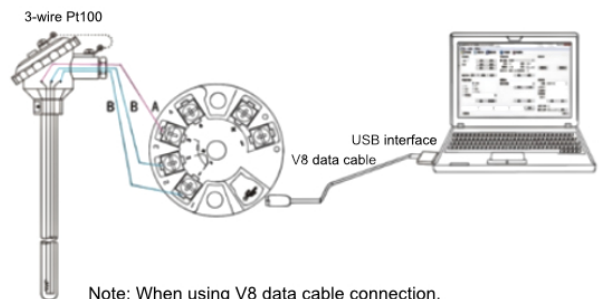
3 CONFIGURATION

3.1 Configuration diagram

V9 data cable connection method::



V8 data cable connection method



Note: When using V8 data cable connection, the transmitter is not allowed to be connected to 24V power supply

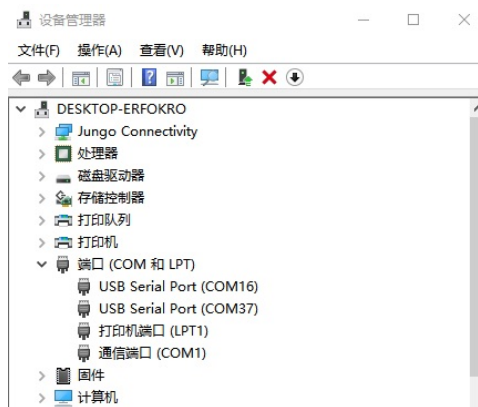
Figure 3.1 Intelligent temperature transmitter connected to PC

3.2 Data cable and serial port

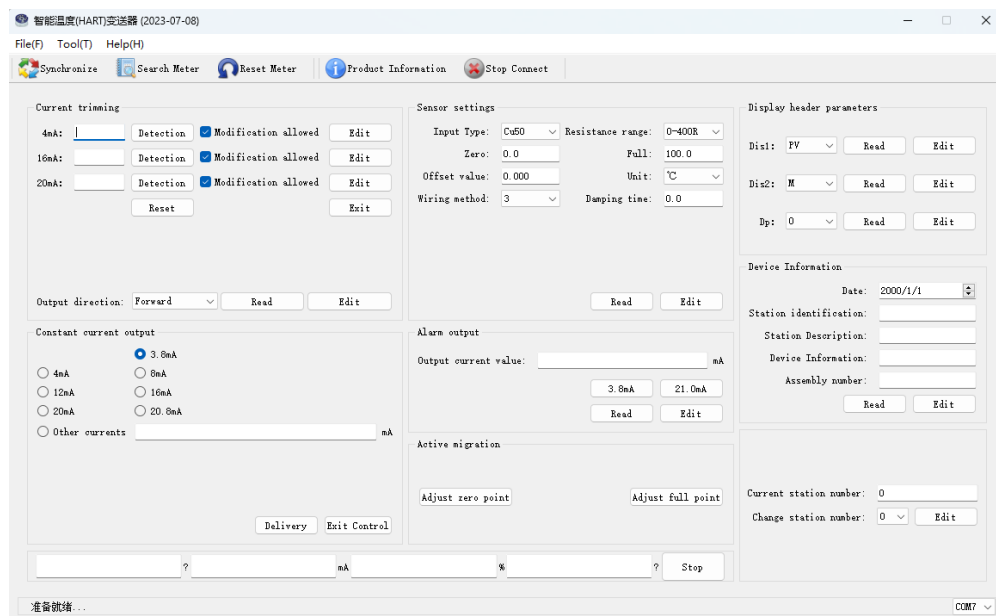
The V8 data cable is only suitable for NCS-TT106A-N and does not require additional power supply. The V9 data cable is suitable for all products of NCS-TT106A and requires an external DC power supply. The data cable can be reused, and at least one data cable is required for each configuration station.

Ftdi_Ft232_Drive.exe is a driver program for data cables, suitable for installation on personal computers. After successful installation, a new "USB Serial Port (xx)" will appear under the port entry in the device manager. If you have previously installed the FT232 driver from FTDI company, simply plug in the V9 data cable to see the appearance of "USB Serial Port (xx)". Afterwards, the configuration software can be applied.

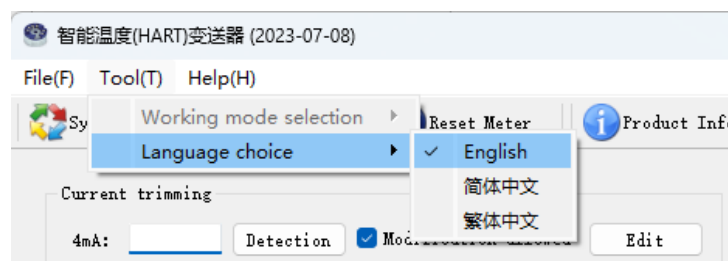
3.3 Configuration



Taking NCS-TT106A as an example, open the intelligent transmitter configuration software, as shown in the following figure.



Click on 'Tools' > Language selection allows you to select one of the interface display languages from Simplified Chinese, Traditional Chinese, and English.



In the bottom right corner of the interface, select the serial port used for the data cable, and plug in the new serial port that appears in the device manager of the personal computer.



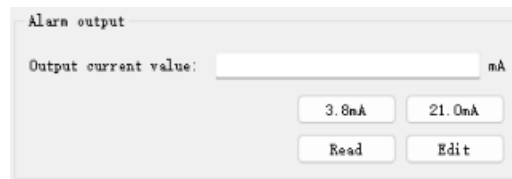
The Sensor Settings column allows you to select options such as sensor type, wiring method, setting range zero, range full point, unit, damping time, etc.

Click the "Read" button to read the current sensor settings in the transmitter. Click the "Edit" button to write the current content of the sensor settings column to the transmitter.

When you need to view the current measurement values, current values, and other information of the transmitter, you can click the "Start" button at the bottom of the interface. After clicking, the configuration software will cycle through the measurement value, current value, percentage, and cold end temperature of the transmitter. At the same time, the button name is automatically changed to 'Stop'.

The Current trimming bar provides users with the function of calibrating the output current value of the transmitter. The "Detection" button will issue a command to adjust the current to the transmitter. The transmitter will output the specified current value according to the command. The customer will measure the current value and input it into the blank column after the corresponding current value in the current fine-tuning column, and then click the "Edit" button on the back. The transmitter will receive the measured value and correct its own output current value.

The Alarm output column can set the alarm current of the transmitter, and select one between 3.8mA and 21.0mA.

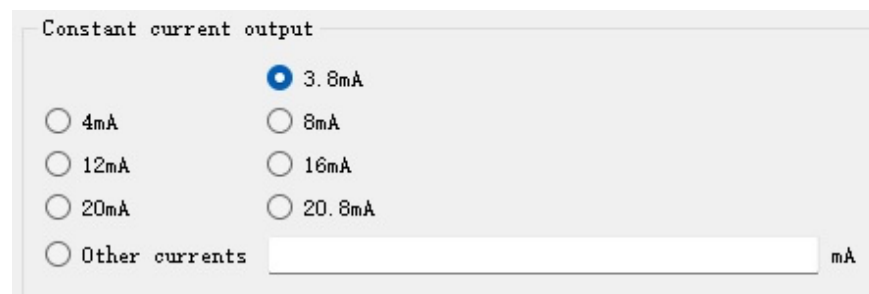


Alarm output

Output current value: mA

The Constant current output column can verify the output of multiple current values of the transmitter. The user needs to connect a Ammeter in series to measure whether the output current of the transmitter meets the requirements. The "other currents" can be input by the inspector to other current values that need to be verified.

The device information bar can read and modify the basic information of the transmitter. Users can configure as needed, including date, configuration, station identification, station description, device information, assembly number, etc.



Constant current output

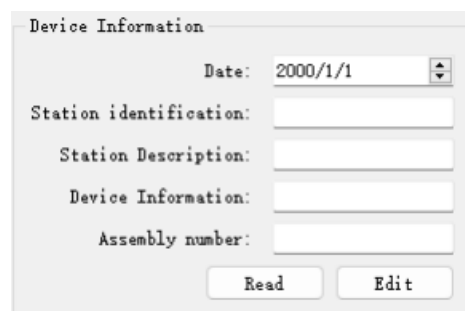
☒ 3.8mA

☐ 4mA ☐ 8mA

☐ 12mA ☐ 16mA

☐ 20mA ☐ 20.8mA

☐ Other currents mA



Device Information

Date: 2000/1/1

Station identification:

Station Description:

Device Information:

Assembly number:

The configuration of the NCS-TT106A N non isolated temperature transmitter is basically the same as that of the isolated temperature transmitter and will not be repeated.

4 SPECIFICATION

4.1 Technical Parameters

Input signal	Pt100、CU50 Thermocouples:B, E, J, N, K, R, S, T
Number of channels	Single channel
RTD wiring method	2-wire、3-wire
Working power supply	12~40 VDC
Output signal	4~20mA
Electric isolation	1500VAC/Non-isolation
Working temperature	-20℃~60℃
Humidity range	5%~95%RH
Start time	≤5s
Update time	Reaching 90% of the final value in 1 second
EMC	Complies with GB/T 18268.1-2010 and EN61326.1-2013
Protection level	Terminal IP00 Housing IP40
Voltage influence	±0.005%/V
Upper/lower limit current	I _H =21mA、I _L =3.8mA
Alarm signal	0.03%

4.2 Input type and transmission accuracy:

Model	Type	Measurement scope	Minimum measurement scope	Conversion accuracy (larger value)
RTD	Pt100	-200~850℃	20℃	±0.1%range Or±0.2℃
	Cu50	-50~150℃	20℃	±0.1%range Or±0.2℃
Thermocouple (TC)	B	100~1820℃	500℃	±0.1%range Or±1.5℃
	E	-100~1000℃	50℃	±0.1%range Or±0.5℃
	J	-100~1200℃	50℃	±0.1%range Or±0.5℃
	K	-180~1372℃	50℃	±0.1%range Or±0.5℃
	N	-180~1300℃	50℃	±0.1%range Or±0.5℃
	R	-50~1768℃	500℃	±0.1%range Or±1.5℃
	S	-50~1768℃	500℃	±0.1%range Or±1.5℃
	T	-200~400℃	50℃	±0.1%range Or±0.5℃

Notes:

1. The above accuracy data was obtained by testing at an ambient temperature of $20^{\circ}\text{C} \pm 2^{\circ}\text{C}$.
2. The output precision “%” is relative to the set range.
3. The cold end compensation error needs to be added to the thermocouple measurement, and the internal cold end compensation error is $\leq \pm 1^{\circ}\text{C}$.

4.3 Input type and temperature drift:

Model	Type	Measurement scope	Temperature drift
RTD	Pt100	$-200.0 \sim 850.0^{\circ}\text{C}$	$\pm 0.005^{\circ}\text{C}/^{\circ}\text{C}$
	Cu50	$-50.0 \sim 150.0^{\circ}\text{C}$	$\pm 0.010^{\circ}\text{C}/^{\circ}\text{C}$
Thermocouple (TC)	B	$400 \sim 1800^{\circ}\text{C}$	$\pm 0.10^{\circ}\text{C}/^{\circ}\text{C}$
	E	$-100 \sim 1000^{\circ}\text{C}$	$\pm 0.05^{\circ}\text{C}/^{\circ}\text{C}$
	J	$-100 \sim 1200^{\circ}\text{C}$	$\pm 0.02^{\circ}\text{C}/^{\circ}\text{C}$
	K	$-180 \sim 1372^{\circ}\text{C}$	$\pm 0.05^{\circ}\text{C}/^{\circ}\text{C}$
	N	$-180 \sim 1300^{\circ}\text{C}$	$\pm 0.03^{\circ}\text{C}/^{\circ}\text{C}$
	R	$-50 \sim 1768^{\circ}\text{C}$	$\pm 0.05^{\circ}\text{C}/^{\circ}\text{C}$
	S	$-50 \sim 1768^{\circ}\text{C}$	$\pm 0.05^{\circ}\text{C}/^{\circ}\text{C}$
	T	$-200 \sim 400^{\circ}\text{C}$	$\pm 0.05^{\circ}\text{C}/^{\circ}\text{C}$
	Wre3-25	$0 \sim 2315^{\circ}\text{C}$	$\pm 0.15^{\circ}\text{C}/^{\circ}\text{C}$
	Wre5-26	$0 \sim 2310^{\circ}\text{C}$	$\pm 0.15^{\circ}\text{C}/^{\circ}\text{C}$

4.4 Selection

Model No.	Transmitter type	
NCS-TT106A	Head mounted single channel analog signal temperature transmitter	
NCS-TT106A-R1	Rail mounted single channel analog signal temperature transmitter	
	Code	Electric isolation
	-	Isolation
	N	Non-isolation



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