1-channel grating ruler magnetic grating ruler encoder 4-fold pulse counter, Modbus RTU module WJ153

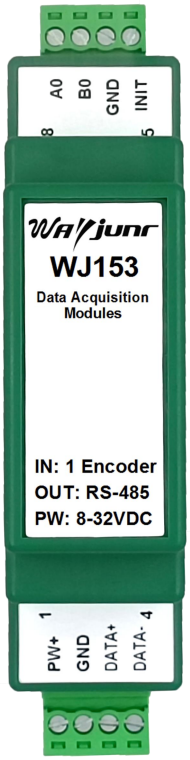


diagram 1 WJ153 module appearance **diagram**

Product features:

- ●The grating ruler and magnetic grating ruler are converted to the standard Modbus RTU protocol
- ● Can be used for measuring range angle or speed
- ● Using 4th harmonic counting, it can identify positive and negative rotations
- ● Measurement values support automatic saving in case of power failure
- ● The pulse rate can be set to automatically convert the actual value
- ●Pulse input supports PNP and NPN inputs
- ●When there is interference in the pulse input, the filtering time can be set
- ● Measurement values can be reset and set through RS-485 interface
- ●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

Typical applications:

- ●Measurement of grating ruler pulse signal
- ●Measurement of magnetic grating ruler pulse signal
- ● Three coordinate system position measurement
- ● Ball grid ruler pulse signal measurement
- ●The grating ruler signal is transmitted remotely to the industrial computer
- ●The encoder signal is transmitted remotely to the industrial computer
- ●Encoder pulse signal measurement
- ●Intelligent factory and industrial Internet of Things

Product Overview:

The WJ153 product realizes signal acquisition between sensors and hosts, used to decode grating ruler magnetic grating ruler signals. The WJ153 series products can be applied in RS-485 bus industrial automation control systems, automated machine tools, industrial robots, three coordinate positioning systems, displacement measurement, stroke measurement, angle measurement, speed measurement, product meters, and more.

The product includes signal acquisition, pulse signal capture, signal conversion, and RS-485 serial communication. Each serial port can connect up to 255 WJ153 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.

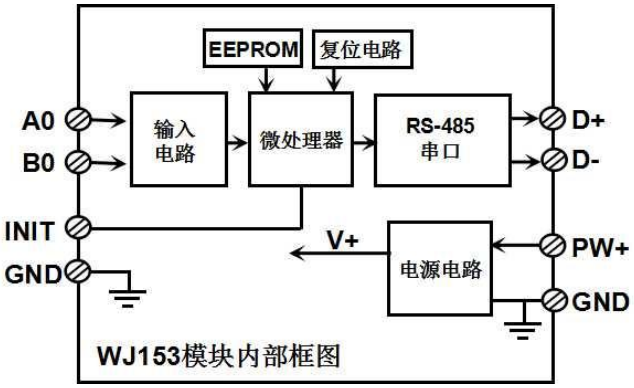


Figure 2 Internal Block Diagram of WJ153 Module

The WJ153 series products are intelligent monitoring and control systems based on microcontrollers. All user set configuration information such as address, baud rate, data format, checksum status, etc. are stored in non-volatile memory EEPROM.

The WJ153 series products are designed and manufactured according to industrial standards, with no isolation between signal inputs/outputs, strong anti-interference ability, and high reliability. The working temperature range is -45 ℃ to+85 ℃.

Function Introduction:

The WJ153 remote I/O module can be used to measure the signal of one grating ruler magnetic grating ruler encoder.

1、 Signal input

1-channel grating ruler magnetic grating ruler encoder signal input, can be connected to NPN and PNP signals, and the input type can be set through commands.

2、 Communication Protocol

Communication interface: 1 standard RS-485 communication interface.

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. No verification.

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:

WJ153 - □

└ Communication interface

485: Output as RS-485 interface

Selection example: Model: **WJ153-485** indicates an RS-485 interface for output

General parameters of WJ153:

(Typical @+25 ℃, Vs is 24VDC)

Input type: Encoder AB signal input, 1 channel (A0/B0).

Low level: Input<1V

High level: Input 3.5~30V

The frequency range is 0-50KHz.

Encoder counting range -2147483647 ~+2147483647

Input resistance: 30K Ω

Communication: RS-485 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)

Dimensions: 106 mm x 59mm x 24mm

Pin definition:

Pin	name	Description	Pin	name	Description
one	PW+	Positive end of power supply	**five**	INIT	Initial state setting
two	GND	Negative end of power supply	**six**	GND	Digital signal output ground
three	DATA+	RS-485 signal positive terminal	**seven**	A0	Encoder 0 signal A input terminal
four	DATA-	RS-485 signal negative terminal	**eight**	B0	Encoder 0 signal B input terminal

Table 1 Pin Definition

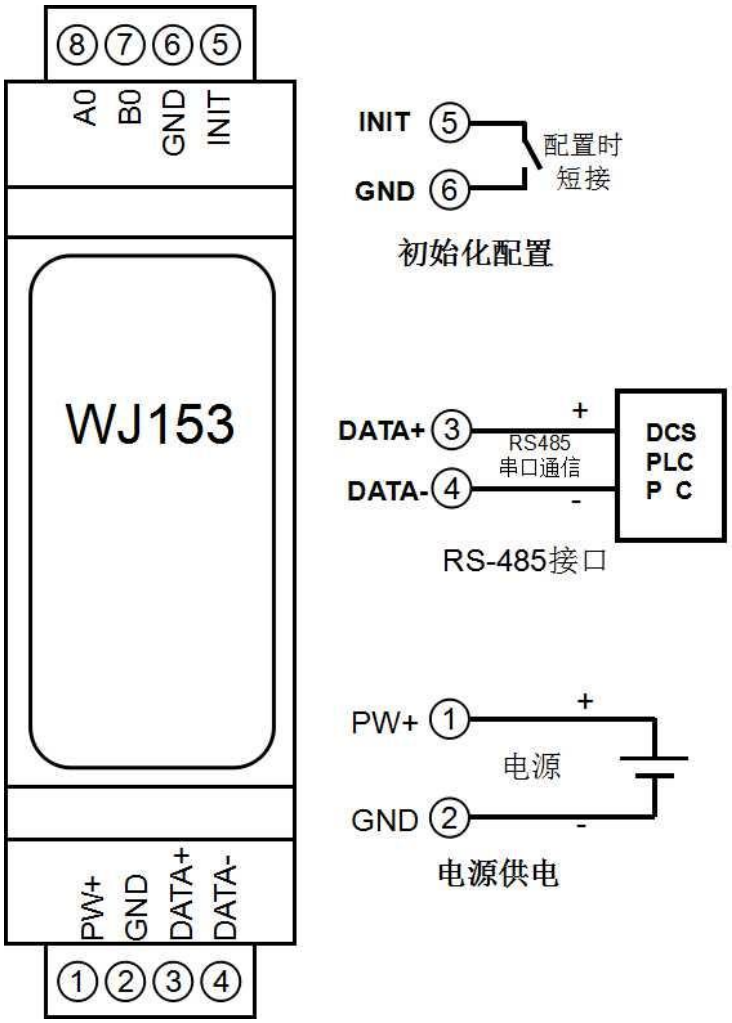
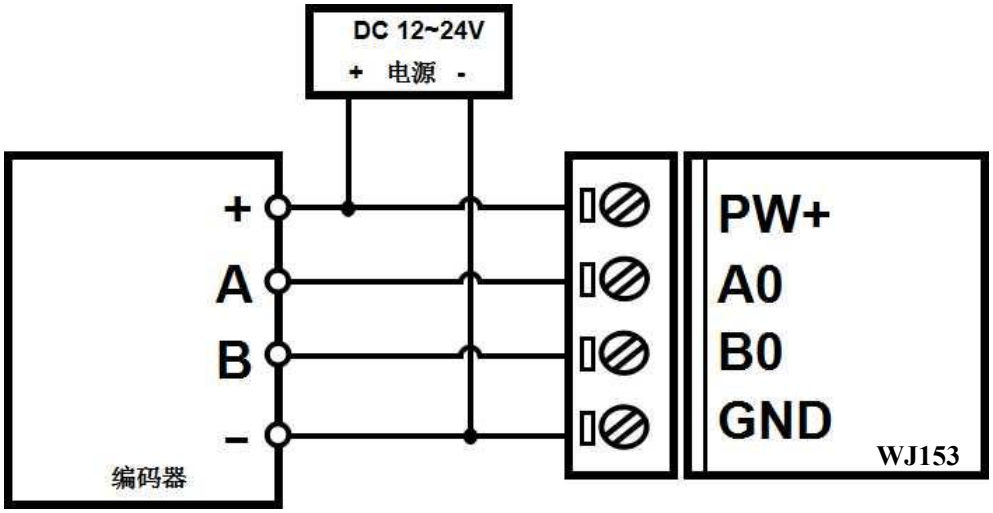


Figure 3 Wiring diagram of WJ153 module

Encoder signal input wiring diagram



Note: The **factory default is** to **turn off pull-up. If** it **is** an **NPN encoder,** you **need** to **turn** on the **internal pull-up resistor, set** the **40082 register to 1, or send** the **character command $01Q1**. **Other types such as NPN encoders with pull-up resistors, PNP encoders, push-pull encoders, etc. can be used directly. If** you **want** to **turn off** the **internal pull-up resistor, set** the **40082 register to 0 or send** the **character command $01Q0**

WJ153 Character Protocol Command Set:

The factory initial settings of the module are as follows:

The address code is 01

Baud rate 9600 bps

No verification

If using an RS-485 network, a unique address code must be assigned, with a hexadecimal value between 00 and FF. Since the address codes of new modules are the same, their addresses will conflict with those of other modules. Therefore, when building the system, you must reconfigure the addresses of each WJ153 module. After connecting the power line and RS485 communication line of the WJ153 module, the address of the WJ153 module can be modified through configuration commands. The baud rate and parity check also need to be adjusted according to the user's requirements.

Method to put the module into default state:

The WJ153 module has a special pin labeled as Initiat. Short circuit the Initiat pin to the GND pin, 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

No verification

When unsure of the specific configuration of a module, the Initiat pin can also be short circuited to the GND pin, and then the power can be turned on to put the module into default state, and then the module can be reconfigured.

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

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 switch status command

Explanation: Read back the switch status of all encoder input channels from the module.

Command format: **# AA**

Parameter description: # delimiter. Hexadecimal is 23H

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.

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

? The **01 (cr)** command is invalid or an illegal operation.

Parameter description:>delimiter. Hexadecimal is 3EH

CC represents the input switch status of the encoder read, consisting of 8 numbers arranged in the order of B0A0,

Value 0: Input low level; Value 1: Input high level

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

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

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

Explanation: The input switch status of the module is **01**, and the arrangement order is B0A0

A0: High level B0: Low level

2. Read encoder actual engineering value command

Explanation: Read the actual engineering value data of the encoder. '+' Represents positive, '-' represents negative, in floating-point format. The actual engineering value data is obtained by multiplying the count value by the pulse rate. The pulse rate can be set by issuing commands, which facilitates the automatic conversion of actual engineering values in practical applications.

Command format: **# AA0**

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.

0 represents the actual engineering value command of the encoder.

Response format:**+ AAAAAAAAAA.AAAAAA (cr)**

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

Module response (character format)**+ 12345678.000000(cr)**

Explanation: The actual engineering value of the encoder is+12345678

3. Read encoder counter data command

Explanation: Read the data from the encoder counter. '+' Indicates forward rotation, '-' indicates reverse rotation. The data is obtained using the 4th harmonic counting method.

Command format: **# AA2**

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.

2 represents the command to read encoder counter data.

Response format:**+ AAAAAAAAAA(cr)**

Application example: User command (character format) **# 012**

Module response (character format)**+ 0012345678 (cr)**

Explanation: The count value of the encoder is forward rotation+12345678

4. Read encoder input frequency command

Explanation: Read the frequency of the encoder input. '+' Indicates forward rotation, '-' indicates reverse rotation.

Command format: **# AA3**

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.

3 represents the input frequency command of the encoder.

Response format:**+ AAAAAA.AA (cr)**

Application example: User command (character format) **# 013**

Module response (character format)**+ 001000.00 (cr)**

Explanation: The input frequency value of the encoder is forward rotation+1kHz.

5. Read encoder input speed command

Explanation: Read the input speed of the encoder. '+' Indicates forward rotation, '-' indicates reverse rotation.

Command format: **# AA4**

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.

4 represents the input speed command from encoder 0 to encoder 7.

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

Response format:**+ AAAAA (cr)**

Application example: User command (character format) **# 014 (cr)**

Module response (character format)**+ 01000 (cr)**

Explanation: The input speed value of the encoder is forward rotation+1000 revolutions.

6. Modify the numerical command of the encoder counter

Explanation: You can modify the value of the encoder counter or reset it to zero to start counting again.

Command format: **$AA1+AAAAAAAAA** Modify the count value of the encoder.

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.

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

Response format:**! AA (cr)** indicates successful setting

Application example 1: User command (character format) **$011+0**

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

Explanation: Set the count value of the encoder to 0.

Application example 2: User command (character format) **$011+3000**

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

Explanation: Set the count value of the encoder to+3000.

7. Set the number of pulses per revolution for the encoder

Description: Set the number of pulses per revolution for the encoder. Set according to the parameters of the connected encoder, with a factory default value of 1000. The encoder speed can only be read after setting the correct number of

pulses.

Command format: **$AA5AAAAA** sets the number of pulses per revolution for the encoder.

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.

5. Set the number of pulses per revolution command for the encoder.

AAAAA represents the number of pulses, such as 1000, 800, or 600.

Response format:**! AA (cr)** indicates successful setting

Application example: User command (character format) **$01500300**

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

Explanation: Set the number of pulses per revolution of the encoder to 300.

8. Read the number of pulses per revolution of the encoder

Explanation: Read the number of pulses per revolution for all encoders.

Command format: **$AA6** reads the number of pulses per revolution from the encoder.

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:**! AAAAA (cr)** represents the number of pulses per revolution of the encoder.

Application example: User command (character format) **$016**

Module response (character format)**! 01000 (cr)**

Explanation: The number of pulses per revolution of the encoder is 1000.

9. Set the magnification of the pulse and the actual value corresponding to each pulse.

Description: Set the actual value and floating-point number corresponding to each pulse, with a default value of 1 at the factory. The actual engineering value is obtained by converting this value with the actual pulse.

For example, if each pulse is 0.005mm and can be set to 0.005, then the engineering value is 0.005 * number of pulses.

Command format: **$AATW (data)** Set the actual value corresponding to each pulse as a floating point number.

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.

(data) Actual value corresponding to each pulse, floating point number

Response format:**! AA (cr)** indicates successful setting

Application example: User command (character format) **$01TW0.005**

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

Explanation: Set the pulse rate to 0.005.

10. Read the magnification of the pulse and the actual value corresponding to each pulse.

Explanation: Read the pulse rate and the actual value corresponding to each pulse.

Command format: **$AATR** reads pulse rate.

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:**! (data) (cr)** Pulse rate, actual value corresponding to each pulse, floating point number.

Application example: User command (character format) **$01TR**

Module response (character format)**! 0.005000 (cr)**

Explanation: The pulse rate is 0.005

11. Set encoder filtering time

Explanation: Set the filtering time of the encoder. Unit 1mS, factory default is 0. Normally set to 0, if the movement or rotation speed is slow and there is pulse interference or mechanical encoder, it can be set to 1-20.

Command format: **$01LWAAAAA** sets the filtering time of the encoder. **AAAAA** represents filtering time, such as 0, 1, or 20.

Response format:**! 01 (cr)** indicates successful setting

Application example: User command (character format) **$01LW00002**

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

Explanation: Set the filtering time of the encoder to 2mS.

12. Read the filtering time of DI

Explanation: Read the filtering time of the encoder.

Command format: **$01LR** reads the filtering time of the encoder.

Response format:**! AAAAA** represents the filtering time of the encoder.

Application example: User command (character format) **$01LR**

Module response (character format)**! 00020 (cr)**

Explanation: The filtering time for all encoders is 20mS.

13. Set whether the count value will be automatically saved when the power is turned off

Explanation: Set the count value to automatically save when power is off. The factory default value is 1 (automatically saved when power is off).

Command format: **$01SW**

Parameter description: **S** sets the command to automatically save the count value when the power is turned off.

W 0: Do not automatically save, power off and reset to zero; 1: Power off automatically saves DI count value.

Response format:**! 01 (cr)** indicates successful setting

Application example: User command (character format) **$01S0**

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

Explanation: Set DI to not save count values and automatically reset the count after power failure.

14. Set the pull-up switch for DI

Explanation: Set the pull-up switch of DI to the factory default value of 0 (DI turns off the pull-up function).

Command format: **$01QX**

Parameter description: **Q** sets the pull-up switch command for DI.

X 0: DI turns off the pull-up voltage; 1: Connect the pull-up voltage to DI.

Response format:**! 01 (cr)** indicates successful setting

Application example: User command (character format) **$01Q1**

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

Explanation: Set the pull-up voltage for DI connection. When DI is an NPN input, it can be set to turn on the DI pull-up voltage.

15. Configure WJ153 module command

Explanation: Set the address, baud rate, and parity for a WJ153 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).

NN represents the new module hexadecimal address, with values ranging from 00 to FF.

TT uses hexadecimal to represent type encoding. The WJ153 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 parity check.

00: No verification

10: Odd verification

20: Even verification

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

? The **AA (cr)** command is invalid or an illegal operation, or a configuration jumper is not installed 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=00, NN equals the 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**% 0011000600**

Module response**! 11(cr)**

Explanation:**%** delimiter.

00 means that the original address of the WJ153 module you want to configure is 00H.

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

00 type code, WJ153 product must be set to 00.

06 represents a baud rate of 9600 baud.

00 indicates no verification.

16. Read configuration status command

Explanation: Read configuration for a specified WJ153 module.

Command format: **$AA2**

Parameter description: **$**delimiter.

AA 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 represents verification

(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 WJ153 module address is 01H.

00 represents the input type code.

06 represents a baud rate of 9600 baud.

00 indicates no verification.

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

Explanation: The parameters set by the above character commands in the module will be reset to factory settings, and the module will automatically restart after completion.

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.

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

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

Data format: 10 digits. 1 start bit, 8 data bits, and 1 stop bit. No verification.

Method to put the module into default state:

The WJ153 module has a special pin labeled as Initiat. Short circuit the Initiat pin to the GND pin, 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.

Supports Modbus RTU communication protocol, with command format following the standard Modbus RTU communication protocol.

Register Address Description for WJ153

Register supporting function code 01

Address 0X (PLC)	**Address (PC, DCS)**	**Data content**	**attribute**	**Data Explanation**
00033	thirty-two	A0 input switch quantity	read-only	The level state of the encoder input point 0 represents low-level input, 1 represents high-level input
00034	thirty-three	B0 input switch quantity	read-only	

Supports registers with function codes 03, 06, and 16

Address 4X (PLC)	**Address (PC, DCS)**	**Data content**	**attribute**	**Data Explanation**
40001~40002	0~1	Actual engineering value data	read-only	The data is a 32-bit floating-point number in CDAB format Floating point number low 16 bits in register 40001 Floating point number with high 16 bits in register 40002 The actual engineering value data is obtained by multiplying the count value by the pulse rate. The pulse rate can be set by issuing commands, which facilitates the automatic conversion of actual engineering values in practical applications.
40003~40004	2~3	Pulse rate	Read/ Write	Set the actual value corresponding to each pulse, which defaults to 1, The data is a 32-bit floating-point number in CDAB format The actual engineering value is obtained by converting this value with the actual pulse. For example, if each pulse is 0.005mm and can be set to 0.005, then the actual engineering value is 0.005 * number of pulses.
Address 4X (PLC)	**Address (PC, DCS)**	**Data content**	**attribute**	**Data Explanation**
40017~40018	16~17	Encoder count value	Read/	The data is a 32-bit integer in CDAB

			Write	format The data is obtained using the 4th harmonic counting method. Negative numbers use two complement, Positive numbers (0x0000000~0x7FFFFFF), Negative numbers (0xFFFFFFFF~0x8000001), Reset the counter and directly write 0 to the corresponding register, Other values can also be written as needed. The lower 16 bits are in register 40017, The high 16 bits are in register 40018
forty thousand and sixty-eight	sixty-seven	Count reset register	write	Unsigned integer, default to 0, modify this register to reset the encoder counter. After modification, the register will automatically return to 0. **Write 10: Set the encoder count value to 0,** Writing other values is invalid.
forty thousand and seventy-three	seventy-two	The number of pulses in the encoder	Read/ Write	Number of pulses per revolution of the encoder An unsigned integer (default value at factory is 1000), set according to the number of pulses per revolution of the encoder, and register 40101 is the corresponding channel speed after setting.
forty thousand and eighty-one	eighty	Automatic saving of count values	Read/ Write	0: Do not automatically save, power off and reset to zero; 1: Power off automatically saves the count value. (Default value is 1)
forty thousand and eighty-two	eighty-one	DI's pull-up switch	Read/ Write	0: DI turns off the pull-up voltage; (default value is 0) 1: Connect the pull-up voltage to DI.
forty thousand and eighty-nine	eighty-eight	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 one hundred and one	one hundred	Encoder speed	read-only	Encoder speed Signed integer, positive or negative indicates positive or negative reversal.

				The speed is converted based on the number of pulses set in register 40073.
40129~40130	128~129	Encoder frequency	read-only	Pulse frequency of encoder The data is a 32-bit floating-point number Floating point number low 16 bits in register 40129 Floating point numbers up to 16 bits are stored in register 40130
forty thousand one hundred and eighty-one	one hundred and eighty	The filtering time of the encoder	Read/ Write	The filtering time of the encoder Unsigned integer. Unit mS, factory default is 0. Normally set to 0, if the movement or rotation speed is slow and there is pulse interference or mechanical encoder, it can be set to 1-20.
Address 4X (PLC)	**Address (PC, DCS)**	**Data content**	**attribute**	**Data Explanation**
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 three	two hundred and two	Parity check	Read/ Write	Integer, takes effect after restart 0: No verification 1: Odd verification 2: Even verification
forty thousand two hundred and eleven	two hundred and ten	Module Name	read-only	High bit: 0x01 Low bit: 0x53

Table 5 Modbus Rtu Register Description

Communication example 1: If the module address is 01, send **010300100002C5CE** in hexadecimal to retrieve the data from the register.

01	03	00	ten	00	02	C5	CE
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: **010304CA90FFFFC476**, the read data is 0xFFFCA90, which is converted to decimal as -13680, indicating that the current count value of encoder 0 is -13680.

01	03	04	CA	ninety	FF	FF	C4	seventy-six
Module address	Read and hold register	The number of bytes in the data	Data 1 high position	Data 1 Low Bit	Data 2 high bit	Data 2 Low Bit	CRC check low bit	CRC check high bit

Communication example 2: If the module address is 01, send in hexadecimal: **0103000000002C40B** to retrieve the data from the register.

01	03	00	00	00	02	C4	0B
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: **010304500047C39892**, the read data is 0x47C35000, and the floating-point number is converted to decimal 10000, it indicates that the current engineering value is 10000.

01	03	04	fifty	00	forty-seven	C3	ninety-eight	ninety-two
Module address	Read and hold register	The number of bytes in the data	Data 1 high position	Data 1 Low Bit	Data 2 high bit	Data 2 Low Bit	CRC check low bit	CRC check high bit

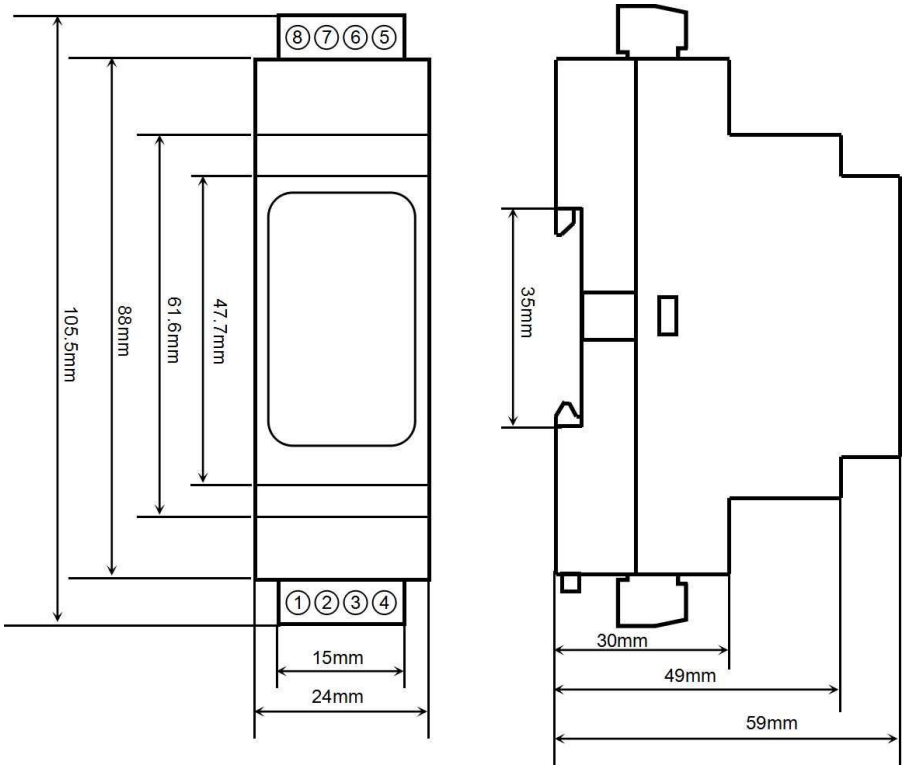
Communication example 3: If the module address is 01, send in hexadecimal: **01060043000AF819**, which means reset the count value of the encoder.

01	06	00	forty-three	00	0A	F8	nineteen
Module address	Write a single hold register	Register Address High Bit	Low bit register address	data-high	data-low	CRC check low bit	CRC check high bit

If the module replies: 01060043000AF819, it means the setting is successful and the encoder's count value is changed to 0.

01	06	00	forty-three	00	0A	F8	nineteen
Module address	Write a single hold register	Register Address High Bit	Low bit register address	data-high	data-low	CRC check low bit	CRC check high bit

Dimensions: (Unit: mm)



Can be installed on standard DIN35 rails

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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