8-way 4-20mA to RS-485/232, data acquisition module WJ128

Product features:

WJ128

●Eight channel analog signal acquisition, isolated conversion to RS-485/232 output
●Using a 12 bit AD converter, the measurement accuracy is better than 0.1%
●The precision of the calibration module can be programmed through the RS-485/232 interface
●Isolation withstand voltage between signal input/output 1000VDC
●Wide power supply range: 8~32VDC
●High reliability, easy programming, and easy application
●Standard DIN35 rail installation, convenient for centralized wiring
● Users can program module addresses, baud rates, etc
● Supports Modbus RTU communication protocol and automatic recognition protocol
●Industrial flame retardant shell, RS485 port surge protection
●The AD conversion rate can be programmed and set

Typical applications:

● Signal measurement, monitoring, and control
●RS-485 remote I/O, data acquisition
●Intelligent building control, security engineering and other application systems
●RS-232/485 bus industrial automation control system
●Industrial site signal isolation and long-distance transmission
● Equipment operation monitoring
●Measurement of sensor signals
● Acquisition and recording of industrial field data
●Development of medical and industrial control products
● 4-20mA or 0-5V signal acquisition

Product Overview:

The WJ128 product implements signal acquisition between sensors and hosts for detecting analog signals. The WJ128 series products can be applied to industrial automation control systems with RS-232/485 bus, 4-20mA/0-5V signal measurement and monitoring, as well as industrial field signal isolation and long-distance transmission, etc.

The product includes power isolation, signal isolation, linearization, A/D conversion, and RS-485 serial communication. Each serial port can connect up to 255 WJ128 series modules, and the communication method adopts ASCII code communication protocol or MODBUS RTU communication protocol. The baud rate can be set by code and can be hung on the same RS-485 bus as control modules from other manufacturers, making it easy for computer programming.

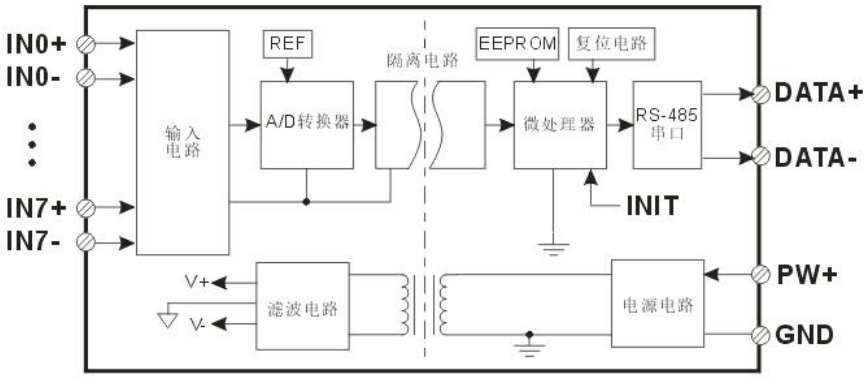


Figure 2 Internal Block Diagram of WJ128 Module

The WJ128 series products are intelligent monitoring and control systems based on microcontrollers. All user set calibration values, addresses, baud rates, data formats, checksum statuses, and other configuration information are stored in non-volatile memory EEPROM.

The WJ128 series products are designed and manufactured according to industrial standards, with isolation between signal inputs/outputs, capable of withstanding 1000VDC isolation voltage, strong anti-interference ability, and high reliability. The working temperature range is -45 ℃ to+85 ℃.

Function Introduction:

The WJ128 signal isolation acquisition module can be used to measure eight voltage or current signals.

1、 Analog signal input

12 bit acquisition accuracy, 8 analog signal inputs. All signal input ranges have been calibrated before the product leaves the factory. During use, users can also easily program and calibrate themselves. Please refer to the product selection for specific current or voltage input range.

2、 Communication Protocol

Communication interface: 1 standard RS-485 communication interface or 1 standard RS-232 communication interface, please specify when ordering and selecting.

Communication Protocol: Supports two protocols, the character protocol defined by the command set and the MODBUS RTU communication protocol. The module automatically recognizes communication protocols and can achieve network communication with various brands of PLCs, RTUs, or computer monitoring systems.

Data format: 10 digits. 1 start bit, 8 data bits, and 1 stop bit.

The communication address (0-255) and baud rate (2400, 4800, 9600, 19200, 38400, 57600, 115200bps) can be set; The communication network can reach a maximum distance of 1200 meters and is connected through twisted pair shielded cables.

High anti-interference design of communication interface, ± 15KV ESD protection, communication response time less than 100mS.

3、 anti-interference

Checksums can be set as needed. There is a transient suppression diode inside the module, which can effectively suppress various surge pulses, protect the module, and the internal digital filter can also effectively suppress power frequency interference from the power grid.

Product selection:

WJ128 - U(A)□ - □

Input voltage or current signal value communication interface

U1:0-5V	**A1**:0-1mA	**485**: Output via RS-485 interface
U2: 0-10V	**A2**: 0-10mA	**232**: Output via RS-232 interface
	A3：0-20mA	
U4：0-2.5V	**A4**：4-20mA	
U5：0-±5V	**A5**：0-±1mA	
U6：0-±10V	**A6**：0-±10mA	
	A7：0-±20mA	
U8: User defined	**A8:** User defined	

Selection example 1: Model: **WJ128-A4-485** represents 8 channels of 4-20mA signal input, and the output is RS-485 interface

Selection Example 2: Model: **WJ128-U1-232** indicates 8-channel 0-5V signal input and output via RS-232 interface

Selection Example 3: Model: **WJ128-U2-485** represents 8 channels of 0-10V signal input, and the output is RS-485 interface

WJ128 General Parameters:

(Typical @+25 ℃, Vs is 24VDC)

Input type: current input/voltage input

Accuracy: 0.1%

Temperature drift: ± 50 ppm/℃ (± 100 ppm/℃, maximum)

Input resistance: 150 Ω (4-20mA/0-20mA/0- ± 20mA current input)

300 Ω (0-10mA/0- ± 10mA current input)

1.5K Ω (0-1mA/0- ± 1mA current input)

Greater than 200K (5V/10V voltage input)

Greater than 1M Ω (input voltage below 2.5V)

Bandwidth: -3 dB 10 Hz

Conversion rate: 10 Sps (factory default value, users can modify the conversion rate by issuing commands.)

You can set the AD conversion rate to 2.5 SPS, 5 SPS, 10 SPS, and 20 SPS by sending commands. (Channel conversion rate=AD conversion rate/number of open channels)

Note: Please recalibrate the **module after modifying** the **conversion rate, otherwise** the **measured data may have deviations. You can also specify the conversion rate when placing an order, and we will recalibrate the product according to the conversion rate you require when it leaves the factory.**

Common mode rejection (CMR): 120 dB (1k Ω Source Imbalance @ 50/60 Hz)

Normal mode suppression (NMR): 60 dB (1k Ω Source Imbalance @ 50/60 Hz)

Input protection: overvoltage protection, overcurrent protection

Communication: RS-485 or RS-232 standard character protocol and MODBUS RTU communication protocol

Baud rates (2400, 4800, 9600, 19200, 38400, 57600, 115200bps) can be selected by software

The address (0-255) can be selected by software

Communication response time: 100 ms maximum

Working power supply:+8~32VDC wide power supply range, with internal anti reverse and overvoltage protection circuits

Power consumption: less than 1W

Working temperature: -45~+80 ℃

Working humidity: 10~90% (no condensation)

Storage temperature: -45~+80 ℃

Storage humidity: 10~95% (no condensation)

Isolation withstand voltage: 1KVDC between input/output, 1 minute, leakage current 1mA

The RS-232/RS-485 output and power supply are grounded together.

Surge resistant voltage: 3KVAC, 1.2/50us (peak)

Dimensions: 120mm x 70mm x 43mm

Pin definition:

Pin	name	Description	Pin	name	Description
one	IN5+	Channel 5 analog signal input positive terminal	**eleven**	IN0-	Channel 0 analog signal input negative terminal
two	IN5-	Channel 5 analog signal input negative terminal	**twelve**	IN0+	Channel 0 analog signal input positive terminal
three	IN6+	Channel 6 analog signal input positive terminal	**thirteen**	IN1-	Channel 1 analog signal input negative terminal
four	IN6-	Channel 6 analog signal input negative terminal	**fourteen**	IN1+	Channel 1 analog signal input positive terminal
five	IN7+	Channel 7 analog signal input positive terminal	**fifteen**	IN2-	Channel 2 analog signal input negative terminal
six	IN7-	Channel 7 analog signal input negative terminal	**sixteen**	IN2+	Channel 2 analog signal input positive terminal
seven	DATA+	RS-485 signal positive terminal	**seventeen**	IN3-	Channel 3 analog signal input negative terminal
eight	DATA-	RS-485 signal negative terminal	**eighteen**	IN3+	Channel 3 analog signal input positive terminal
nine	PW+	Positive end of power supply	**nineteen**	IN4-	Channel 4 analog signal input negative terminal
ten	GND	Negative terminal of power supply, digital signal output ground	**twenty**	IN4+	Channel 4 analog signal input positive terminal

Table 1 Pin Definition

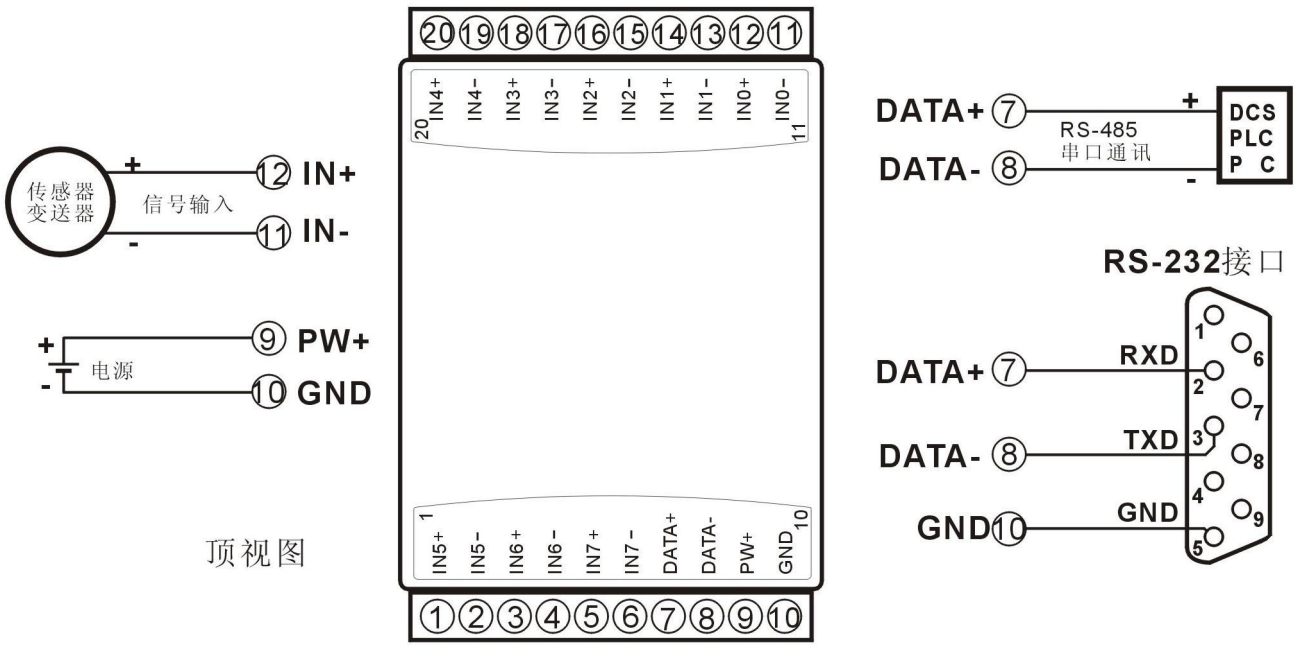


Figure 3 Wiring diagram of WJ128 module

WJ128 Character Protocol Command Set:

The factory initial settings of the module are as follows:

The address code is 01

Baud rate 9600 bps

Prohibition of checksum verification

If using an RS-485 network, a unique address code must be assigned, which is a hexadecimal number between 00 and FF. Since the address codes of new modules are the same, their addresses will conflict with other modules. Therefore, when building the system, you must reconfigure the addresses of each WJ128 module. After connecting the power line and RS485 communication line of the WJ128 module, the address of the WJ128 module can be modified through configuration commands. The baud rate and checksum status also need to be adjusted according to the user's requirements.

Method to put the module into default state:

There is an Initiate switch located on the side of the WJ128 module. Turn the Initiat switch to the Initiat position, then turn on the power, and the module will enter the default state. In this state, the configuration of the module is as follows:

The address code is 00

Baud rate 9600 bps

Prohibition of checksum verification

At this point, the baud rate, checksum status, and other parameters of the WJ128 module can be modified through configuration commands. When unsure of the specific configuration of a module, the Initiat switch can also be turned to the Initiat position to put the module into default mode, and then the module can be reconfigured.

Note: Please turn the Initiat switch to the NORMAL position during normal use.

The character protocol command consists of a series of characters, such as the prefix, address ID, variables, and optional checksum bytes.

Command format: **(Leading Code) (Addr) (Command) [data] [checksummary]**

The **leading code** is the first letter in the command. All commands require a command prefix, such as%, $, #, @ Wait. **1-character**

The address code of the **(Addr)** module, if not specified below, ranges from 00 to FF (hexadecimal). **2-character**

(Command) displays command code or variable values. **Variable length**

[data] Some data required for output commands. **Variable length**

The **Checksum** in parentheses is an optional parameter that is only required when checksum is enabled. **2-character**

When checksum is enabled, [Checksum] is required. It occupies 2 characters. Both commands and responses must be accompanied by checksum features. The checksum is used to check all input commands to help you detect errors in host to module commands and module to host responses. The checksum character is placed after the command or response character and before the carriage return.

Calculation method: Two characters, hexadecimal number, which is the sum of the ASCII code values of all the characters previously sent, and then combined with the hexadecimal number 0xFF to obtain the result.

Application example: Prohibit checksum

User command **$002**

Module response**! 00020600 (cr)**

Enable checksum

User command **$002B6**

Module response**! 00020600 A9 (cr)**

'$' = 0x24 '0' = 0x30 '2' = 0x32

B6=(0x24+0x30+0x30+0x32) AND 0xFF

'**!**' = 0x21 '0' = 0x30 '2' = 0x32 '6' = 0x36

A9=(0x21+0x30+0x30+0x30+0x32+0x30+0x36+0x30+0x30) AND 0xFF

Response to Command:

The response information depends on various commands. The response also consists of several characters, including the initial code, variables, and ending identifier. There are two types of initial codes for response signals, '**!**' Or '**>**' represents a valid command while '**?**' It represents invalidity. By checking the response information, it is possible to monitor whether the command is valid

Note: In some cases, many commands use the same command format. To ensure that the address you are using is correct in a command, if you use the wrong address that represents another module, the command will take effect in that module, resulting in an error.

2. Commands must be entered in uppercase letters.

1. Read measurement data command

Explanation: Read back the measurement data of all channel analog inputs from the module.

Command format: **# 01**

Parameter description: # delimiter. Hexadecimal is 23H

01 module address, with a value range of 00 to FF (hexadecimal). The factory address is 01, which is converted to hexadecimal as the ASCII code for each character. If address 01 is replaced with hexadecimal, it will be 30H and 31H

Response format: The**>(data) (cr)** command is valid.

? The **AA (cr)** command is invalid or an illegal operation.

Parameter description:>delimiter. Hexadecimal is 3EH

(data) represents the retrieved data. Users can issue commands to modify the zero and full values of the data as needed, and the modified data will be converted based on the new zero and full values.

(cr) End symbol, upper computer enter key, hexadecimal is 0DH.

Other instructions: If the format is incorrect, the communication is incorrect, or the address does not exist, the module will not respond.

If a channel has been closed, the read data will be displayed as space characters.

If the serial communication software you are using cannot input the enter key character, please switch to hexadecimal format for communication.

Application example: User command (character format) **# 01**

(Hexadecimal format) **233031**

Module response (character format)**>+12.000+16.000+**16.000**+16.000+16.000+16.000+**16.**000+16.000+16.000+18.168 (cr)**

(Hexadecimal format):

3E2B31322E3030302B31362E3030302B31362E3030302B31362E3030302B31362E303030

2B31362E3030302B31362E3030302B31362E3030302B31382E3136380D

Explanation: The input for address 01H module is (data format is engineering unit):

Channel 0:+12.00mA Channel 1:+16.000mA Channel 2:+16.000mA Channel 3:+16.000mA

Channel 4:+16.000mA Channel 5:+16.000mA Channel 6:+16.000mA Channel 7:+18.168mA

Enter **# 01** and click send command**.**

On the received data line, it will display**>+0.0000+0.0000+0.0000+0.0000+0.0000+**0.**0000+**0.0000**+0.0000+0.0000+0.0000**

2. Read channel N analog input module data command

Explanation: Read back the analog input data of channel N from the module.

Command format: **# 010**

Parameter description: **#** delimiter.

01 module address, with a value range of 00 to FF (hexadecimal). The factory address is 01, which is converted to hexadecimal as the ASCII code for each character. If address 01 is replaced with hexadecimal, it will be 30H and 31H.

Channel code 0-7, hexadecimal 30H~37H

Response format: The**>(data) (cr)** command is valid.

? The **AA (cr)** command is invalid or an illegal operation or channel is closed.

Parameter description:**>**delimiter.

(data) represents the read back data of channel N. Users can issue commands to modify the zero and full values of the data as needed, and the modified data will be converted based on the new zero and full values.

(cr) End symbol, enter key on the upper computer (0DH).

Other instructions: If there is a syntax error, communication error, or if the address does not exist, the module will not respond.

Application example: User command (character format) **# 010**

(Hexadecimal format) **23303130**

Module response (character format)**>+18.000 (cr)**

(Hexadecimal format): **3E2B31382E3030300D**

Explanation: The input for channel 0 on address 01H module is+18.000mA

3. Configure WJ128 module command

Explanation: Set the address, input range, baud rate, and checksum status for a WJ128 module. The configuration information is stored in non-volatile memory EEPROM.

Command format:**% AANNTTCCFF**

Parameter description:**%** delimiter.

AA module address, with a value range of 00 to FF (hexadecimal). The factory address is 01, which is converted to hexadecimal as the ASCII code for each character. If address 01 is replaced with hexadecimal, it will be 30H and 31H.

NN represents the new module hexadecimal address, with values ranging from 00 to FF. Convert to hexadecimal to ASCII code for each character. If address 18 is replaced with hexadecimal as 31H and 38H.

TT uses hexadecimal to represent type encoding. The WJ128 product must be set to 00.

CC uses hexadecimal to represent baud rate encoding.

Baud rate code	Baud rate
04	2400 baud
05	4800 baud
06	9600 baud
07	19200 baud
08	38400 baud
09	57600 baud

Table 2 Baud rate codes

FF uses 8 bits in hexadecimal to represent the checksum. Note that from bits0 to bits5, it is not necessary to set it to zero.

Bit7	Bit 6	Bit 5	Bit 4	Bit 3	Bit2	Bit 1	Bit 0

Table 3 Checksum Code

Bit7: Reserved bit, must be set to zero

Bit6: checksum status, 0: prohibited; For 1: Allow

Bit5-bit0: No need, it must be set to zero.

Response format:**!** The **AA (cr)** command is valid.

? The **AA (cr)** command is invalid or an illegal operation, or the Initiat switch is not turned to the Initiat position before changing the baud rate or checksum.

Parameter description:**!** The delimiter indicates that the command is valid.

? The delimiter indicates that the command is invalid.

AA represents the input module address

(cr) End symbol, upper computer enter key, hexadecimal is 0DH.

Other instructions: If you are configuring the module for the first time, AA=01H, NN equals the new address. If the module is reconfigured to change the address and input range. AA equals the currently configured address, NN equals the current or new address. If you want to reconfigure the module to change the baud rate or checksum status, you must turn the Initiat switch to the Initiat position to enter the default state of the module. At this time, the module address is 00H, that is, AA=00H, NN is equal to the current or new address.

If the format is incorrect, the communication is incorrect, or the address does not exist, the module will not respond.

Application example: User command**% 0111000600**

Module response**! 11(cr)**

Explanation:**%** delimiter.

01 means that the original address of the WJ128 module you want to configure is 01H.

11 indicates that the new module's hexadecimal address is 11H.

00 type code, WJ128 product must be set to 00.

06 represents a baud rate of 9600 baud.

00 indicates that checksum is prohibited.

4. Read configuration status command

Explanation: Read configuration for a designated WJ128 module.

Command format: **$012**

Parameter description: **$**delimiter.

01 module address, with a value range of 00 to FF (hexadecimal).

2 represents the command to read the configuration status

(cr) End symbol, upper computer enter key, hexadecimal is 0DH.

Response format:**!** The **AATTCCFF (cr)** command is valid.

? The **AA (cr)** command is invalid or an illegal operation.

Parameter description:**!** Boundary symbol.

AA represents the input module address.

TT stands for type code.

CC stands for baud rate encoding. See Table 2

FF is shown in Table 3

(cr) End symbol, upper computer enter key, hexadecimal is 0DH.

Other instructions: If the format is incorrect, the communication is incorrect, or the address does not exist, the module will not respond.

Application example: User command **$012**

Module response**! 01000600(cr)**

Explanation:**!** Boundary symbol.

01 indicates that the WJ128 module address is 01H.

00 default value.

06 represents a baud rate of 9600 baud.

00 indicates that checksum is prohibited.

5. Set the zero and full commands for the WJ128 module

Explanation: Set the data format, channel status, and zero saturation of a WJ128 module. The configuration information is stored in non-volatile memory EEPROM.

Command format: **$AA0NLDV, (zero), (span)**

Parameter description: $delimiter.

AA module address, with a value range of 00 to FF (hexadecimal). The factory address is 01, which is converted to hexadecimal as the ASCII code for each character. If address 01 is replaced with hexadecimal, it will be 30H and 31H.

Set zero and full command to **0**

N represents the set channel number, ranging from 0 to 7. If set to M, it means all channels are set simultaneously.

Set the data format, the total length of each channel's data, with a value range of 7-9. For example, 7 represents+0.0000, a total of 7 characters.

D sets the data format, with several decimals and a value range of 0-5. For example, 3 represents 0.000 and has 3 decimal places.

V value of 0: disable channel, value of 1: enable channel

(zero) represents the zero point of the channel, a floating-point number. The value cannot be greater than the full degree and can be negative. For example, 4mA can be set to 4

(span) represents the fullness of the channel, floating point number. For example, 20mA can be set to 20

Response format:**!** The **AA (cr)** command is valid.

? The **AA (cr)** command is invalid or an illegal operation.

Application example 1: Set the module to display the actual 4-20mA output

User command **$010M731,4,20**

Module response**! 01(cr)**

Explanation: **$**delimiter.

01 Module Address

Set zero and full command to **0**

M simultaneously sets all channels

7 data with a total of 7 characters

3 means there are 3 decimals.

Channel **1** is open

4 represents a zero point of 4mA

20 represents a full degree of 20mA

Format of data display after setting:+12.345

Application example 2: Setting module 4-20mA corresponding to temperature -20~100 degrees display output

User command **$0100721, -2000**

Module response**! 01(cr)**

Explanation: **$**delimiter.

01 Module Address

Set zero and full command to **0**

0 Set Channel 0

7 data with a total of 7 characters

2 means there are 2 decimals.

Channel **1** is open

-20 means zero is -20 degrees

100 represents a full degree of 100 degrees

Format of data display after setting:+123.45

6. Read zero and full command

Explanation: Read the zero point and full degree of the WJ128 module.

Command format: **$AA1N** reads the zero point and fullness of channel N, where N represents the set channel number and ranges from 0 to 7.

Response format:**!** The **AA1NLDV, (zero), (span) (cr)** commands are valid. Parameter description refers to the previous command

? The **AA (cr)** command is invalid or an illegal operation.

Application example: User command **$0110**

Module response**! 0110841, 4.000000,20.000000 (cr)**

Explanation:**!** Boundary symbol.

01 Module Address

1. Read zero and full command

0 Read Channel 0

8 data with a total of 8 characters

4 means there are 4 decimals.

1 indicates that the channel is open

4.000000 represents a zero point of 4mA.

20.000000 indicates a full degree of 20mA.

7. Set module AD conversion rate

Description: Set the AD conversion rate of the module. Among them, channel conversion rate=AD conversion rate/number of opened channels. The slower the sampling rate, the more accurate the data collected. Users can adjust it according to their needs. The default conversion rate at the factory is 10SPS.

Note: Please recalibrate the **module after modifying** the **conversion rate, otherwise** the **measured data may have deviations. You can also specify the conversion rate when placing an order, and we will recalibrate the product according to the conversion rate you require when it leaves the factory.**

Command format: **$AA3R**

Parameter description: **$**delimiter.

AA module address, with a value range of 00 to FF (hexadecimal).

3 represents the command to set conversion rate

R conversion rate code, which can range from 0 to 3

Code R	0	one	two	three						
Conversion rate	2.5 SPS	5 SPS	10 SPS	20 SPS						

Response format:**!** The **AA (cr)** command is valid.

? Invalid or illegal operation of **AA (cr)** command

Parameter description:**!** The delimiter indicates that the command is valid.

? The delimiter indicates that the command is invalid.

AA represents the input module address.

(cr) End symbol, upper computer enter key, hexadecimal is 0DH.

Other instructions: If the format is incorrect, the communication is incorrect, or the address does not exist, the module will not respond.

Application example 1: User command **$0032**

Module response**! 00 (cr)**

Explanation: Set the AD conversion rate to 10SPS.

Application example 2: User command **$0033**

Module response**! 00 (cr)**

Explanation: Set the AD conversion rate to 20SPS.

8. Read module AD conversion rate

Explanation: Read the AD conversion rate of the module. Among them, channel conversion rate=AD conversion rate/number of opened channels. The slower the sampling rate, the more accurate the data collected.

Command format: **$AA4**

Parameter description: **$**delimiter.

AA module address, with a value range of 00 to FF (hexadecimal).

4 represents the read conversion rate command

Response syntax:**!** The **AAR (cr)** command is valid.

? Invalid or illegal operation of **AA (cr)** command

Parameter description:**!** The delimiter indicates that the command is valid.

? The delimiter indicates that the command is invalid.

AA represents the input module address.

R conversion rate code, which can range from 0 to 3

Code R	0	one	two	three						

Conversion rate	2.5 SPS	5 SPS	10 SPS	20 SPS						

(cr) End symbol, enter key on the upper computer (0DH).

Other instructions: If there is a syntax error, communication error, or if the address does not exist, the module will not respond.

Application example 1: User command **$004**

Module response**! 002 (cr)**

Explanation: The current AD conversion rate is 10SPS.

Application Example 2: User Command **$004**

Module response**! 003 (cr)**

Explanation: The current AD conversion rate is 20SPS.

9. Reset all parameters set by the above character command to factory settings.

Explanation: The parameters set by the module using the above character commands are restored to factory settings.

Command format: **$AA900** Set parameters to factory settings.

Parameter description: **AA** module address, value range 00~FF (hexadecimal). The factory address is 01, which is converted to hexadecimal as the ASCII code for each character. If address 01 is replaced with hexadecimal, it will be 30H and 31H.

Response format:**! AA (cr)** indicates successful setup, and the module will automatically restart.

Application example: User command (character format) **$01900**

Module response (character format)**! 01(cr)**

Explanation: Parameters are reset to factory settings.

Modbus RTU communication protocol:

The factory initial settings of the module are as follows:

The Modbus address is 01

Baud rate 9600 bps

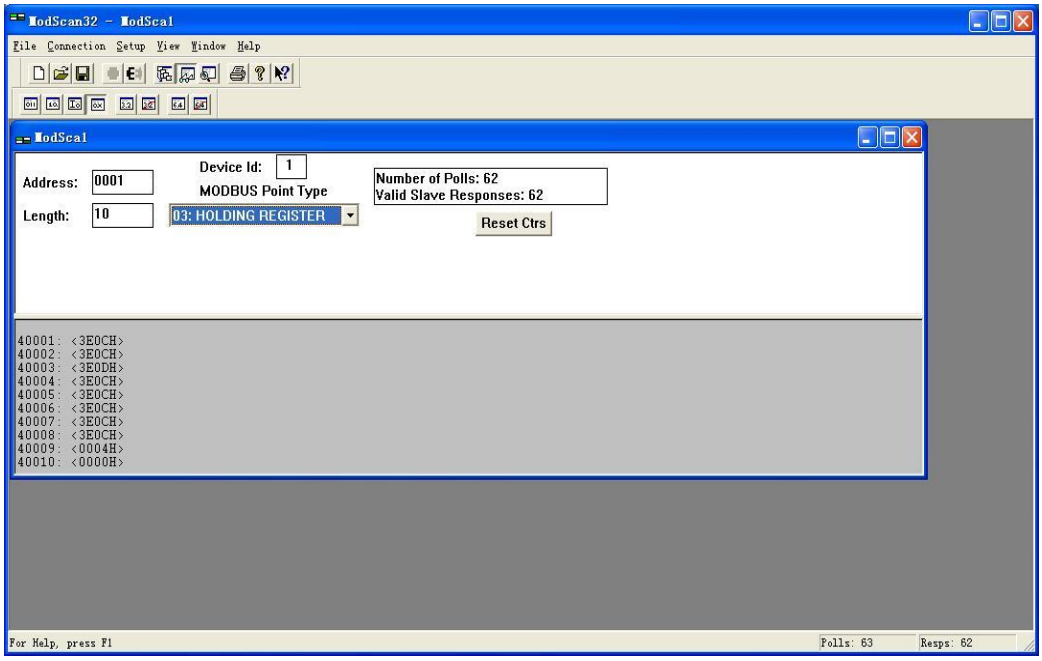
Method to put the module into default state:

There is an Initiate switch located on the side of the WJ128 module. Turn the Initiat switch to the Initiat position, then turn on the power, and the module will enter the default state. In this state, the module temporarily returns to its default state: address 01, baud rate 9600. When unsure of the specific configuration of a module, users can query the address and baud rate registers 40201-40202 to obtain the actual address and baud rate of the module, or modify the address and baud rate as needed.

Note: Please turn the Initiat switch to the NORMAL position during normal use.

Supports Modbus RTU communication protocol **function codes 03** (read hold register), **06** (write single register), and **16** (write multiple registers), with command formats following the standard Modbus RTU communication protocol.

Modbus software testing example:



Supports registers with function codes 03, 06, and 16, and the addresses in the table are decimal numbers. 32-bit long integers and floating-point numbers with the lower 16 bits in front.

Address 4X (PLC)	**Address (PC, DCS)**	**Data content**	**attribute**	**Data Explanation**
forty thousand and one	0	IN0 input analog quantity	read-only	Signed integers, channel IN0~IN7 data, 0x0000=zero point; 0x7FFF=Full Degree Supplement method with data of 2 0x0000-0x7FFF represents positive numbers 0x8000-0xFFFF represents negative numbers For example, 4-20mA: 0x0000=4mA; 0x7FFF=20mA; Less than 4mA is a negative number. If you cannot use a negative number, please read registers 40021~40028
forty thousand and two	one	IN1 input analog quantity	read-only	
forty thousand and three	two	IN2 input analog quantity	read-only	
forty thousand and four	three	IN3 input analog quantity	read-only	
forty thousand and five	four	IN4 input analog quantity	read-only	
forty thousand and six	five	IN5 input analog quantity	read-only	
forty thousand and seven	six	IN6 input analog quantity	read-only	
forty thousand and eight	seven	IN7 input analog quantity	read-only	
forty thousand and twenty-one	twenty	4-20mA dedicated IN0	read-only	Unsigned integer, Channel IN0~IN7 data, 4mA=0x0000，20mA=0x7FFF
forty thousand and twenty-two	twenty-one	4-20mA dedicated IN1	read-only	
forty thousand and twenty-three	twenty-two	4-20mA dedicated IN2	read-only	
forty thousand	twenty-three	4-20mA dedicated	read-	

and twenty-four		IN3	only	
forty thousand and twenty-five	twenty-four	4-20mA dedicated IN4	read-only	
forty thousand and twenty-six	twenty-five	4-20mA dedicated IN5	read-only	
forty thousand and twenty-seven	twenty-six	4-20mA dedicated IN6	read-only	
forty thousand and twenty-eight	twenty-seven	4-20mA dedicated IN7	read-only	
40061~40062	60~61	IN0 input analog quantity	read-only	The data is a 32-bit floating-point number stored in CDAB order. Channel IN0~IN7 data. Zero point and fullness are defined by registers 40161~40192 It can be used for converting analog and actual data, for example, 4-20mA corresponds to -20~100 degrees. The zero register can be set to -20 and the full register to 100, and the data read from this register is the actual input temperature value.
40063~40064	62~63	IN1 input analog quantity	read-only	
40065~40066	64~65	IN2 input analog quantity	read-only	
40067~40068	66~67	IN3 input analog quantity	read-only	
40069~40070	68~69	IN4 input analog quantity	read-only	
40071~40072	70~71	IN5 input analog quantity	read-only	
40073~40074	72~73	IN6 input analog quantity	read-only	
40075~40076	74~75	IN7 input analog quantity	read-only	
40081 ~ 40088	80 ~ 87	IN0~IN7 input analog quantity (integer part)	read-only	16 bit unsigned integer, channel IN0~IN7 data, data is the integer part of 40061~40076. If it is inconvenient to read floating-point numbers, the range can be enlarged to read the integer part of this register. For example, 4-20mA corresponds to 0-100 degrees, and the zero register can be set to 0, and the full register can be set to 10000 (amplified by 100 times). Therefore, dividing the data read by this register by 100 is the actual input temperature value.
forty thousand one hundred and one	one hundred	IN0 calibration	Read/ Write	The product has been calibrated before leaving the factory, and users can use it directly without calibration. If recalibration is necessary, please refer to the calibration section and follow the steps.
forty thousand one hundred and two	one hundred and one	IN1 calibration	Read/ Write	

forty thousand one hundred and three	one hundred and two	IN2 calibration	Read/ Write	
forty thousand one hundred and four	one hundred and three	IN3 calibration	Read/ Write	
forty thousand one hundred and five	one hundred and four	IN4 calibration	Read/ Write	
forty thousand one hundred and six	one hundred and five	IN5 calibration	Read/ Write	
forty thousand one hundred and seven	one hundred and six	IN6 calibration	Read/ Write	
forty thousand one hundred and eight	one hundred and seven	IN7 calibration	Read/ Write	
Address 4X (PLC)	**Address (PC, DCS)**	**Data content**	**attribute**	**Data Explanation**
40157~40158	156~157	IN0~7:00	write	The data is a 32-bit floating-point number stored in CDAB order. If the zero points of all channels are the same, this register can be set, and after setting, all zero point registers will be modified at once.
40159~40160	158~159	IN0~7 full degree	write	The data is a 32-bit floating-point number stored in CDAB order. If the fullness of all channels is the same, this register can be set, and after setting, all fullness registers will be modified at once.
40161~40162	160~161	IN0 zero point	Read/ Write	The data is a 32-bit floating-point number stored in CDAB order. Zero point of channels IN0~IN7. numerical value Cannot be greater than the full degree, can be negative. For example, 4mA is acceptable Set to 4
40163~40164	162~163	IN1 zero point	Read/ Write	
40165~40166	164~165	IN2 zero point	Read/ Write	
40167~40168	166~167	IN3 zero point	Read/ Write	
40169~40170	168~169	IN4 zero point	Read/ Write	
40171~40172	170~171	IN5 zero point	Read/ Write	
40173~40174	172~173	IN6 zero point	Read/	

			Write	
40175~40176	174~175	IN7 zero point	Read/ Write	
40177~40178	176~177	IN0 full degree	Read/ Write	The data is a 32-bit floating-point number stored in CDAB order. The fullness of channels IN0~IN7. For example, 20mA can be used Set to 20
40179~40180	178~179	IN1 full degree	Read/ Write	
40181~40182	180~181	IN2 full degree	Read/ Write	
40183~40184	182~183	IN3 full degree	Read/ Write	
40185~40186	184~185	IN4 full degree	Read/ Write	
40187~40188	186~187	IN5 full degree	Read/ Write	
40189~40190	188~189	IN6 full degree	Read/ Write	
40191~40192	190~191	IN7 full degree	Read/ Write	
forty thousand and two hundred	one hundred and ninety-nine	Parameter reset to factory settings	Read/ Write	If set to FF00, all register parameters of the module will be restored to factory settings, and the module will automatically restart after completion
forty thousand two hundred and one	two hundred	Module address	Read/ Write	Integer, effective after restart, range 0x0000-0x00FF
forty thousand two hundred and two	two hundred and one	Baud rate	Read/ Write	Integer, effective after restart, range 0x0004-0x000A 0x0004 = 2400 bps，0x0005 = 4800 bps 0x0006 = 9600 bps，0x0007 = 19200 bps 0x0008 = 38400 bps，0x0009 = 57600 bps 0x000A = 115200bps
forty thousand two hundred and four	two hundred and three	Conversion rate	Read/ Write	Integer, range 0x0000-0x0003, The factory default is 2. Please recalibrate the module after modification. 0x0000 = 2.5 SPS，0x0001 = 5 SPS， 0x0002 = 10 SPS， 0x0003 = 20 SPS
forty thousand two hundred and eleven	two hundred and ten	Module Name	read-only	High bit: 0x01 Low bit: 0x28
forty thousand two hundred and twenty-one	two hundred and twenty	Channel status	Read/ Write	High bit: 0x00 Low bit: Channel status (0xFF)

Communication example 1: If the module address is 01, sending in hexadecimal: **01 03 00 00 01 84 0A** can retrieve the data from register 40001.

01	03	00	00	00	01	eighty-four	0A
Module address	Read and hold register	Register Address High Bit	Low bit register address	Register quantity high	Low register quantity	CRC check low bit	CRC check high bit

If the module replies: **01 03 02 19 99 73 BE**, the read data is 0x1999. If the range is A4: 4-20mA
Convert 0x1999 * 16mA/0x7FFF+4mA=7.2mA. This indicates that the current input is currently 7.2mA.

01	03	02	nineteen	ninety-nine	seventy-three	BE
Module address	Read and hold register	The number of bytes in the data	data-high	data-low	CRC check low bit	CRC check high bit

Communication example 2: When the range is A4: 4-20mA, the zero point 40161~40162 is set to 4, and the full degree 40177~40178 is set to 20. Read data from the floating-point register with register addresses 40061~40062,. For example, as follows
If the module address is 01, send in hexadecimal: **01 03 00 3C 00 02 04 07** to retrieve the data from registers 40061~40062.

01	03	00	3C	00	02	04	07
Module address	Read and hold register	Register Address High Bit	Low bit register address	Register quantity high	Low register quantity	CRC check low bit	CRC check high bit

If the module replies: **01 03 04 00 41 80 CB C3**, the floating-point data read is 16, indicating that the current input is 16mA.

01	03	04	00	00	forty-one	eighty	CB	C3
Module address	Read and hold register	The number of bytes in the data	Floating point number 15-8 bits	Floating point number 7-0 bits	Floating point number 31-24 bits	Floating point numbers 23-16 bits	CRC check low bit	CRC check high bit

Calibration module:

The product has been calibrated before leaving the factory, and users can use it directly without calibration.

During use, you can also use the product's calibration function to recalibrate the module. When in school, the module needs to input appropriate signals, and different input ranges require different input signals.

To improve calibration accuracy, it is recommended to use the following equipment for calibration:
1. A DC voltage/current signal source with stable output and low noise
2. A voltage/current measuring instrument with a precision of 5 and a half bits or higher is used to monitor the accuracy of input signals
Calibration process
2、1. Connect the corresponding input signal to the channel that needs to be calibrated according to the input range of the module.
3、2. Input zero point signals to the channels that need to be calibrated for the WJ128 module, usually 4mA, 0V, or 0mA.

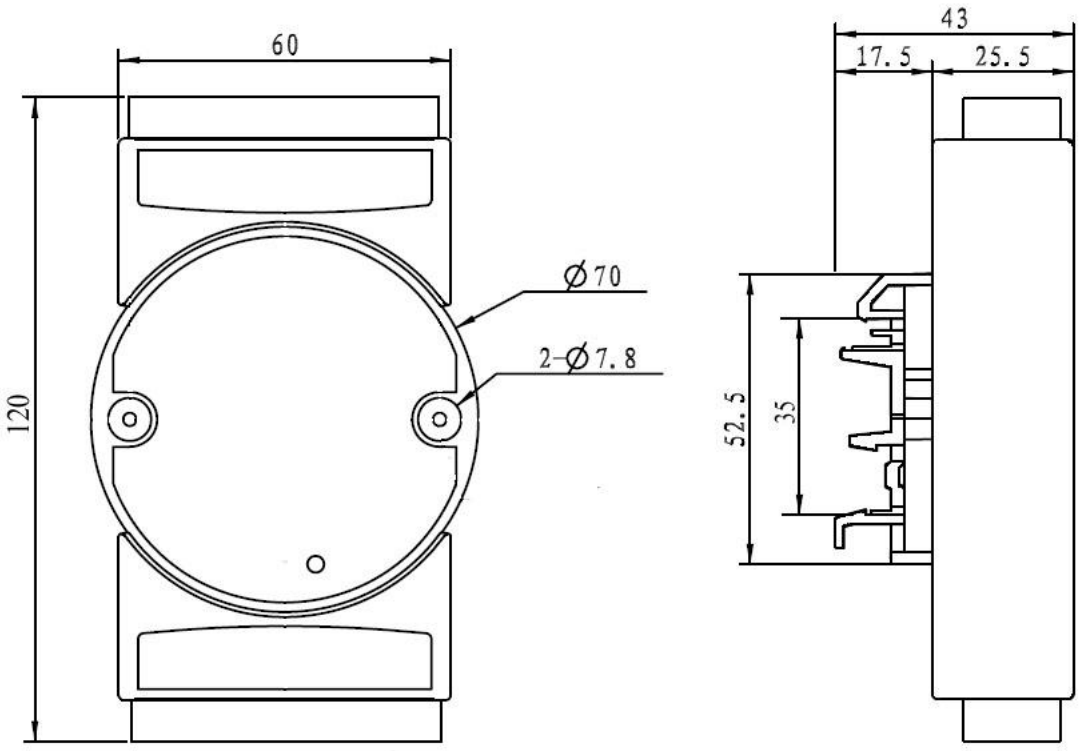
4、After the signal stabilizes, the Modbus protocol modifies register 40101 (channel 0) to 0xFF00, and the module will perform zero calibration. (To calibrate other channels, please modify the corresponding channel register data to 0xFF00).

5、4. Input 100% current or voltage signal at full capacity to the channels that need to be calibrated for the WJ128 module.

6、After the signal stabilizes, the Modbus protocol modifies register 40101 (channel 0) to 0xFFFF, and the module will perform full calibration. (To calibrate other channels, please modify the corresponding channel register data to 0xFFFF).

6. Calibration completed

Dimensions: (Unit: mm)



Can be installed on standard DIN35 rails

Communication testing software:

After receiving the product, users can contact sales personnel and provide their QQ number or email address to receive the WAYJUN Test software. This testing software is used for communication testing between computers and WJ128 products. You can also download it from the website softwayjun.net.

guarantee:

Within two years from the date of sale, if the user complies with the storage, transportation, and usage requirements and the product quality is lower than the technical specifications, it can be returned to the factory for free repair. If damage is caused due to violation of operating regulations and requirements, device fees and maintenance fees shall be paid.

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