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Rail temperature and humidity transmitter

manual



Model: CR-CT01TH

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1.Product Introduction

1.1Product Overview

CR-CT01TH is used to collect ambient temperature and humidity. It has a standard DIN35 rail mounting card and can be directly used Rail installation. Use imported high-precision temperature and humidity sensors to ensure the product's excellent reliability, high precision and mutual It adopts 485 communication interface and standard Modbus-RTU communication protocol. It is powered by 9~24V wide voltage range. Complete specifications and easy installation.

1.2Features

This product uses built-in sensors, is compact, and integrates multiple elements to meet customers' environmental information needs.

The measuring unit is imported from Switzerland, which features accurate measurement, stable values and small errors.

The output signal is RS485, standard Modbus-RTU communication protocol, supports changing the communication address and wave

The 485 communication can theoretically communicate up to 1200 meters, supports secondary development, and is widely used.

2.Main technical indicators

Technical Parameters					
Signal output type	RS485				
Supply voltage	DC 9V-24V				
Product power consumption (@12V DC)	≪4mA				
Communication Protocol	Modbus-RTU				
Data refresh time	<15				
temperature	Range: -40-80°C Resolution: 0.1°C Accuracy: ±0.3°C (0°C-65°C)				
humidity	Range: 0-100%RH Resolution: 0.1%RH Accuracy: ±3%RH				
Operating Environment	- 40~80°C				

3.Wiring Instructions



4.Dimensions and installation instructions









5. RS485Communication Protocol

5.1ModbusCommunication Protocol

Basic communication parameters:				
Baud rate	9600 (default)			
Data bits	8-bit			
Stop bits	1 bit			
Check digit	none			
Device Address	1 (default)			

Host inquiry frame structure:

Address code Function code	Register start address		Number of registers		CRC16 checksum		
	Function code	high	Low	high	Low	Low	high
1 byte	1 byte 1	byte	1 byte	1 byte	1 byte	1 byte	1 byte

Slave response frame structure:

Address code	Function code	Number of valid bytes	Data Area	Check code
1 byte 1	byte	1 byte	N bytes	2 bytes

Address code: The device address of the transmitter, which is unique in the communication network (factory default 0x01).

When the 485 bus is connected to multiple 485 devices, do not set the same device address.

Function code: Function instructions sent by the host. Modbus protocol has two common register instructions:



(1) Read single or multiple register values: Function number 3 (0x03) is used to read device information, parameters,

Number data.

(2) Write a single register: Function number 6 (0x06) is used to change device information, such as device address,

The device baud rate, etc., will not be lost when power is off.

Register starting address, number of registers:

(1) When reading a single parameter, the register starting address is the register address of the parameter, and the number is 1.

For example, when reading humidity, the register start address is 0x0002 and the number of registers is 0x0001.

(2) When reading multiple parameters, the register starting address is the first register address among the multiple parameters.

The number of registers is the number of registers occupied by all parameters. For example, when reading temperature and humidity, the register starting address is

0x0001, the number of registers is 0x0002.

Data Area: Specific communication data, note that the high byte of 16-bit data comes first.

CRC code: 16-bit CRC check code, low byte first, high byte last.

5.2Modbusregister

Parameter name	Register Address (hexadecimal)	parameter type	Modbus	Parameter range and description	Remark	
temperature	0x0001	16 bit	3 Read-only	- 400-800 correspondence - 40.0~80.0°C	Negative numbers are two's	complement
humidity	0x0002	16 bit	3 Read-only	0-1000 corresponding 0-100.0%RH		
Modbus Slave address	0x0100	16 bit	3/6 Read and Write	0-255	1 (default)	
Serial communication baud Rate	0x0101	16 bit	3/6 Read and Write	0-6 1:2400 2:4800 3:9600 4:19200 5:57600 6:115200	9600 (default)	

6. ModbusCommunication Example

6.1Function Number03Communication Example

Read device address:

Inquiry frame:

Address code	Function code	Starting address	Number of registers	Check code	^{Check code} High
01	03	01 00	00 01	85	F6

Response frame:

Address code	Function code	Character length	Data content	Check code	^{Check code} High
01	03	02	00 01	79	84



Device address: 0001 (hexadecimal) = 0001 (decimal) => Device address: 1

Read temperature and humidity values:

Inquiry frame:

Address code	Function code	Starting address	Number of registers	Check code	^{Check code} High
01	03	00 01	00 02	95	CB

Response frame:

Address code	Function code	Character length	Data content	Check code	^{Check code} High
01	03	04	01 0C 02 3E	BB	7C

Temperature calculation: 010C (hexadecimal) = 268 (decimal) => Temperature = 268/10 = 26.8°C

Humidity calculation: 023E (hexadecimal) = 574 (decimal) => Humidity = 574/10 = 57.4%RH

6.2Function Number06Communication Example

Modify the device address to 02:

Request frame:

Address code	Function code	Modified mail	Write to register	Check code	Check code
Address code		Register address	value	Low	High
01	06	01 00	00 02	09	F7

Response frame:

Address code	Function code	Register Address	Modified value	Check code	^{Check code} High
02	06	01 00	00 02	09	C4

7.Software Usage

7.1Device connection computer instructions

Users can use the "Temperature and Humidity" software provided by our company or any serial port debugging software and device When communicating, please note that the device needs to be connected to the computer via USB to 485. After the USB is inserted into the computer,

You can check the COM port in "My Computer - Properties - Device Manager - Ports".

~	Ŵ	端口 (COM 和 LPT)
		USB-SERIAL CH340 (COM108)
		💭 USB-SERIAL CH340 (COM7)
		💭 通信端口 (COM51)

Connect the A and B of the device to the A and B of the adapter module, power the device, open the software, and select the correct serial port.

port, baud rate and other serial communication parameters. Note that both the sent and received data must be in hexadecimal.

Transmit and display.

7.2" CUBERAYS"Environmental Monitoring" Software Instructions

7.2.1Connecting devices

Steps: ①Set up---②Select serial port---③Get device information---④Communication is successful

显示	用口检测 [COM7 ∨ 获]	取设备信息 获取网络信息	1. 设备地址	」设置渡	特军 2400 > 设	置 出厂日期 一 获1
<u> </u>	並小原血 数据刷新间隔(秒)	1	<u></u> → 气象类		✓ □ 生效	□ 开启导出报表
~~~	网络设置					
205	选择网卡 192.168.75.1	~ 捜索设备	昏 重启设备生效			
	设备名称			服务器类型	IP	~
$\mathcal{M}(1)$	设备IP			目标IP/域名	(	
~~~~	设备网关			目标端口	(	
	子网掩码			通信方式	TCP	~
	DHCP CheckBox			TextLabel	(
	确定	E C 完成	2	×	确定	
	设置区		设备地址: 1 波特率: 9	600		
	与急些 土壤类 气休类 水质类					

7.2.2Reading Data

Steps: 1) Display---2) Click to query

○ 卡轨温温度											
	设备状态 串口状态 🗸	设备地址	E1 %8	特率 9600	I∎EI 未	获取	ICCID 未获取	网络伯	言 号 未获取	网络状态	未获取
€	气象类 温度 29.8 最大风速 光照 蒸发里	C 查 n/s 查 lux 查 ne 查	 1) 湿度 1) 湿度 1) 瞬时雨重 1) 大气压 1) PM1.0 	60.4 %7 t mr p: ug	H 查询 /min 查询 	风向 累计雨量 光和有效 PM2.5	∘ nm u•mol/m³•s ug/m³	查询 查询 查询 查询	瞬时风速 紫外线 太阳辐射 FM10	m/s uw/om ³ W/m ³ ug/m ³	查询 查询 查询 查询

7.2.3Change device address and baud rate

Modify device addressSteps: 1)Set --- 2)Fill in the modified content --- 3)Set --- 4)OK

□ 卡轨温湿度		0	0	- 🗆 X
	通讯设置 串口检测 com7 > 获取设备信息 获取	2 (网络信息 设备地址 2	3 设置 波特率 2400 ~ 设置	出厂日期 获取
	显示设置 數据刷新间隔(秒) 1	<u>÷</u> 气象类	~ □ 生效	□ 开启导出报表
	网络设置 选择网卡 192.168.75.1 ~ > :	搜索设备 重启设备生效		
	设备名称 设备IP 设备网关)	服务器类型 IP 目标IP/I或名	
查询:01 03 00 01 00 01 接收:01 03 02 01 2a 38 0b	子阿擔码 DHCP CheckBox)	通信方式 TCP TextLabel	×
查词:01 03 00 02 00 01 接收:01 03 02 02 5c b9 1d	确定	C] 完成 ×	确定	
查询 01 06 01 00 00 02 接收:02 06 01 00 00 02 09 c4	设置区 气势支 土壤类 气体类 水质类	使新地址: 2 波特率: 9600		

Modify the baud rateSteps: ①Set --- ②Select baud rate --- ③Set --- ④OK

○ 卡轨温湿度	诵讯设罢		(2)	×
	串口检测 COM7 ~ 获取设备信息	. 获取网络信息 设备地址 2		2 设置 出厂日期
	显示设置 数据刷新间隔(秒)	<u>÷</u> 气象类	~ □ 生效	□ 开启导出报表
5	网络设置 选择网卡 192.168.75.1	✓ 搜索设备 重启设备生效		
	设备名称		服务器类型 IP	~
	设备IP		目标IP/域名	
查询:01 03 00 01 00 01	(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)	=	目标端口 通信方式 TCP	~
接收:01 03 02 01 2 138 0b	DHCP CheckBox		TextLabel	
查询:01 03 00 02 00 01 接收:01 03 02 02 5c b9 1d	确定	0 完成	× 确定	
查询:01 06 01 00 00 02 接收:02 06 01 00 00 02 09 4	设置区 <mark>气象类</mark> 土壤类 气体类 水质类	2 没备地址: 2 波特率: 1	9200	
查询:02 06 01 01 00 04 接收:28 08 08 ec		(4)	OK	

7.3Common Serial Port Assistant Usage Examples

ኛ 猫猫串口网络调试助手 V4.9 意见、	– 🗆 🗙
升级最新版·猫猫串口网络调试助手V4.9 自动回复,发送扩展,字段波形,使用必读教程->>	菜单工具
COMILID 服务器 数据级 三通道字段解析一波形 Comiling Comiling 18:39:16 (249): 01 03 00 01 00 02 95 C8 18:39:16 (249): 01 03 04 02 97 02 45 88 7C 数据位 8 • 18:39:16 (430): 01 03 04 02 97 02 45 88 7C 18:39:16 (430): 01 03 04 02 97 02 45 88 7C 数据位 None • • • • 使止位 1 • • • •	接收控制 清空 暫停显示 收钟数 1 收字节 9 发体转数 1 发字节 8 □ 自动清空接收 过速帧关键字 清
 ✓ 自动操行 ✓ 显示发送 ✓ 时间 ■ 日期 ● 仅数据 ■ 标记TX XX 	✓ 高亮接收关键字 查找关键字 保存数据 更改保存路径 D:\anaoComDataLo 显示的编码指式
发送区 校验方式设置	十六进制(Hex) >
校验结果 ● 仅低字节 ● 高 <mark>低</mark> ● 低高 ■ 定时 1000 ms ▼ HXX 清空 发送 01 03 00 01 00 02 95 CB ● 5 代值	 □ 自增自动校验 1 自增周期 □ ● 低前高后
定时500 ms ✓ NEX 清空 发送 次送 以田夕市山 歩长值 定时1000 ms ✓ NEX 清空 发送 支送 よ給今市山	1 ○ 高前低后 0 ● 1byte ● 2byte 1 ● 3byte ● 4byte

Note: After selecting the communication parameters, "Open the serial port", the verification result is "low high", and the displayed encoding format

The format is "HEX", enter the command in the command box, right-click and select "CRC-16 Check" to fill in

Enter the verification code and click "Send".



Description: Select communication parameters, turn on "HEX display", "time stamp and packet display", "HEX

Send", "End", add checksum "ModbusCRC16", enter the command in the command box, and click "Send".

MODBOS開記明手 (VI.0)	
串口设置 设置串口 打开串口 关闭串口 当前串口:COM7 波特率: 9600	04H指令(读输入寄存器) 485地址 寄存器地址 寄存器个数 读取 方在器值
01H指令(读线圈寄存器) 485地址 寄存器地址 寄存器个数 读取 寄存器值	05H指令(写单个线圈寄存器) 485地址 寄存器地址 算存器地址 寄存器值
22H指令(读离散输入寄存器) 485地址 寄存器地址 寄存器个数 读取 寄存器值	06H指令(写单个保持寄存器) 485地址 寄存器地址 寄存器值 01 0×1000 2 发送 10H指令(写多个保持寄存器)
03+指令(读保持寄存器) 485地址 寄存器地址 寄存器个数 02 01 0x02 寄存器值 06A4 03E8	405地址 寄存器值 发送 任意指令 发送
	清空数据 接收缓冲区 清空数据
	· ·

Note: Open "Set Serial Port" and select communication parameters, then "Open Serial Port".

Enter the 485 address, register start address, and number of registers to read in the 03H instruction, and click "Read

"Read", the register value shows the parameter value read.

Enter the 485 address, the register address to be modified, and the modified content in the 06H instruction, and click "Send".

deliver".

8.Common Problems and Solutions

The device cannot connect to the PLC or computer. Possible reasons:

(1) The device is not powered normally. Low voltage or unstable voltage may cause data abnormality.

(2) The computer has multiple COM ports and the COM port selected is incorrect.

(3) The communication parameters such as baud rate, checksum, data bits, etc. are incorrectly selected.

(4) The device address is incorrect, or there is a device with a duplicate address (factory default is 1).

(5) The host polling interval and waiting response time are too short and need to be set to more than 300ms.

(6) The RS485 wiring is disconnected, or the A and B lines are connected in reverse.

(7) If there are too many devices or the wiring is too long, the power supply should be nearby, a 485 amplifier should be added, and a 120 Ω terminal should be added.

Terminal resistance.

(8) The USB to 485 driver is not installed or is damaged.

(9) Equipment damage.

9.Warranty and after-sales

9.1Warranty Commitment

The product warranty period is 12 months from the date of delivery (due to failure to operate in accordance with the corresponding technical requirements or other

Except for product problems caused by human behavior).

9.2After-sales commitment

Users can consult technical issues by phone and get clear solutions.

If there is any problem, it can be returned to the factory for repair or replacement.



10.Contact Details

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