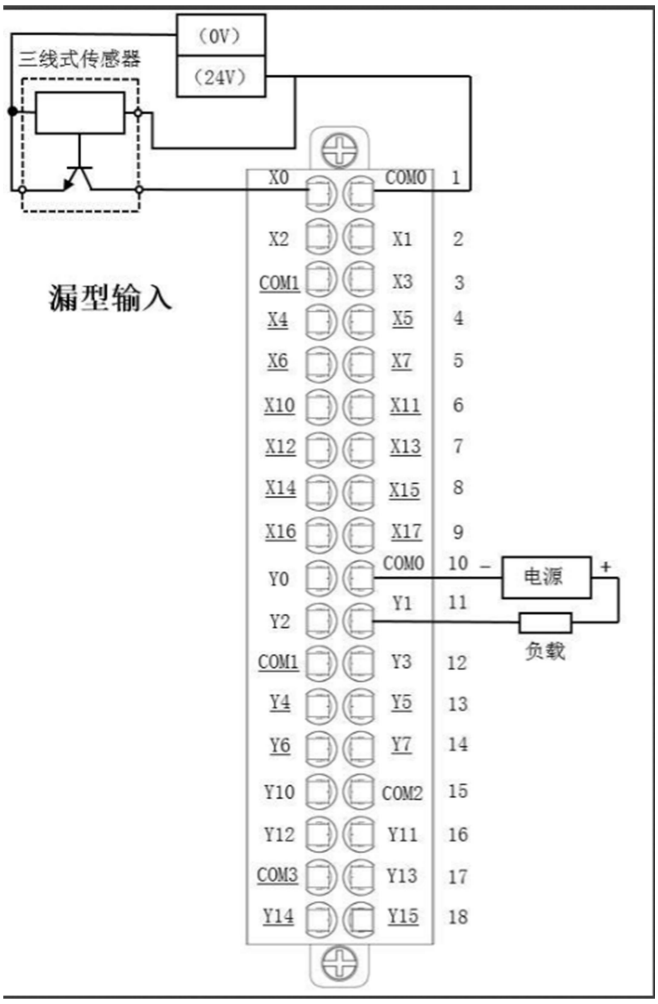
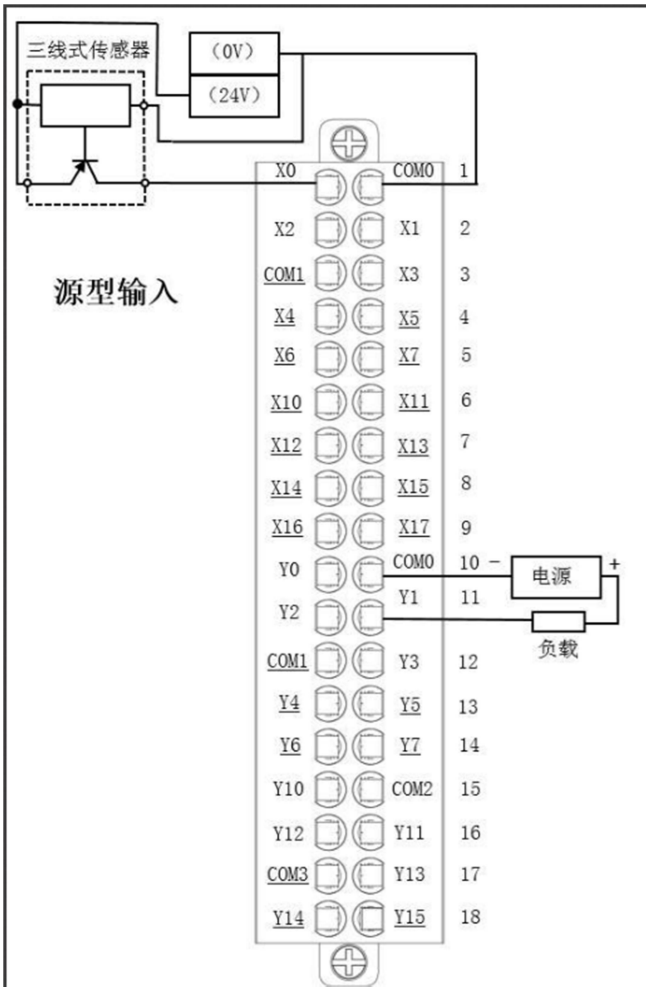
Introduction to the use of analog and plug-in extensions for the all-in-one PC body

1. GT-070-32MT Wiring NPN Type



2.2 GT-070-32MT　Wiring PNP Type



1. This machine temperature analog use

The all-in-one GT_070_32MT model measures 8-way RTDs (PT100, NI120), and the GT_070_32MT_8TC model measures 8-way thermocouples (type K/T thermocouples); the differences in the use of the two models are described in the following sections.

1.1 GT_070_32MT hardware wiring diagram

GT_070_32MT model local temperature analog input wiring diagram, can be accessed three/four-wire PT100 temperature sensor, as shown in Figure 1.1, GT_070_32MT temperature of the first interface, for example, three-wire PT100 is the same color of the two terminals to access the TA1 and TAG. four-wire system, then any two of the same color of the terminal to access the TA0, the other two of the same color respectively to access the TA1 and TAG. Another two of the same color were accessed TA1 and TAG.

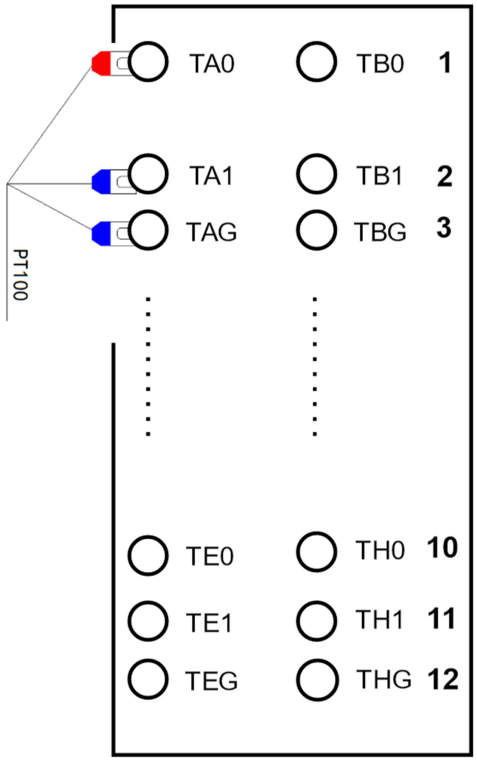


Figure 1.1: GT_070_32MT Temperature Sensor Wiring Diagram

1.2 GT_070_32MT_8TC hardware wiring diagram

GT_070_32MT_8TC model local temperature analog input wiring diagram, can be accessed two-wire K / T type thermocouple temperature sensor, as shown in Figure 1.1; to GT_070_32MT_8TC temperature first interface, for example, the K / T type thermocouple temperature sensor of the positive (+) terminals and the negative (-) terminals of the two were connected to the TA + and TA - interfaces, and also need to Access to the cold end of the temperature measurement sensor NTC, interface pins GND and NTC, NC foot for the suspension is not connected.

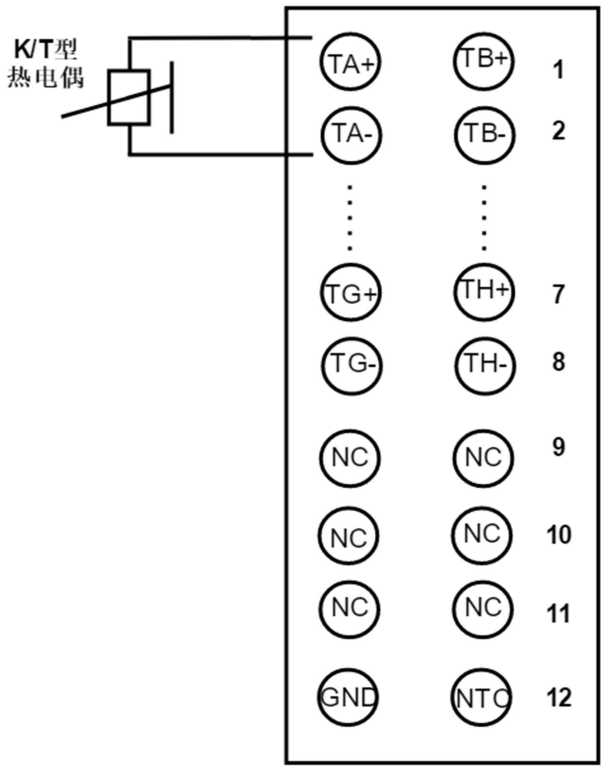


Figure 1.2: GT_070_32MT_8TC Temperature Sensor Wiring Diagram

1.3 Save address for collecting temperature data

GT_070_32MT/8TC, there are 8 temperature acquisition channels, its acquisition to the results stored in the AI register, these 8 channels are corresponding to the register bits AI0 ~ AI7, its data type is a 16-bit signed number, the use of the following steps:

1.3.1 Configuration of GT_070_32MT upper software parameters (analog settings)

As shown in Figure 1.3, open the engineering settings of the ladder diagram and select the analog setting. GT_070_32MT has 8 temperature acquisition channels, corresponding to channels AI0~AI7 in the analog

setting.

Figure 1.3: GT_070_32MT analog setting

1.3.2 Configuration of GT_070_32MT_8TC upper software parameters (analog settings)

As shown in Figure 1.4, GT_070_32MT_8TC and GT_070_32MT are similar in the parameter item type setting, only the measurement object is different, and the difference is described in detail in the setting **parameter description.**

Figure 1.4: GT_070_32MT_8TC analog settings

1.3.3 GT_070_32MT/8TC Analog Setting Parameter Setting Description

GT_070_32MT and GT_070_32MT_8TC need to set the relevant parameters before use, respectively:

[1] **Enable**: Activate the switch, this channel will be scanned, check the box to enable, the parameters related to this channel can be set to take effect.

[2] **Mode**: the object of measurement, under the GT_070_32MT model, there are two options, PT100 and NI120, and in the case of GT_070_32MT_8TC there are K-type thermocouple and T-type thermocouple available.

[3] Channel conversion & sampling times: the number of channel data acquisition, the larger the value, the better the filtering effect, the stronger the anti-interference, but at the same time scanning this channel will take longer.

There are 4 options available: 25ms/ch,12; 50ms/ch,18; 75ms/ch,24; 100ms/ch,30.

[4] **Digital range**: the collection of data results in the original value (temperature) of the numerical mapping range, the range, such as GT_070_32MT model under the mode of PT100, the default use of digital range -2000 ~ 8500, the unit of 0.1 ℃, that is, -200 ℃ ~ 850 ℃, the range of this range is the temperature measurement range of the PT100.

[5] Data offset register: Use PLC's D register, as manual compensation of the measurement result value to use, that is, the value will be superimposed to the measurement result value (AI0~AI7), according to the demand scenario using the program to realize the compensation of the data, when enabled, check the box.

[6] Mode change register: you can change the value of parameter **[2] mode**, used to switch the measurement object, using the PLC's D register, check when enabled, when the model number is GT_070_32MT, the value is 0 for PT100, 1 for NI120. if GT_070_32MT_8TC then the value is 0 for K-type thermocouple, 1 for T-type Thermocouple

1.3.4 Measurement value acquisition

With the above software configuration after the completion of the download can be viewed AI0 ~ AI7 registers can be seen in the acquisition of data (temperature) data, as shown in Figure 1.5 monitoring to GT_070_32MT model mode for PT100 as an example, such as the AI0 value is displayed as 285, then the temperature is expressed as 28.5 ℃, the other channels are the same reason.

Figure 1.5: PT100 temperature acquisition and monitoring

1.3.5 Notes:

(1) If there is no sensor access, or sensor access is disconnected, then the current channel values (AI0~AI7) will display 32767, indicating no load or fault (disconnected).

(2) Toggle the GT_070_32MT/8TC switch to STOP and then back to RUN, and the channel set to on will re-initialize the data according to the configured parameters.

2: Extended use of external plug-ins

2.1 Adding plug-ins

As shown in Figure 2.1, open the engineering settings of the ladder diagram and select Extension Plug-in, which corresponds to the two plug-in ports (K1 and K2) of the All-in-One GT_070_32MT/8TC in the

following figure. If plug-in port K1 is inserted with an analog plug-in, address AI100~AI103 is used to save the measurement results, while plug-in port K2 uses AI110~AI113.

Figure 2.1: Extension plug-in

When using, check "Enable Extended Plug-in", then double-click to directly add the corresponding model of the plug-in, now supports the following models: **F-4AI/F-8T/F-8X/F-4X4T/F-4TC/F-4PT,** as shown in Figure 2.2.

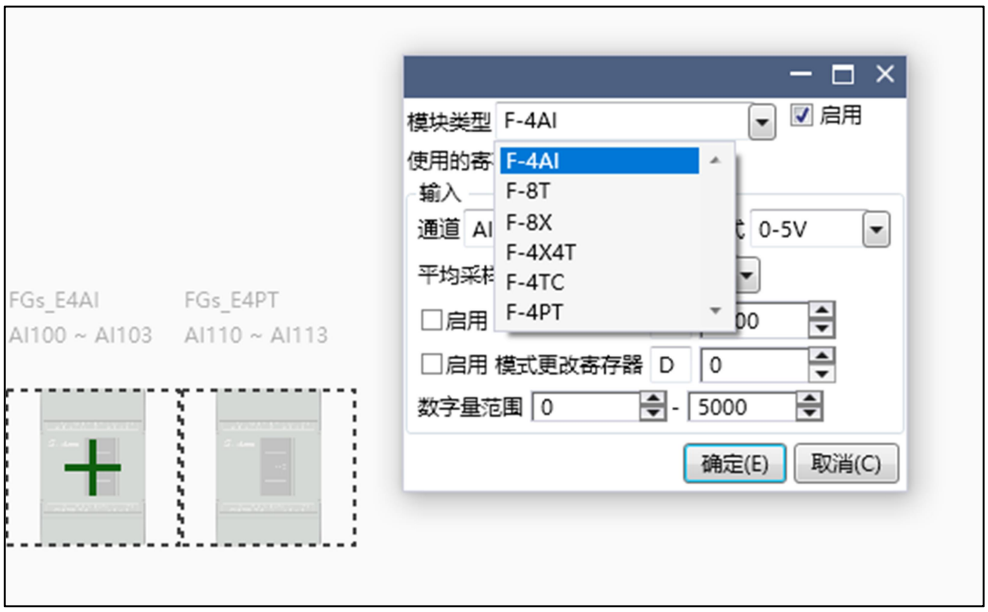


Figure 2.2: Extended plug-in types

Or click on the "automatic detection" can be directly obtained to identify the plug-in model has been inserted. Double-click the plug-in to configure its parameters after adding the corresponding model.

Figure 2.3: Extended Plugin Detection Report

Caveats:

1.Plug-ins can not be hot-plugged, you need to power off and then power on to use, power on will be initialized by default to identify a time, and then add plug-in extensions to add (or auto-detect) for configuration.

2. After the configuration of the upper parameter is completed, the download (not online download mode) can take effect.

2.2 F-8X/F-8T/F-4X4T plug-in utilization

2.2.1 Using the configuration

F-8X/F-8T/F-4X4T module in the all-in-one GT_070_32MT/8TC, such as the insertion of the first plug-in expansion K1 is used in the address

X100/Y100 ~ X107/Y107, such as the insertion of the second plug-in expansion K2 is used in the address X110/Y110 ~ X117/Y117, as shown in Fig. 2.4 to 2.6:

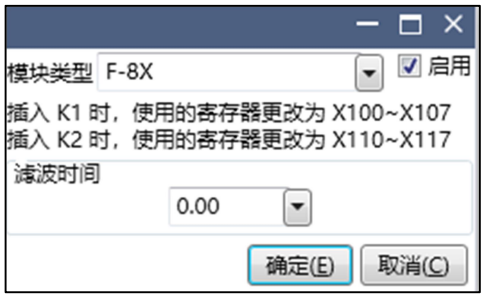


Figure 2.4: Extended Plugin Detection Report

Figure 2.5: Extended Plugin Detection Report

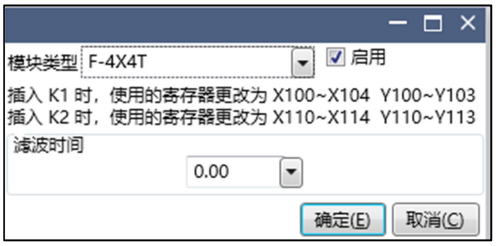


Figure 2.6: Extended Plugin Detection Report

2.2.2 Notes:

If the F-4X4T module is inserted into the first plug-in extension K1, then X100~X103 will be used for the X input port; while Y100~Y103 will be used for the Y output port, and the same for the second extension port.

2.3 F-4AI Plug-in Configuration Usage

2.3.1 Wiring diagram:

When selecting the voltage measurement mode (0~5V/0~10V), take channel TA as an example, the wiring diagram is shown in Fig. 2.7 (a), when selecting the current measurement mode (4~20mA), the wiring diagram is shown in Fig. 2.7 (b).

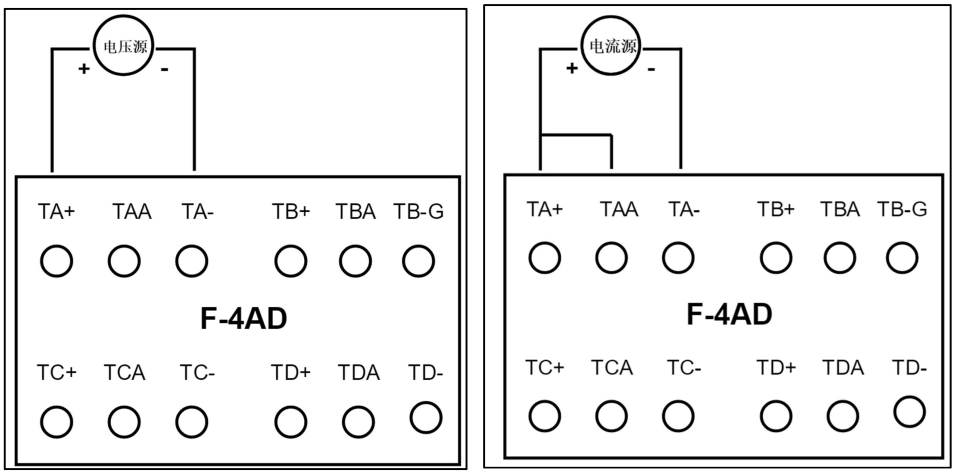


Figure 2.7 (a): Voltage mode wiring diagram (b) Current mode wiring diagram

2.3.2 Parameter Configuration

F-4AI plug-in and analog configuration is similar, the difference lies in the mode: when checking the start channel can be selected after the measurement mode, when selecting the 0 ~ 5V mode, the digital range will be used by default 0 ~ 5000, the unit of mV, that is to say, the results of the measurements in the range of 0 ~ 5000mV digital range, the default value for the original results of the measurements, according to the need to adjust the digital range of the results of linear scaling values. This default value is the original measurement result value, and the

result can be scaled linearly by adjusting the digital range as needed.

Similarly, if you choose 4~20mA mode, the digital range defaults to 0~20000, the same as the original measurement result value, the unit is uA; if you choose 0~10V mode, the digital range defaults to 0~10000, the same as the original measurement result value, the unit is mV;

Figure 2.8: Extension plug-in F-4AI configuration parameters

2.3.3 Notes:

When the measured voltage or current is detected as exceeding the measurement range, the measurement result value (AIx) displays 32767 to indicate a measurement overrun.

2.4 F-4TC Plug-in Configuration Usage

2.4.1 Wiring diagram

Take channel TA as an example, wired as shown in Figure 2.8, to access the K/T type thermocouple.

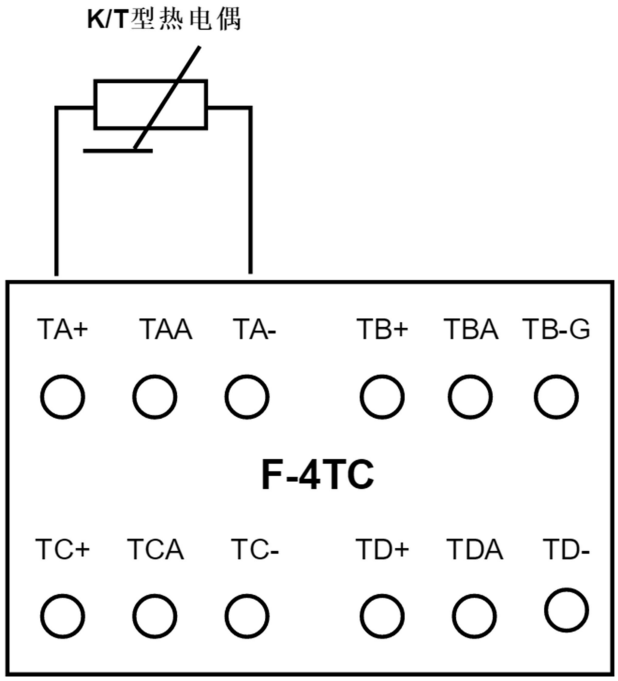


Figure 2.8: Expansion plug-in F-4TC wiring diagram

2.4.2 Parameter configuration

F-4TC plug-in and analog configuration is similar, when the start channel can be selected after checking the measurement mode, when selecting the K-type thermocouple mode, the digital range will be used by default -500 ~ 5000, the unit of 0.1 ℃, that is, the measurement results in the digital range of -50 ~ 500 ℃, the default value of the original measurement results, according to the need to adjust the digital range of the results of the value of linear scaling. This default value is the original measurement result value, and the result value can be scaled linearly by adjusting the digital range as needed.

Similarly, if T-type thermocouple mode is selected, the digital range defaults to -2600~4000, the same as the original measurement result value, the unit is 0.1℃.

Figure 2.10: Expansion Plugin F-4TC Configuration Parameters

2.5 F-4PT Plug-in Configuration Usage

2.5.1 Wiring diagram

The F-4PT plug-in is for 4-channel PT100/NI120 measurement, the wiring is the same as analog PT100, please refer to it.

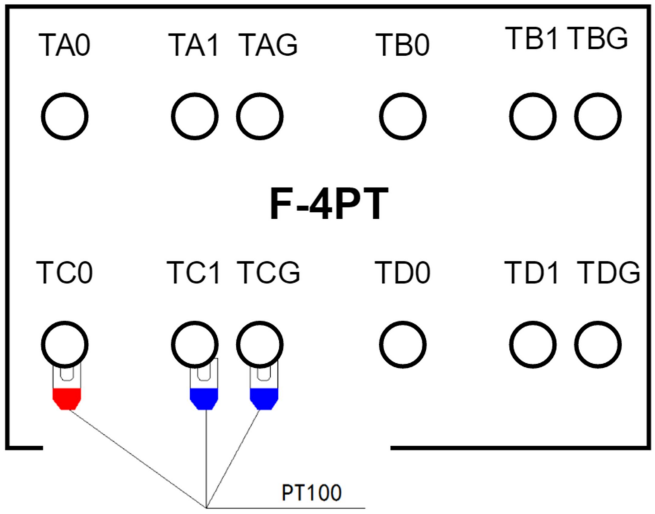


Figure 2.11: Extension plug-in F-4PT wiring diagram

2.5.2 Parameter Configuration

The configuration of F-4PT plug-in and "Analog Setup" is exactly the same as shown in the figure below, please refer to the configuration of analog setup, which will not be repeated here.

Figure 2.11: Extension Plugin F-4PT Configuration Parameters