DS Series Communication Protocol

V1.0.1

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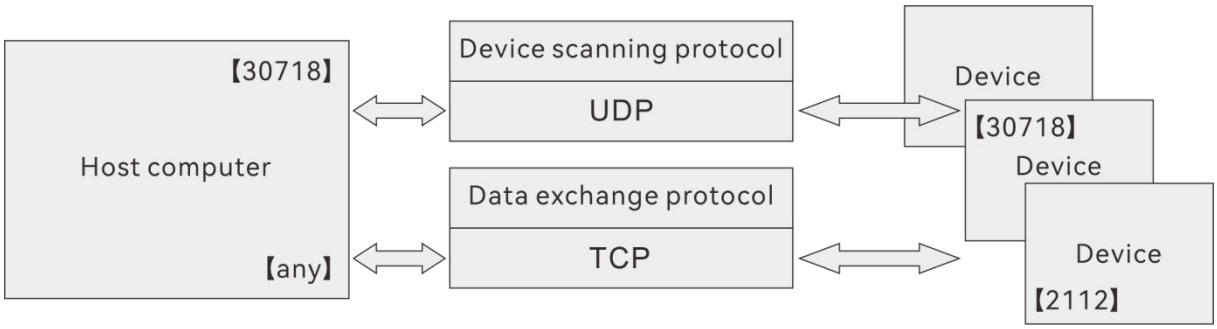
Revision History

date	content	Version
June 1 , 2024	Document first release	1.0.0
August 26 , 2024	Detailed description of data format and length	1.0.1

1 Protocol Overview

1.1 Basic architecture of the protocol

This protocol describes the communication protocol between the host computer and DS series, including the "device scanning protocol" based on UDP and the "data exchange protocol" based on TCP.



1. Device scanning protocol: based on UDP broadcast

This protocol is used to scan DS series devices. The host computer sends a device scan broadcast to a specific port, and the slave computer responds to the scan command to achieve device discovery.

The port occupied by the device scanning protocol is 30718. The host computer and the device use this fixed port for device scanning and replying. The port cannot be changed.

2. Data exchange protocol: based on TCP

The data communication between the host computer and the slave computer is based on the TCP protocol. The default listening port of the device is 2112, which cannot be changed by the user.

Within the framework of the agreement, there are two concepts:

1. Variable

Variables store information such as the device's status, parameters, and measurement data. Variables have two attributes: read and write. For readable and writable variables, the host computer can read and write; for read-only variables, the host computer can only read.

2. Method

The method is called by the host computer and executed by the lower computer. The host computer sends the called method and parameters to the lower computer, and the lower computer replies with the method call result and return value.

1.2 Other protocols

The DS series device also supports the following protocols:

1. ICMP protocol. This protocol corresponds to the Ping command.

The lower computer can respond to the Ping command.

2. ARP protocol.

(1) The lower computer can reply to the ARP request.

(2) When the lower computer is just started, it sends an ARP request to the outside so that the upper computer can update its routing table in time.

(3) If the device has no TCP connection, no Ping, and no device scan command, it will interact with the outside world once every 10 seconds.

(4) The type of ARP is Gratuitous ARP.

2 Device Scanning Protocol

The main characteristics of the device scanning protocol are:

1. The host computer uses the LAN broadcast address 255.255.255.255 to scan the devices in the network, and the port used is 30718.

2. After receiving the broadcast content from the upper computer, the lower computer also replies at the broadcast address 255.255.255.255, and the port it uses is also 30718.

2.1 Device Scan

2.1.1 Scan Broadcast

Scan broadcast is used by the host computer or other devices to scan and discover DS series. The format is as follows:

10 Bytes	4 Bytes	2 Bytes	4 Bytes	4 Bytes
Head	Serial	Command	Host IP	Host Mask

Head: 10 Bytes, fixed content is 0x10 0x00 0x00 0x08 0xff 0xff 0xff 0xff 0xff 0xff

Serial: 4 Bytes, a 4-byte random number. This random number will be used in the broadcast reply and returned to the host computer that issued the scan broadcast for identification. The random number is generated by the host computer.

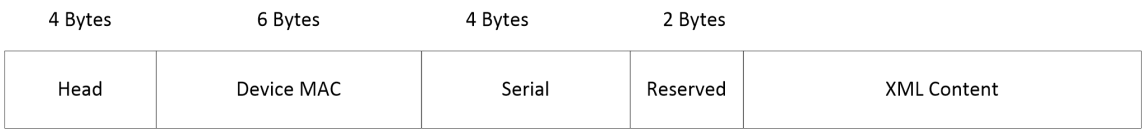
Command: 2 Bytes, fixed bytes, content is 0x01 0x02

Host IP: 4 Bytes, host IP address, such as 0xc0 0xa8 0x64 0x64 (192.168.100.100)

Host Mask: 4 Bytes, host subnet mask, 0xff 0xff 0xff 0x00 (255.255.255.0)

2.1.2 Reply Broadcast

Reply broadcast is used to feed back the basic device information of DS series to the host computer or scanning device. The format is as follows:



Head: 4 Bytes, fixed value is 0x90 0x00 0x02 0x67

Device MAC: 6 Bytes, such as 0x00 0x06 0x77 0x28 0xd1 0x82

Serial: 4 Bytes, same as the value of "Scan Broadcast"

Reserved: 2 Bytes, currently fixed at 0x00 0x00

XML Content: Delivers basic device information in the form of an XML document. Its content is:

```
<?xml version="1.0" ?>
 <NetScanResult MACAddr="00:06:77:28:D1:82">
 <Item key="IPAddress" value="192.168.100.236" readonly="FALSE" />
 <Item key="IPMask" value="255.255.255.0" readonly="FALSE" />
 <Item key="IPGateway" value="0.0.0.0" readonly="FALSE" />
 <Item key="DeviceType" value=" DS series " readonly="TRUE" />
 <Item key="FirmwareVersion" value="V001.002.081" readonly="TRUE" />
 <Item key="SerialNumber" value="18040010" readonly="TRUE" />
 <Item key="LocationName" value="" readonly="TRUE" />
 <Item key="IPConfigDuration" value="10000" readonly="TRUE" />
 <Item key="HasDHCPClient" value="FALSE" readonly="TRUE" />
</NetScanResult>
```

The DS series device's response contains the following elements:

MACAddr : MAC address of the device

IPAddress : IP address of the device

IPMask : The subnet mask of the device

IPGateway : Gateway of the device

DeviceType : Device type

FirmwareVersion : The firmware version of the device

SerialNumber : SN of the device , serial number

LocationName : The location information of the device, usually empty.

IPConfigDuration HasDHCPClient : Whether the device supports DHCP .

These elements make it easy for the host computer to establish a TCP connection with the device to obtain data.

2.2 Modify network address information

Modifying network address information includes:

1. Modify IP address
2. Modify Mask
3. Modify Gateway

Its basic structure is:

Modification Request:

4 Bytes	6 Bytes	4 Bytes	2 Bytes	
Head	Device MAC	Serial	Request Command	XML Content

Modified reply:

4 Bytes	6 Bytes	4 Bytes	2 Bytes	
Head	Device MAC	Serial	Response Command	XML Content

Head: The Head value is different for different commands.

1. Modifying IP, Mask, and Gateway Head are different
2. Modify the reply header to be the same

Serial: The serial number of the modification request is generated by the host computer, and the serial number of the modification reply is the same as that of the host computer.

Command: Indicates whether it is a modification request or a modification reply. The modification request command is 0x01 0x02, and the modification reply command is 0x00 0x00

Request XML: Modify the request XML document

Response XML: Modify the response XML document

1. Modify IP, modify Mask, modify Gateway Request XML format is the same
2. The Response XML format of replying to modify IP, replying to modify Mask, and

replying to modify Gateway is the same

2.2.1 Modify IP address request

Modification Request:

Head: 0x11 0x00 0x01 0x04

MAC: 0x00 0x06 0x77 0x28 0xd1 0x82 (this value is different for different devices)

Serial: Randomly generated (4 bytes)

Command: 0x01 0x02

Request XML:

```
<?xml version="1.0" encoding="UTF-8"?>
<IPconfig MACAddr="00:06:77:28:d1:82">
  <Item key="IPMask" value="255.255.255.0"/>
  <Item key="DHCPClientEnabled" value="FALSE"/>
  <Item key="IPGateway" value="0.0.0.0"/>
  <Item key="IPAddress" value=" 192.168.100.236 "/>
</IPconfig>
```

Modified reply:

Head: 0x91 0x00 0xa3 0x00

MAC: 0x00 0x06 0x77 0x28 0xd1 0x82

Serial: Same as the Serial number of the modification request

Command: 0x00 0x00

Response XML:

```
<?xml version="1.0" ?>
<IPConfigResult MACAddr="00:06:77:28:D1:82">
  <Item key="Success" value=" TRUE " />
  <Item key="IPConfigDuration" value="10000" />
</IPConfigResult>
```

If the modification fails, the value of the "Success" field is "FALSE".

2.2.2 Modify Mask Request

Modification Request:

Head: 0x11 0x00 0x01 0x02

MAC: 0x00 0x06 0x77 0x28 0xd1 0x82

Serial: Randomly generated (4 bytes)

Command: 0x01 0x02

Request XML:

```
<?xml version="1.0" encoding="UTF-8"?>
<IPconfig MACAddr="00:06:77:28:d1:82">
  <Item key="IPMask" value=" 255.255.0.0 "/>
  <Item key="DHCPClientEnabled" value="FALSE"/>
  <Item key="IPGateway" value="0.0.0.0"/>
  <Item key="IPAddress" value="192.168.100.236"/>
</IPconfig>
```

Modified reply:

Head: 0x91 0x00 0xa3 0x00

MAC: 0x00 0x06 0x77 0x28 0xd1 0x82

Serial: Same as the Serial number of the modification request

Command: 0x00 0x00

Response XML:

```
<?xml version="1.0" ?>
<IPConfigResult MACAddr="00:06:77:28:D1:82">
  <Item key="Success" value=" TRUE " />
  <Item key="IPConfigDuration" value="10000" />
</IPConfigResult>
```

If the modification fails, the value of the "Success" field is "FALSE".

2.2.3 Modify Gateway Request

Modification Request:

Head: 0x11 0x00 0x01 0x0a

MAC: 0x00 0x06 0x77 0x28 0xd1 0x82

Serial: Randomly generated (4 bytes)

Command: 0x01 0x02

Request XML:

```
<?xml version="1.0" encoding="UTF-8"?>
<IPconfig MACAddr="00:06:77:28:d1:82">
  <Item key="IPMask" value="255.255.255.0"/>
  <Item key="DHCPClientEnabled" value="FALSE"/>
  <Item key="IPGateway" value=" 192.168.100.1 "/>
  <Item key="IPAddress" value="192.168.100.236"/>
</IPconfig>
```

Modified reply:

Head: 0x91 0x00 0xa3 0x00

MAC: 0x00 0x06 0x77 0x28 0xd1 0x82

Serial: Same as the Serial number of the modification request

Command: 0x00 0x00

Response XML:

```
<?xml version="1.0" ?>
<IPConfigResult MACAddr="00:06:77:28:D1:82">
  <Item key="Success" value=" TRUE " />
  <Item key="IPConfigDuration" value="10000" />
</IPConfigResult>
```

If the modification fails, the value of the "Success" field is "FALSE".

2.2.4 Modify multiple parameter requests

If the host computer wants to modify 2 or 3 parameters of IP, Mask, Gateway at the same time,

Modification Request:

Head: 0x11 0x00 0x01 0x08

MAC: 0x00 0x06 0x77 0x28 0xd1 0x82

Serial: Randomly generated (4 bytes)

Command: 0x01 0x02

Request XML:

```
<?xml version="1.0" encoding="UTF-8"?>
<IPconfig MACAddr="00:06:77:28:d1:82">
  <Item key="IPMask" value="255.255.255.0"/>
  <Item key="DHCPClientEnabled" value="FALSE"/>
  <Item key="IPGateway" value=" 192.168.100.1 "/>
  <Item key="IPAddress" value=" 192.168.100.236 "/>
</IPconfig>
```

Modified reply:

Head: 0x91 0x00 0xa3 0x00

MAC: 0x00 0x06 0x77 0x28 0xd1 0x82

Serial: Same as the Serial number of the modification request

Command: 0x00 0x00

Response XML:

```
<?xml version="1.0" ?>
<IPConfigResult MACAddr="00:06:77:28:D1:82">
  <Item key="Success" value=" TRUE " />
  <Item key="IPConfigDuration" value="10000" />
</IPConfigResult>
```

If the modification fails, the value of the "Success" field is "FALSE".

3 Data exchange protocol

In the protocol, all data is represented in binary.

3.1 Data Types

All data in the protocol belongs to a certain type, as shown in the following table:

Name	Description	Range Of Values
Bool	boolean(8 bits)	True(1), False(0)
UInt8	unsigned short(8 bits)	(0...255)
UInt16	unsigned int(16 bits)	(0...65535)
UInt32	unsigned double int(32 bits)	
UInt64	unsigned long int(64 bits)	
Int8	signed short(8 bit)	(-128..127)
Int16	signed int(16 bits)	
Int32	signed double int(32 bits)	
Int64	signed long int(64 bits)	
Real	IEEE-754 single-precision floating point number (32 bit) (float)	
Double	IEEE-754 double-precision floating point number (64 bit) (double)	
Enum8	short enumeration (8 bits)	
Enum16	short enumeration (16 bits)	
FixString	bits per character)	
FlexString	Variable length string. There is length information before the character, and the length type is UInt (8 bits per character)	

3.2 Variable/Method Number

In the data exchange protocol, all data is transmitted in the form of **"command" reading, writing and response .**

The concepts involved in data exchange are:

1. variable

The various parameters of the device exist in the form of variables, and each variable has a number (Index). When the upper read command specifies the number of a variable to be read, the lower computer replies with the value of the variable corresponding to the

number.

If the upper computer specifies the number of a variable to be written in the write command, the lower computer will modify the corresponding variable.

2. method

Each method has a corresponding number (Index). The host computer calls a method with the number (Index) corresponding to the method, and the lower computer returns the method return value corresponding to the number after executing the method.

3. serial number

Variables and methods are identified by numbers (Index). The Index data type is UInt16, which occupies 2 bytes and 16 bits. For example, the Index of the variable "Firmware Version Number" = 0x0004.

The command types are listed in the following table:

Client (host computer)	**Server (device)**	**Order**
sRI{SVIdx}	sRA{SVIdx}{variable value}	Read the variable marked by SVIdx
sWI{SVIdx}	sVIdx	Write to the variable marked with SVIdx
sMI{MIdx}{parameters}	sMA{MIdx}{return values}	Calling MIDx marked method
	sFA{error code}	The device returns an error code

R stands for Read

W stands for Write

M stands for Method

V stands for Variable

Idx means Index

sRI: Read the variable marked with SVIdx, the binary value is: 0x73 0x52 0x49.

sRA: Reply the variable value marked with SVIdx, the binary value is: 0x73 0x52 0x41.

sWI: Write to the variable marked with SVIdx, the binary value is: 0x73 0x57 0x49.

sWA: Reply the variable write result marked with SVIdx, the binary number is: 0x73 0x57 0x41.

sMI: Call the method marked with MIdx, the binary code is: 0x73 0x4D 0x49.

sMA: Reply to the method call result marked with SVIdx, the binary number is: 0x73 0x4D 0x41.

sFA: Returns an error code, the binary code is: 0x73 0x48 0x41.

3.3 Format

There are three main types of commands: read commands, write commands, and methods.

3.3.1 Write Command

Write Request

Byte number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Content	02	02	02	02	00	00	00	06	73	57	49	01	4f	00	23
Meaning	Preamble				Data length = 6				“ sWI”			Idx=014f		00	Checksum
Protocol explanation	Frame header								Variable idx					Value	Frame end

A "write request" consists of the following fields:

1. Preamble

   4 bytes, fixed at 0x02 0x02 0x02 0x02.

2. Data length

   4 bytes, which refers to the length of the data content including "command type", "number", and "value", excluding the checksum.

3. Command Type

   3 bytes, here is "write command sWI" 0x73 0x57 0x49

4. serial number

   2 bytes, indicating which variable the host computer needs to write to, and "number" refers to the number of the variable.

5. value

   The length is not fixed, and varies according to the variable type.

6. Check code

   1 byte, the XOR value of all bytes starting from "Command Type" (excluding "Preamble" and "Data Length" fields).

Write a reply

Byte number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Content	02	02	02	02	00	00	00	05	73	57	41	01	4f	2b
Meaning	Preamble				Data length =5				“sWA”			Idx=014f		Checksum
Protocol explanation	Frame header								Variable idx					Frame end

"Write Reply" consists of the following fields

1. Preamble

   4 bytes, fixed as 0x02 0x02 0x02 0x02.

2. Data length

   4 bytes, which refers to the length of the data content including "command type" and "number", excluding the check code.

3. Command Type

   3 bytes, here is "write reply sWA" 0x73 0x57 0x41

4. serial number

   2 bytes, the value of which variable the lower computer responds to when it is written successfully.

5. Check code

   1 byte, the XOR value of all bytes starting from "Command Type" (excluding "Preamble" and "Data Length" fields).

3.3.2 Read Command

Read Request

A read request consists of the following fields:

1. Preamble

   4 bytes, fixed as 0x02 0x02 0x02 0x02

2. Data length

   4 bytes, including the length of the data content including "command type" and "number", excluding the checksum

3. Command Type

   3 bytes, here is "read command sRI" 0x73 0x52 0x49

4. serial number

   2 bytes, indicating which variable the host computer needs to read, and "number" refers to the number of the variable.

5. Check code

   1 byte, the XOR value of all bytes starting from "Command Type" (excluding "Preamble" and "Data Length" fields), in this example, including sRI, Idx

For example:

Byte number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Content	02	02	02	02	00	00	00	05	73	52	49	00	04	6c
Meaning	Preamble				Data length =5				“sRI”			Idx=4		Checksum
Protocol explanation	Frame header								Variable idx					Frame end

(1) Preamble code, fixed to 0x02 02 02 02

(2) Data length: "sRI" length is 3, idx length is 2, total length is 5

(3) Command type: "sRI" indicates a read command

(4) Number: Read variable number 4, which here means requesting the "firmware version".

(5) Check code: XOR value of all bytes including "sRI", "Idx" = 0x6c

Read Reply

1. Preamble

   4 bytes, fixed value 0x02 02 02 02

2. Data length

4 bytes, including "command type", "number", and "reply content"

3. Command Type

3 bytes, here is "read return sRA" 0x73 0x52 0x41

4. serial number

2 bytes, indicating which variable is being replied to, each variable corresponds to an index

5. Reply content

The length is determined by the "Number" field

6. Check code

1 byte, the XOR value of all bytes starting from "Command Type" (excluding the "Preamble" and "Data Length" fields), these fields include: "Command Type", "Number", "Reply Content".

Byte number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Content	02	02	02	02	00	00	00	15	73	52	41	00	04	00	0e	44	35
Meaning	Preamble				Data length=21				“sRA”			Idx=4		FlexString Len=14			
Protocol explanation	Frame header								Variable idx					Variable Value			

Byte number	18	19	20	21	22	23	24	25	26	27	28	29	30
Content	2e	31	33	23	30	30	38	2e	32	37	32	32	07
Meaning	ascii=“D5.13.008.2722”												Checksum
Protocol explanation	Protocol variable value												Frame tail

(1) Preamble code, fixed to 0x02 02 02 02

(2) Data length, including the length of "command type", "number", and "reply content"

(3) Command type, "sRA", indicates reply to read variable request

(4) Number, Idx=4, means reply "firmware version"

(5) The reply content is the firmware version, which is represented by ASCII code, i.e. "D5.13.008.2722".

(6) Checksum, the XOR value of all bytes starting from "Command Type" (excluding "Preamble" and "Data Length" fields).

3.3.3 Different types of data formats

3.3.3.1 Bool

Reading variables

Read Command

Byte number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Content	02	02	02	02	00	00	00	05	73	52	49	00	51	39
Meaning	Preamble				Data length =5				"sRI"			Idx=51		Checksum
Protocol explanation	Frame header								Reading variables idx					Frame end

Read Return

Byte number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Content	02	02	02	02	00	00	00	06	73	52	41	00	51	00	31
Meaning	Preamble				Data length=6				"sRA"			Idx=51		Val	Checksum
Protocol explanation	Frame header								Read variable idx Reply					Value	Frame end

Writing to variables

Write Command

Byte number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Content	02	02	02	02	00	00	00	06	73	57	49	01	4d	00	21
Meaning	Preamble				Data length =6				"sWI"			Idx=014d		Val	Checksum
Protocol explanation	Frame header								Writing variables idx					Value	Frame end

Write Return

Byte number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Content	02	02	02	02	00	00	00	05	73	57	41	01	4d	29
Meaning	Preamble				Data length =5				"sWA"			Idx=014d		Checksum
Protocol explanation	Frame header								Writing variables idx Reply					Frame end

3.3.3.2 UInt8

Reading variables

Read Command

Byte number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Content	02	02	02	02	00	00	00	05	73	52	49	01	4e	27
Meaning	Preamble				Data length =5				“sRI”			Idx=014e		Checksum
Protocol explanation	Frame header								Read variable idx					Frame end

Read Return

Byte number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Content	02	02	02	02	00	00	00	06	73	52	41	01	4e	00	2f
Meaning	Preamble				Data length =6				“sRA”			Idx=014e		Val	Checksum
Protocol explanation	Frame header								Read variable idx Reply					Value	Frame end

Writing to variables

Write Command

Byte number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Content	02	02	02	02	00	00	00	06	73	57	49	01	4e	01	23
Meaning	Preamble				Data length =6				“sWI”			Idx=014e		Val	Checksum
Protocol explanation	Frame header								Writing variables idx					Value	Frame end

Write Return

Byte number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Content	02	02	02	02	00	00	00	05	73	57	41	01	4e	2a
Meaning	Preamble				Data length =5				“sWA”			Idx=014e		Checksum
Protocol explanation	Frame header								Writing variables idx Reply					Frame end

3.3.3.3 UInt16

There is currently no UInt16 data reading or writing.

3.3.3.4 UInt32

Reading variables

Read Command

Byte number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Content	02	02	02	02	00	00	00	05	73	52	49	01	53	3a
Meaning	Preamble				Data length =5				“sRI”			Idx=0153		Checksum
Protocol explanation	Frame header								Read variable idx					Frame end

Read Return

Byte number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Content	02	02	02	02	00	00	00	09	73	52	41	01	53	00	00	00	0a	38
Meaning	Preamble				Data length=9				“sRA”			Idx=0153		Val				Checksum
Protocol explanation	Frame header								Read variable idx Reply					Value				Frame end

Writing to variables

Write Command

Byte number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Content	02	02	02	02	00	00	00	09	73	57	49	01	53	00	00	00	0a	35
Meaning	Preamble				Data length=9				“ sWI”			Idx=0153		Val				Checksum
Protocol explanation	Frame header								Writing variables idx					Value				Frame end

Write Return

Byte number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Content	02	02	02	02	00	00	00	05	73	57	41	01	53	37
Meaning	Preamble				Data length =5				“sWA”			Idx=0153		Checksum
Protocol explanation	Frame header								Writing variables idx Reply					Frame end

3.3.3.5 Int8

Reading variables

Read Command

Byte number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Content	02	02	02	02	00	00	00	05	73	52	49	01	1e	77
Meaning	Preamble				Data length =5				“sRI”			Idx=011e		Checksum
Protocol explanation	Frame header								Read variable idx					Frame end

Read Return

Byte number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Content	02	02	02	02	00	00	00	06	73	52	41	01	1e	21	5e
Meaning	Preamble				Data length =6				“sRA”			Idx=011e		Val	Checksum
Protocol explanation	Frame header								Read variable idx Reply					Value	Frame end

No "write variable" usage

3.3.3.6 Int16

Reading variables

Read Command

Byte number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Content	02	02	02	02	00	00	00	05	73	52	49	00	2d	45
Meaning	Preamble				Data length =5				“sRI”			Idx=002d		Checksum
Protocol explanation	Frame header								Read variable idx					Frame end

Read Return

Byte number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Content	02	02	02	02	00	00	00	07	73	52	41	00	2d	ff	be	0c
Meaning	Preamble				Data length=7				“sRA”			Idx=002d		Val		Checksum
Protocol explanation	Frame header								Read variable idx Reply					Value		Frame end

No "write variable" usage

3.3.3.7 Int32

Reading variables

Read Command

Byte number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Content	02	02	02	02	00	00	00	05	73	52	49	01	4a	23
Meaning	Preamble				Data length =5				“sRI”			Idx=014a		Checksum
Protocol explanation	Frame header								Read variable idx					Frame end

Read Return

Byte number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Content	02	02	02	02	00	00	00	09	73	52	41	01	4a	ff	ff	ff	9c	48
Meaning	Preamble				Data length=9				"sRA"			Idx=014a		Val				Checksum
Protocol explanation	Frame header								Read variable idx Reply					Value				Frame end

Writing to variables

Write Command

Byte number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Content	02	02	02	02	00	00	00	09	73	57	49	01	4a	00	00	00	64	42
Meaning	Preamble				Data length=9				"sWI"			Idx=014a		Val				Checksum
Protocol explanation	Frame header								Writing variables idx					Value				Frame end

Write Return

Byte number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Content	02	02	02	02	00	00	00	05	73	57	41	01	4a	2e
Meaning	Preamble				Data length=5				"sWA"			Idx=014a		Checksum
Protocol explanation	Frame header								Writing variables idx Reply					Frame end

3.3.3.8 Float32

Reading variables

Read Command

Byte number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Content	02	02	02	02	00	00	00	05	73	52	49	00	0a	62
Meaning	Preamble				Data length=5				"sRI"			Idx=000a		Checksum
Protocol explanation	Frame header								Read variable idx					Frame end

Read Return

Byte number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Content	02	02	02	02	00	00	00	09	73	52	41	01	0a	3f	f9	e1	b1	fc
Meaning	Preamble				Data length=9				"sRA"			Idx=000a		Val				Checksum
Protocol explanation	Frame header								Read variable idx Reply					Value				Frame end

No "write variable" usage

3.3.3.9 FixString

Reading variables

Read Command

Byte number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Content	02	02	02	02	00	00	00	05	73	52	49	00	a8	c0
Meaning	Preamble				Data length =5				“sRI”			Idx=a8		Checksum
Protocol explanation	Frame header								Variable idx					Frame end

Read Return

Byte number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Content	02	02	02	02	00	00	00	11	73	52	41	00	a8	56	30	30	31
Meaning	Preamble				Data length =21				“sRA”			Idx=a8					
Protocol explanation	Frame header								Variable idx					Variable Value			

Byte number	18	19	20	21	22	23	24	25	30
Content	2e	30	30	30	2e	30	30	31	ae
Meaning	ascii=“V001.000.001”								Checksum
Protocol explanation	Protocol variable value								Frame end

3.3.3.10 FlexString

Reading variables

Read Command

Byte number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Content	02	02	02	02	00	00	00	05	73	52	49	00	04	6c
Meaning	Preamble				Data length =5				“sRI”			Idx=4		Checksum
Protocol explanation	Frame header								Variable idx					Frame end

Read Return

Byte number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Content	02	02	02	02	00	00	00	15	73	52	41	00	04	00	0e	44	35
Meaning	Preamble				Data length =21				“sRA”			Idx=4		FlexString Len=14			
Protocol explanation	Frame header								Variable idx					Variable Value			

Byte number	18	19	20	21	22	23	24	25	26	27	28	29	30
Content	2e	31	33	23	30	30	38	2e	32	37	32	32	0a
Meaning	ascii=“D5.13.008.2722”												Checksum
Protocol explanation	Protocol variable value												Frame end

Writing to variables

Write Command

Byte number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Content	02	02	02	02	00	00	00	09	73	57	49	00	02	00	09
Meaning	Preamble				Data length =9				“sWI”			Idx=0002		FlexStrLen=9	
Protocol explanation	Frame header								Write variable idx					FlexStr length	

Byte number	16	17	18	19	20	21	22	23	24	18
Content	48	65	6c	6c	57	6f	72	6c	64	09
Meaning	ascii=“HellWorld”									Checksum
Protocol explanation	Variable Value									Frame end

Write Return

Byte number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Content	02	02	02	02	00	00	00	05	73	57	41	00	02	67
Meaning	Preamble				Data length =5				“sWA”			Idx=0002		Checksum
Protocol explanation	Frame header								Write variable idx Reply					Frame end

3.4 Error code and error return format

When the host computer operates DS series, there may be errors in the command format or parameters. When an error occurs, the device will return an error code to the host computer. Error messages are returned by triggering, and no error is returned.

3.4.1 Error Code

The meanings of the error codes are shown in the following table.

Error Code	meaning
0x00	NoError
0x01	Method: Access restrictedMethodInvokeDenied
0x02	Method: The method number does not exist UnknownMethod

0x03	Variable: variable number UnknownIndex does not exist
0x04	ParameterUnavailable
0x05	Invalid Data
0x0a	Variable: Read-only, not writableWriteAccessDenied
>0	Other Errors

illustrate:

1. Error code 0x00: indicates no error. However, the device will not send an sFA message with an error code of 0x00 to the host computer. Here, only an error code value is defined.

2. Error code 0x01: indicates that the user does not have permission to access this method.

3. Error code 0x02: Indicates that the method indicated by the index field in the method call command does not exist.

4. Error code 0x03: Indicates that the variable indicated by the index field in the read or write command does not exist.

5. Error code 0x04: Indicates that the value written to a variable exceeds its defined range.

6. Error code 0x05: The triggered event is not found and is not used yet .

7. Error code 0x0a: When a variable is read-only, if the host computer tries to write the variable.

8. CheckSum error: When a command sent by the host computer has a CheckSum error, the device discards the command without replying.

9. Data length error: When the command data length sent by the host computer is incorrect, the device will discard the command without replying.

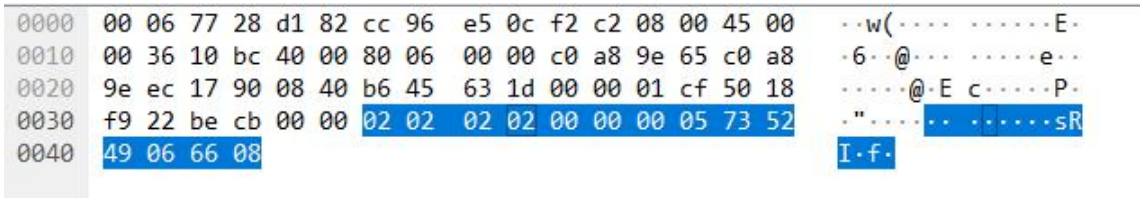
3.4.2 Error return format

This section describes how the device returns error codes to the host computer. Error codes 0x03 and 0x0a are used as examples. Other error codes are similar.

3.4.2.1 UnKnownIndex(0x03)

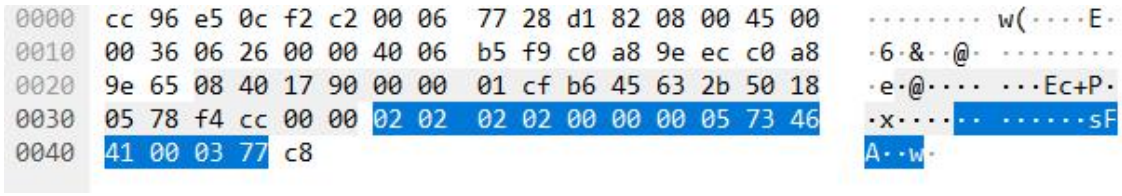
The host computer reads the variable through sRI: Index is 0x0666

02 02 02 02 00 00 00 05 73 52 49 06 66 08



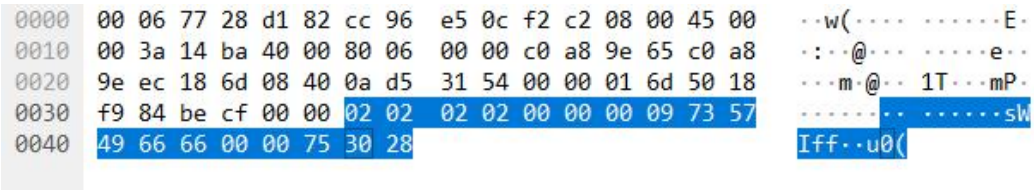
The device returns sFA + error_code (0x03)

02 02 02 02 00 00 00 05 73 46 41 00 03 77



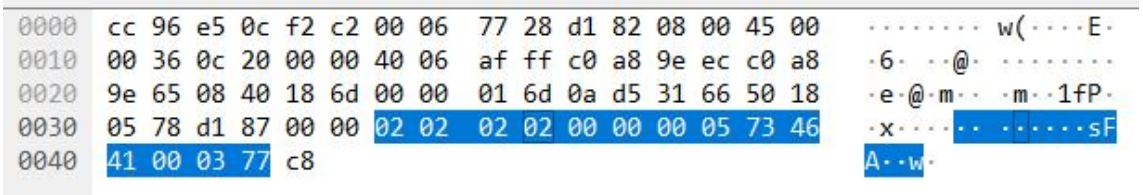
The host computer writes variables through sWI: Index is 0x6666

02 02 02 02 00 00 00 09 73 57 49 66 66 00 00 75 30 28



The device returns sFA + error_code (0x03)

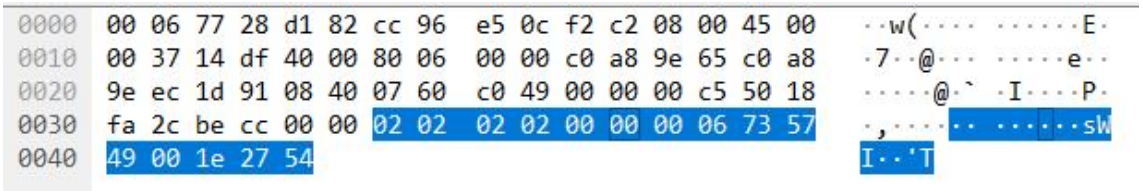
02 02 02 02 00 00 00 05 73 46 41 00 03 77



3.4.2.2 WriteAccessDenied (0x0a)

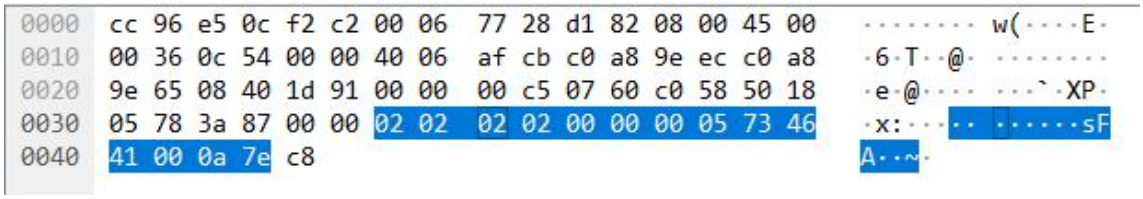
The host computer writes variables through sWI: Index is 0x001e (indicates temperature, a read-only variable)

02 02 02 02 00 00 00 06 73 57 49 00 1e 27 54



The device returns sFA + error_code (0x0a)

02 02 02 02 00 00 00 05 73 46 41 00 0a 7e



3.5 variable

The variable in brackets represents a scalar Index .

Note:

1. index corresponding to the variable is in brackets .
2. The binary screenshot is the data format captured by Wireshark .
3. DADISICK " produced by Dadi Electronics .

3.5.1 DeviceIdent (0x0000)

Data Type:

FlexString + FlexString

meaning:

Device Identification, which indicates the self-identification (identity) of the device. Unique Identification of device.

Device name (FlexString) + Device version number (FlexString)

example:

"(length 0x05) DS series (length 0x0c) V001.002.082"

Data format:

read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 00 00 68

```
0000  50 9a 4c 26 64 b0 cc 96  e5 0c f2 c2 08 00 45 00   P·L&d··· ·····E·
0010  00 36 e9 51 40 00 80 06  c6 ce c0 a8 64 64 c0 a8   ·6·Q@··· ····dd··
0020  64 ec c2 8a 08 40 34 7d  d2 81 bf 6c ef 83 50 18   d····@4} ···l··P·
0030  04 02 1f 9d 00 00 02 02  02 02 00 00 00 05 73 52   ······ ·· ·····sR
0040  49 00 00 68                                       I··h
```

Read Response:

02 02 02 02 00 00 00 1a 73 52 41 00 00 00 05 44
4c 31 30 30 00 0c 56 30 30 31 2e 30 30 32 2e 30
38 32 3f

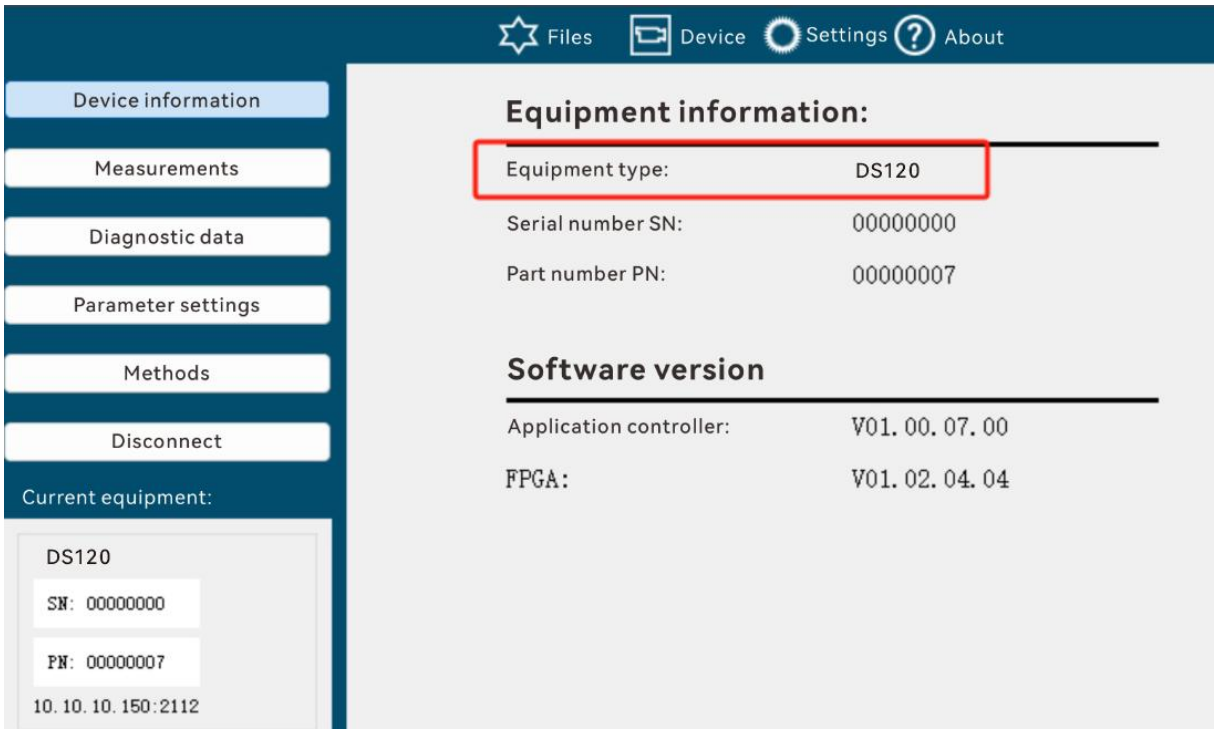
```
0000  cc 96 e5 0c f2 c2 50 9a  4c 26 64 b0 08 00 45 00   ·····P· L&d···E·
0010  00 4b 2a 29 40 00 40 06  00 00 c0 a8 64 ec c0 a8   ·K*)@·@· ····d···
0020  64 64 08 40 c2 8a bf 6c  ef 83 34 7d d2 8f 50 18   dd·@···l ··4}··P·
0030  04 02 4a df 00 00 02 02  02 02 00 00 00 1a 73 52   ··J····· ·····sR
0040  41 00 00 00 05 44 4c 31  30 30 00 0c 56 30 30 31   A····DL1 00··V001
0050  2e 30 30 32 2e 30 38 32  3f                       .002.082 ?
```

Device Name: DS series

Device version number: V001.002.08 2

Not writable

DADISICK corresponding relationship:



3.5.2 SerialNumber (0x0003)

Data Type:

FlexString

Length: 0-12

meaning:

Serial Number

Data format:

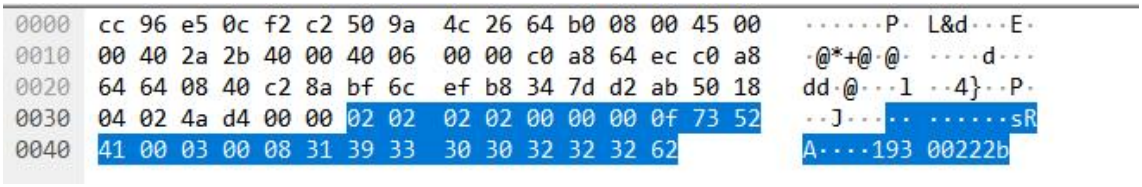
read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 00 03 6b

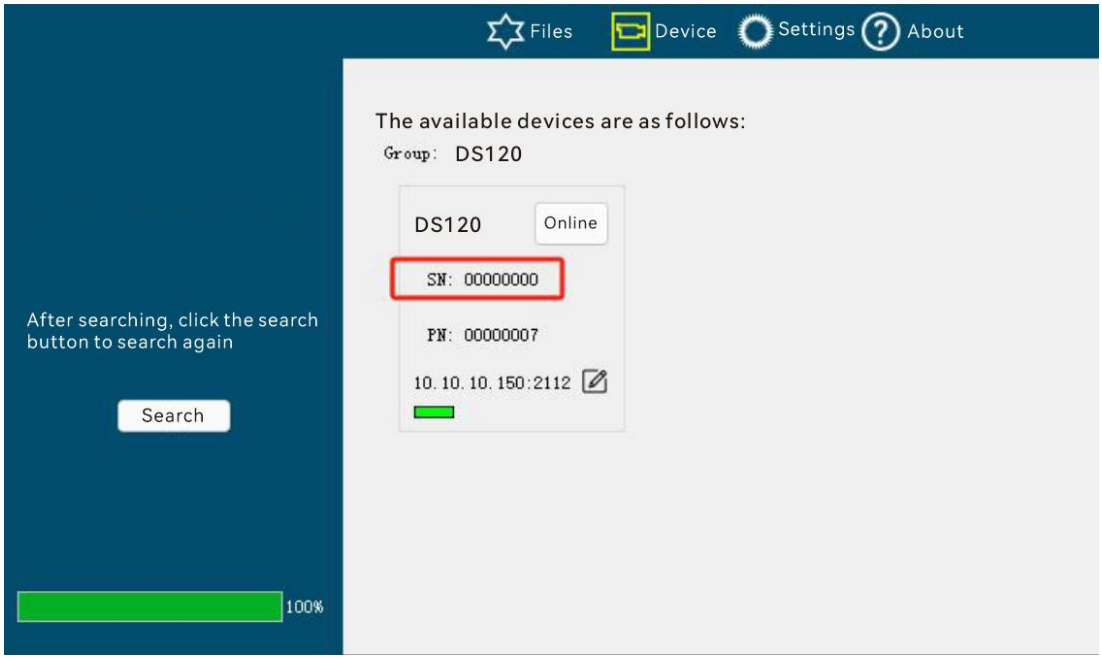
Read Response:

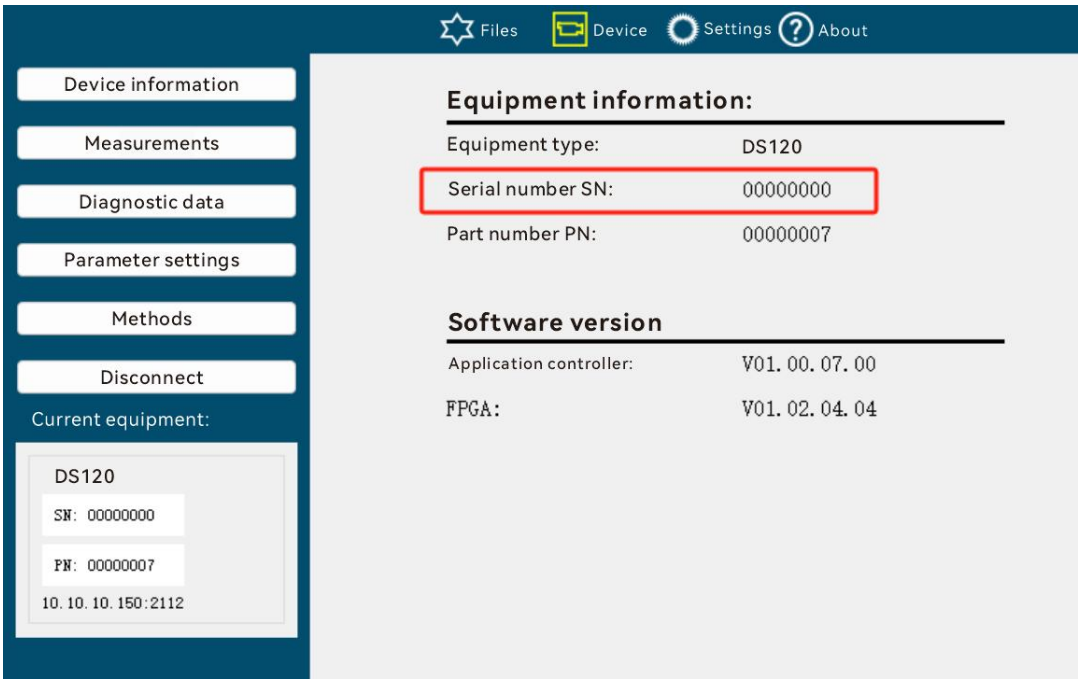
02 02 02 02 00 00 00 0f 73 52 41 00 03 00 08 31 39 33 30 30 32 32 32 62



Not writable

DADISICK corresponding relationship:





3.5.3 FirmwareVersion(0x0004)

Data Type:

FlexString

Length: 0-15

meaning:

Firmware version

Data format:

read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 00 04 6c

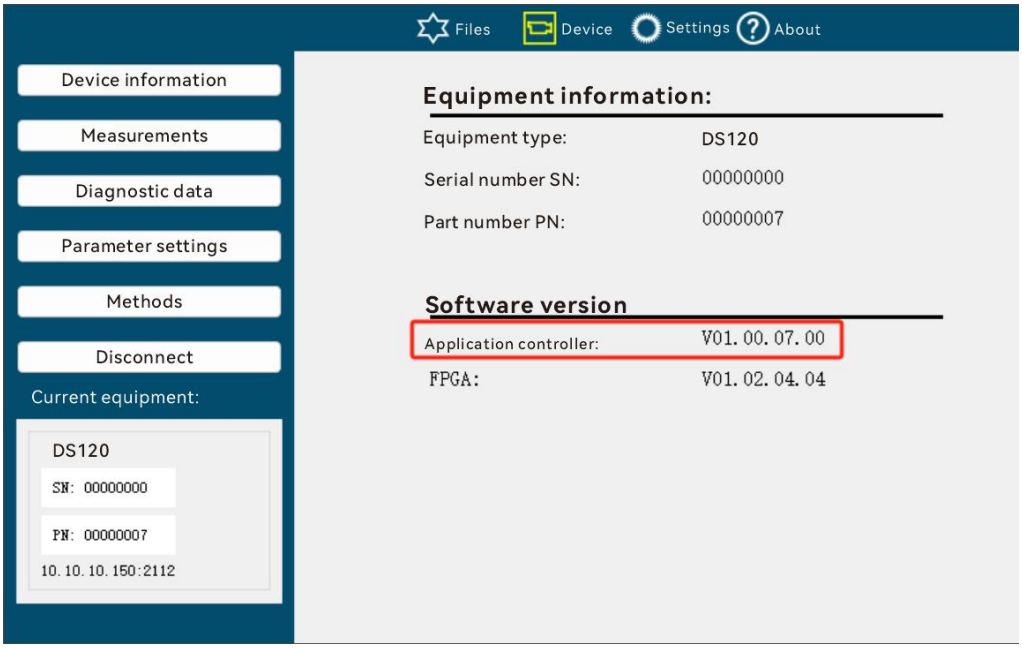
Read Response:

02 02 02 02 00 00 00 13 73 52 41 00 04 00 0c 56 30 30 31 2e 30 30 32 2e 30 38 32 07

```
0000  cc 96 e5 0c f2 c2 50 9a  4c 26 64 b0 08 00 45 00   ......P. L&d...E.
0010  00 44 2a 2c 40 00 40 06  00 00 c0 a8 64 ec c0 a8   .D*,@.@. ....d...
0020  64 64 08 40 c2 8a bf 6c  ef d0 34 7d d2 b9 50 18   dd.@...l ..4}..P.
0030  04 02 4a d8 00 00 02 02  02 02 00 00 00 13 73 52   ..J..... ......sR
0040  41 00 04 00 0c 56 30 30  31 2e 30 30 32 2e 30 38   A....V00 1.002.08
0050  32 07                                             2.
```

Not writable

DADISICK corresponding relationship:



3.5.4 Distance (0x000a)

Data Type:

Float32

Note: The distance is expressed in IEEE-754 floating point format.

Unit: m

meaning:

Distance measured by DS series

Data format:

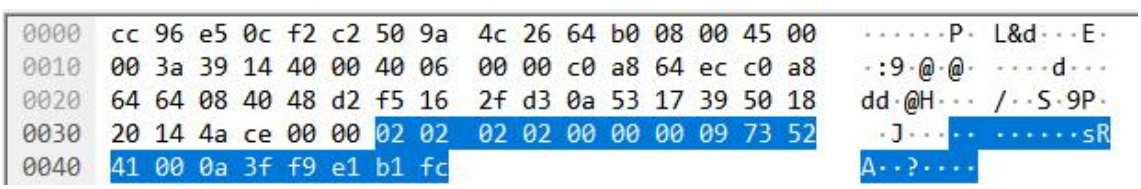
read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 00 0a 62

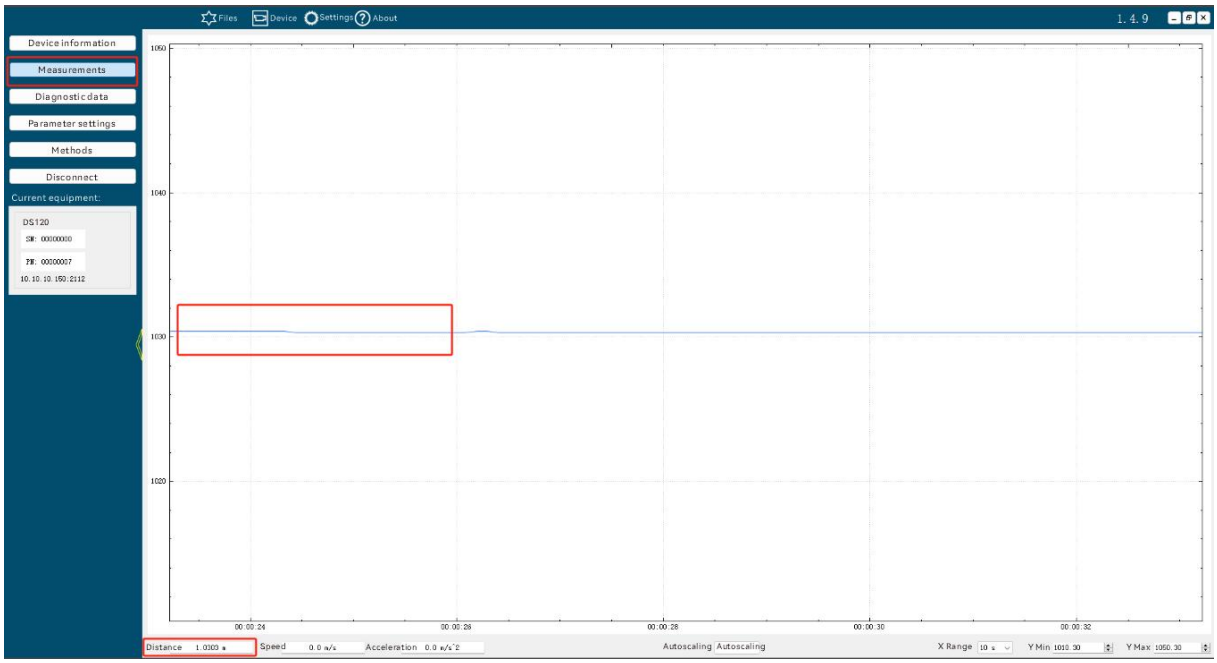
Read Response:

02 02 02 02 00 00 00 09 73 52 41 00 0a 3f f9 e1 b1 fc



Not writable

DADISICK corresponding relationship:



3.5.5 Acceleration (0x000c)

Data Type:

Float32

meaning:

Object acceleration measured by DS series

Data Format:

read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 00 0c 64

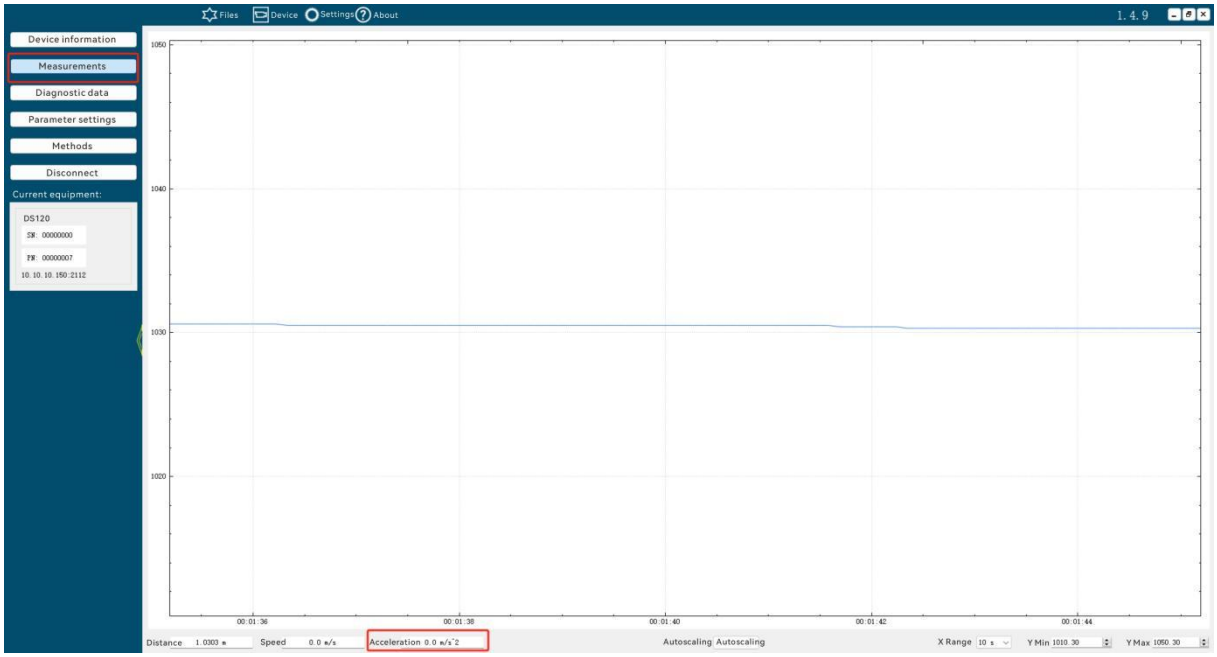
Read Response:

02 02 02 02 00 00 00 09 73 52 41 00 0c 40 40 00 00 6c

```
0000  cc 96 e5 0c f2 c2 50 9a  4c 26 64 b0 08 00 45 00   ......P. L&d...E.
0010  00 3a 39 1f 40 00 40 06  00 00 c0 a8 64 ec c0 a8   .:9.@.@. ....d...
0020  64 64 08 40 48 d2 f5 16  30 99 0a 53 17 d3 50 18   dd.@H... 0..S..P.
0030  20 13 4a ce 00 00 02 02  02 02 00 00 00 09 73 52    .J..... ......sR
0040  41 00 0c 40 40 00 00 6c                           A..@@..l
```

Not writable

DADISICK corresponding relationship:



3.5.6 Temperature(0x001e)

Data Type:

Int8

meaning:

DS series device internal temperature

Data format:

read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 00 1e 76

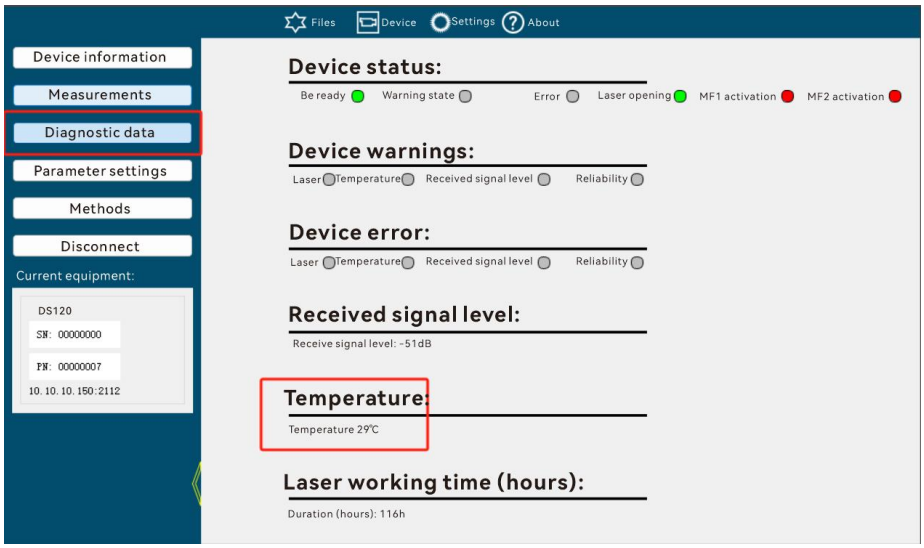
Read Response:

02 02 02 02 00 00 00 06 73 52 41 00 1e 21 5f

```
0000  cc 96 e5 0c f2 c2 50 9a  4c 26 64 b0 08 00 45 00   ·····P· L&d···E·
0010  00 37 2a 6d 40 00 40 06  00 00 c0 a8 64 ec c0 a8   ·7*m@·@· ····d···
0020  64 64 08 40 c2 8b 83 15  e8 54 9a 11 ef a4 50 18   dd·@···· ·T····P·
0030  03 ff 4a cb 00 00 02 02  02 02 00 00 00 06 73 52   ··J····· ····sR
0040  41 00 1e 21 5f                                    A··!_
```

Not writable

DADISICK corresponding relationship:



3.5.7 dbLevelComm(0x002d)

Data Type:

Int16

meaning:

Communication port: received reflected signal level attenuation, unit: dB

Data format:

read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 00 2d 45

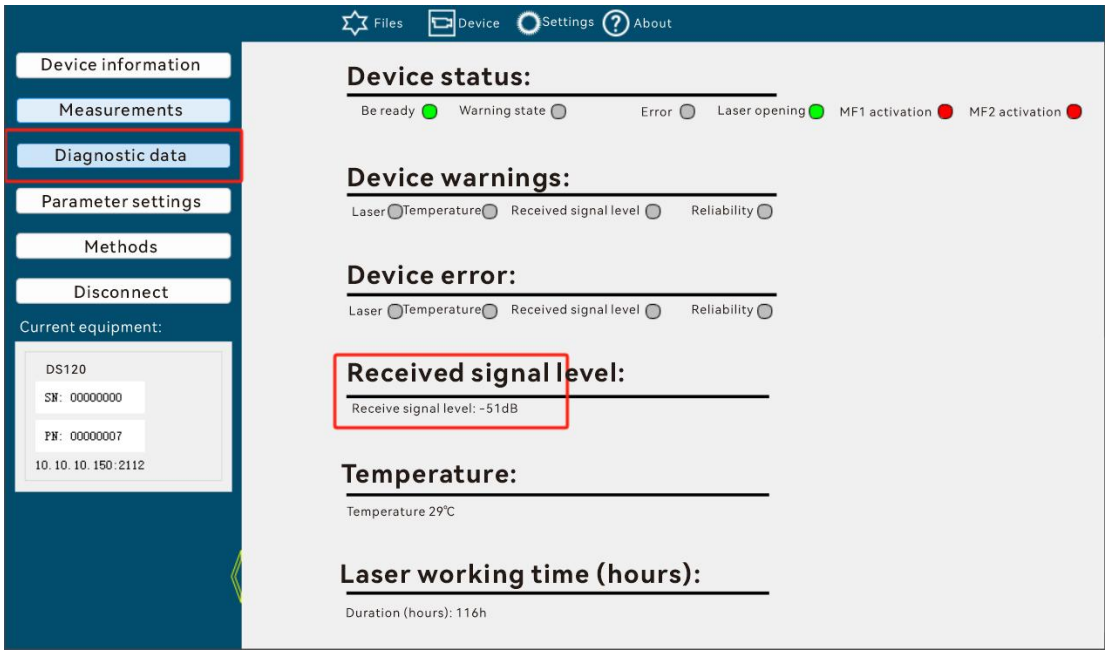
Read Response:

02 02 02 02 00 00 00 07 73 52 41 00 2d ff be 0c

```
0000  cc 96 e5 0c f2 c2 50 9a  4c 26 64 b0 08 00 45 00   ......P. L&d...E.
0010  00 38 2b 86 40 00 40 06  00 00 c0 a8 64 ec c0 a8   .8+.@.@. ....d...
0020  64 64 08 40 c2 8b 83 16  04 85 9a 11 ff 02 50 18   dd.@.... ......P.
0030  20 11 4a cc 00 00 02 02  02 02 00 00 00 07 73 52    .J..... ......sR
0040  41 00 2d ff be 0c                                  A.-...
```

Not writable

DADISICK corresponding relationship:



3.5.8 publicSoftwareVersion(0x004a)

Data Type:

FixString, length 12

meaning:

The software public version number. The format is: V001.002.081.

Data format:

read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 00 4a 22

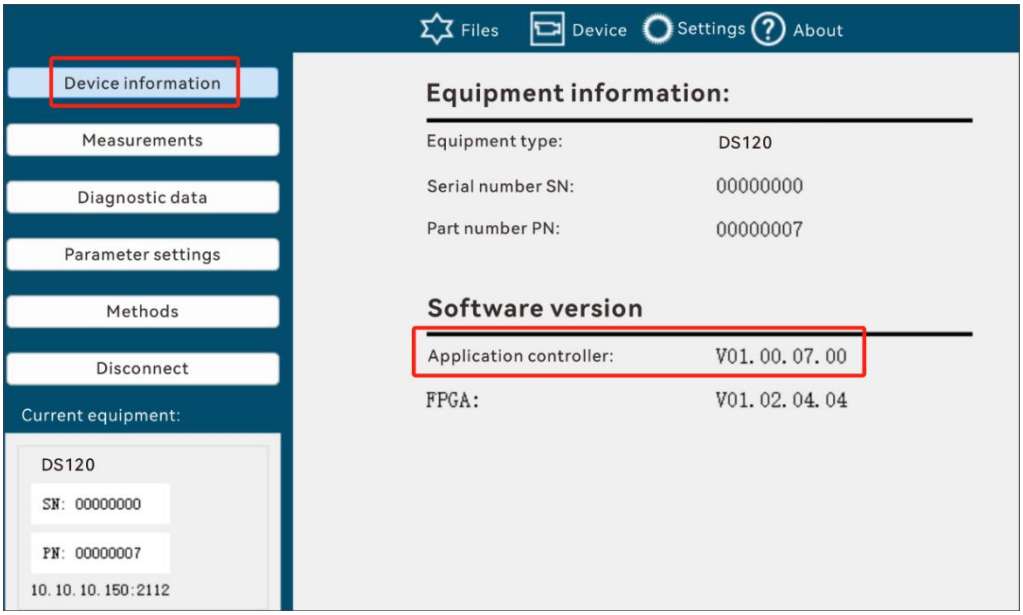
Read Response:

02 02 02 02 00 00 00 11 73 52 41 00 4a 56 30 30 31 2e 30 30 32 2e 30 38 31 46

```
0000  cc 96 e5 0c f2 c2 00 06  77 28 d1 82 08 00 45 00   ........ w(....E.
0010  00 42 ae 6e 00 00 40 06  0d a5 c0 a8 9e ec c0 a8   .B.n..@. ........
0020  9e 65 08 40 7e bb 00 00  1f 96 d7 f9 bc c1 50 18   .e.@~... ......P.
0030  05 78 88 51 00 00 02 02  02 02 00 00 00 11 73 52   .x.Q.... ......sR
0040  41 00 4a 56 30 30 31 2e  30 30 32 2e 30 38 31 46   A.JV001. 002.081F
0050  63                                                c
```

Not writable

DADISICK corresponding relationship:



3.5.9 readyStatus (0x0051)

Data Type:

Bool

meaning:

Device status: whether the device is ready

0: Not ready

1: Ready

Data format:

read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 00 51 39

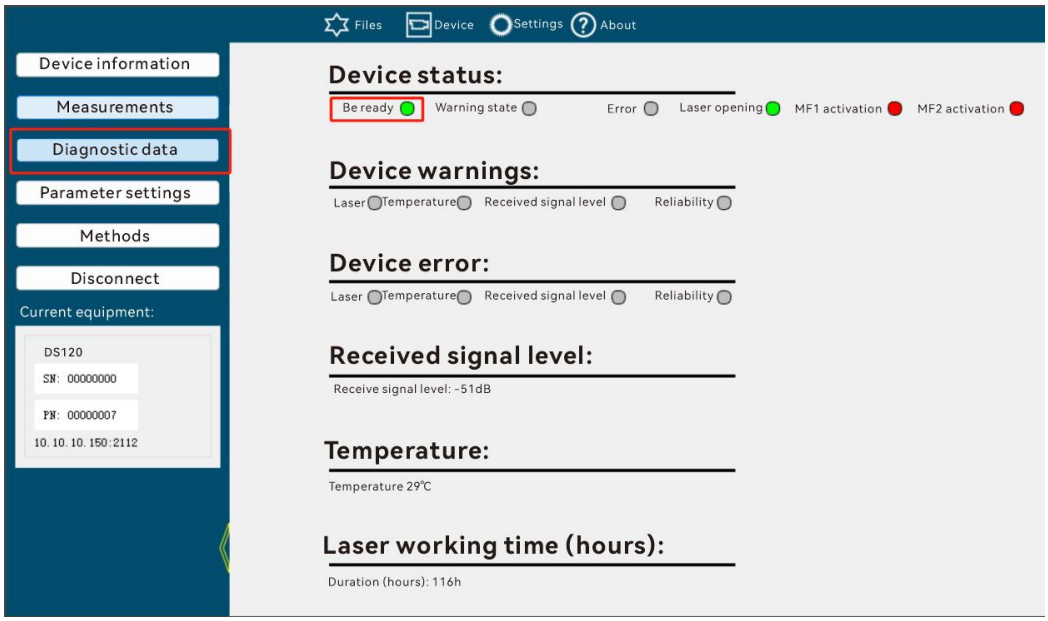
Read Response:

02 02 02 02 00 00 00 06 73 52 41 00 51 00 31

```
0000  cc 96 e5 0c f2 c2 50 9a  4c 26 64 b0 08 00 45 00   ......P. L&d...E.
0010  00 37 2a bb 40 00 40 06  00 00 c0 a8 64 ec c0 a8   .7*.@.@. ....d...
0020  64 64 08 40 c2 8b 83 15  f0 64 9a 11 f3 e8 50 18   dd.@.... .d....P.
0030  04 00 4a cb 00 00 02 02  02 02 00 00 00 06 73 52   ..J..... ......sR
0040  41 00 51 00 31                                     A.Q.1
```

Not writable

DADISICK corresponding relationship:



3.5.10 warningStatus (0x0052)

Data Type:

Bool

meaning:

Device status: whether there is any warning on the device

0: No warning

1: With warning

Data format:

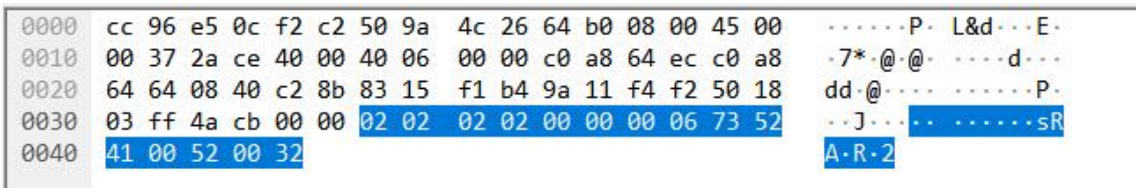
read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 00 52 3a

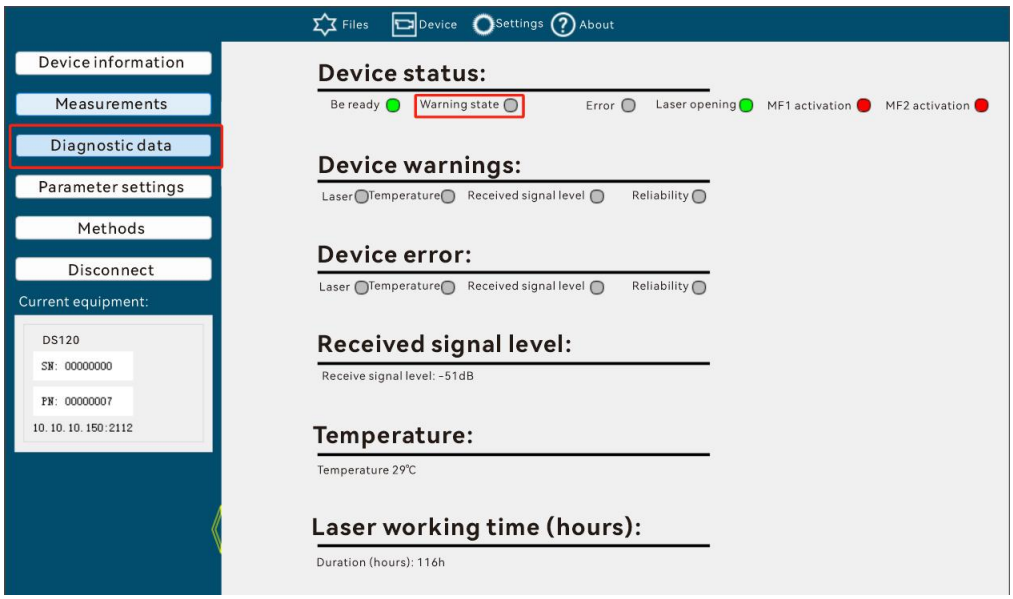
Read Response:

02 02 02 02 00 00 00 06 73 52 41 00 52 00 32



Not writable

DADISICK corresponding relationship:



3.5.11 errorStatus (0x0053)

Data Type:

Bool

meaning:

Device status: whether there is any error in the device

0: No error

1: There is an error

Data format:

read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 00 53 3b

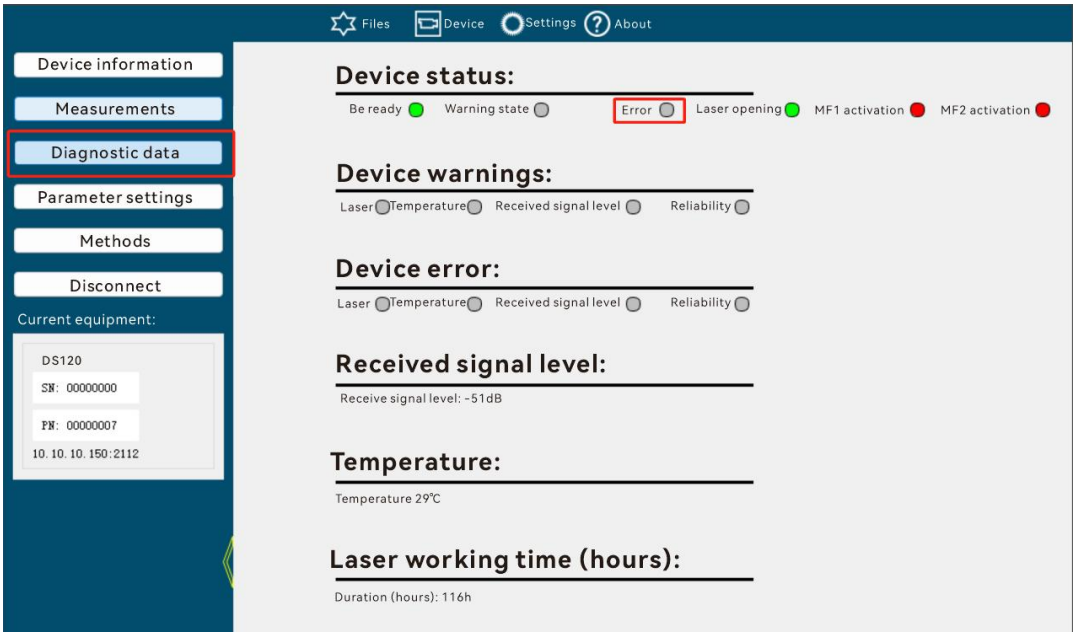
Read Response:

02 02 02 02 00 00 00 06 73 52 41 00 53 00 33

```
0000  cc 96 e5 0c f2 c2 50 9a  4c 26 64 b0 08 00 45 00   ......P· L&d···E·
0010  00 37 2a be 40 00 40 06  00 00 c0 a8 64 ec c0 a8   ·7*·@·@· ····d···
0020  64 64 08 40 c2 8b 83 15  f0 9c 9a 11 f4 12 50 18   dd·@···· ......P·
0030  04 00 4a cb 00 00 02 02  02 02 00 00 00 06 73 52   ··J····· ......sR
0040  41 00 53 00 33                                     A·S·3
```

Not writable

DADISICK corresponding relationship:



3.5.12 laserOnStatus (0x0055)

Data Type:

Bool

meaning:

Is the laser emitting light?

0: No light

1: Glow

Data format:

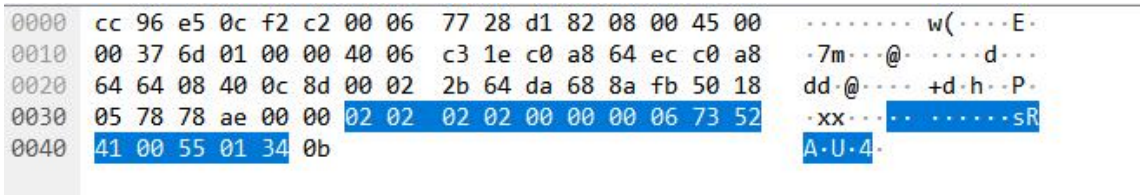
read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 00 55 3d

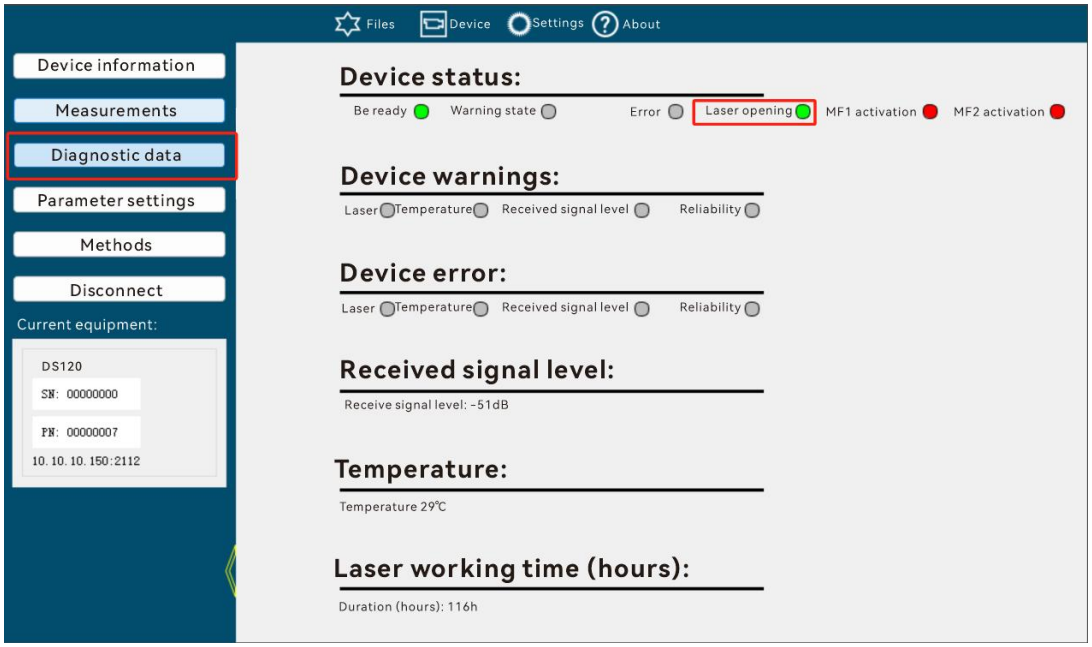
Read Response:

02 02 02 02 00 00 00 06 73 52 41 00 55 01 34



Not writable

DADISICK corresponding relationship:



3.5.13 mf1ActiveStatus (0x0056)

Data Type:

Bool

meaning:

MF1 is activated

0: Not triggered

1: Triggered

Data format:

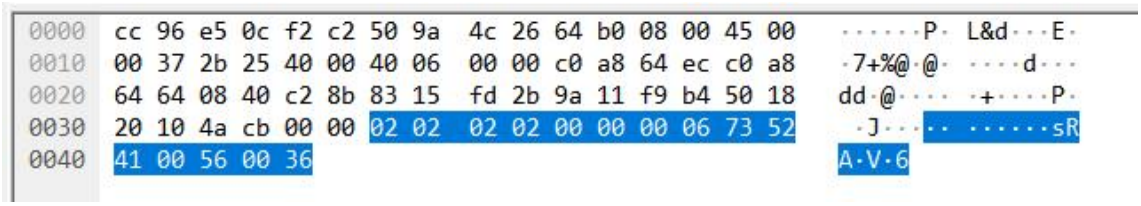
read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 00 56 3e

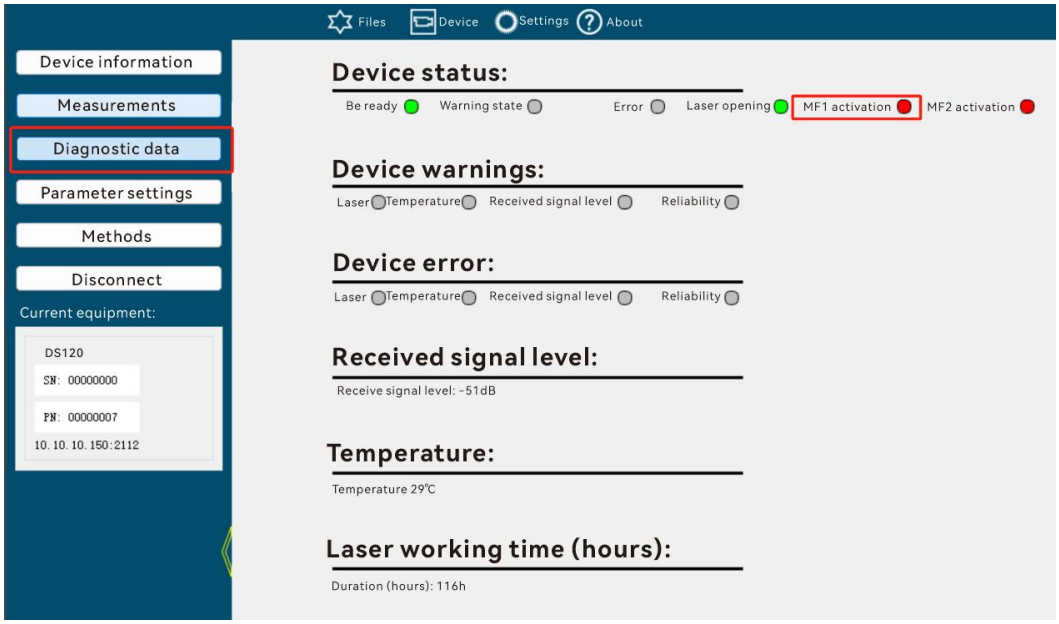
Read Response:

02 02 02 02 00 00 00 06 73 52 41 00 56 00 36



Not writable

DADISICK corresponding relationship:



3.5.14 mf2ActiveStatus (0x0057)

Data Type:

Bool

meaning:

MF2 is activated

0: Not triggered

1: Triggered

Data format:

read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 00 57 3f

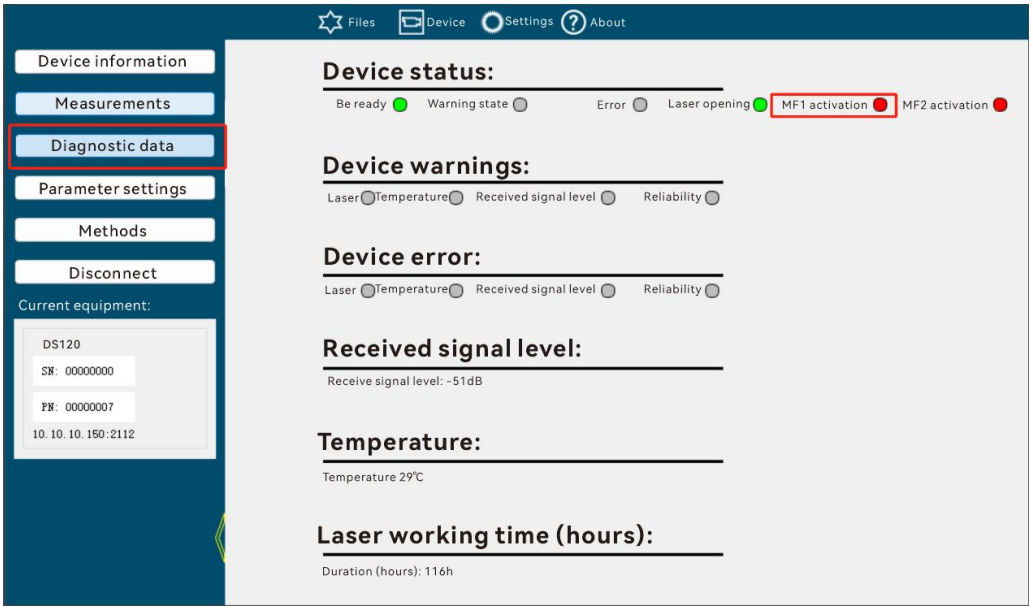
Read Response:

02 02 02 02 00 00 00 06 73 52 41 00 57 01 36

```
0000  cc 96 e5 0c f2 c2 50 9a  4c 26 64 b0 08 00 45 00   ......P. L&d...E.
0010  00 37 2b 29 40 00 40 06  00 00 c0 a8 64 ec c0 a8   .7+)@.@. ....d...
0020  64 64 08 40 c2 8b 83 15  fd 7e 9a 11 f9 ec 50 18   dd.@.... .~....P.
0030  20 10 4a cb 00 00 02 02  02 02 00 00 00 06 73 52    .J..... ......sR
0040  41 00 57 01 36                                     A.W.6
```

Not writable

DADISICK corresponding relationship:



3.5.15 averagedVelocity (0x00a2)

Data Type:

Float32

meaning:

The average speed of the object measured by DS series is the speed obtained when the host computer draws the picture.

Data format:

read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 00 a2 ca

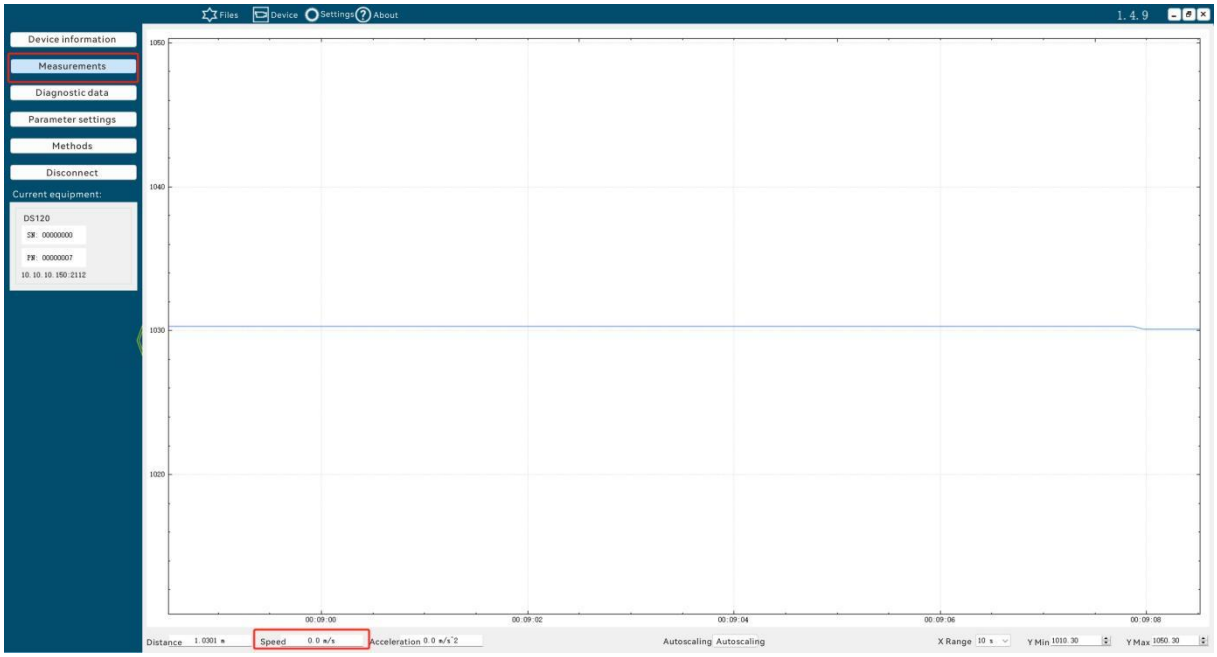
Read Response:

02 02 02 02 00 00 00 09 73 52 41 00 a2 40 00 00 00 82

```
0000  cc 96 e5 0c f2 c2 50 9a  4c 26 64 b0 08 00 45 00   ......P. L&d...E.
0010  00 3a 39 1e 40 00 40 06  00 00 c0 a8 64 ec c0 a8   .:9.@.@. ....d...
0020  64 64 08 40 48 d2 f5 16  30 87 0a 53 17 c5 50 18   dd.@H... 0..S..P.
0030  20 13 4a ce 00 00 02 02  02 02 00 00 00 09 73 52    .J..... ......sR
0040  41 00 a2 40 00 00 00 82                           A..@....
```

Not writable

DADISICK corresponding relationship:



3.5.16 laserServiceStateSSI (0x00a4)

Data Type:

Bool

meaning:

Is SSI in LaserWarning state?

Data format:

read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 00 a4cc

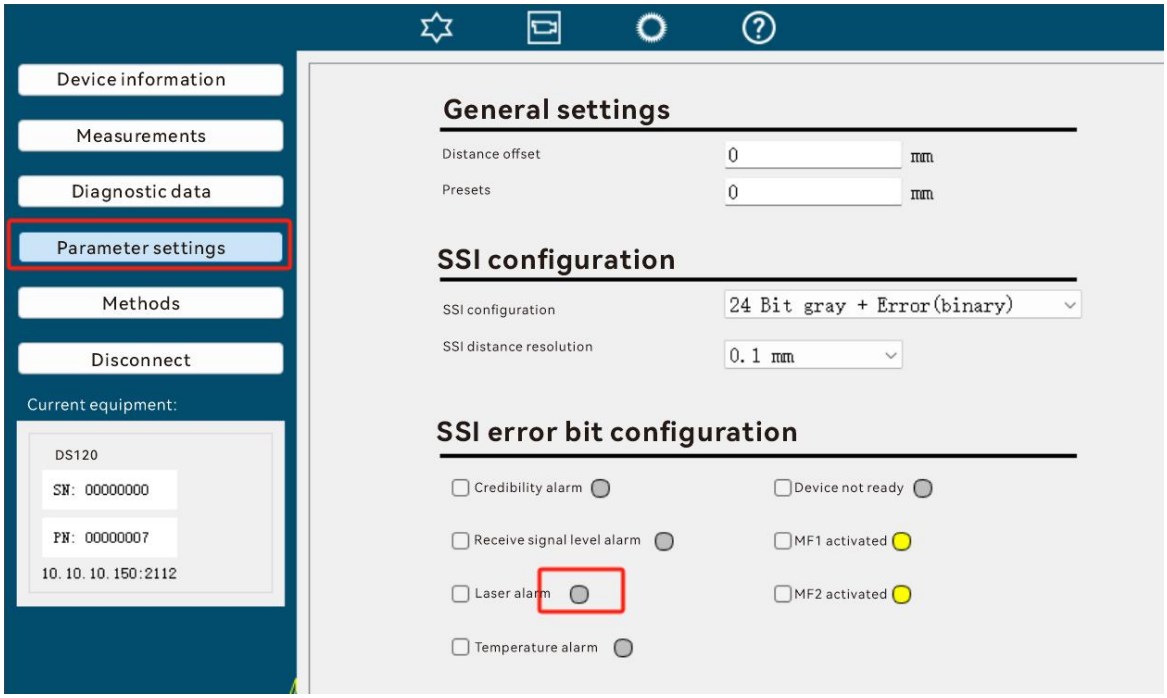
Read Response:

02 02 02 02 00 00 00 06 73 52 41 00 a4 00 c4

```
cc 96 e5 0c f2 c2 00 06  77 28 e0 11 08 00 45 00   ........ w(....E.
00 37 c3 a8 00 00 40 06  6c 77 c0 a8 64 ec c0 a8   .7....@. lw..d...
64 64 08 40 04 56 01 13  51 40 d3 ce 96 35 50 18   dd.@.V.. Q@...5P.
05 78 76 58 00 00 02 02  02 02 00 00 00 06 73 52   .xvX.... ......sR
41 00 a4 00 c4 00                                  A.....
```

Not writable

DADISICK corresponding relationship:



Note: When configuring the Error Bit of SSI, only configure the Warning state, not the Error state.

3.5.17 temperatureServiceStateSSI (0x00a5)

Data Type:

Bool

meaning:

Is SSI in TemperatureWarning state?

Data format:

read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 00 a5 cd

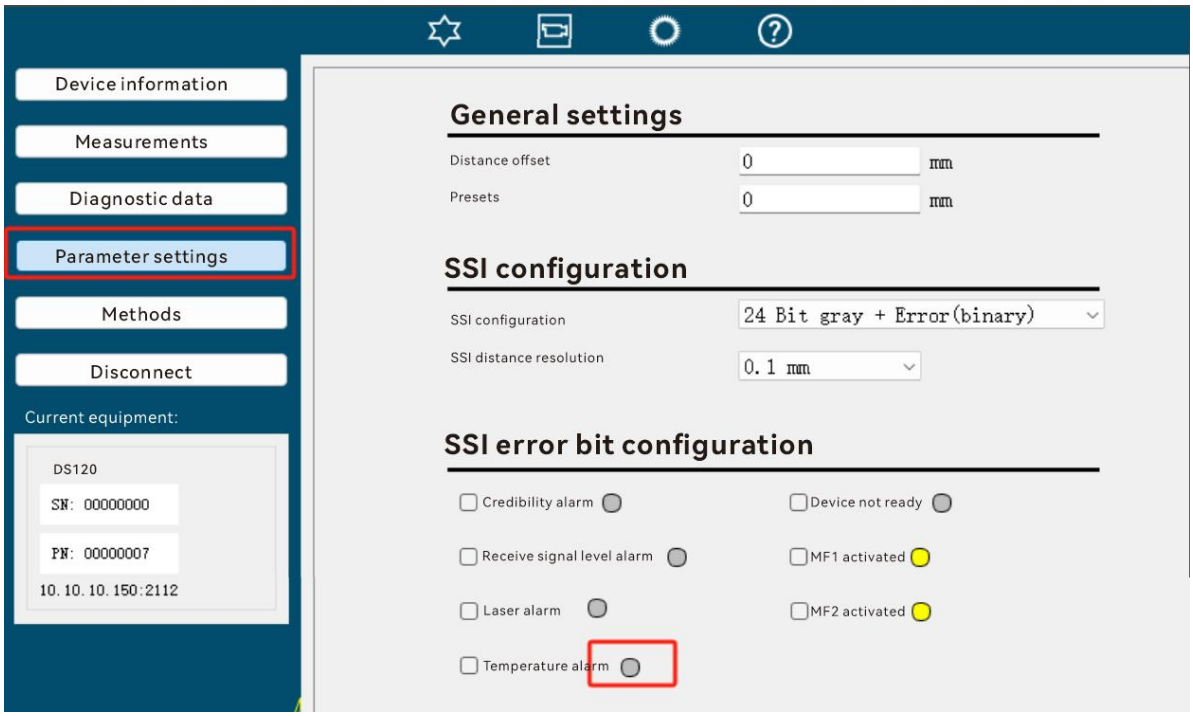
Read Response:

02 02 02 02 00 00 00 06 73 52 41 00 a5 00 c5

```
cc 96 e5 0c f2 c2 00 06  77 28 e0 11 08 00 45 00   ........ w(....E.
00 37 c3 9c 00 00 40 06  6c 83 c0 a8 64 ec c0 a8   .7....@. l...d...
64 64 08 40 04 56 01 13  51 01 d3 ce 95 fd 50 18   dd.@.V.. Q.....P.
05 78 74 cf 00 00 02 02  02 02 00 00 00 06 73 52   .xt..... ......sR
41 00 a5 00 c5 69                                  A....i
```

Not writable

DADISICK corresponding relationship:



3.5.18 levelServiceStateSSI (0x00a6)

Data Type:

Bool

meaning:

Is SSI in LevelWarnings state?

Data format:

read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 00 a6 ce

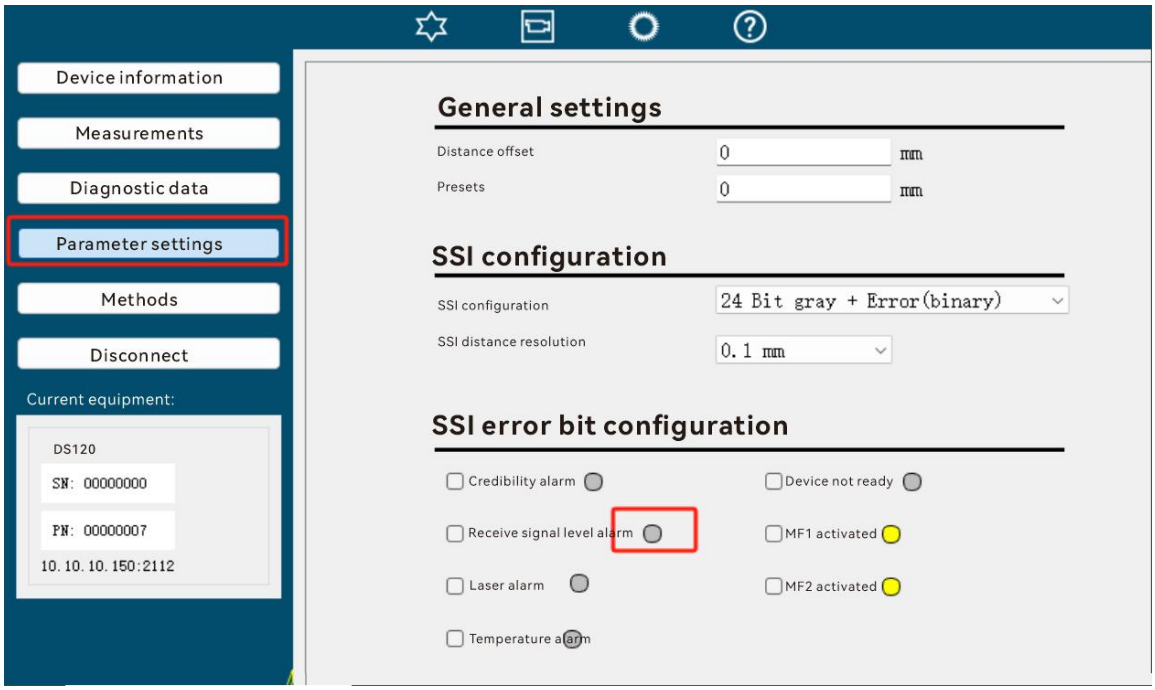
Read Response:

02 02 02 02 00 00 00 06 73 52 41 00 a6 00 c6

```
cc 96 e5 0c f2 c2 00 06  77 28 e0 11 08 00 45 00   ........ w(....E.
00 37 af 80 00 00 40 06  80 9f c0 a8 64 ec c0 a8   .7....@. ....d...
64 64 08 40 04 56 01 0d  8b 16 d3 c9 8d 7e 50 18   dd.@.V.. .....~P.
05 78 41 44 00 00 02 02  02 02 00 00 00 06 73 52   .xAD.... ......sR
41 00 a6 00 c6 a7                                  A.....
```

Not writable

DADISICK corresponding relationship:



3.5.19 publicSoftwareVersionFpga(0x00a8)

Data Type:

FixString, length 12

meaning:

Fpga version number. Its format is: V001.000.001.

Data format:

read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 00 a8 c0

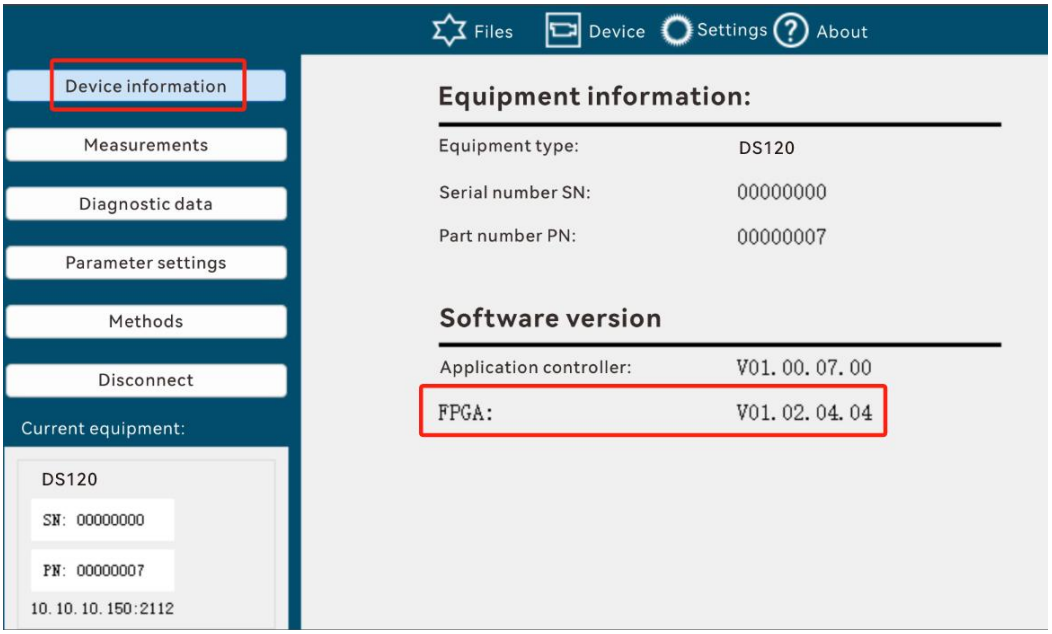
Read Response:

02 02 02 02 00 00 00 11 73 52 41 00 a8 56 30 30 31 2e 30 30 30 2e 30 30 31 ae

```
0000  cc 96 e5 0c f2 c2 50 9a  4c 26 64 b0 08 00 45 00   ......P. L&d...E.
0010  00 42 2a 38 40 00 40 06  00 00 c0 a8 64 ec c0 a8   .B*8@.@. ....d...
0020  64 64 08 40 c2 8b 83 15  e4 4a 9a 11 ec be 50 18   dd.@.... .J....P.
0030  04 02 4a d6 00 00 02 02  02 02 00 00 00 11 73 52   ..J..... ......sR
0040  41 00 a8 56 30 30 31 2e  30 30 30 2e 30 30 31 ae   A..V001. 000.001.
```

Not writable

DADISICK corresponding relationship:



3.5.20 plausibilityServiceStateSSI (0x00a9)

Data Type:

Bool

meaning:

Is SSI in PlausibilityWarnings state?

Data format:

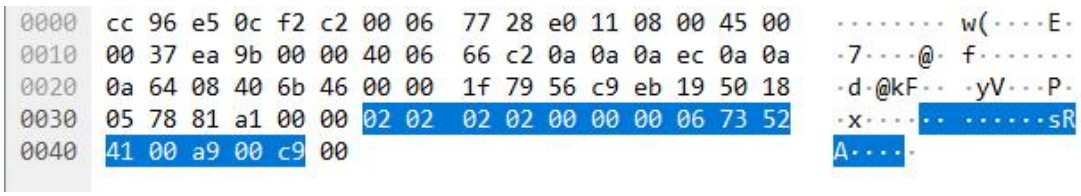
read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 00 a9 c1

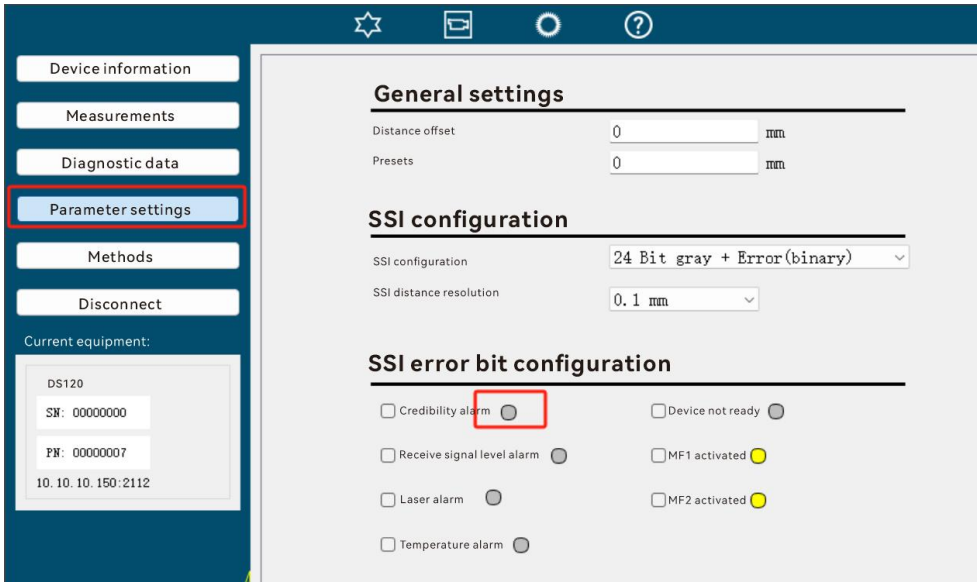
Read Response:

02 02 02 02 00 00 00 06 73 52 41 00 a9 00 c9



Not writable

DADISICK corresponding relationship:



3.5.21 displayedConfigEthernetIP(0x00ad)

Data Type:

FixString, length 15

meaning:

Device IP address

Data format:

read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 00 ad c5

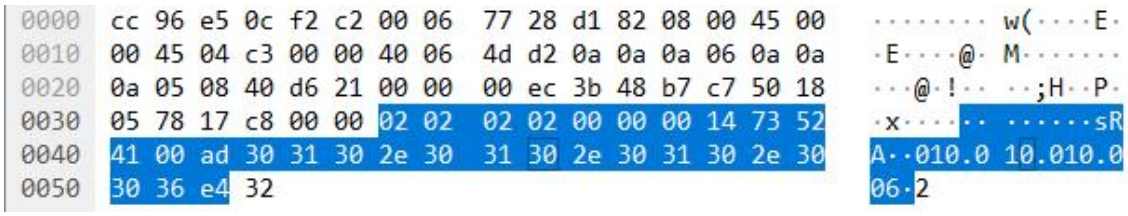
Read Response:

02 02 02 02 00 00 00 14 73 52 41 00 ad 31 39 32 2e 31 36 38 2e 31 30 30 2e 32 33 36 e0

```
0000  cc 96 e5 0c f2 c2 50 9a  4c 26 64 b0 08 00 45 00   ......P· L&d···E·
0010  00 45 2a 39 40 00 40 06  00 00 c0 a8 64 ec c0 a8   ·E*9@·@· ····d···
0020  64 64 08 40 c2 8b 83 15  e4 64 9a 11 ec cc 50 18   dd·@···· ·d····P·
0030  04 01 4a d9 00 00 02 02  02 02 00 00 00 14 73 52   ··J····· ......sR
0040  41 00 ad 31 39 32 2e 31  36 38 2e 31 30 30 2e 32   A··192.1 68.100.2
0050  33 36 e0                                          36·
```

Not writable

Note: The IP address must be 4 three-digit numbers, such as "192.168.100.125". If the IP address is less than three digits, it should be supplemented. For example, if the IP address is " 10.10.10.6 " , the lower computer should return " 010.010.010.006 " . As shown below:



3.5.22 displayedConfigEthernetNM(0x00ae)

Data Type:

FixString, length 15

meaning:

Device IP address subnet mask

Data format:

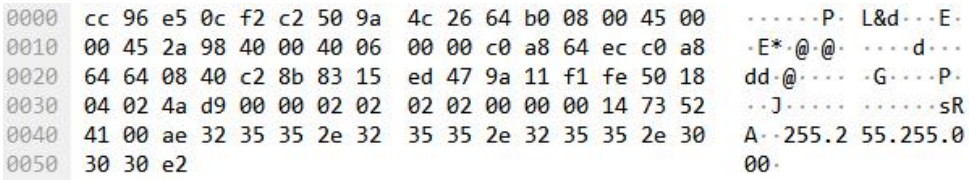
read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 00 ae c6

Read Response:

02 02 02 02 00 00 00 14 73 52 41 00 ae 32 35 35 2e 32 35 35 2e 32 35 35 2e 30 30 30 e2



Not writable

3.5.23 displayedConfigEthernetGW(0x00af)

Data Type:

FixString, length 15

meaning:

Device gateway address

Data format:

read

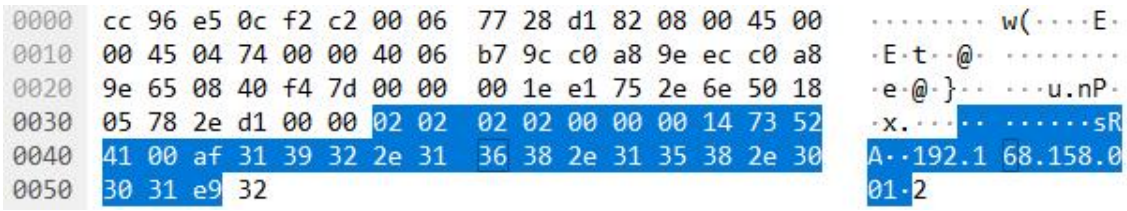
Read Request:

02 02 02 02 00 00 00 05 73 52 49 00 af c7

Read Response:

02 02 02 02 00 00 00 14 73 52 41 00 af 31 39 32

2e 31 36 38 2e 31 35 38 2e 30 30 31 e9



Not writable

3.5.24 laserError (0x00ca)

Data Type:

Bool

meaning:

Is the laser wrong?

Data format:

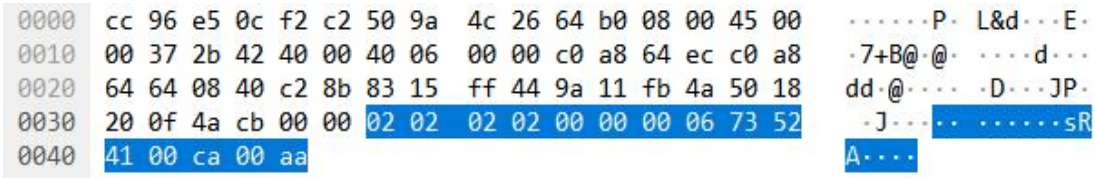
read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 00 ca a2

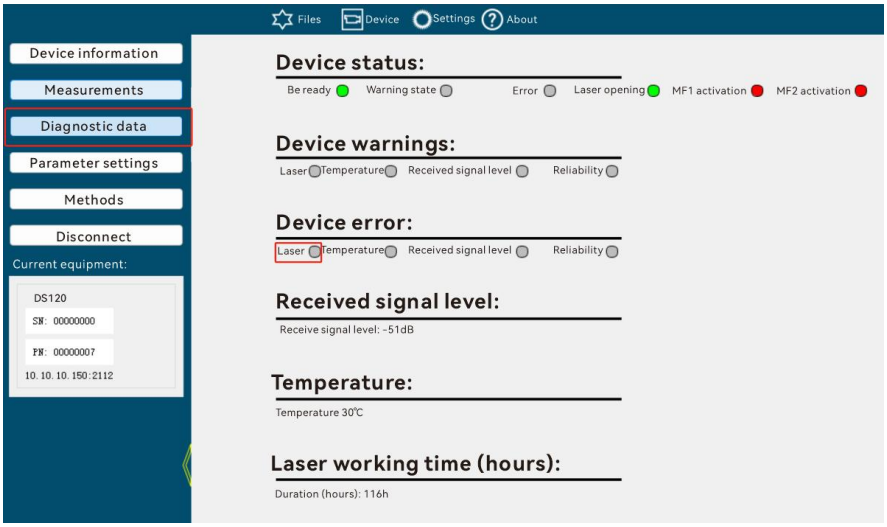
Read Response:

02 02 02 02 00 00 00 06 73 52 41 00 ca 00 aa



Not writable

DADISICK corresponding relationship:



3.5.25 temperatureError (0x00cb)

Data Type:

Bool

meaning:

Is there an error in the temperature measurement?

Data Format:

read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 00 cb a3

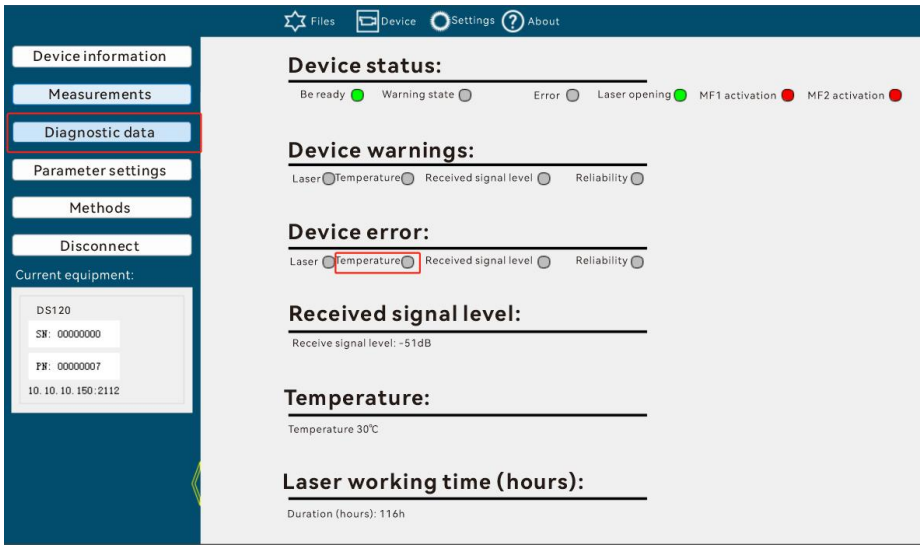
Read Response:

02 02 02 02 00 00 00 06 73 52 41 00 cb 00 ab

```
0000  cc 96 e5 0c f2 c2 50 9a  4c 26 64 b0 08 00 45 00   ......P. L&d...E.
0010  00 37 2a 3d 40 00 40 06  00 00 c0 a8 64 ec c0 a8   .7*=@.@. ....d...
0020  64 64 08 40 c2 8b 83 15  e4 b1 9a 11 ed 04 50 18   dd.@.... ......P.
0030  04 01 4a cb 00 00 02 02  02 02 00 00 00 06 73 52   ..J..... ......sR
0040  41 00 cb 00 ab                                     A....
```

Not writable

DADISICK corresponding relationship:



3.5.26 levelError (0x00cc)

Data Type:

Bool

meaning:

Is there any error in the received reflected signal level?

Data format:

read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 00 cc a4

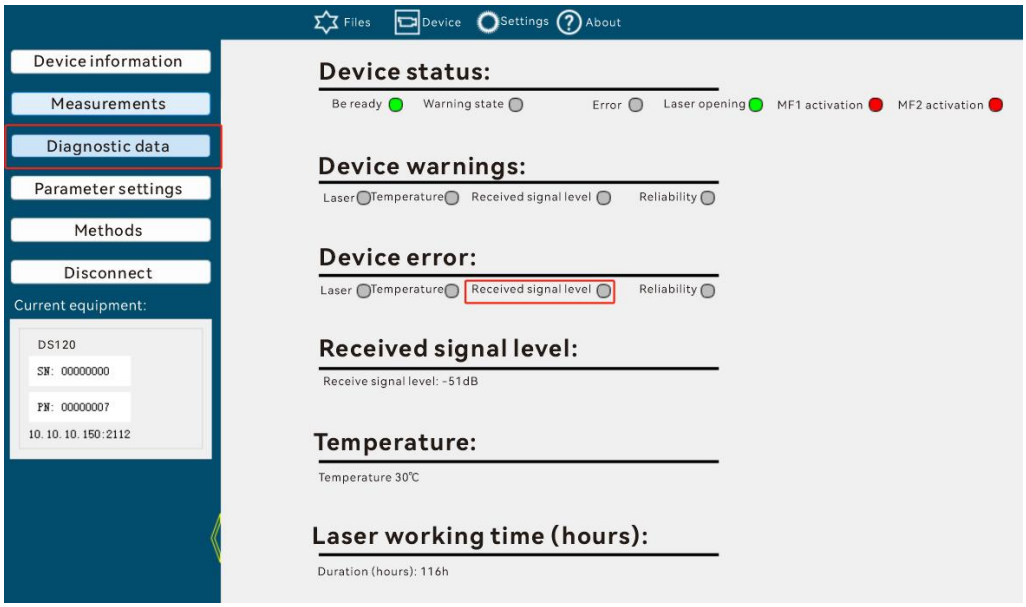
Read Response:

02 02 02 02 00 00 00 06 73 52 41 00 cc 00 ac

```
0000  cc 96 e5 0c f2 c2 50 9a  4c 26 64 b0 08 00 45 00   ......P. L&d...E.
0010  00 37 2a 3b 40 00 40 06  00 00 c0 a8 64 ec c0 a8   .7*;@.@. ....d...
0020  64 64 08 40 c2 8b 83 15  e4 93 9a 11 ec e8 50 18   dd.@.... ......P.
0030  04 01 4a cb 00 00 02 02  02 02 00 00 00 06 73 52   ..J..... ......sR
0040  41 00 cc 00 ac                                    A....
```

Not writable

DADISICK corresponding relationship:



3.5.27 plausiblityError (0x00cd)

Data Type:

Bool

meaning:

Is there an error in equipment reliability?

Data format:

read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 00 cd a5

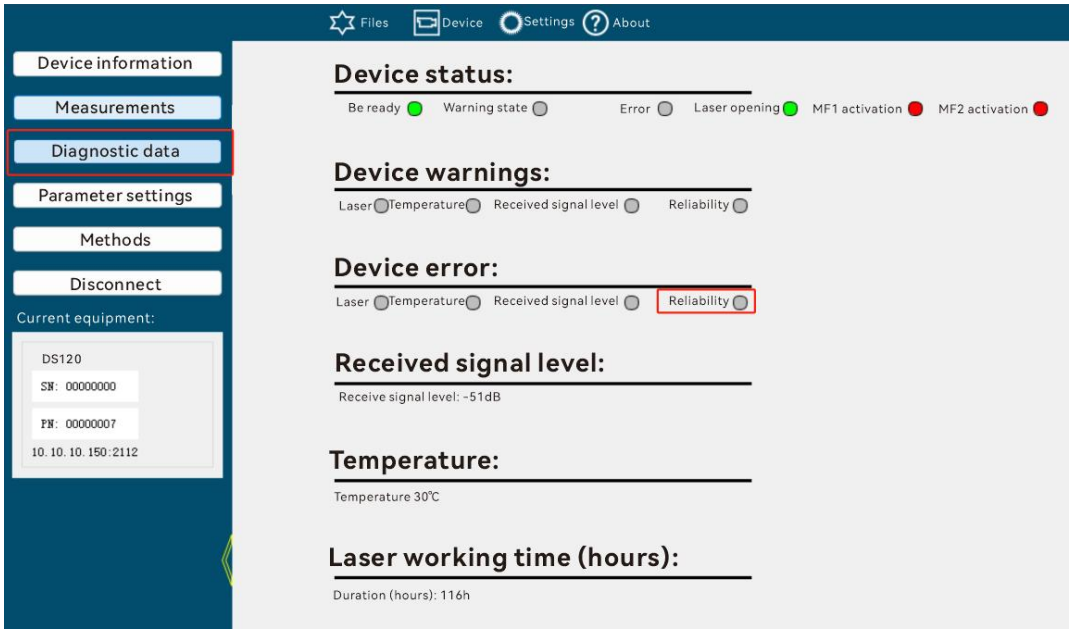
Read Response:

02 02 02 02 00 00 00 06 73 52 41 00 cd 01 ac

```
0000  cc 96 e5 0c f2 c2 50 9a  4c 26 64 b0 08 00 45 00   ......P. L&d...E.
0010  00 37 2b 14 40 00 40 06  00 00 c0 a8 64 ec c0 a8   .7+.@.@. ....d...
0020  64 64 08 40 c2 8b 83 15  fb ef 9a 11 f8 c6 50 18   dd.@.... ......P.
0030  20 11 4a cb 00 00 02 02  02 02 00 00 00 06 73 52    .J..... ......sR
0040  41 00 cd 01 ac                                    A....
```

Not writable

DADISICK corresponding relationship:



3.5.28 laserPrefailWarning(0x00ce)

Data Type:

Bool

meaning:

Is there an alarm for the laser?

Data format:

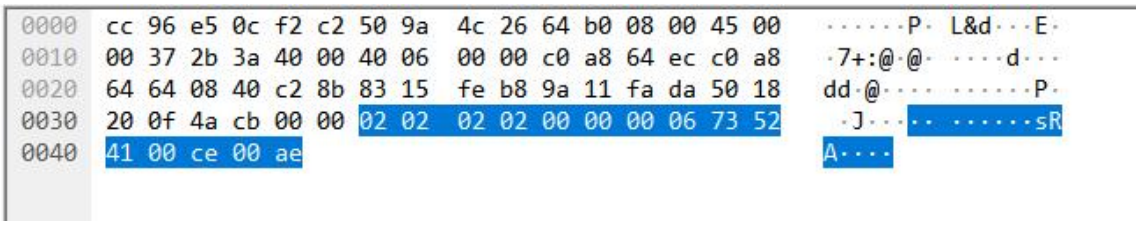
read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 00 ce a6

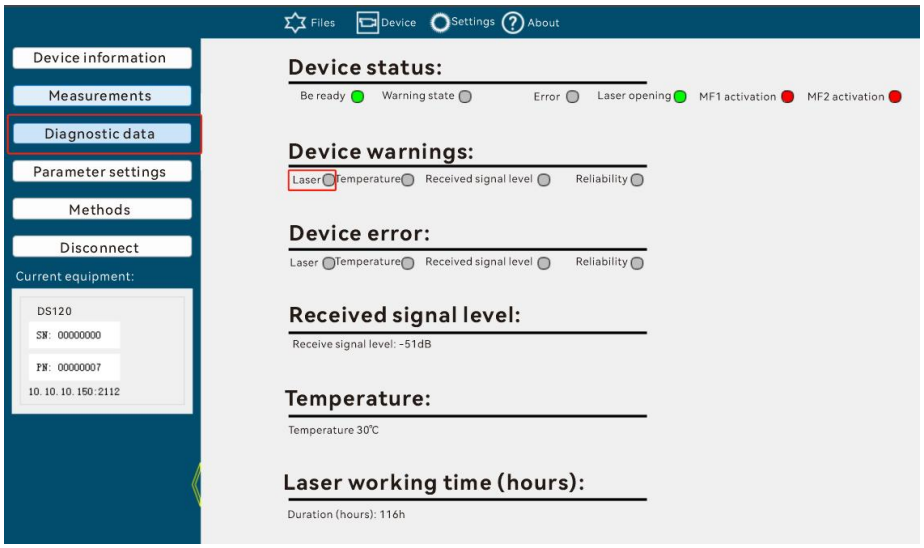
Read Response:

02 02 02 02 00 00 00 06 73 52 41 00 ce 00 ae



Not writable

DADISICK corresponding relationship:



3.5.29 temperaturePrefailWarning(0x00cf)

Data Type:

Bool

meaning:

Is there an alarm for temperature measurement?

Data format:

read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 00 cf a7

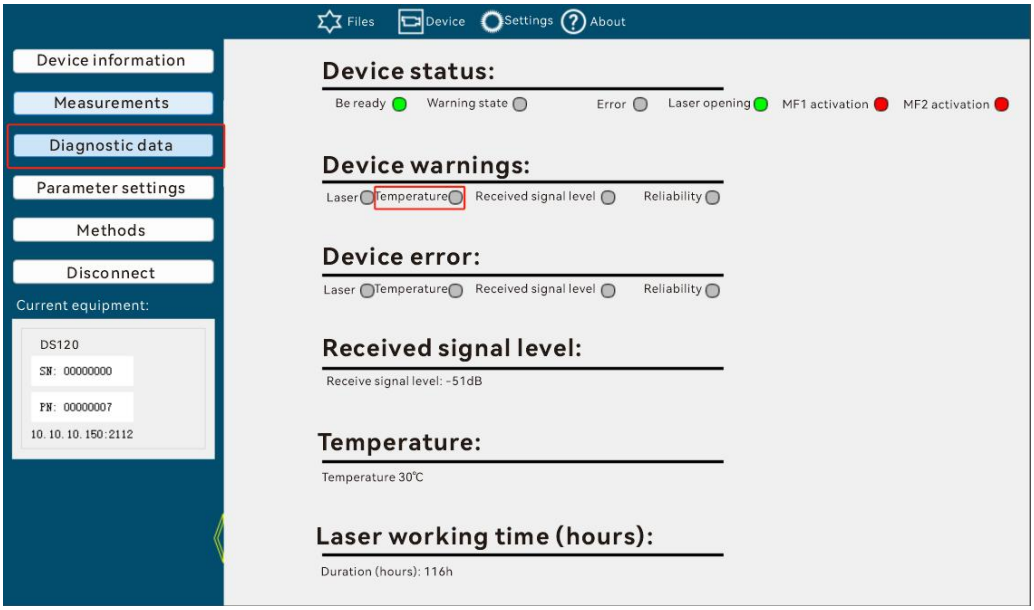
Read Response:

02 02 02 02 00 00 00 06 73 52 41 00 cf 00 af

```
0000  cc 96 e5 0c f2 c2 50 9a  4c 26 64 b0 08 00 45 00   ......P. L&d...E.
0010  00 37 2b 84 40 00 40 06  00 00 c0 a8 64 ec c0 a8   .7+.@.@. ....d...
0020  64 64 08 40 c2 8b 83 16  04 46 9a 11 fe e6 50 18   dd.@.... .F....P.
0030  20 11 4a cb 00 00 02 02  02 02 00 00 00 06 73 52    .J..... ......sR
0040  41 00 cf 00 af                                     A....
```

Not writable

DADISICK corresponding relationship:



3.5.30 levelPrefailWarning(0x00d0)

Data Type:

Bool

meaning:

Laser level alarm

Data format:

read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 00 d0 b8

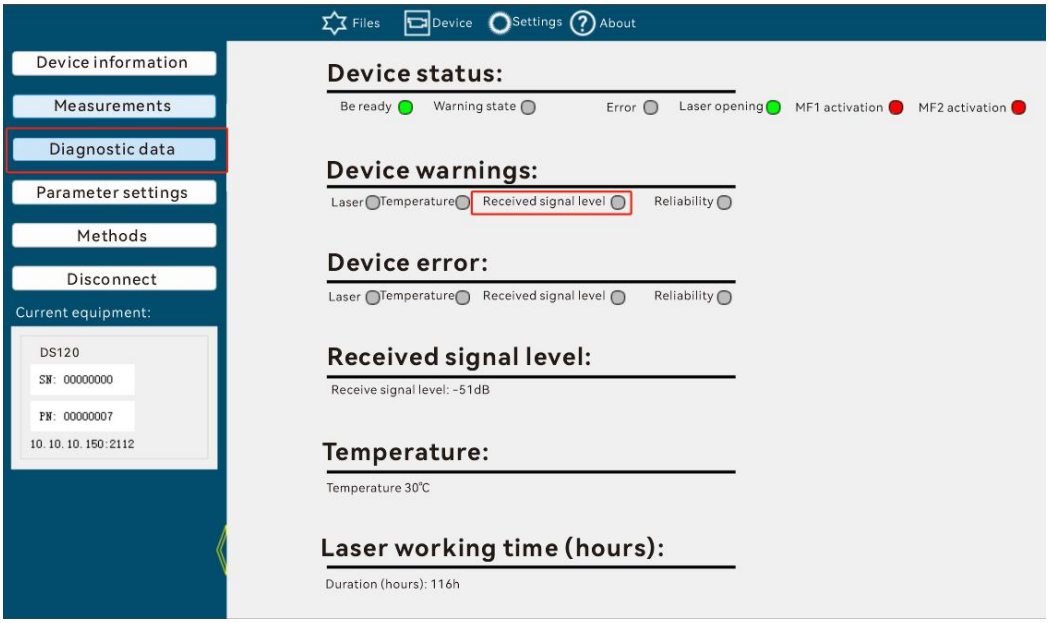
Read Response:

02 02 02 02 00 00 00 06 73 52 41 00 d0 00 b0

```
0000  cc 96 e5 0c f2 c2 50 9a  4c 26 64 b0 08 00 45 00   ·····P· L&d···E·
0010  00 37 2b 2b 40 00 40 06  00 00 c0 a8 64 ec c0 a8   ·7++@·@· ····d···
0020  64 64 08 40 c2 8b 83 15  fd 9c 9a 11 fa 08 50 18   dd·@···· ·····P·
0030  20 10 4a cb 00 00 02 02  02 02 00 00 00 06 73 52    ·J····· ·····sR
0040  41 00 d0 00 b0                                    A····
```

Not writable

DADISICK corresponding relationship:



3.5.31 plausiblityPrefailWarning(0x00d1)

Data Type:

Bool

meaning:

Equipment reliability alarm

Data format:

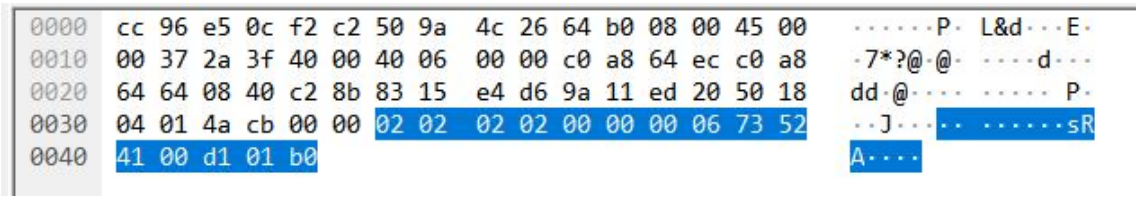
read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 00 d1 b9

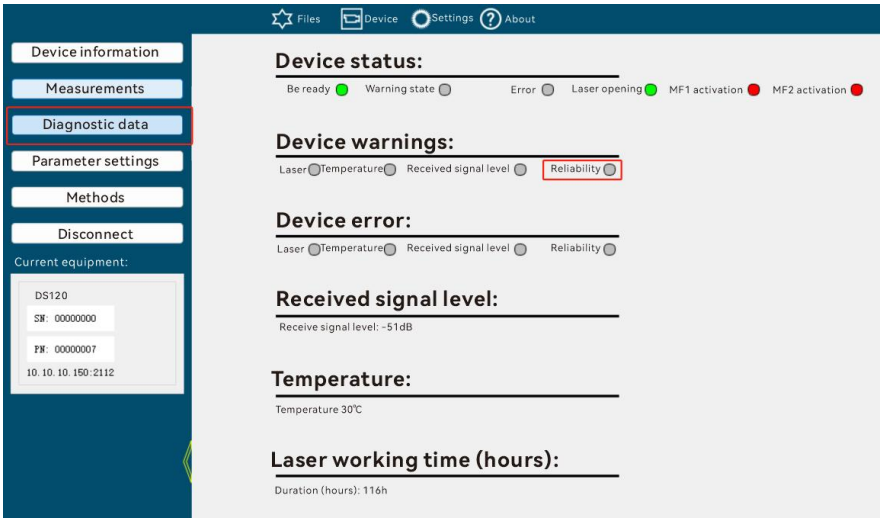
Read Response:

02 02 02 02 00 00 00 06 73 52 41 00 d1 01 b0



Not writable

DADISICK corresponding relationship:



3.5.32 productPartNo (0x00de)

Data Type:

FlexString

meaning:

DS series Device Part Number

Data format:

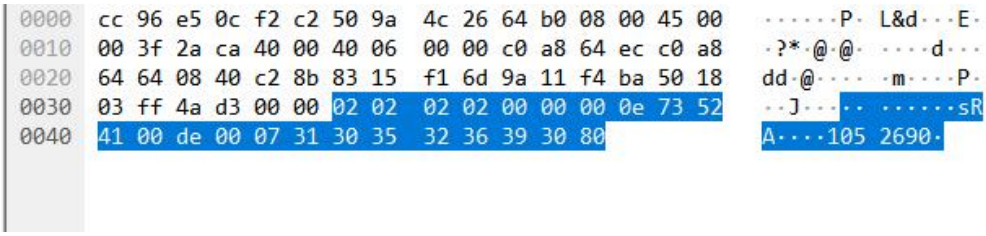
read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 00 de b6

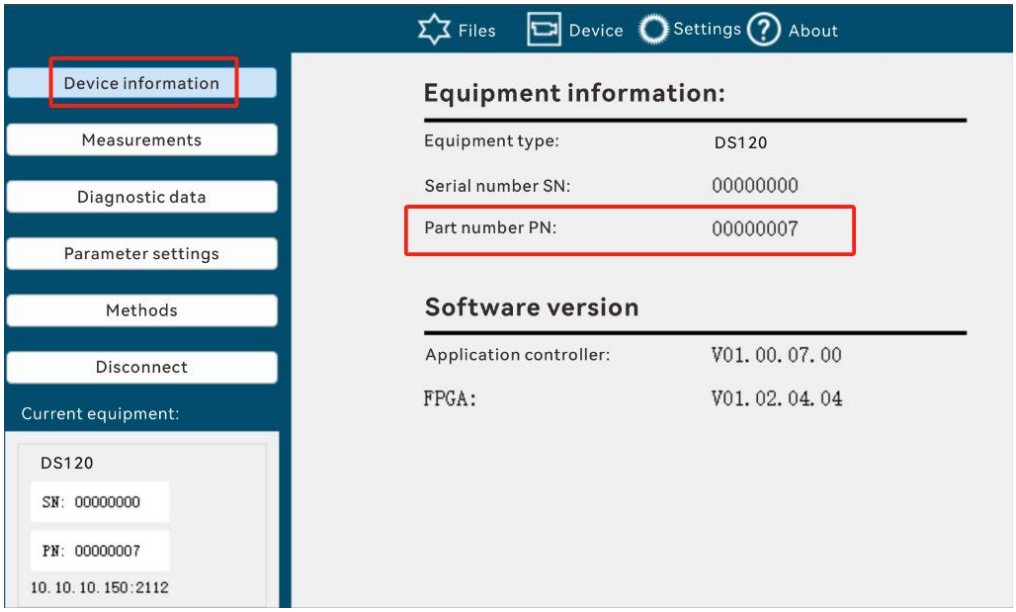
Read Response:

02 02 02 02 00 00 00 0e 73 52 41 00 de 00 07 31 30 35 32 36 39 30 80



Not writable

DADISICK corresponding relationship:



3.5.33 laserServiceState(0x00e6)

Data Type:

Bool

meaning:

Whether the device is in Laser Warning or Error state, and MFx is triggered. If MF1 is configured to respond to Laser error or warning, MF1 is triggered; if MF2 is configured to respond to Laser error or warning, MF2 is triggered.

Data Format:

read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 00 e6 8e

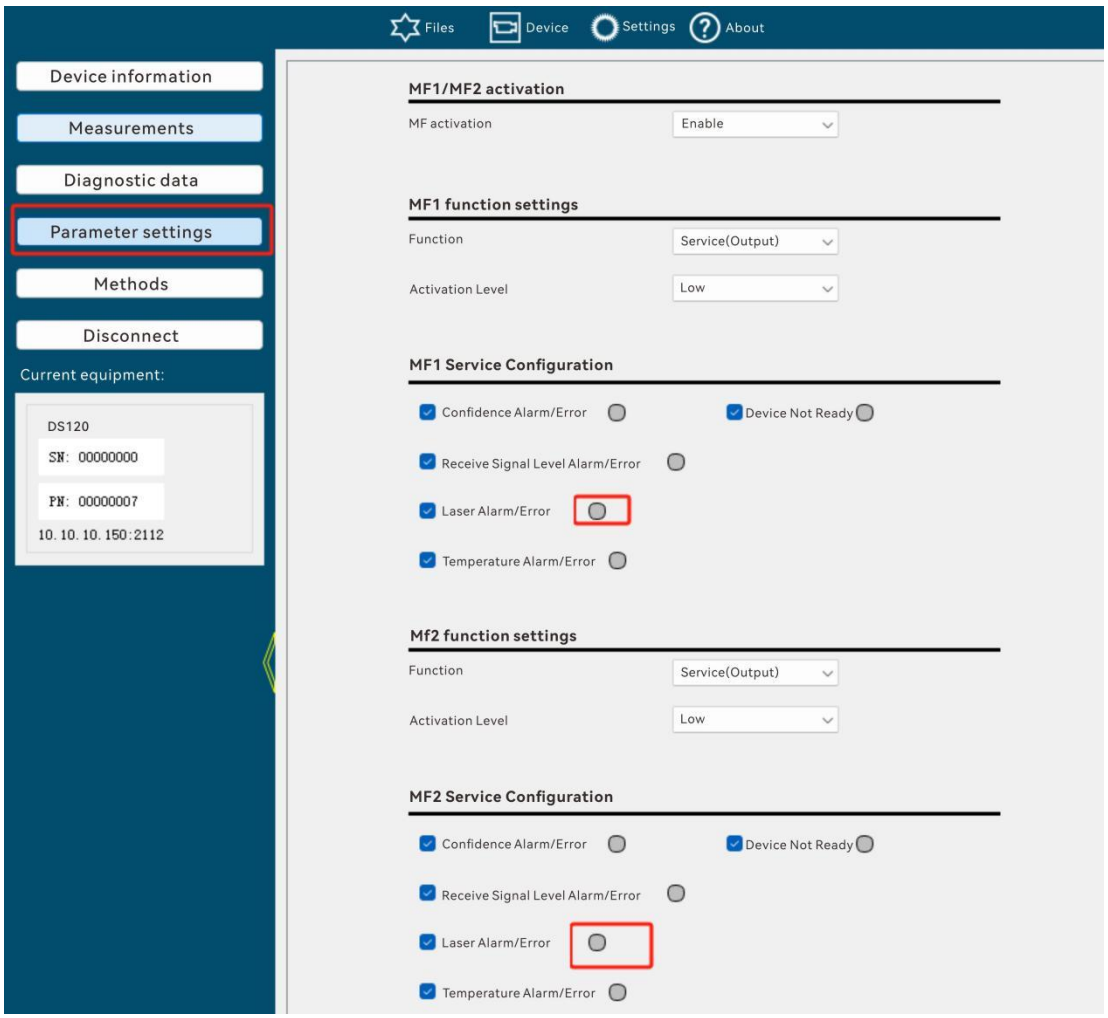
Read Response:

02 02 02 02 00 00 00 06 73 52 41 00 e6 00 86

```
cc 96 e5 0c f2 c2 00 06  77 28 e0 11 08 00 45 00   ........ w(....E.
00 37 a1 52 00 00 40 06  8e cd c0 a8 64 ec c0 a8   .7.R..@. ....d...
64 64 08 40 04 56 01 32  b7 6e d3 e9 f5 dd 50 18   dd.@.V.2 .n....P.
05 78 ac 47 00 00 02 02  02 02 00 00 00 06 73 52   .x.G.... ......sR
41 00 e6 00 86 00                                  A.....
```

Not writable

DADISICK corresponding relationship:



3.5.34 temperatureServiceState(0x00e7)

Data Type:

Bool

meaning:

Whether the device is in Temperature Warning or Error state, and MFx is activated. If MF1 is configured to respond to temperature error or warning, MF1 is activated; if MF2 is configured to respond to temperature error or warning, MF2 is activated.

Data format:

read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 00 e7 8f

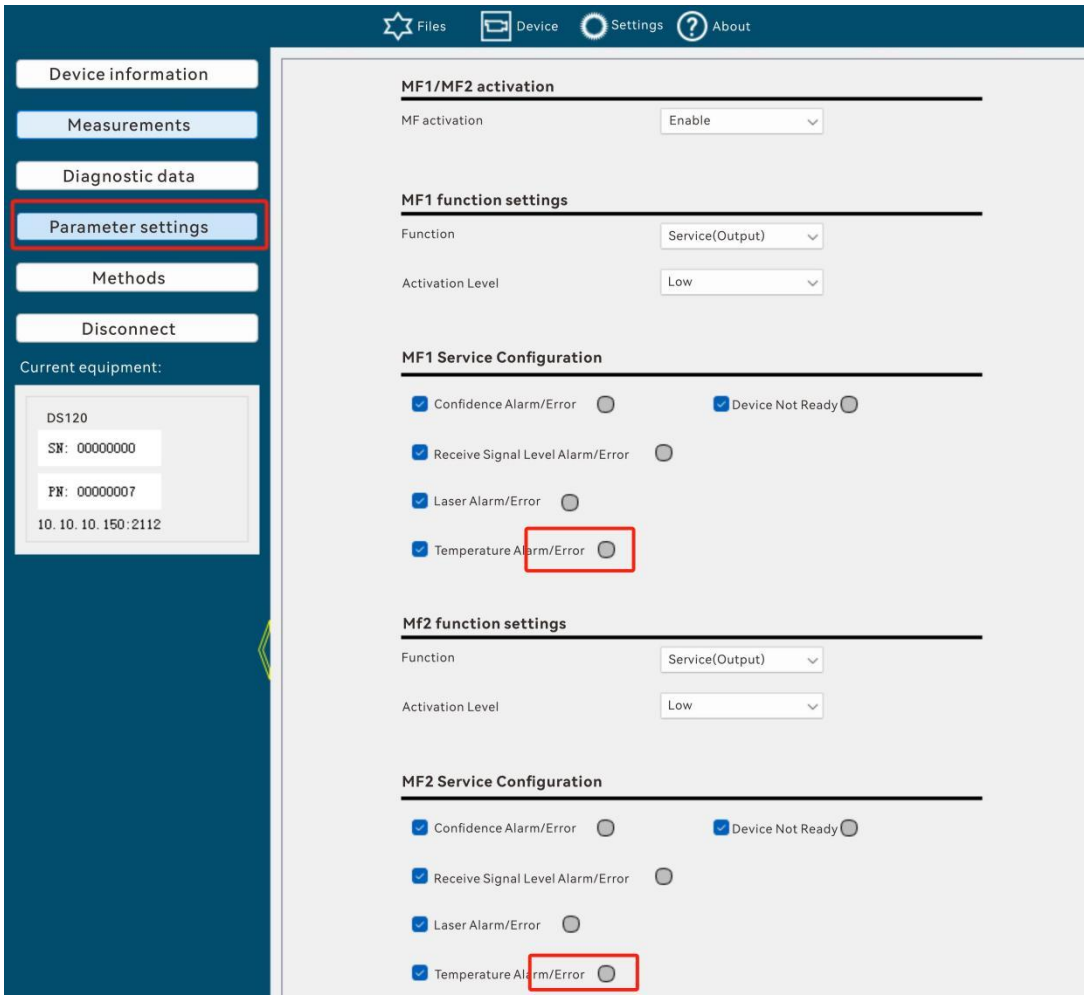
Read Response:

02 02 02 02 00 00 00 06 73 52 41 00 e7 00 87

```
cc 96 e5 0c f2 c2 00 06  77 28 e0 11 08 00 45 00   ........ w(....E.
00 37 a1 2b 00 00 40 06  8e f4 c0 a8 64 ec c0 a8   .7.+..@. ....d...
64 64 08 40 04 56 01 32  b6 9f d3 e9 f5 27 50 18   dd.@.V.2 .....'P.
05 78 ab cc 00 00 02 02  02 02 00 00 00 06 73 52   .x...... ......sR
41 00 e7 00 87 00                                  A.....
```

Not writable

DADISICK corresponding relationship:



3.5.35 levelServiceState(0x00e8)

Data Type:

Bool

meaning:

Whether the device is in Level Warning or Error state, and MFx is triggered. If MF1 is configured to respond to level error or warning, MF1 is triggered; if MF2 is configured to respond to level error or warning, MF2 is triggered.

Data format:

read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 00 e8 80

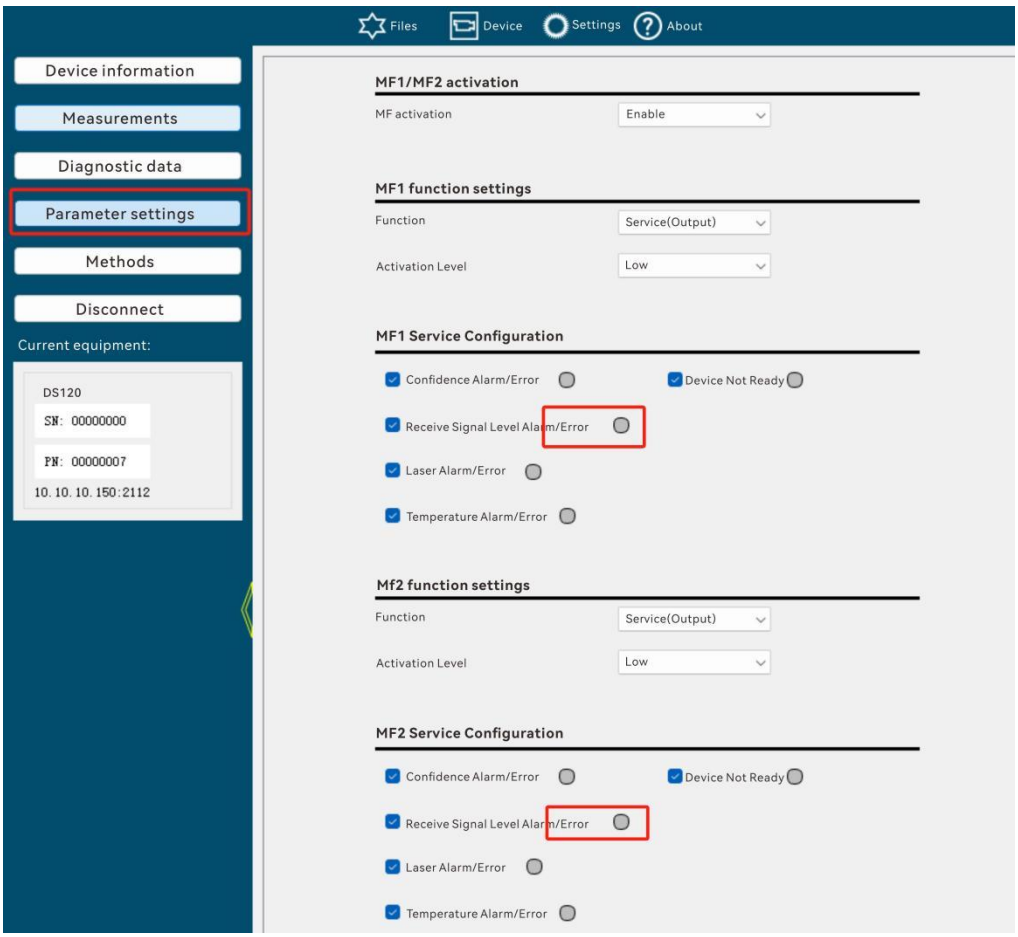
Read Response:

02 02 02 02 00 00 00 06 73 52 41 00 e8 00 88

```
cc 96 e5 0c f2 c2 00 06  77 28 e0 11 08 00 45 00   ........ w(....E.
00 37 a1 13 00 00 40 06  8f 0c c0 a8 64 ec c0 a8   .7....@. ....d...
64 64 08 40 04 56 01 32  b6 1e d3 e9 f4 b7 50 18   dd.@.V.2 ......P.
05 78 aa bd 00 00 02 02  02 02 00 00 00 06 73 52   .x...... ......sR
41 00 e8 00 88 00                                  A.....
```

Not writable

DADISICK corresponding relationship:



3.5.36 readyServiceState (0x00e9)

Data Type:

Bool

meaning:

Whether the device is in Device Not Ready state and MFx or SSI Error Bit is stimulated.

Data format:

read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 00 e9 81

Read Response:

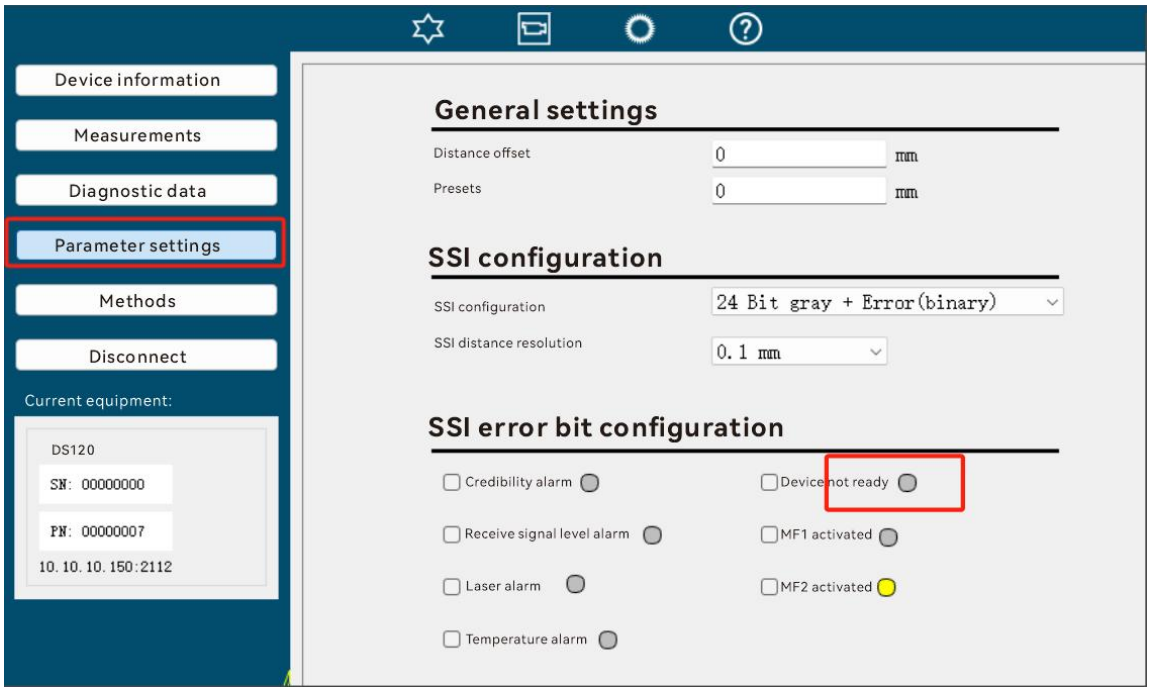
02 02 02 02 00 00 00 06 73 52 41 00 e9 01 88

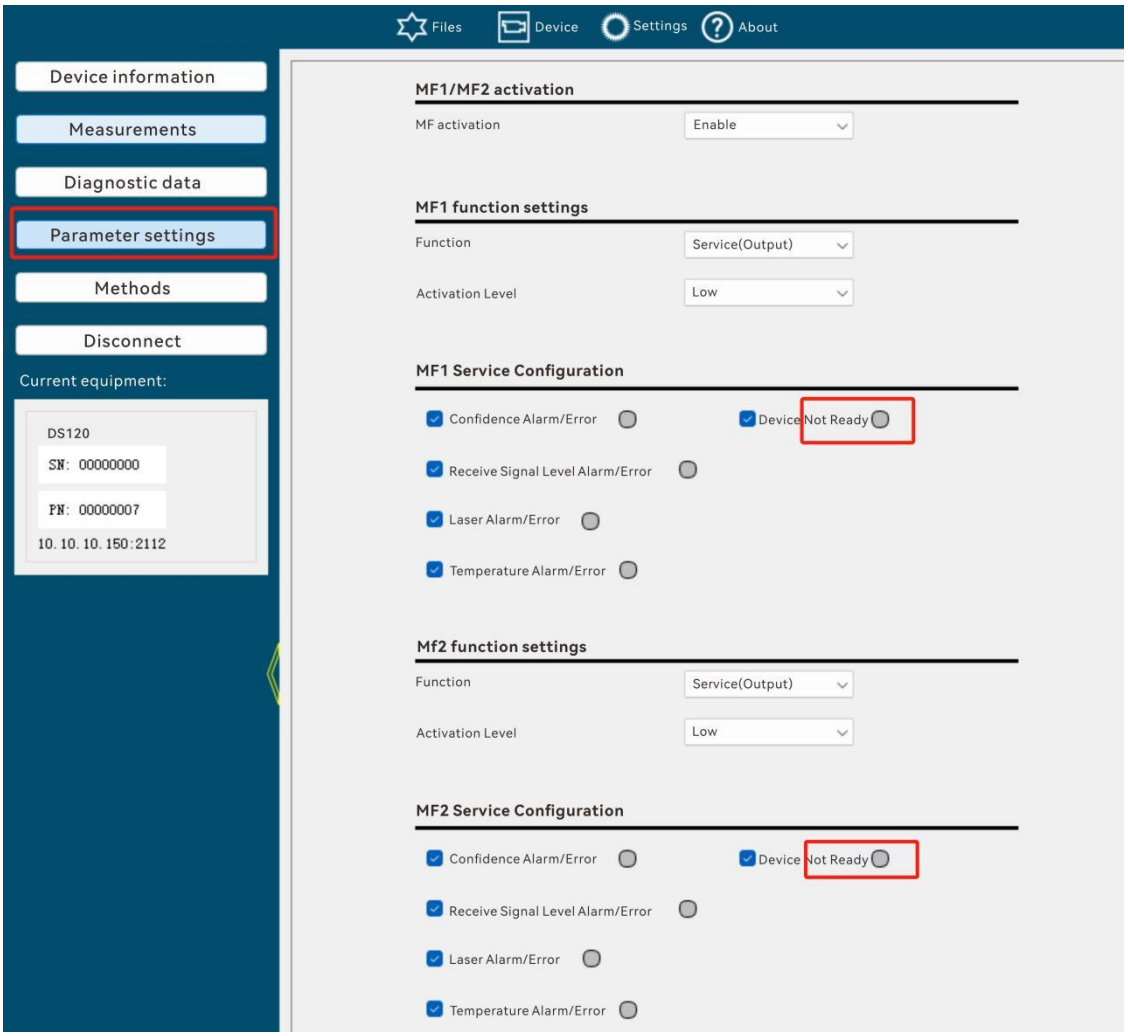
```
cc 96 e5 0c f2 c2 00 06  77 28 e0 11 08 00 45 00   ........ w(....E.
00 37 a1 07 00 00 40 06  8f 18 c0 a8 64 ec c0 a8   .7....@. ....d...
64 64 08 40 04 56 01 32  b5 dc d3 e9 f4 7f 50 18   dd.@.V.2 ......P.
05 78 aa 36 00 00 02 02  02 02 00 00 00 06 73 52   .x.6.... ......sR
41 00 e9 01 88 00                                  A.....
```

Not writable

Mfx, SSI state both use this identifier

DADISICK corresponding relationship:





3.5.37 plausiblityServiceState(0x00eb)

Data Type:

Bool

meaning:

Whether the device is in Plausibility Warning or Error state, and MFx is triggered. If MF1 is configured with plausibility error or warning, MF1 is triggered; if MF2 is configured with response plausibility error or warning, MF2 is triggered.

Data format:

read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 00 eb 83

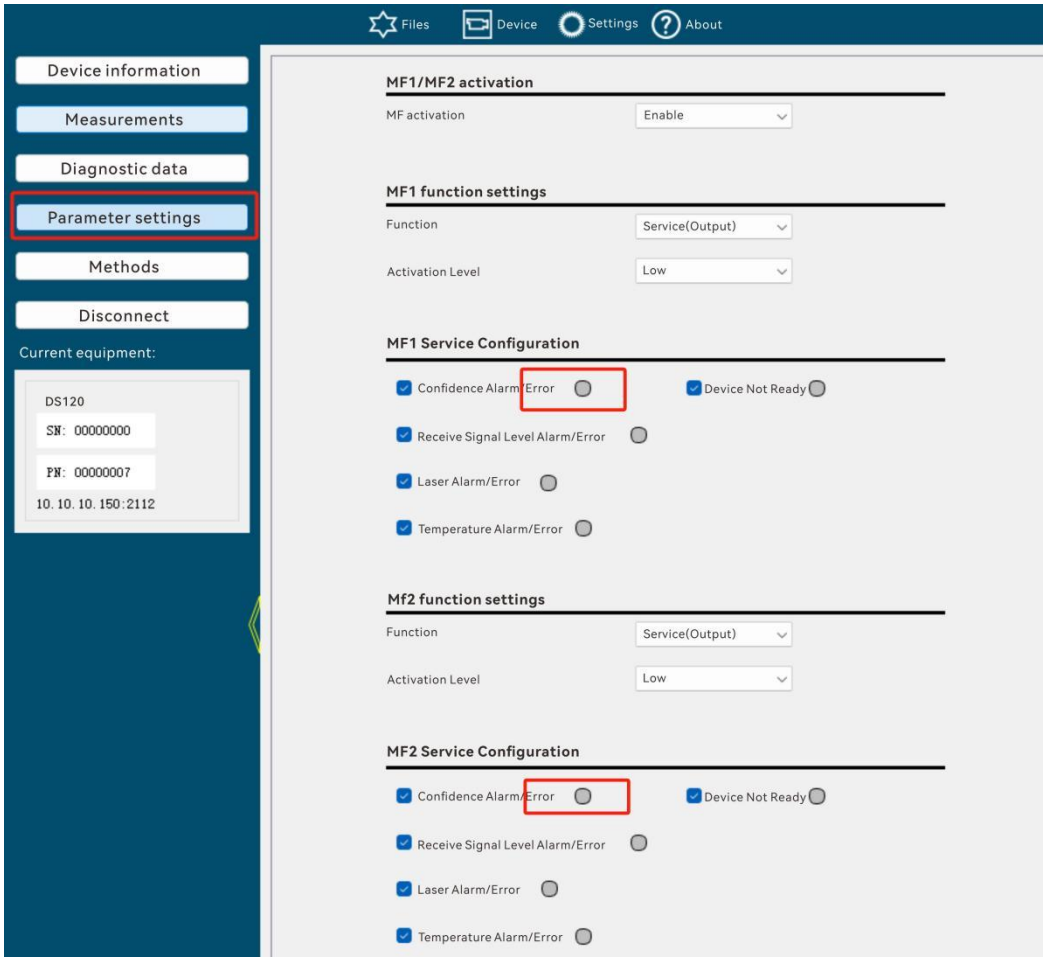
Read Response:

02 02 02 02 00 00 00 06 73 52 41 00eb 00 8b

```
cc 96 e5 0c f2 c2 00 06  77 28 e0 11 08 00 45 00   ........ w(....E.
00 37 c3 ab 00 00 40 06  6c 74 c0 a8 64 ec c0 a8   .7....@. lt..d...
64 64 08 40 04 56 01 13  51 4f d3 ce 96 43 50 18   dd.@.V.. QO...CP.
05 78 68 3b 00 00 02 02  02 02 00 00 00 06 73 52   .xh;.... ......sR
41 00 eb 00 8b 00                                  A.....
```

Not writable

DADISICK corresponding relationship:



3.5.38 mf1ServiceState(0x00ec)

Data Type:

Bool

meaning:

Whether Mf1 is excited using a high level or a low level, or whether it is at a high level or a low level when excited.

Data format:

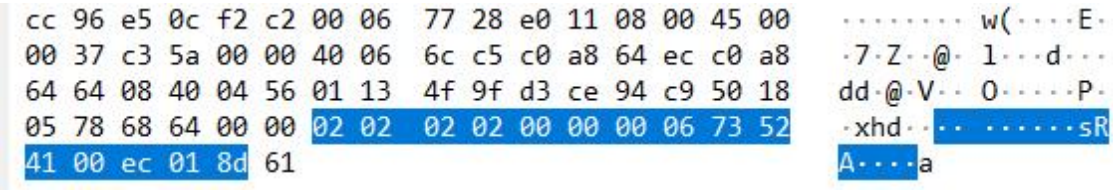
read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 00 ec 84

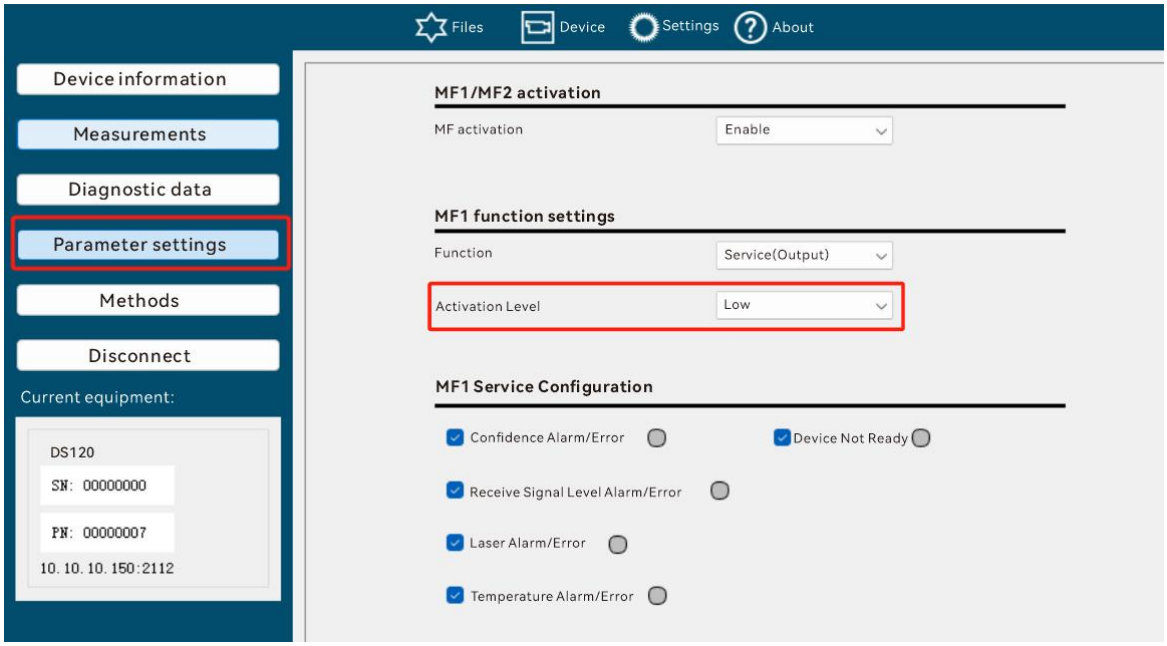
Read Response:

02 02 02 02 00 00 00 06 73 52 41 00 ec 01 8d



Not writable

DADISICK corresponding relationship:



3.5.39 mf2ServiceState (0x00ed)

Data Type:

Bool

meaning:

Whether Mf2 is at a high level or a low level when it is excited.

Data format:

read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 00 ed 85

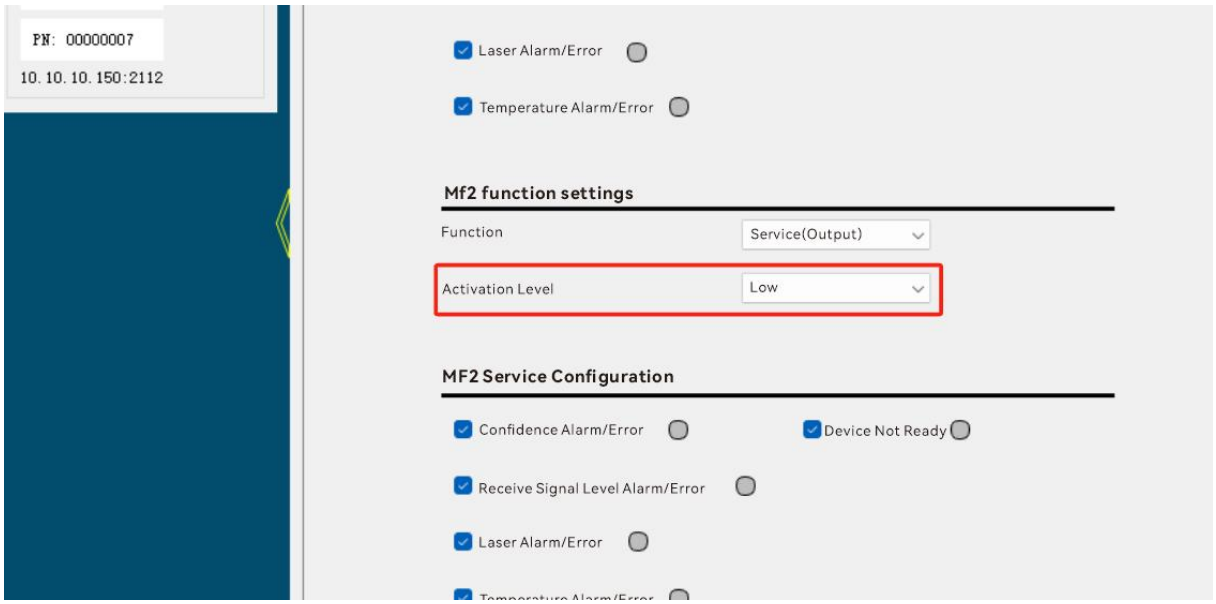
Read Response:

02 02 02 02 00 00 00 06 73 52 41 00 ed 00 8d

```
cc 96 e5 0c f2 c2 00 06  77 28 e0 11 08 00 45 00   ........ w(....E.
00 37 c3 6f 00 00 40 06  6c b0 c0 a8 64 ec c0 a8   .7.o..@. l...d...
64 64 08 40 04 56 01 13  50 0e d3 ce 95 2b 50 18   dd.@.V.. P....+P.
05 78 66 94 00 00 02 02  02 02 00 00 00 06 73 52   .xf..... ......sR
41 00 ed 00 8d 13                                  A.....
```

Not writable

DADISICK corresponding relationship:



3.5.40 operatingHours (0x00ef)

Data Type:

UInt32

meaning:

Total equipment working time

Data format:

read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 00 ef 87

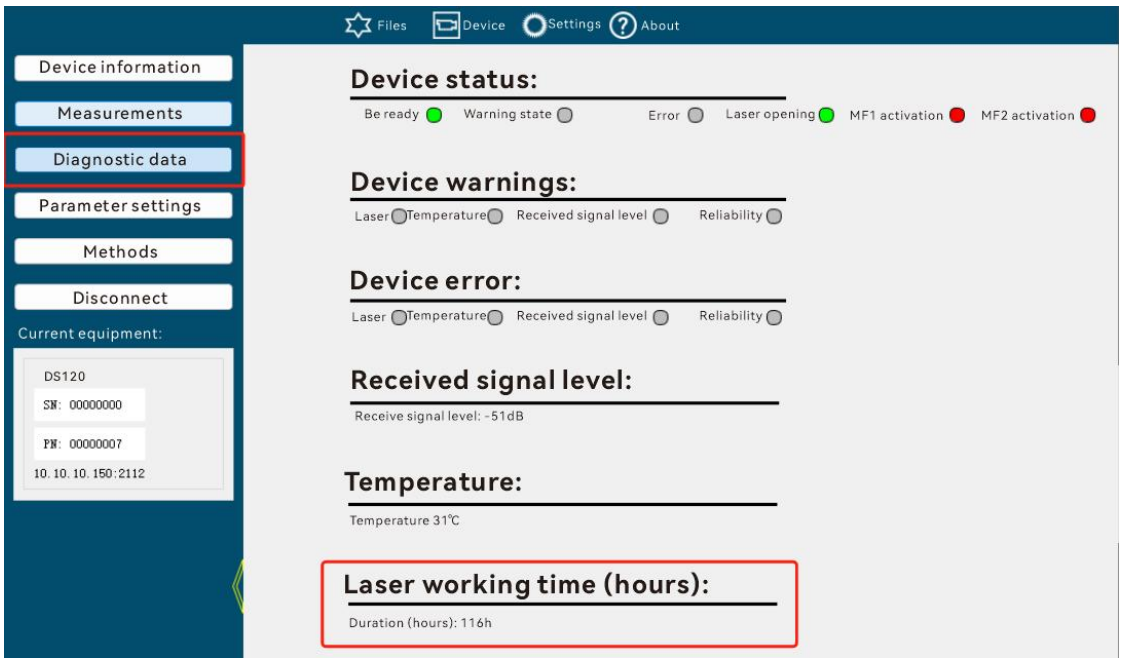
Read Response:

02 02 02 02 00 00 00 09 73 52 41 00 ef 00 00 03 37 bb

```
0000  cc 96 e5 0c f2 c2 50 9a  4c 26 64 b0 08 00 45 00   ......P. L&d...E.
0010  00 3a 2a 5c 40 00 40 06  00 00 c0 a8 64 ec c0 a8   .:*\@.@. ....d...
0020  64 64 08 40 c2 8b 83 15  e7 2e 9a 11 ee b6 50 18   dd.@.... ......P.
0030  04 00 4a ce 00 00 02 02  02 02 00 00 00 09 73 52   ..J..... ......sR
0040  41 00 ef 00 00 03 37 bb                           A.....7.
```

Not writable

DADISICK corresponding relationship:



3.5.41 distanceOffset (0x014a)

Data Type:

Int32

meaning:

Distance offset. Range -600,000 … +300,000 [mm]

The compensation value is added to the determined distance value. The compensation value is effective for all outputs and for the distance display on the display.

Unit: [mm]

Default value: 0

Data format:

read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 01 4a 23

Read Response:

02 02 02 02 00 00 00 09 73 52 41 01 4a ff ff ff 9c 48

```
0000  cc 96 e5 0c f2 c2 50 9a  4c 26 64 b0 08 00 45 00   ......P· L&d···E·
0010  00 3a 2b 36 40 00 40 06  00 00 c0 a8 64 ec c0 a8   ·:+6@·@· ····d···
0020  64 64 08 40 c2 8b 83 15  fe 76 9a 11 fa a2 50 18   dd·@···· ·v····P·
0030  20 0f 4a ce 00 00 02 02  02 02 00 00 00 09 73 52    ·J····· ·····sR
0040  41 01 4a ff ff ff 9c 48                           A·J····H
```

Write

Write Request

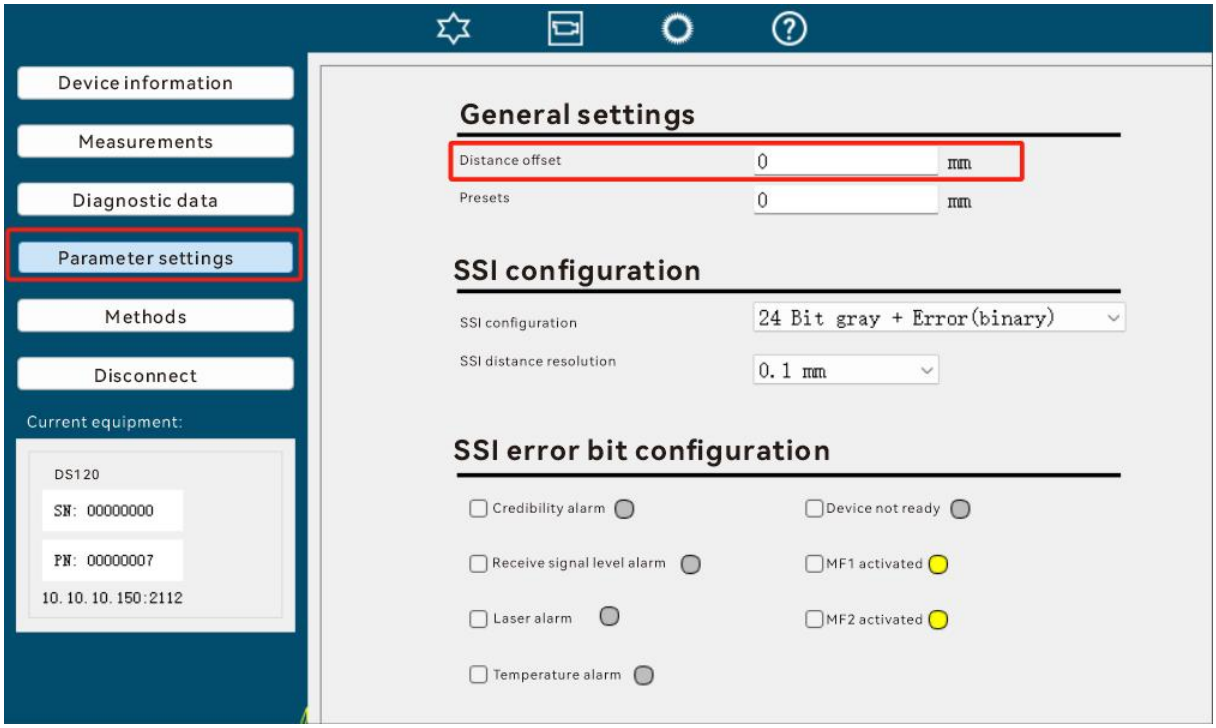
02 02 02 02 00 00 00 09 73 57 49 01 4a 00 00 00 64 42

```
0000  00 06 77 28 d1 82 cc 96  e5 0c f2 c2 08 00 45 00   ··w(···· ·····E·
0010  00 3a 77 52 40 00 80 06  00 00 c0 a8 64 64 c0 a8   ·:wR@··· ····dd··
0020  64 ec 56 6e 08 40 0f 86  6d cb 00 2f a8 6d 50 18   d·Vn·@·· m··/·mP·
0030  f5 6b 4a ce 00 00 02 02  02 02 00 00 00 09 73 57   ·kJ····· ·····sW
0040  49 01 4a 00 00 00 64 42                           I·J···dB
```

Write Response

02 02 02 02 00 00 00 05 73 57 41 01 4a 2e

DADISICK corresponding relationship:



3.5.42 distancePreset (0x014b)

Data Type:

Int32

meaning:

Preset distances, range -600,000 … +300,000 [mm].

Unit: [mm]

Default value: 0

Data format:

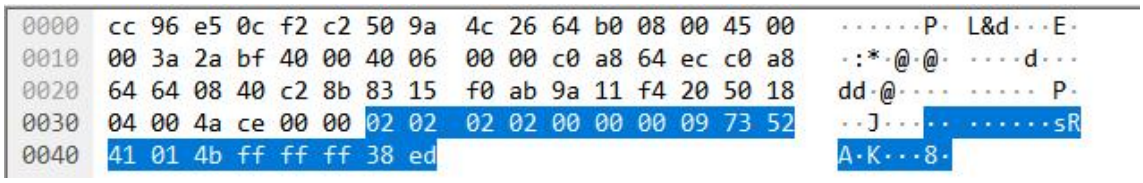
read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 01 4b 22

Read Response:

02 02 02 02 00 00 00 09 73 52 41 01 4b ff ff ff 38 ed



Important: Relationship between Preset and Offset

Compensation value = preset - measured distance value, that is:

Offset = Preset - Distance

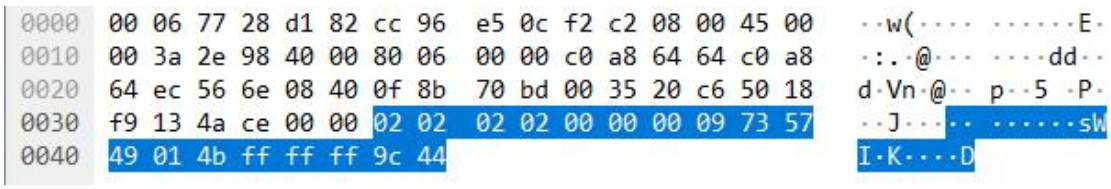
In the final distance, final distance = measured distance + Offset

Distance = TestedDistance + Offset

Write

Write Request

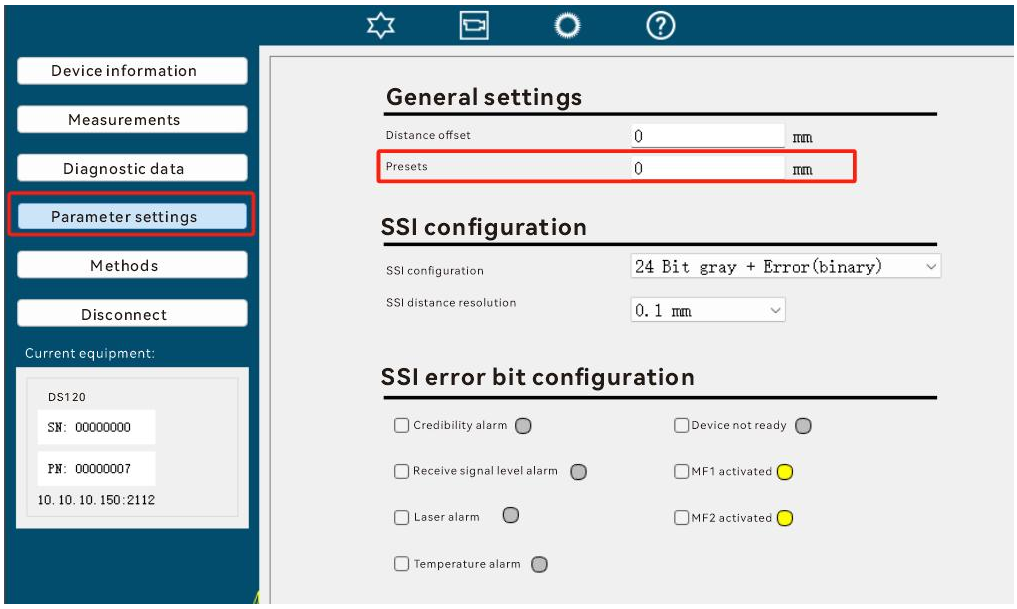
02 02 02 02 00 00 00 09 73 57 49 01 4b ff ff ff 9c 44



Write Response

02 02 02 02 00 00 00 05 73 57 41 01 4b 2f

DADISICK corresponding relationship:



3.5.43 globalFunctionMF (0x014d)

Data Type:

Bool

meaning:

Whether to enable the MF1/MF2 function

0, Disable MF1/MF2

1, Enable MF1/MF2

default value:

1, indicating that MF1/MF2 is enabled

Data format:

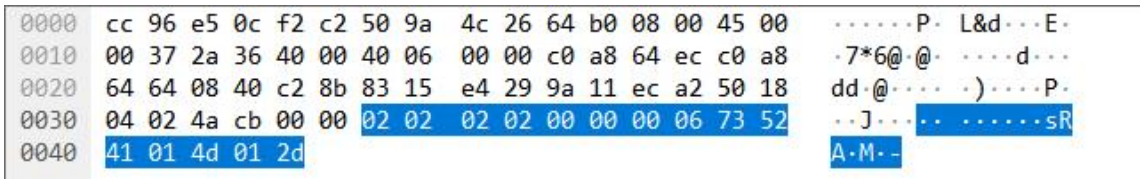
read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 01 4d 24

Read Response:

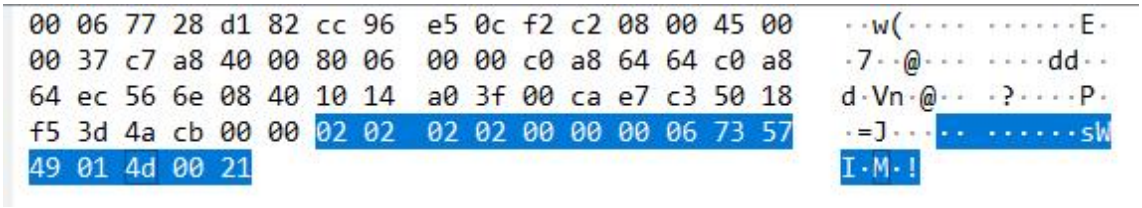
02 02 02 02 00 00 00 06 73 52 41 01 4d 01 2d



Write

Write Request

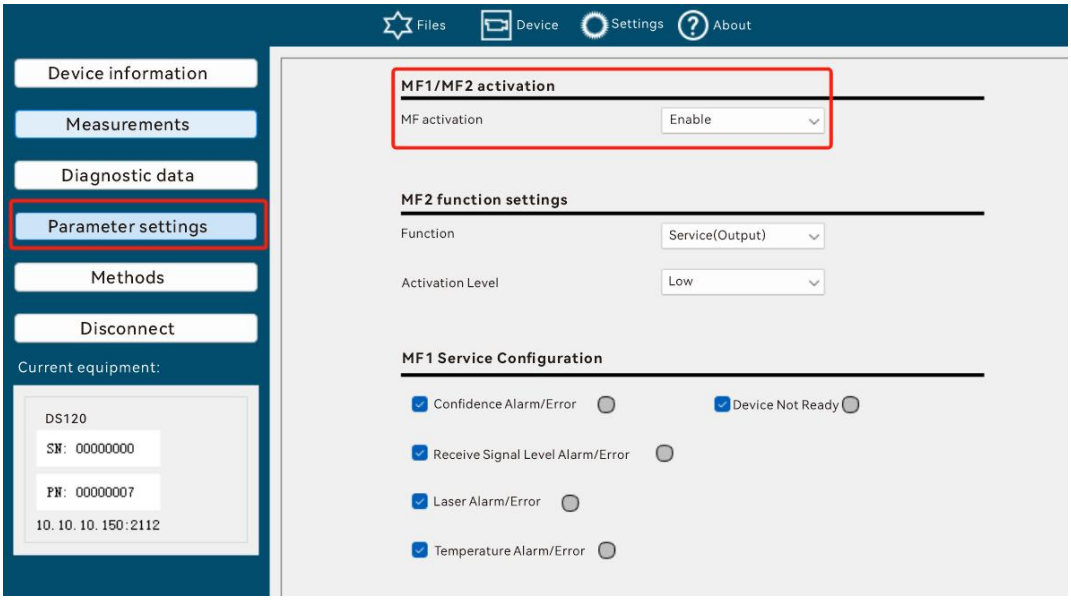
02 02 02 02 00 00 00 06 73 57 49 01 4d 00 21



Write Response

02 02 02 02 00 00 00 05 73 57 41 01 4d 29

DADISICK corresponding relationship:



3.5.44 functionMF1 (0x014e)

Data Type:

UInt8

meaning:

Configuring MF1 Functions

0: Distance : used as output signal distance switching device
1: Velocity : used as a speed output signal switching device
2: Service : used as service output port
3: Laser off : used to turn off the laser input
4: Preset : Will be used as input to activate a static preset

default value:

0: Distance

Data format:

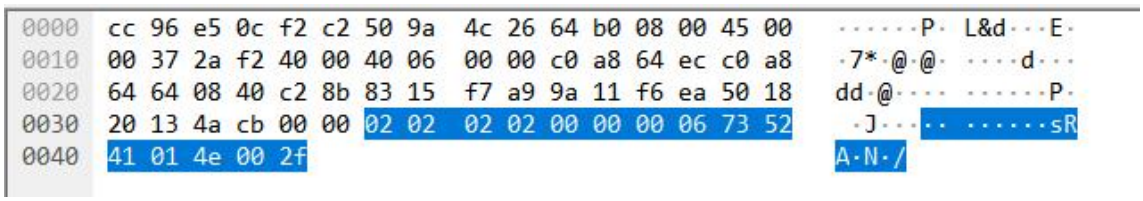
read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 01 4e 27

Read Response:

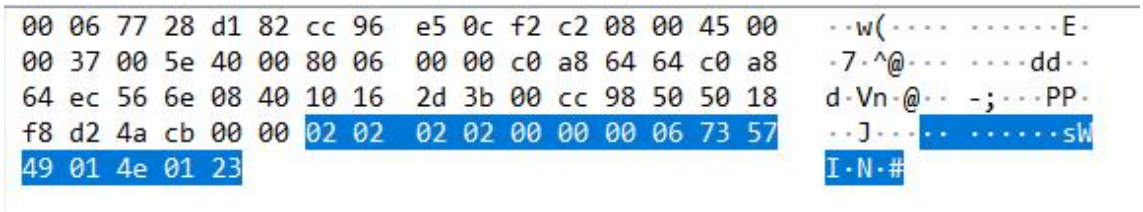
02 02 02 02 00 00 00 06 73 52 41 01 4e 00 2f



Write

Write Request

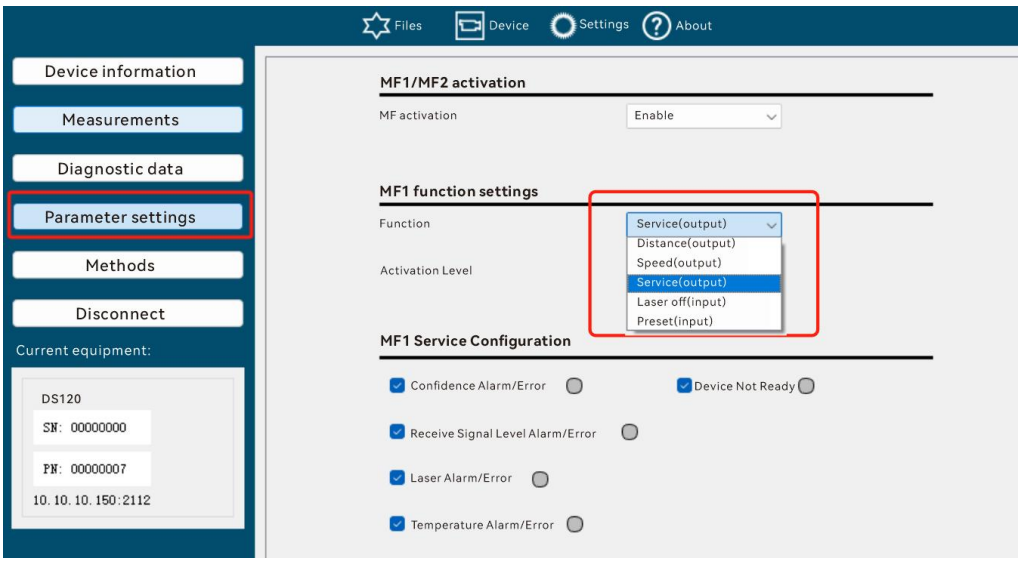
02 02 02 02 00 00 00 06 73 57 49 01 4e 01 23



Write Response

02 02 02 02 00 00 00 05 73 57 41 01 4e 2a

DADISICK corresponding relationship:



3.5.45 mf1ActiveState (0x014f)

Data Type:

Bool

meaning:

Configure MF1 excitation state

0: High level

1: Low level

default value:

1: Low level

Data format:

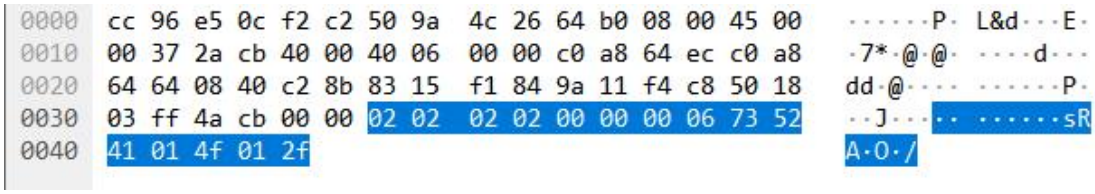
read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 01 4f 26

Read Response:

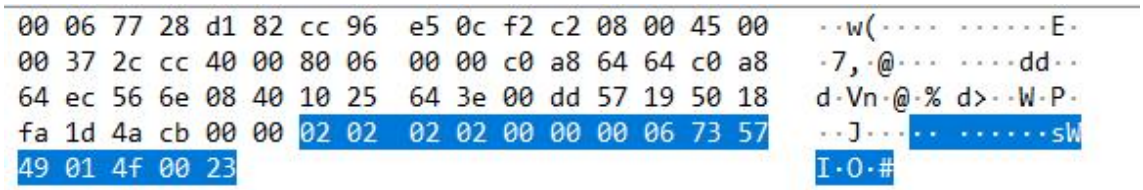
02 02 02 02 00 00 00 06 73 52 41 01 4f 01 2f



Write

Write Request

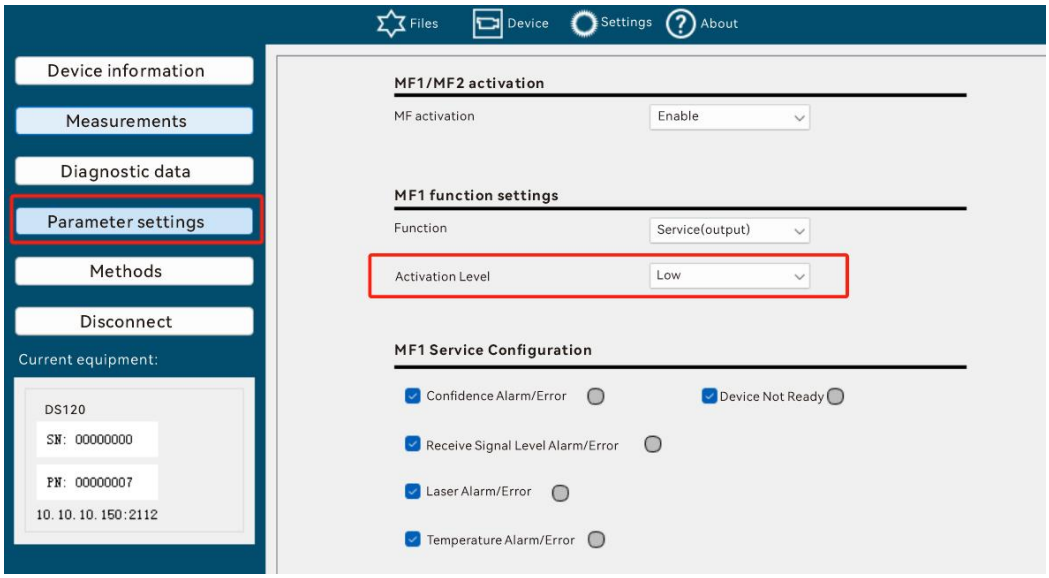
02 02 02 02 00 00 00 06 73 57 49 01 4f 00 23



Write Response

02 02 02 02 00 00 00 05 73 57 41 01 4f 2b

DADISICK corresponding relationship:



3.5.46 functionMF2 (0x0150)

Data Type:

UInt8

meaning:

Configuring the MF2 Function

* 0: Distance
* 1: Velocity
* 2: Service

default value:

2: Service

Data format:

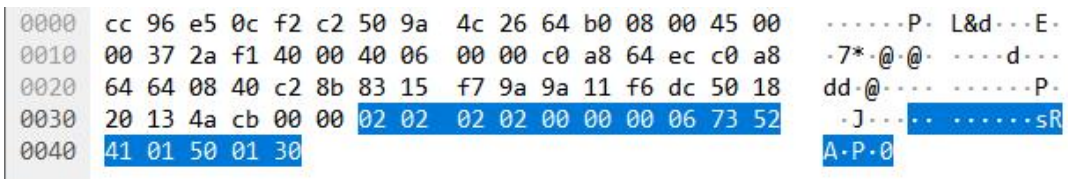
read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 01 50 39

Read Response:

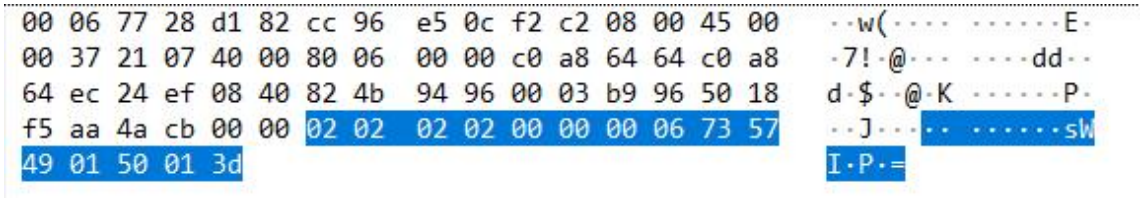
02 02 02 02 00 00 00 06 73 52 41 01 50 01 30



Write

Write Request

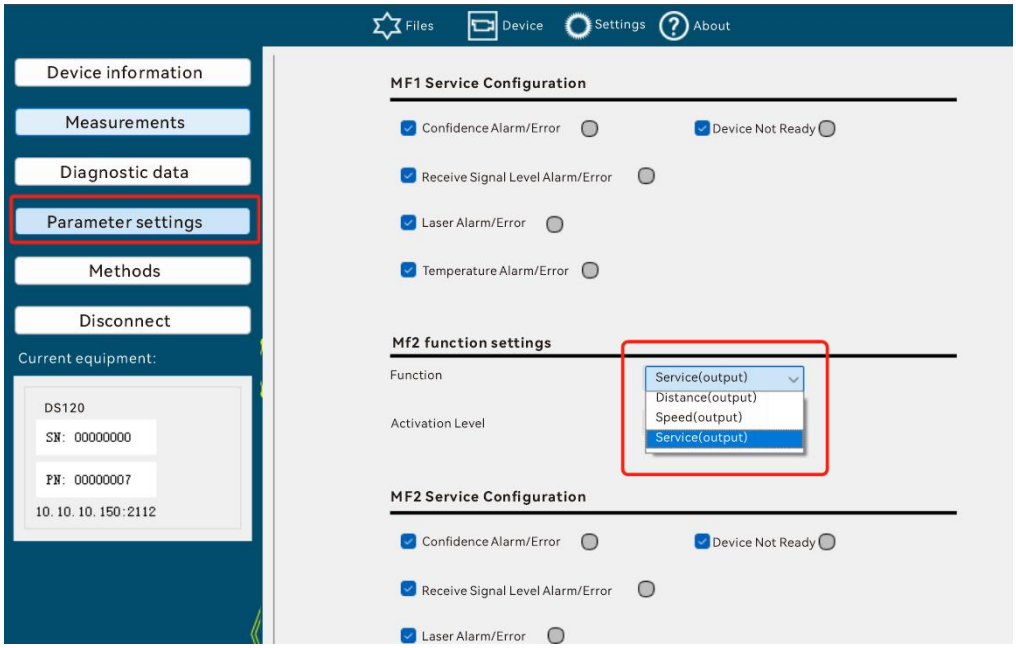
02 02 02 02 00 00 00 06 73 57 49 01 50 01 3d



Write Response

02 02 02 02 00 00 00 05 73 57 41 01 50 34

DADISICK corresponding relationship:



3.5.47 mf2ActiveState (0x0151)

Data Type:

Bool

meaning:

MF2 excitation state

0: High level

1: Low level

default value:

1: Low level

Data format:

read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 01 51 38

Read Response:

02 02 02 02 00 00 00 06 73 52 41 01 51 01 31

```
0000  cc 96 e5 0c f2 c2 50 9a  4c 26 64 b0 08 00 45 00   ......P. L&d...E.
0010  00 37 2b 79 40 00 40 06  00 00 c0 a8 64 ec c0 a8   .7+y@.@. ....d...
0020  64 64 08 40 c2 8b 83 16  03 62 9a 11 fe 4c 50 18   dd.@.... .b...LP.
0030  20 11 4a cb 00 00 02 02  02 02 00 00 00 06 73 52    .J..... ......sR
0040  41 01 51 01 31                                     A.Q.1
```

Write

Write Request

02 02 02 02 00 00 00 06 73 57 49 01 51 00 3d

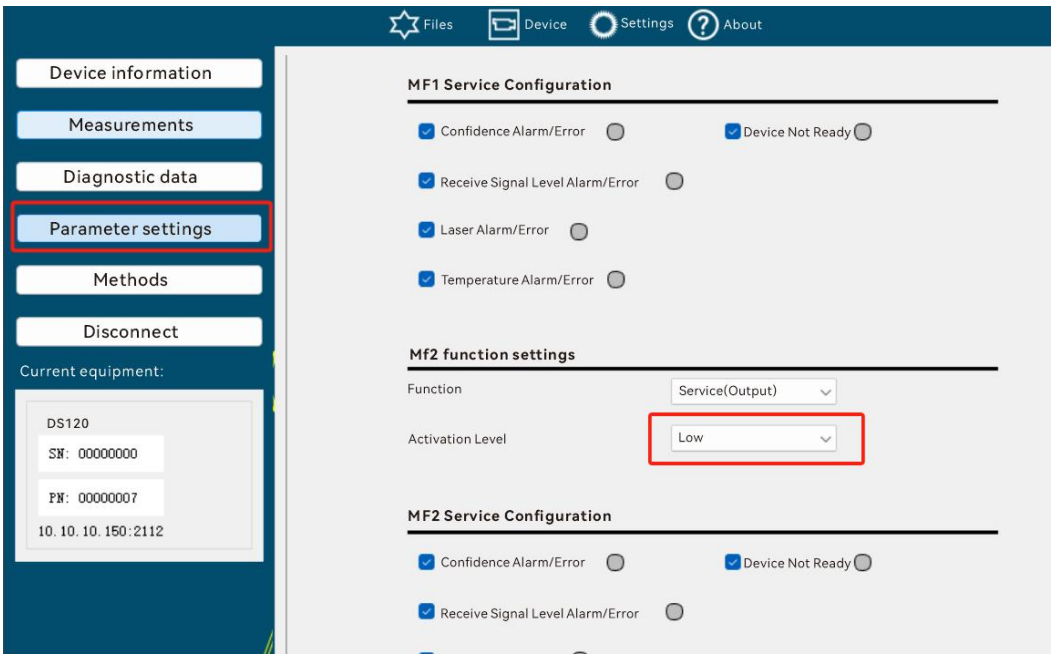
```
0000  00 06 77 28 e0 11 cc 96  e5 0c f2 c2 08 00 45 00   ··w(···· ·····E·
0010  00 37 64 3c 40 00 80 06  00 00 c0 a8 64 64 c0 a8   ·7d<@··· ····dd··
0020  64 ec 08 e8 08 40 92 5f  29 8f 00 06 a7 8a 50 18   d····@·_ )·····P·
0030  f5 cb 4a cb 00 00 02 02  02 02 00 00 00 06 73 57   ··J····· ·····sW
0040  49 01 51 00 3d                                    I·Q·=
```

Write Response

02 02 02 02 00 00 00 05 73 57 41 01 51 35

```
0000  cc 96 e5 0c f2 c2 00 06  77 28 e0 11 08 00 45 00   ·····w(····E·
0010  00 36 93 57 00 00 40 06  9c c9 c0 a8 64 ec c0 a8   ·6·W··@· ····d···
0020  64 64 08 40 08 e8 00 06  a7 8a 92 5f 29 9e 50 18   dd·@···· ···_)·P·
0030  05 78 e1 57 00 00 02 02  02 02 00 00 00 05 73 57   ·x·W···· ·····sW
0040  41 01 51 35 00                                    A·Q5·
```

DADISICK corresponding relationship:



3.5.48 thresholdDistanceMF1 (0x0152)

Data Type:

Int32

meaning:

MF1 is configured as a distance alarm, the switching threshold of the distance value

Setting range: –300,000 ... +300,000 [mm]

Unit: [mm]

default value:

Factory setting: 1,990 [mm]

Data format:

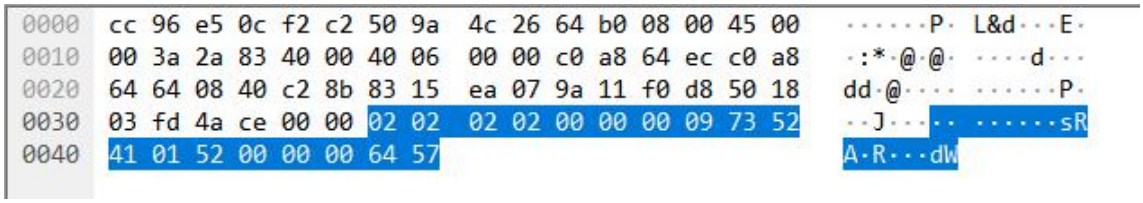
read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 01 52 3b

Read Response:

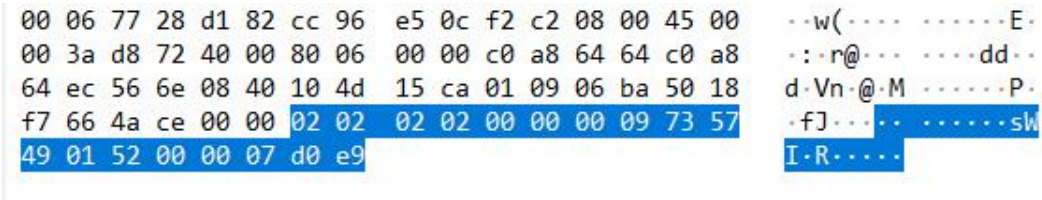
02 02 02 02 00 00 00 09 73 52 41 01 52 00 00 00 64 57



Write

Write Request

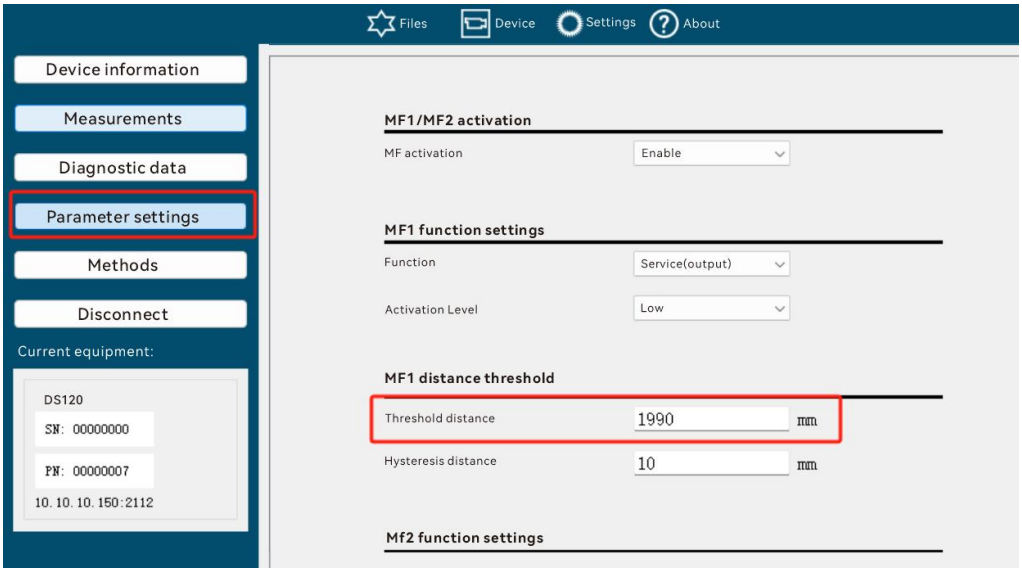
02 02 02 02 00 00 00 09 73 57 49 01 52 00 00 07 d0 e9



Write Response

02 02 02 02 00 00 00 05 73 57 41 01 52 36

DADISICK corresponding relationship:



3.5.49 hysteresisDistanceMF1 (0x0153)

Data Type:

UInt32

meaning:

Distance switch threshold hysteresis

Setting range: 1… +300,000 [mm]

Unit: [mm]

default value:

10[mm]

Data format:

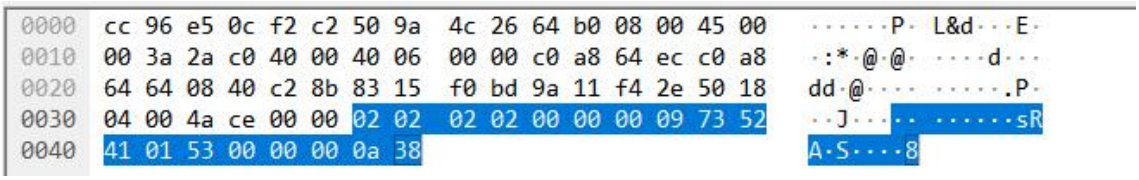
read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 01 53 3a

Read Response:

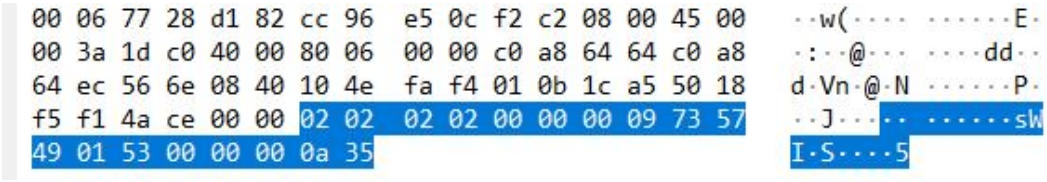
02 02 02 02 00 00 00 09 73 52 41 01 53 00 00 00 0a 38



Write

Write Request

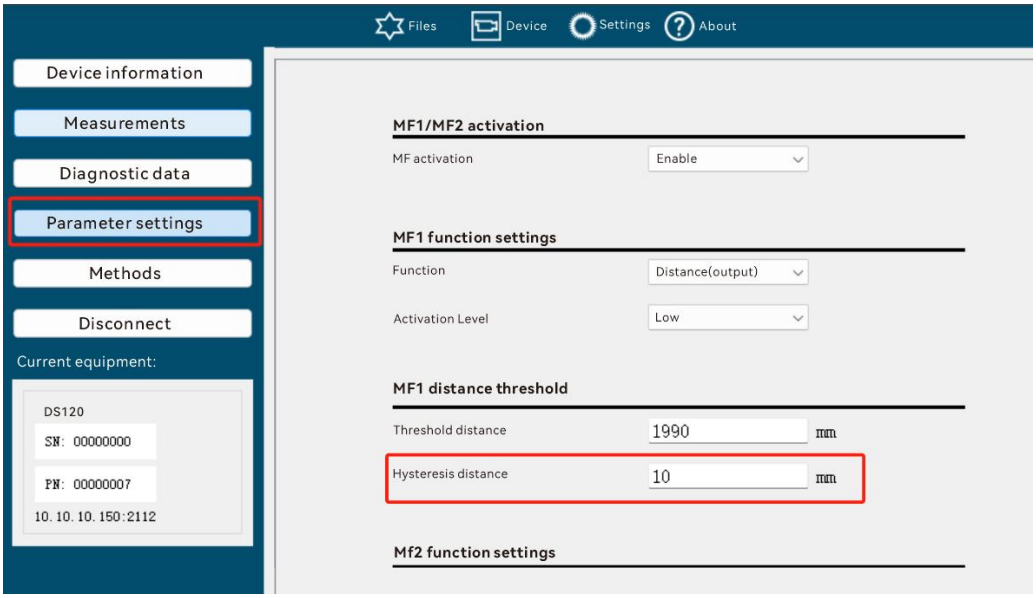
02 02 02 02 00 00 00 09 73 57 49 01 53 00 00 00 0a 35



Write Response

02 02 02 02 00 00 00 05 73 57 41 01 53 37

DADISICK corresponding relationship:



3.5.50 thresholdVelocityMF1 (0x0154)

Data Type:

UInt16

meaning:

When MF1 is set to speed excitation, the excitation threshold

Setting range: 50 … 15,000 [mm/s]

The switching hysteresis is fixed to 100 mm/s

Unit: [mm/s]

default value:

Factory setting: 5,000 [mm/s]

Data format:

read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 01 54 3d

Read Response:

02 02 02 02 00 00 00 09 73 52 41 01 5f 00 00 03 e8d5

```
cc 96 e5 0c f2 c2 00 06  77 28 d1 82 08 00 45 00   ........ w(....E.
00 38 1f 10 00 00 40 06  11 0f c0 a8 64 ec c0 a8   .8....@. ....d...
64 64 08 40 24 cb 00 00  06 49 8d bb 9b 6f 50 18   dd.@$... .I...oP.
05 78 56 1b 00 00 02 02  02 02 00 00 00 07 73 52   .xV..... ......sR
41 01 54 0f a0 9a 4c                               A.T...L
```

Write

Write Request

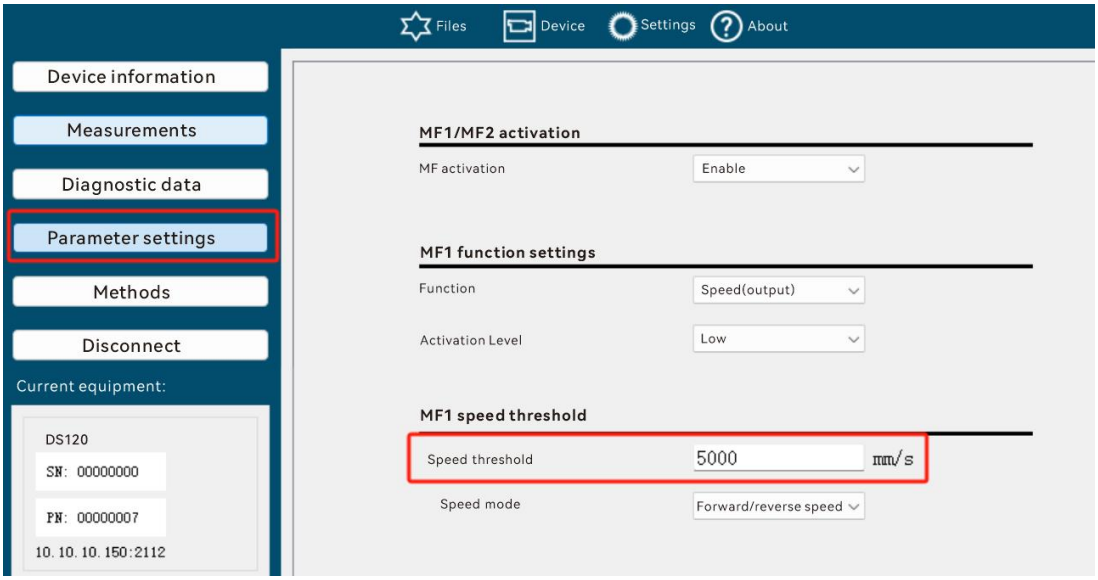
02 02 02 02 00 00 00 07 73 57 49 01 54 0f a0 97

```
00 06 77 28 d1 82 cc 96  e5 0c f2 c2 08 00 45 00   ··w(···· ·····E·
00 38 9c 75 40 00 80 06  00 00 c0 a8 64 64 c0 a8   ·8·u@··· ····dd··
64 ec 24 a6 08 40 f6 74  66 7b 00 00 26 cb 50 18   d·$··@·t f{··&·P·
f6 a6 4a cc 00 00 02 02  02 02 00 00 00 07 73 57   ··J····· ·····sW
49 01 54 0f a0 97                                  I·T···
```

Write Response

02 02 02 02 00 00 00 05 73 57 41 01 54 30

DADISICK corresponding relationship:



3.5.51 velocityModeMF1 (0x0155)

Data Type:

UInt8

meaning:

When set to velocity excitation, is it forward velocity excitation, reverse velocity excitation, or bidirectional excitation?

* 0: increasing
* 1: decreasing
* 2: in creasing /decreasing

default value:

Factory setting: 2 + / – (bidirectional excitation)

Data format:

read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 01 55 3c

Read Response:

02 02 02 02 00 00 00 06 73 52 41 01 55 00 34

```
cc 96 e5 0c f2 c2 00 06  77 28 d1 82 08 00 45 00   ........ w(....E.
00 37 31 ff 00 00 40 06  fe 20 c0 a8 64 ec c0 a8   .71...@. . ..d...
64 64 08 40 24 ef 00 00  1f 35 82 48 73 8c 50 18   dd.@$... .5.Hs.P.
05 78 dc 0c 00 00 02 02  02 02 00 00 00 06 73 52   .x...... .. ......sR
41 01 55 00 34 00                                  A.U.4.
```

Write

Write Request

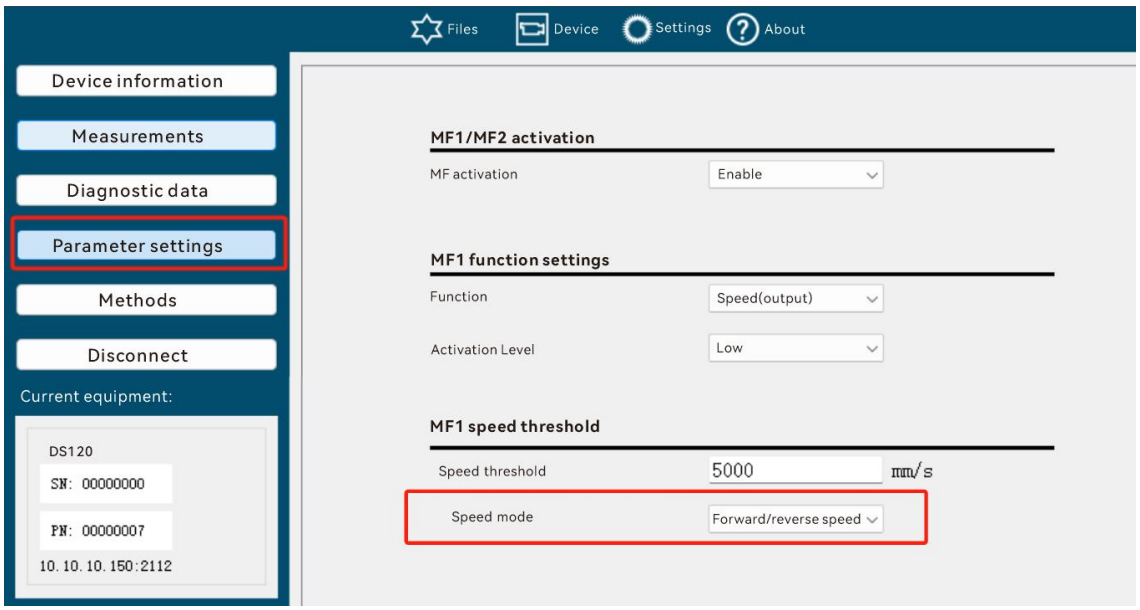
02 02 02 02 00 00 00 06 73 57 49 01 55 00 39

```
00 06 77 28 d1 82 cc 96  e5 0c f2 c2 08 00 45 00   ..w(.... ......E.
00 37 a4 5f 40 00 80 06  00 00 c0 a8 64 64 c0 a8   .7._@... ....dd..
64 ec 24 cb 08 40 8d bb  ac e1 00 00 25 1b 50 18   d.$..@.. ....%.P.
f8 56 4a cb 00 00 02 02  02 02 00 00 00 06 73 57   .VJ..... .. ......sW
49 01 55 00 39                                     I.U.9
```

Write Response

02 02 02 02 00 00 00 05 73 57 41 01 55 31

DADISICK corresponding relationship:



3.5.52 mf1LaserServiceSetup (0x0156)

Data Type:

Bool

meaning:

When MF1 is configured as a Service, whether to respond to Laser warnings and errors.

default value:

1: on, indicating that MF1 responds to Laser warnings/errors

Data format:

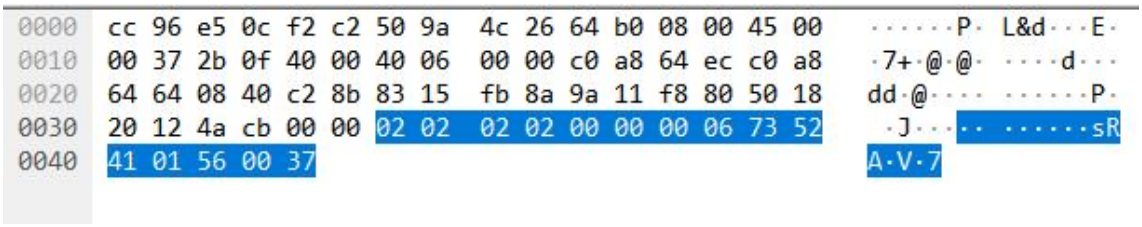
read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 01 56 3f

Read Response:

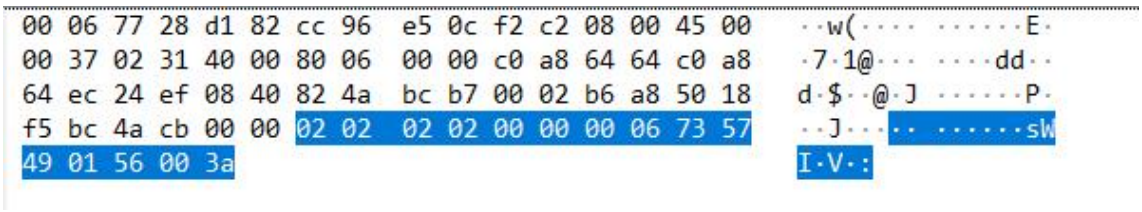
02 02 02 02 00 00 00 06 73 52 41 01 56 00 37



Write

Write Request

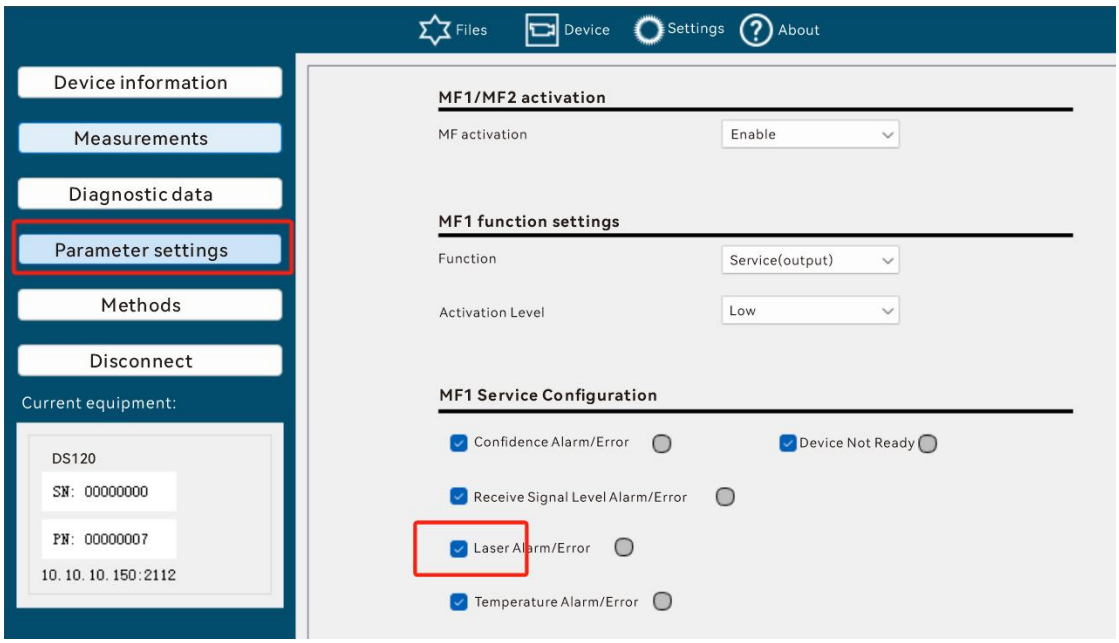
02 02 02 02 00 00 00 06 73 57 49 01 56 00 3a



Write Response

02 02 02 02 00 00 00 05 73 57 41 01 56 32

DADISICK corresponding relationship:



3.5.53 mf1LevelServiceSetup (0x0157)

Data Type:

Bool

meaning:

When MF1 is configured as a Service, whether to respond to Level warnings and errors.

default value:

1: on, indicating that MF1 responds to Level warning/error

Data format:

read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 01 57 3e

Read Response:

02 02 02 02 00 00 00 06 73 52 41 01 57 00 36

```
0000  cc 96 e5 0c f2 c2 50 9a  4c 26 64 b0 08 00 45 00   ......P. L&d...E.
0010  00 37 2b 5e 40 00 40 06  00 00 c0 a8 64 ec c0 a8   .7+^@.@. ....d...
0020  64 64 08 40 c2 8b 83 16  01 a0 9a 11 fc d2 50 18   dd.@.... ......P.
0030  20 13 4a cb 00 00 02 02  02 02 00 00 00 06 73 52    .J..... ......sR
0040  41 01 57 00 36                                     A.W.6
```

Write

Write Request

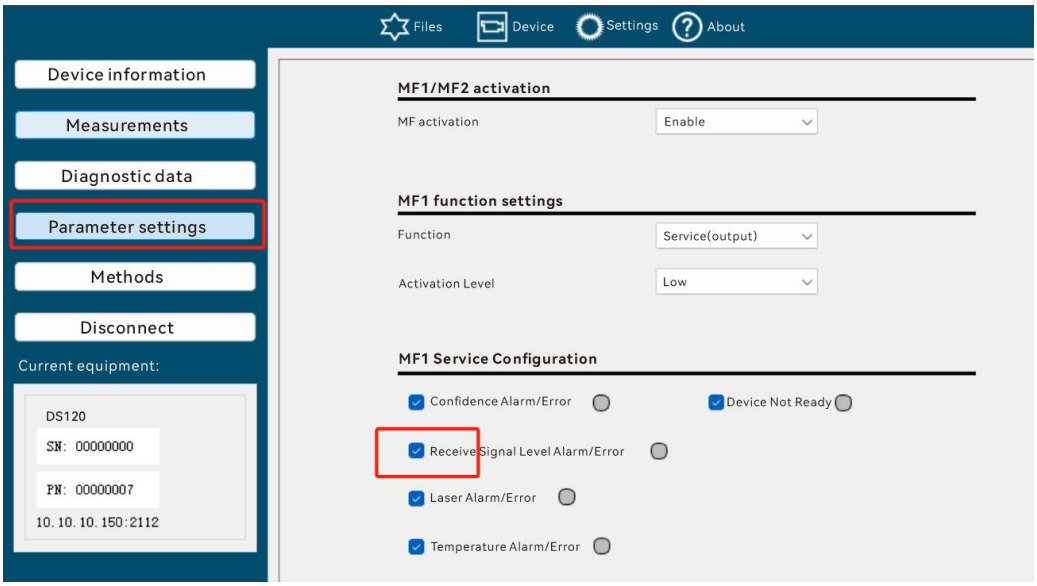
02 02 02 02 00 00 00 06 73 57 49 01 57 00 3b

```
00 06 77 28 d1 82 cc 96  e5 0c f2 c2 08 00 45 00    ··w(···· ·····E·
00 37 c2 79 40 00 80 06  00 00 c0 a8 64 64 c0 a8    ·7·y@··· ····dd··
64 ec 24 ef 08 40 82 48  fe ae 00 00 bd 77 50 18    d·$··@·H ·····wP·
f5 6b 4a cb 00 00 02 02  02 02 00 00 00 06 73 57    ·kJ····· ·····sW
49 01 57 00 3b                                      I·W·;
```

Write Response

02 02 02 02 00 00 00 05 73 57 41 01 57 33

DADISICK corresponding relationship:



3.5.54 mf1TempServiceSetup (0x0158)

Data Type:

Bool

meaning:

When MF1 is configured as a Service, whether to respond to Temperature warnings and errors.

default value:

1: on, indicating that MF1 responds to Temperature warning/error

Data format:

read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 01 58 31

Read Response:

02 02 02 02 00 00 00 06 73 52 41 01 58 00 39

```
0000  cc 96 e5 0c f2 c2 50 9a  4c 26 64 b0 08 00 45 00   ......P· L&d···E·
0010  00 37 2a 73 40 00 40 06  00 00 c0 a8 64 ec c0 a8   ·7*s@·@· ····d···
0020  64 64 08 40 c2 8b 83 15  e8 bb 9a 11 ef f8 50 18   dd·@···· ......P·
0030  03 fe 4a cb 00 00 02 02  02 02 00 00 00 06 73 52   ··J····· ......sR
0040  41 01 58 00 39                                    A·X·9
```

Write

Write Request

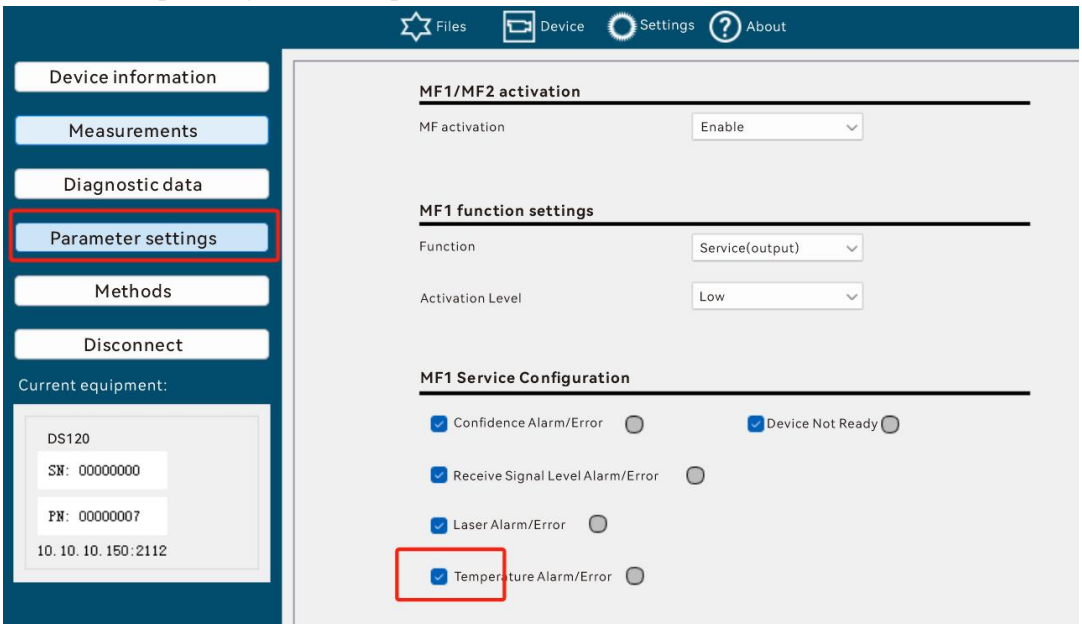
02 02 02 02 00 00 00 06 73 57 49 01 58 00 34

```
00 06 77 28 d1 82 cc 96  e5 0c f2 c2 08 00 45 00   ··w(···· ......E·
00 37 07 8f 40 00 80 06  00 00 c0 a8 64 64 c0 a8   ·7··@··· ····dd··
64 ec 24 ef 08 40 82 4a  e2 4a 00 02 e1 34 50 18   d·$··@·J ·J···4P·
f9 22 4a cb 00 00 02 02  02 02 00 00 00 06 73 57   ·"J····· ......sW
49 01 58 00 34                                     I·X·4
```

Write Response

02 02 02 02 00 00 00 05 73 57 41 01 58 3c

DADISICK corresponding relationship:



3.5.55 mf1PlausibServiceSetup (0x0159)

Data Type:

Bool

meaning:

Whether to respond to Plausibility warnings/errors when MF1 is configured as a Service.

default value:

1: on, MF1 responds to Plausibility warnings/errors

Data format:

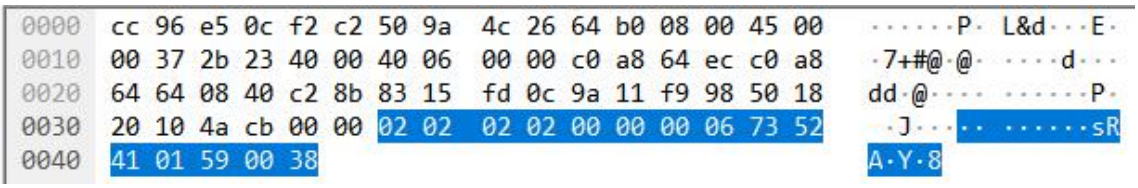
read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 01 59 30

Read Response:

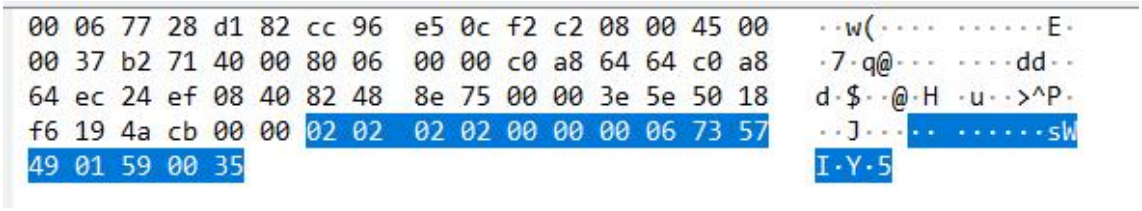
02 02 02 02 00 00 00 06 73 52 41 01 59 00 38



Write

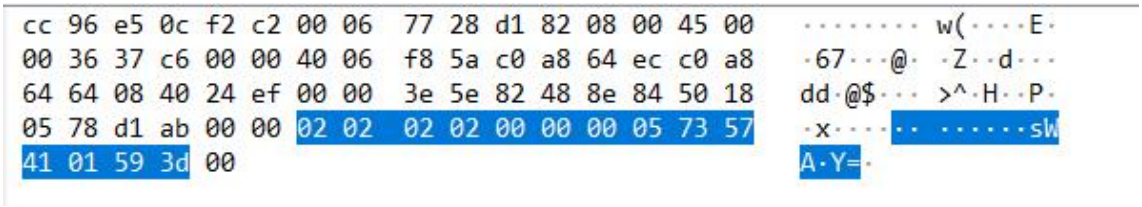
Write Request

02 02 02 02 00 00 00 06 73 57 49 01 59 00 35

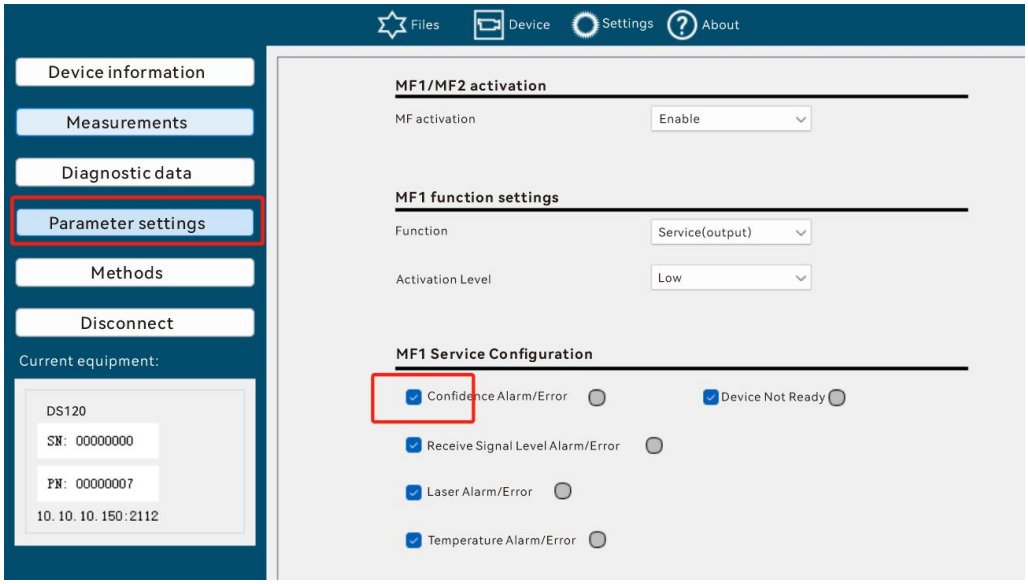


Write Response

02 02 02 02 00 00 00 05 73 57 41 01 59 3d



DADISICK corresponding relationship:



3.5.56 mf1ReadyServiceSetup (0x015a)

Data Type:

Bool

meaning:

Whether to respond to DeviceNotReady warnings when MF1 is configured as a Service.

default value:

1: on, indicating that MF1 responds to TemperatDeviceNotReadyure warning/error

Data format:

read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 01 5a 33

Read Response:

02 02 02 02 00 00 00 06 73 52 41 01 5a 00 3b

```
0000  cc 96 e5 0c f2 c2 50 9a  4c 26 64 b0 08 00 45 00   ......P. L&d...E.
0010  00 37 2a b4 40 00 40 06  00 00 c0 a8 64 ec c0 a8   .7*.@.@. ....d...
0020  64 64 08 40 c2 8b 83 15  ef e2 9a 11 f3 86 50 18   dd.@.... ......P.
0030  04 00 4a cb 00 00 02 02  02 02 00 00 00 06 73 52   ..J..... ......sR
0040  41 01 5a 00 3b                                    A.Z.;
```

Write

Write Request

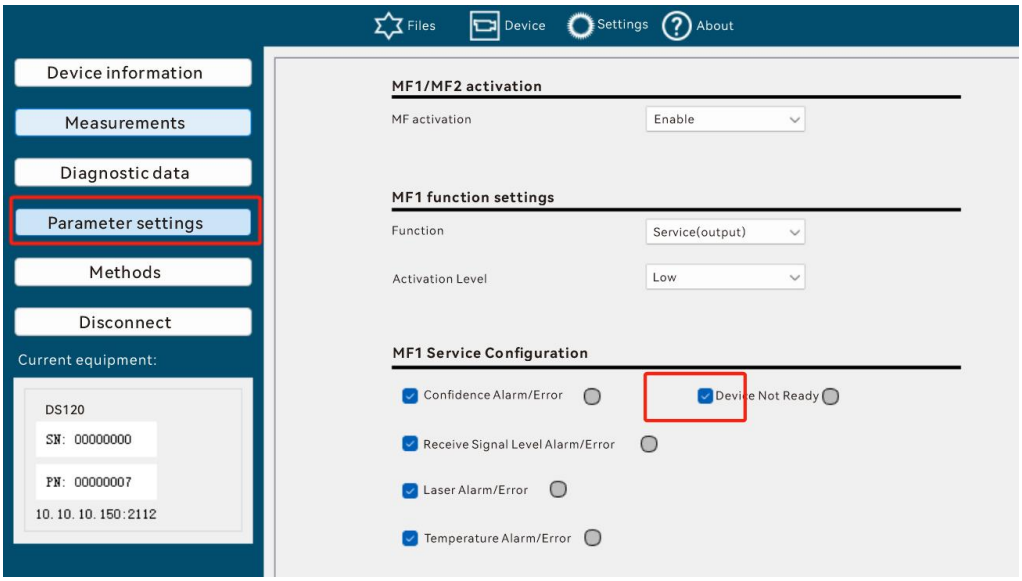
02 02 02 02 00 00 00 06 73 57 49 01 5a 00 36

```
00 06 77 28 d1 82 cc 96  e5 0c f2 c2 08 00 45 00   ··w(···· ·····E·
00 37 0d f7 40 00 80 06  00 00 c0 a8 64 64 c0 a8   ·7··@··· ····dd··
64 ec 24 ef 08 40 82 4b  0f 23 00 03 13 fd 50 18   d·$··@·K ·#····P·
fa 12 4a cb 00 00 02 02  02 02 00 00 00 06 73 57   ··J····· ······sW
49 01 5a 00 36                                     I·Z·6
```

Write Response

02 02 02 02 00 00 00 05 73 57 41 01 5a 3e

DADISICK corresponding relationship:



3.5.57 mf1switchCounter (0x015c)

Data Type:

UInt32

meaning:

Number of MF1 excitations.

Data format:

read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 01 5c 35

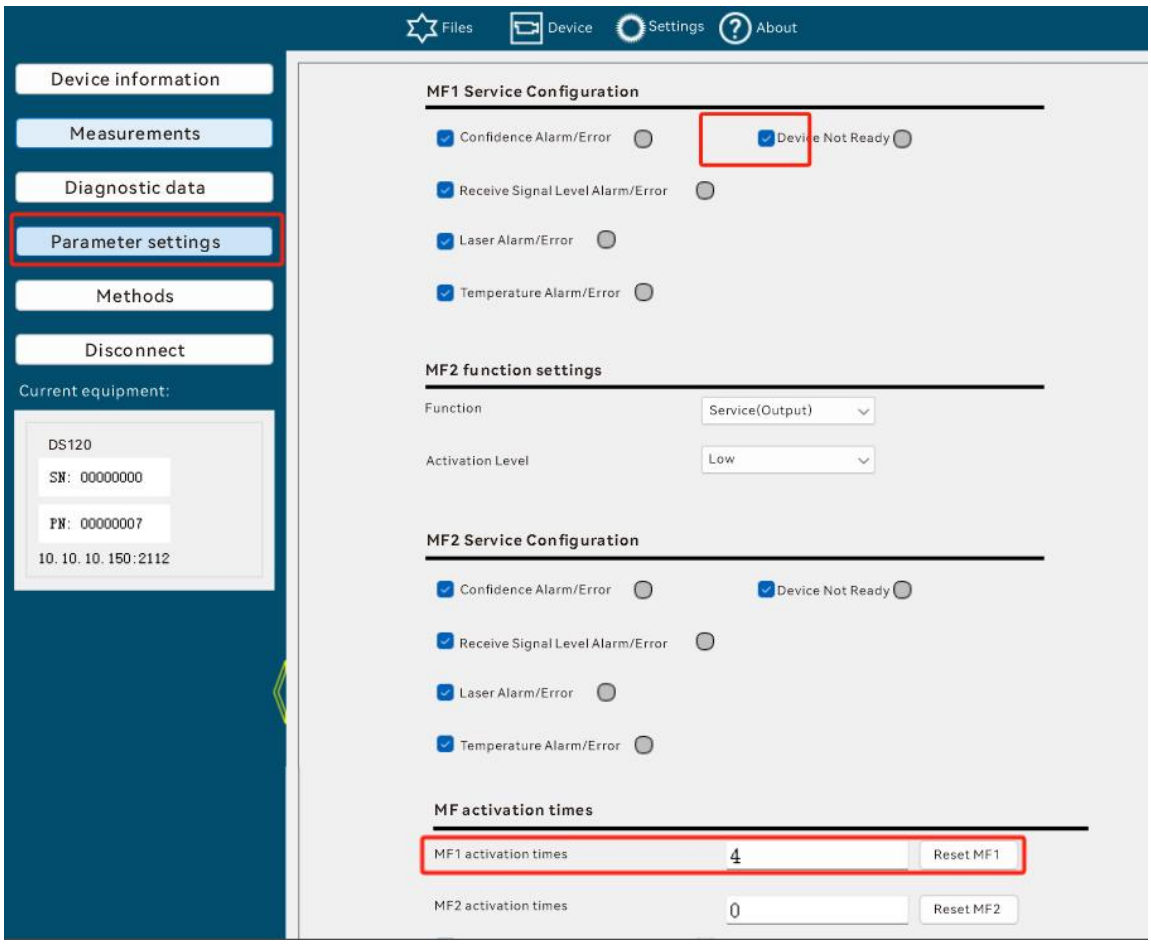
Read Response:

02 02 02 02 00 00 00 09 73 52 41 01 5c 00 00 00 04 39

```
0000  cc 96 e5 0c f2 c2 00 06  77 28 e0 11 08 00 45 00   ······ w(····E·
0010  00 3a 11 9f 00 00 40 06  1e 7e c0 a8 64 ec c0 a8   ·:····@· ·~··d···
0020  64 64 08 40 04 56 00 13  e8 ea d2 e6 ad 9d 50 18   dd·@·V·· ····· P·
0030  05 78 d0 ee 00 00 02 02  02 02 00 00 00 09 73 52   ·x····· ····· sR
0040  41 01 5c 00 00 00 04 39  30                       A·\····9 0
```

Not writable

DADISICK corresponding relationship:



3.5.58 thresholdDistanceMF2(0x015d)

Data Type:

Int32

meaning:

MF2 is configured as a distance alarm, and the switching threshold of the distance value

Setting range: –300,000 ... +300,000 [mm]

Unit: [mm]

default value:

Factory setting: 1,990 [mm]

Data format:

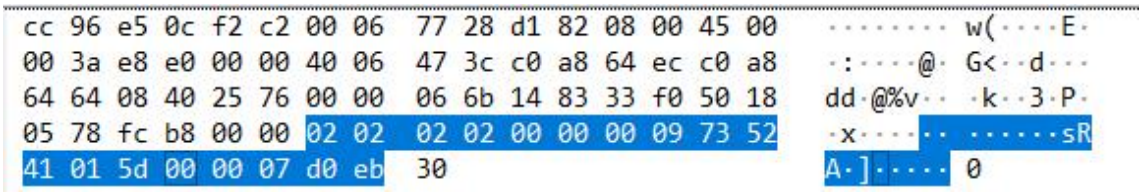
read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 01 5d 34

Read Response:

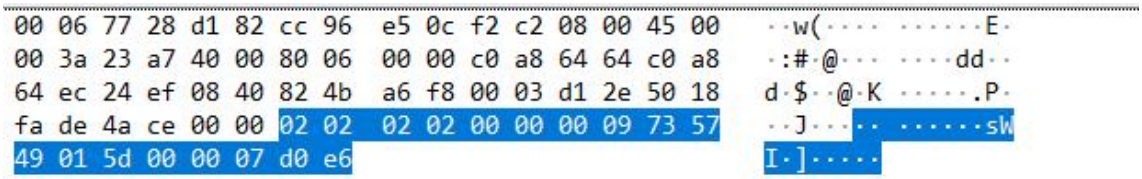
02 02 02 02 00 00 00 09 73 52 41 01 5d 00 00 07 d0 eb



Write

Write Request

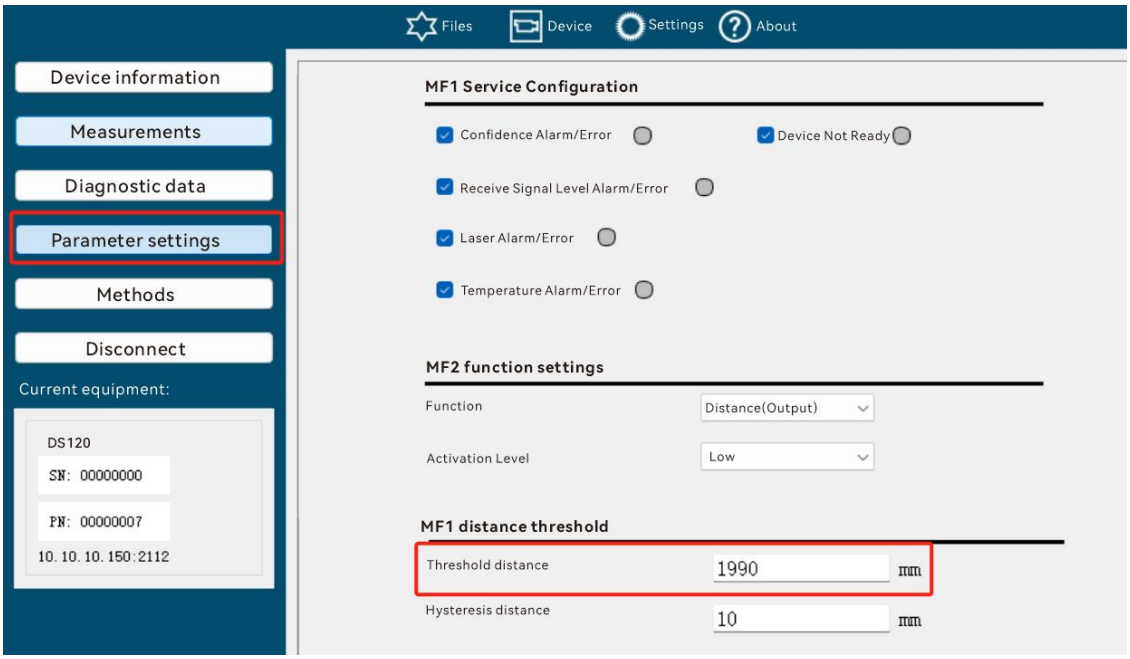
02 02 02 02 00 00 00 09 73 57 49 01 5d 00 00 07 d0 e6



Write Response

02 02 02 02 00 00 00 05 73 57 41 01 5d 39

DADISICK corresponding relationship:



3.5.59 hysteresisDistanceMF2(0x015e)

Data Type:

Int32

meaning:

Distance switch threshold hysteresis

Setting range: 1… +300,000 [mm]

Unit: [mm]

default value:

10[mm]

Data format:

read

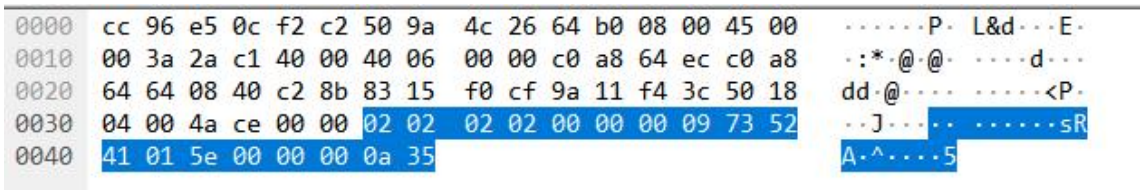
Read Request:

02 02 02 02 00 00 00 05 73 52 49 01 5e 37

Read Response:

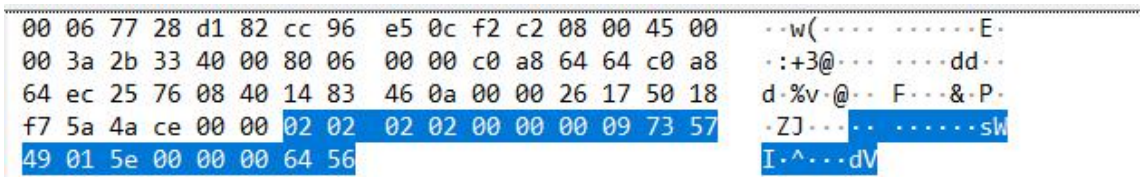
02 02 02 02 00 00 00 09 73 52 41 01 5e 00 00 00

0a 35



Write

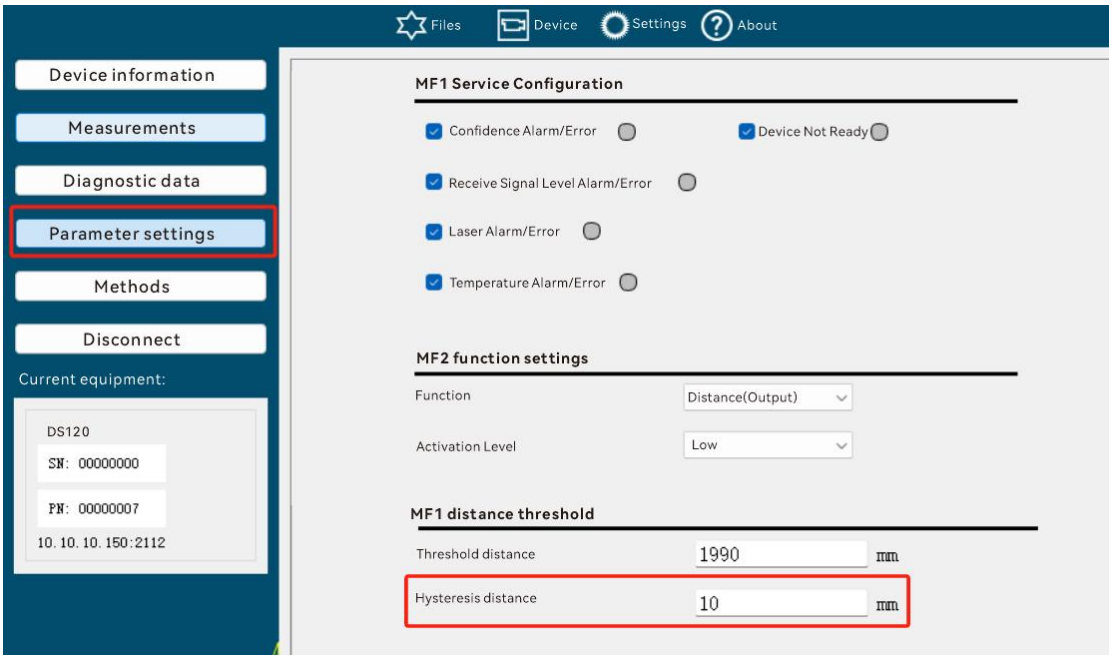
Write Request



Write Response

02 02 02 02 00 00 00 05 73 57 41 01 5e 3a

DADISICK corresponding relationship:



3.5.60 thresholdVelocityMF2 (0x015f)

Data Type:

UInt16

meaning:

When MF2 is set to speed excitation, the excitation threshold

Setting range: 50 … 15,000 [mm/s]

The switching hysteresis is fixed to 100 mm/s

Unit: [mm/s]

default value:

Factory setting: 5,000 [mm/s]

Data format:

read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 01 5f 36

Read Response:

02 02 02 02 00 00 00 07 73 52 41 01 5f 0f a0 91

```
cc 96 e5 0c f2 c2 00 06  77 28 d1 82 08 00 45 00   ........ w(....E.
00 38 fd a9 00 00 40 06  32 75 c0 a8 64 ec c0 a8   .8....@. 2u..d...
64 64 08 40 25 a4 00 00  06 39 40 18 a4 63 50 18   dd.@%... .9@..cP.
05 78 8f 0a 00 00 02 02  02 02 00 00 00 07 73 52   .x...... ......sR
41 01 5f 0f a0 91 00                               A._....
```

Write

Write Request

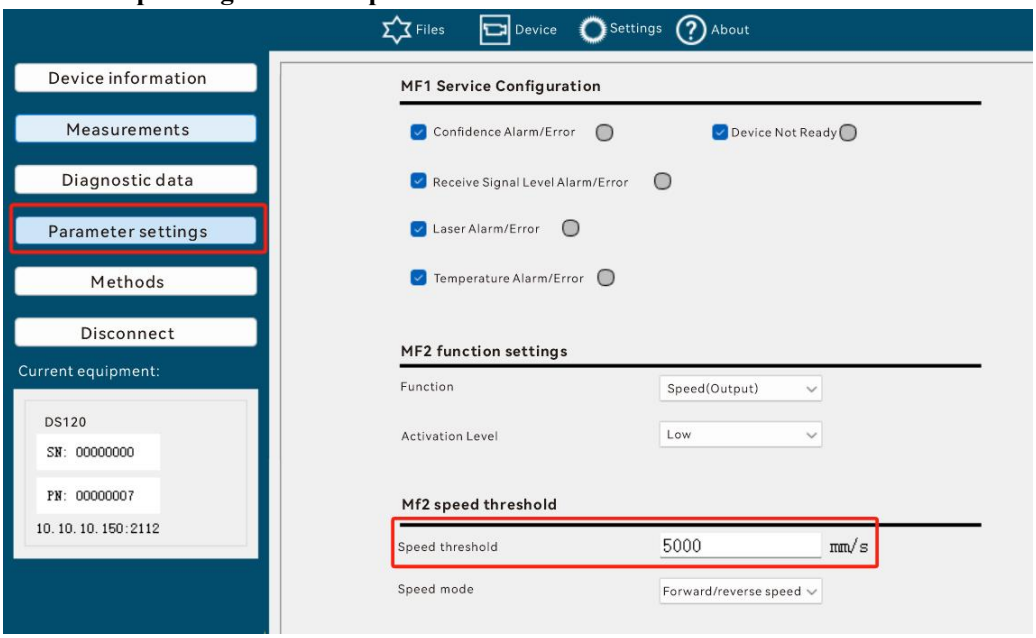
02 02 02 02 00 00 00 07 73 57 49 01 5f 0f a0 9c

```
00 06 77 28 d1 82 cc 96  e5 0c f2 c2 08 00 45 00   ..w(.... ......E.
00 38 2f ab 40 00 80 06  00 00 c0 a8 64 64 c0 a8   .8/.@... ....dd..
64 ec 25 76 08 40 14 83  65 57 00 00 4e 47 50 18   d.%v.@.. eW..NGP.
f7 7e 4a cc 00 00 02 02  02 02 00 00 00 07 73 57   .~J..... ......sW
49 01 5f 0f a0 9c                                  I._...
```

Write Response

02 02 02 02 00 00 00 05 73 57 41 01 5f 3b

DADISICK corresponding relationship:



3.5.61 velocityModeMF2 (0x0160)

Data Type:

UInt8

meaning:

When set to velocity excitation, is it forward velocity excitation, reverse velocity excitation, or bidirectional excitation?

```
        * 0: increasing
        * 1: decreasing
        * 2: in-/decreasing
```

default value:

Factory setting: 2 + / – (bidirectional excitation)

Data format:

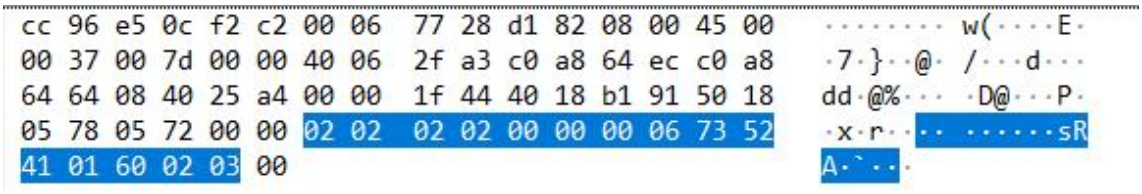
read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 01 60 09

Read Response:

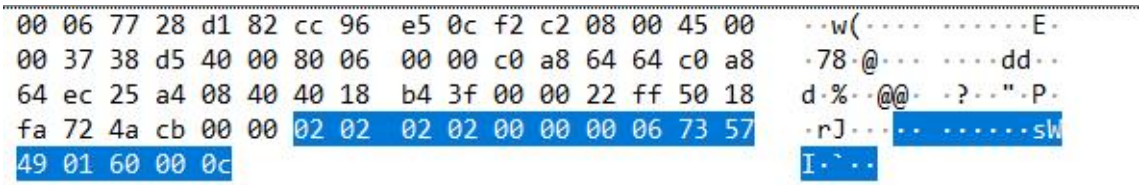
02 02 02 02 00 00 00 06 73 52 41 01 60 02 03



Write

Write Request

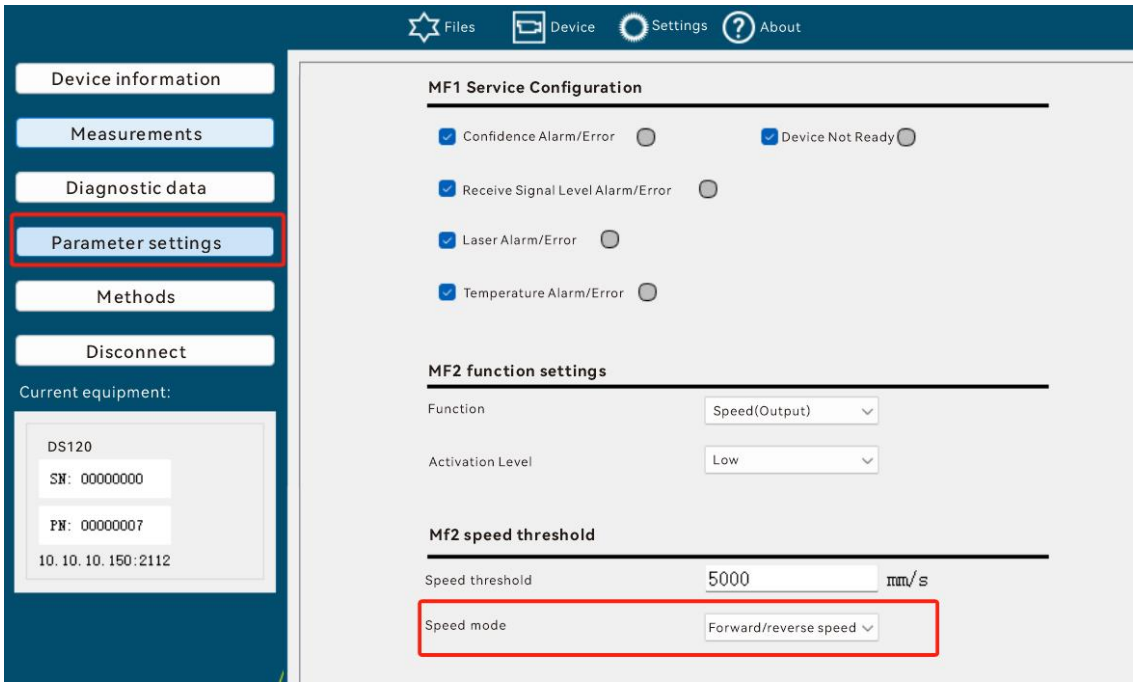
02 02 02 02 00 00 00 06 73 57 49 01 60 00 0c



Write Response

02 02 02 02 00 00 00 05 73 57 41 01 60 04

DADISICK corresponding relationship:



3.5.62 mf2LaserServiceSetup (0x0161)

Data Type:

Bool

meaning:

Whether to respond to Laser warnings/errors when MF2 is configured as a service.

default value:

1: on, indicating that MF2 responds to Laser warnings/errors

Data format:

read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 01 61 08

Read Response:

02 02 02 02 00 00 00 06 73 52 41 01 61 00 00

```
0000  cc 96 e5 0c f2 c2 50 9a  4c 26 64 b0 08 00 45 00   ......P· L&d···E·
0010  00 37 2b 3f 40 00 40 06  00 00 c0 a8 64 ec c0 a8   ·7+?@·@· ····d···
0020  64 64 08 40 c2 8b 83 15  ff 04 9a 11 fb 20 50 18   dd·@···· ····· P·
0030  20 0f 4a cb 00 00 02 02  02 02 00 00 00 06 73 52    ·J····· ·····sR
0040  41 01 61 00 00                                     A·a··
```

Write

Write Request

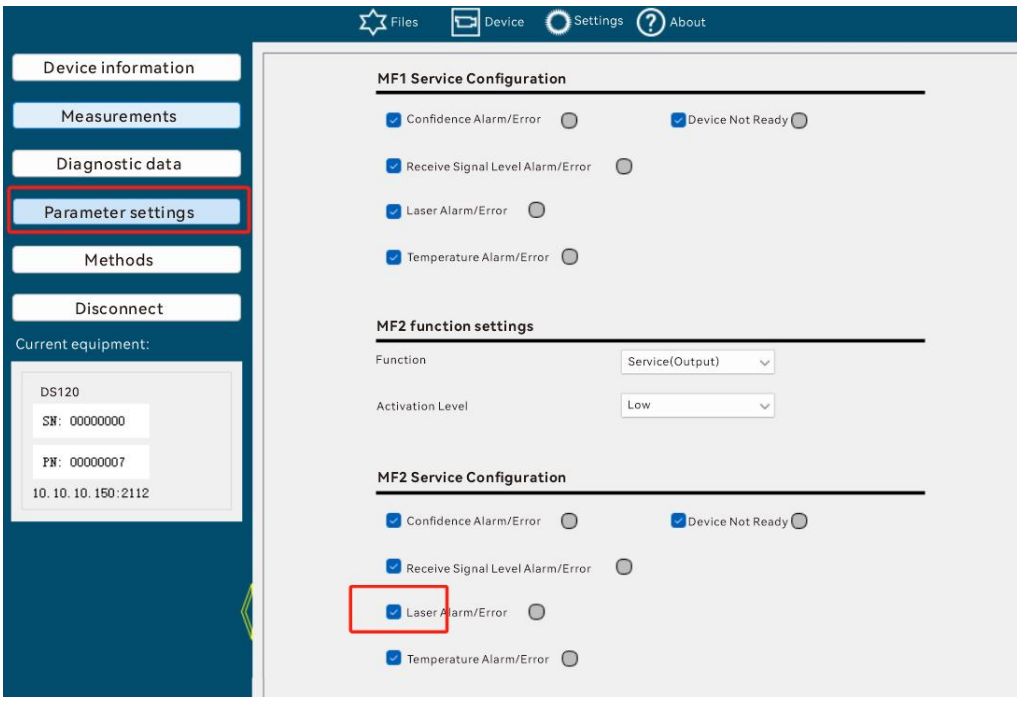
02 02 02 02 00 00 00 06 73 57 49 01 61 00 0d

```
00 06 77 28 d1 82 cc 96  e5 0c f2 c2 08 00 45 00   ··w(···· ·····E·
00 37 fd 2d 40 00 80 06  00 00 c0 a8 64 64 c0 a8   ·7·-@··· ····dd··
64 ec 25 a4 08 40 40 1e  12 ab 00 06 3b e2 50 18   d·%··@@· ····;·P·
f6 79 4a cb 00 00 02 02  02 02 00 00 00 06 73 57   ·yJ····· ·····sW
49 01 61 00 0d                                     I·a··
```

Write Response

02 02 02 02 00 00 00 05 73 57 41 01 61 05

DADISICK corresponding relationship:



3.5.63 mf2LevelServiceSetup (0x0162)

Data Type:

Bool

meaning:

Whether to respond to Level warning/error when MF2 is configured as a service.

default value:

1: on, indicating that MF2 responds to Level warning/error

Data format:

read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 01 62 0b

Read Response:

02 02 02 02 00 00 00 06 73 52 41 01 62 00 03

```
0000  cc 96 e5 0c f2 c2 50 9a  4c 26 64 b0 08 00 45 00   ......P. L&d...E.
0010  00 37 2a e5 40 00 40 06  00 00 c0 a8 64 ec c0 a8   .7*.@.@. ....d...
0020  64 64 08 40 c2 8b 83 15  f4 67 9a 11 f6 34 50 18   dd.@.... .g...4P.
0030  20 14 4a cb 00 00 02 02  02 02 00 00 00 06 73 52    .J..... ......sR
0040  41 01 62 00 03                                     A.b..
```

Write

Write Request

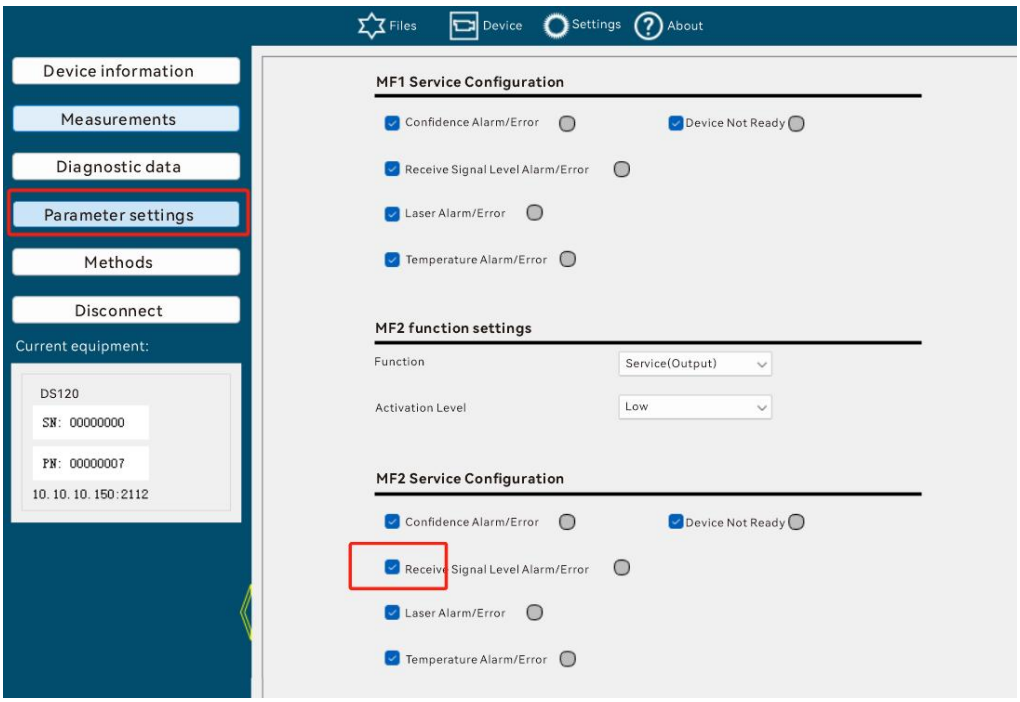
02 02 02 02 00 00 00 06 73 57 49 01 62 00 0e

```
00 06 77 28 d1 82 cc 96  e5 0c f2 c2 08 00 45 00   ..w(.... ......E.
00 37 f8 2f 40 00 80 06  00 00 c0 a8 64 64 c0 a8   .7./@... ....dd..
64 ec 25 a4 08 40 40 1d  ef b8 00 06 14 50 50 18   d.%..@@. .....PP.
f5 da 4a cb 00 00 02 02  02 02 00 00 00 06 73 57   ..J..... ......sW
49 01 62 00 0e                                     I.b..
```

Write Response

02 02 02 02 00 00 00 05 73 57 41 01 62 06

DADISICK corresponding relationship:



3.5.64 mf2TempServiceSetup (0x0163)

Data Type:

Bool

meaning:

Whether to respond to Temperature warnings/errors when MF2 is configured as a service.

default value:

1: on, indicating that MF2 responds to Temperature warning/error

Data format:

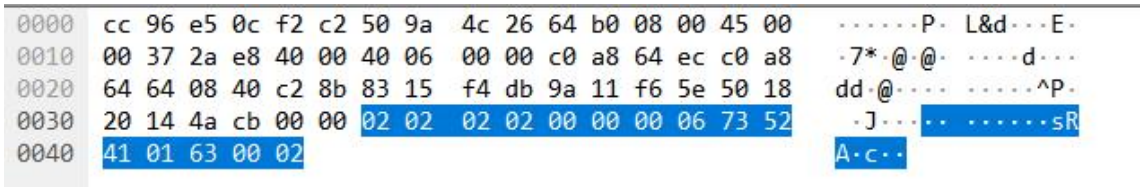
read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 01 63 0a

Read Response:

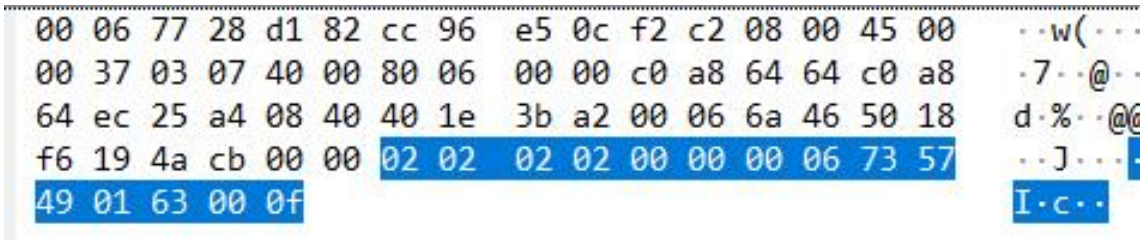
02 02 02 02 00 00 00 06 73 52 41 01 63 00 02



Write

Write Request

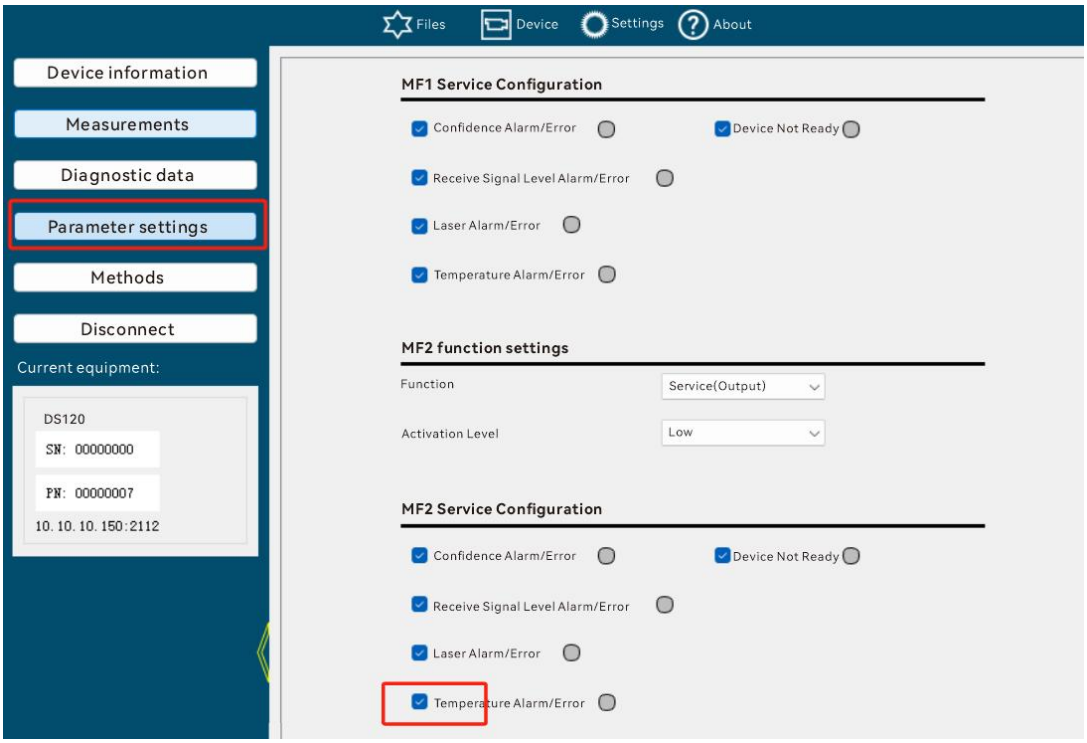
02 02 02 02 00 00 00 06 73 57 49 01 63 00 0f



Write Response

02 02 02 02 00 00 00 05 73 57 41 01 63 07

DADISICK corresponding relationship:



3.5.65 mf2PlausibServiceSetup (0x0164)

Data Type:

Bool

meaning:

Whether to respond to Plausibility warnings/errors when MF2 is configured as a service.

default value:

1: on, MF2 responds to Plausibility warnings/errors

Data format:

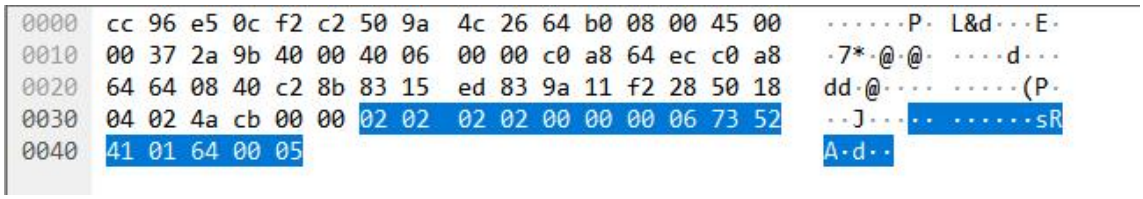
read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 01 64 0d

Read Response:

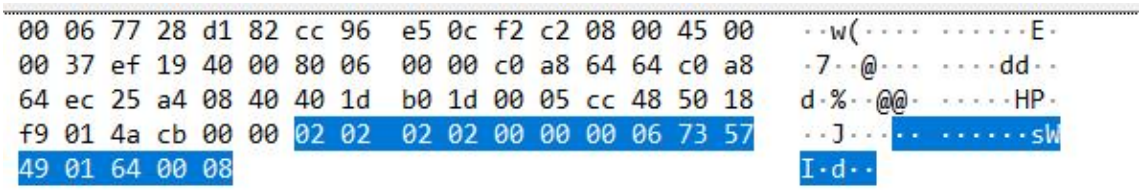
02 02 02 02 00 00 00 06 73 52 41 01 64 00 05



Write

Write Request

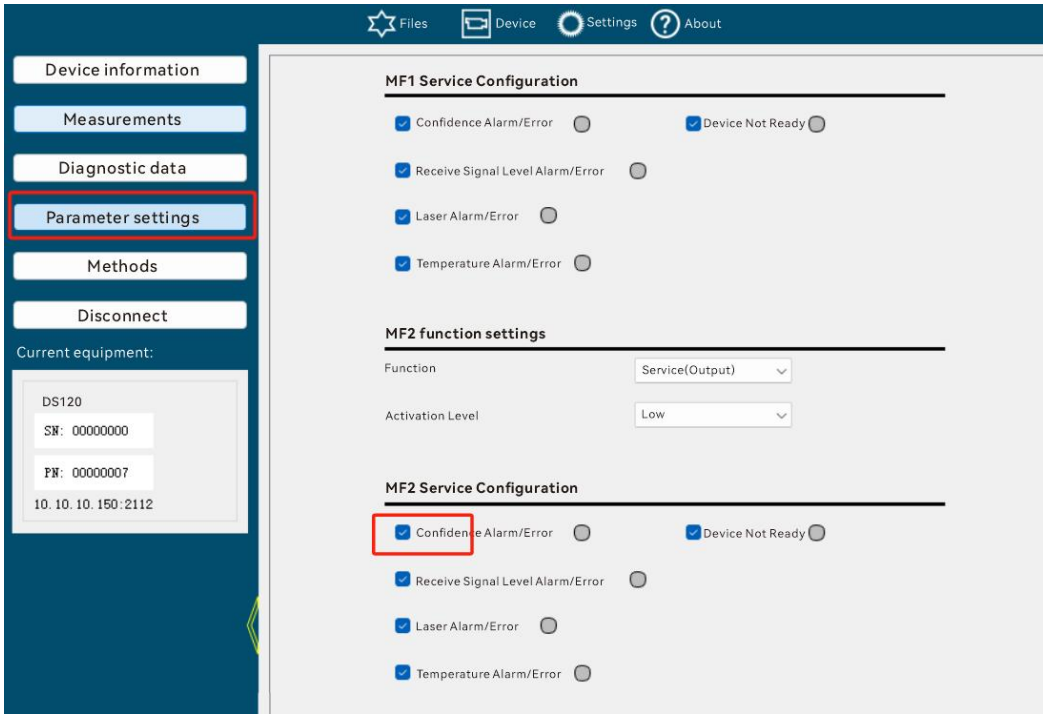
02 02 02 02 00 00 00 06 73 57 49 01 64 00 08



Write Response

02 02 02 02 00 00 00 05 73 57 41 01 64 00

DADISICK corresponding relationship:



3.5.66 mf2ReadyServiceSetup (0x0165)

Data Type:

Bool

meaning:

Whether to respond to DeviceNotReady warnings when MF2 is configured as a service.

default value:

1: on, indicating that MF2 responds to DeviceNotReady warning/error

Data format:

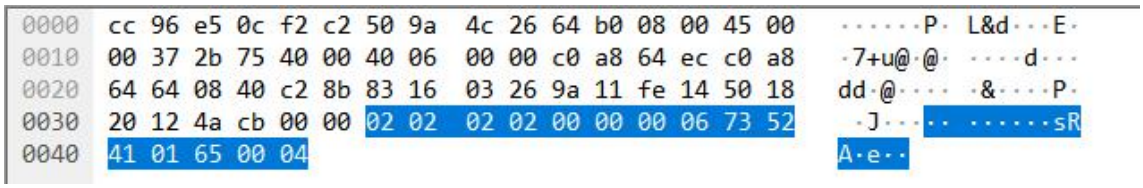
read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 01 65 0c

Read Response:

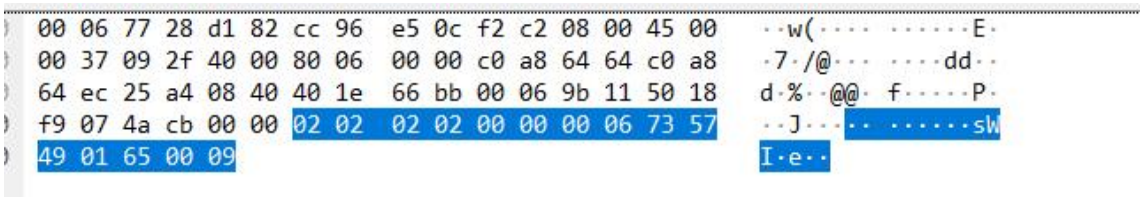
02 02 02 02 00 00 00 06 73 52 41 01 65 00 04



Write

Write Request

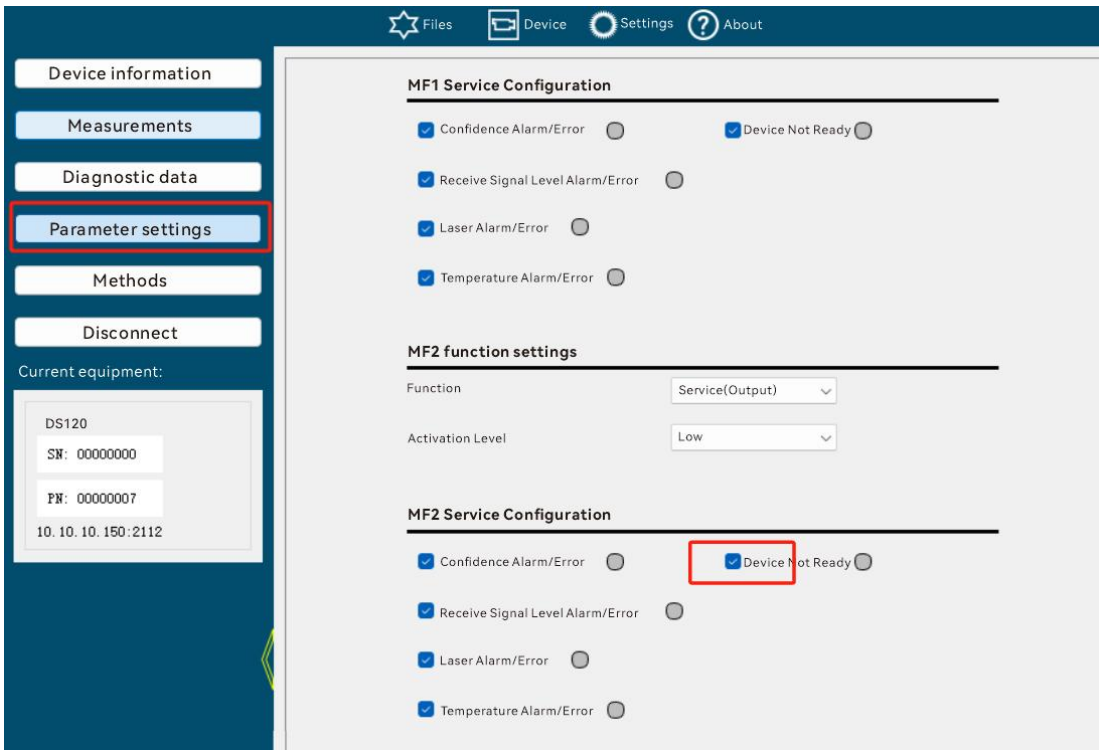
02 02 02 02 00 00 00 06 73 57 49 01 65 00 09



Write Response

02 02 02 02 00 00 00 05 73 57 41 01 65 01

DADISICK corresponding relationship:



3.5.67 mf2switchCounter (0x0167)

Data Type:

UInt32

meaning:

Number of MF2 excitations.

Data format:

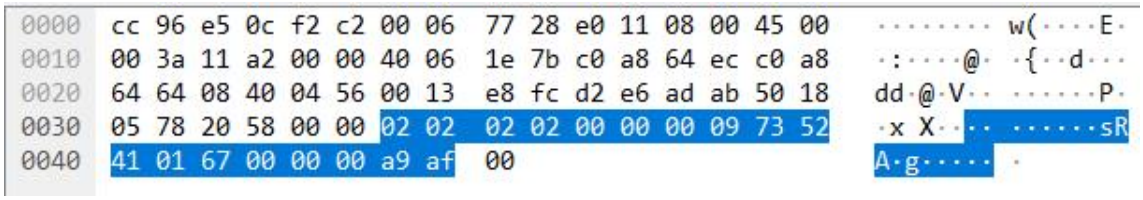
read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 01 67 0e

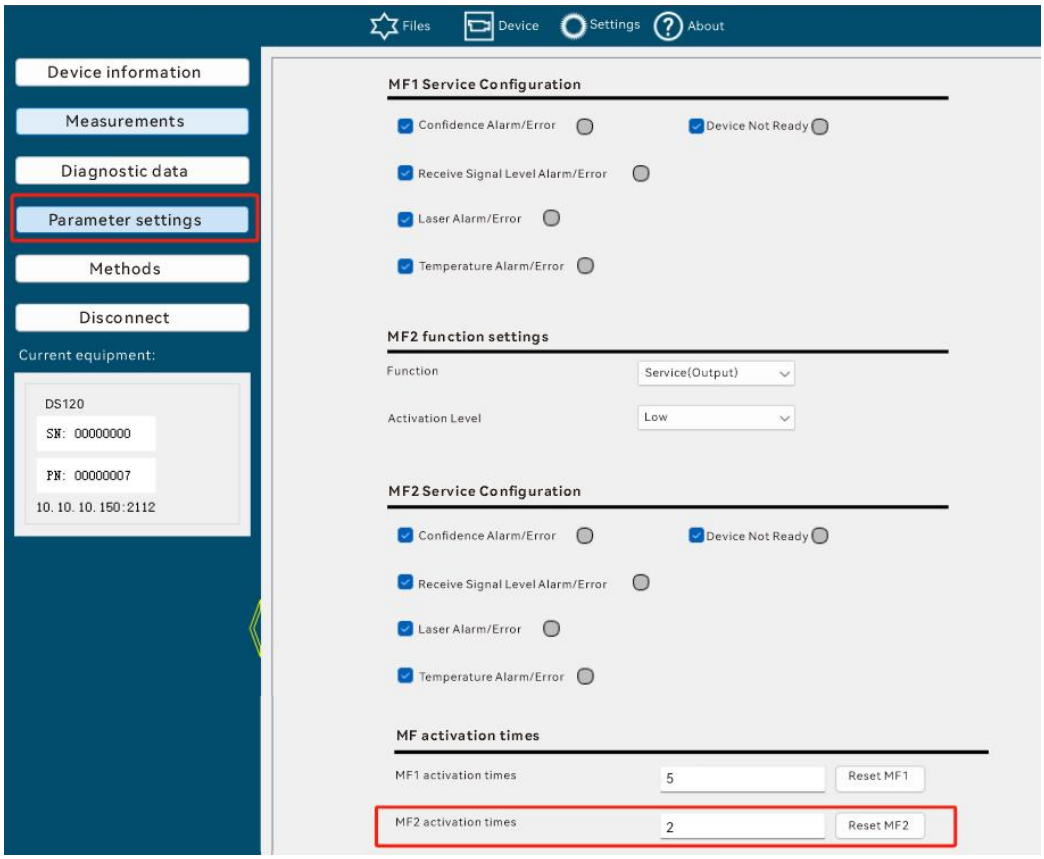
Read Response:

02 02 02 02 00 00 00 09 73 52 41 01 67 00 00 00 a9 af



Not writable

DADISICK corresponding relationship:



3.5.68 averageFilterDistance(0x0168)

Data Type:

UInt8

meaning:

Selecting filter characteristics for distance measurements

0: Fast filtering

1: Medium speed filtering

2: Slow filtering

default value:

1: Medium speed filtering

Data format:

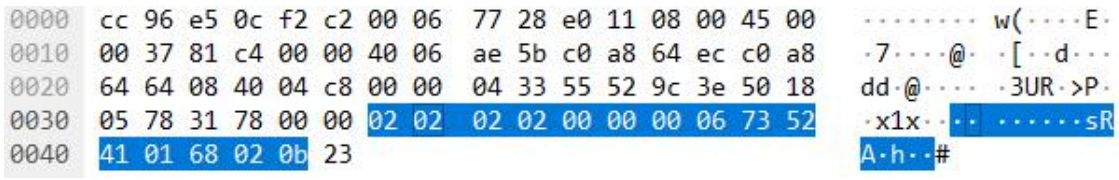
read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 01 68 01

Read Response:

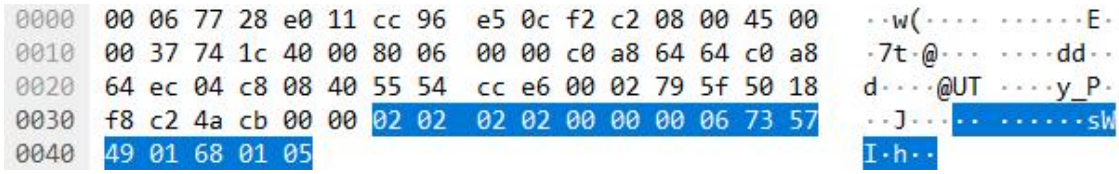
02 02 02 02 00 00 00 06 73 52 41 01 68 02 0b



Write

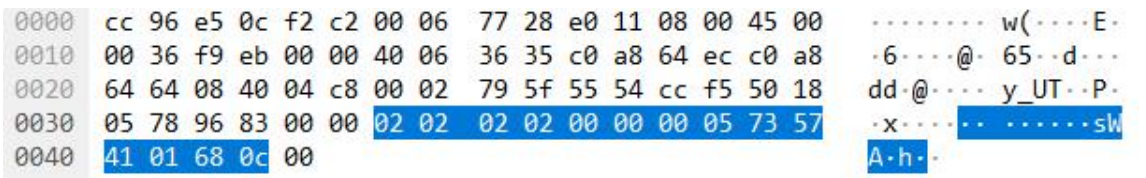
Write Request

02 02 02 02 00 00 00 06 73 57 49 01 68 01 05

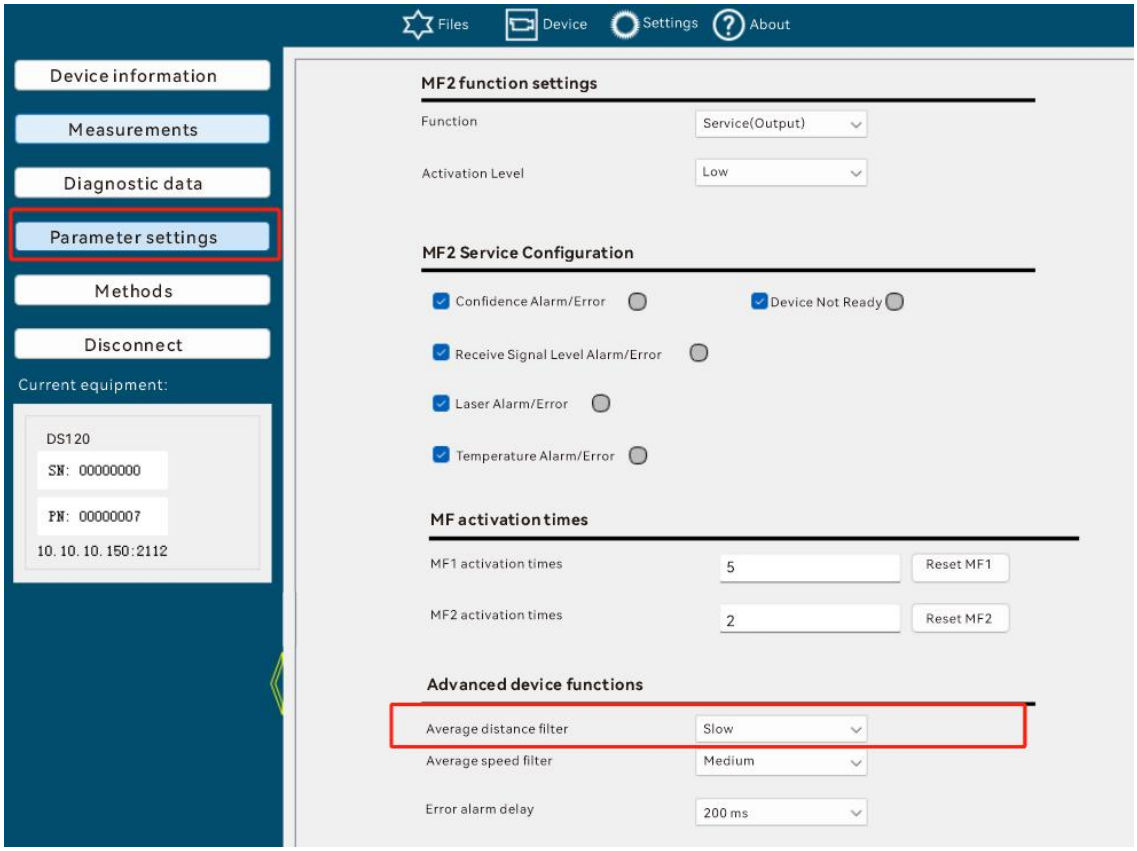


Write Response

02 02 02 02 00 00 00 05 73 57 41 01 68 0c



DADISICK corresponding relationship:



3.5.69 errorRejection(0x016a)

Data Type:

UInt8

meaning:

Select the maximum error suppression time. If a measurement is not possible due to a fault (e.g. a brief light beam interruption), the measured value is extrapolated at most until the end of the set error suppression time. During this time, the WrnPlb plausibility warning is output. If measurement is still not possible after the error suppression time has expired, a measured value of 0, a plausibility error ErrPlb and possibly other faults (eg level error ErrLvl) are output.

0: off

1: 50ms

2: 200ms

default value:

2: 200ms

Data format:

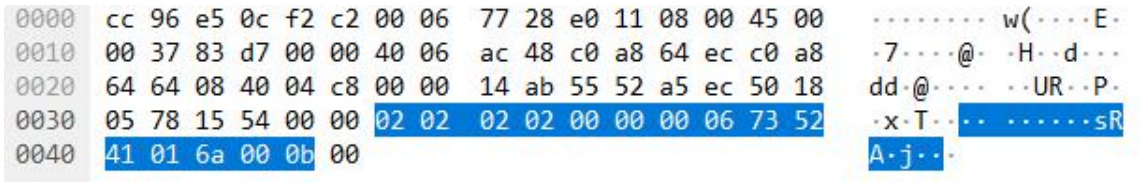
read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 01 6a 03

Read Response:

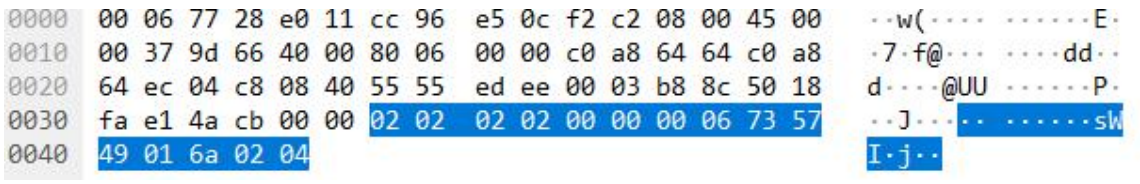
02 02 02 02 00 00 00 06 73 52 41 01 6a 00 0b



Write

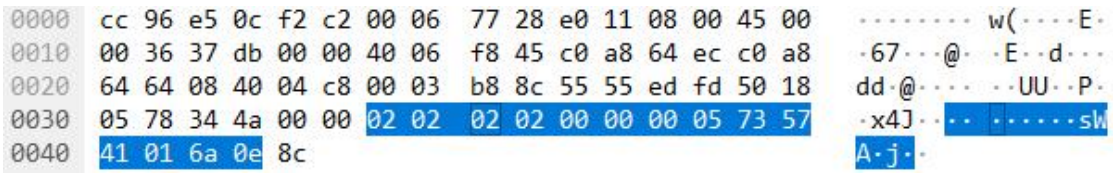
Write Request

02 02 02 02 00 00 00 06 73 57 49 01 6a 02 04

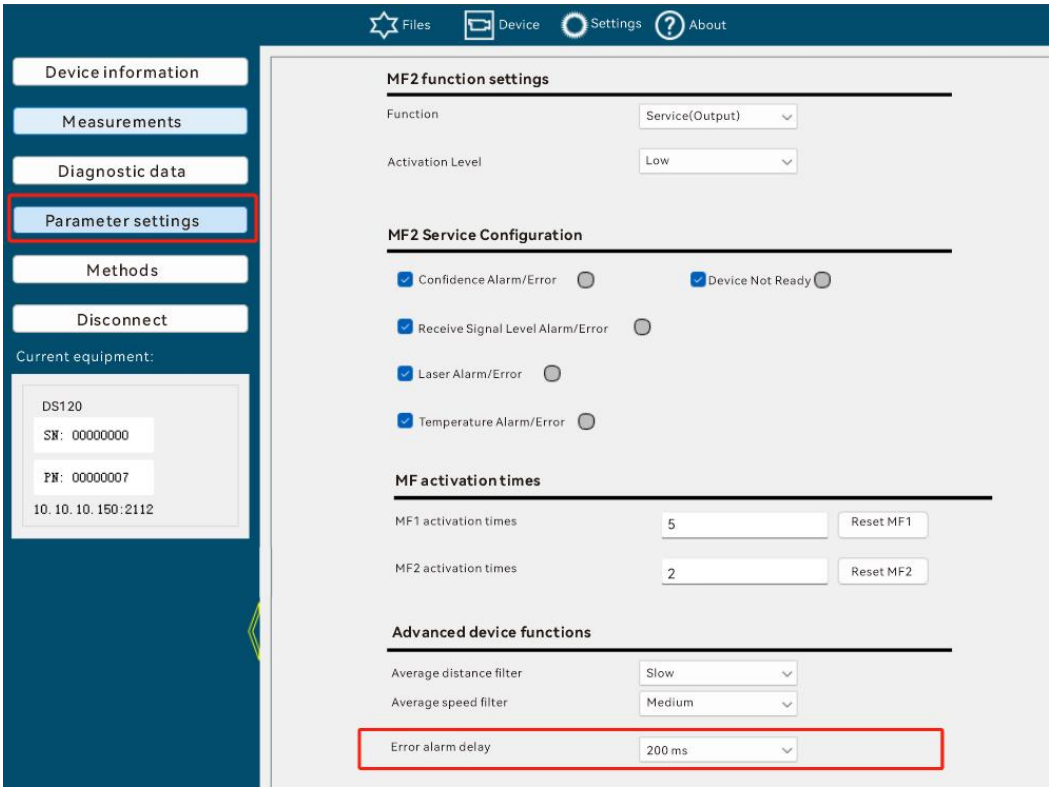


Write Response

02 02 02 02 00 00 00 05 73 57 41 01 6a 0e



DADISICK corresponding relationship:



3.5.70 ssiProtocol (0x016b)

Data Type:

UInt8

meaning:

SSI communication protocol type

*0: twenty four Bit gray + Error(binary)
*1: twenty four Bit gray
*2: 25 Bit gray
*3: twenty four Bit binary + Error(binary)
*4: twenty four Bit binary
*5: 25 Bit binary

default value:

0, indicating Gry24E

Data format:

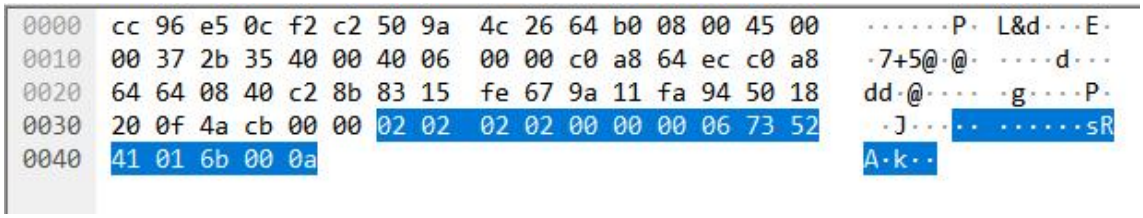
read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 01 6b 02

Read Response:

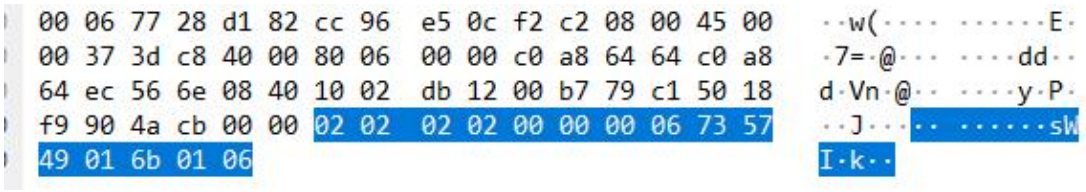
02 02 02 02 00 00 00 06 73 52 41 01 6b 00 0a



Write

Write Request

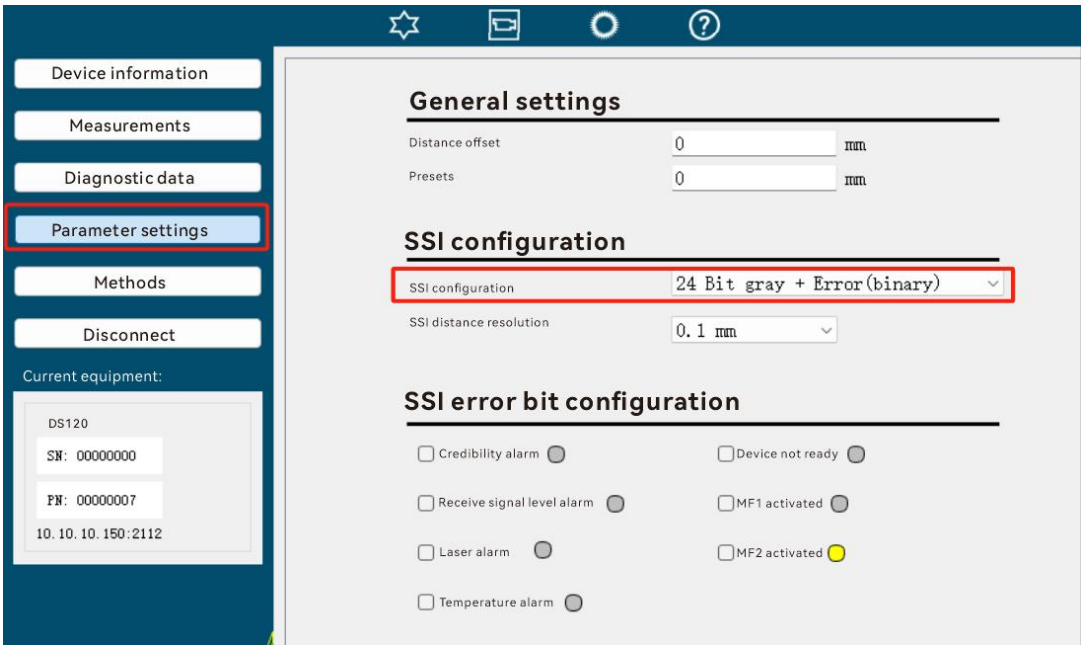
02 02 02 02 00 00 00 06 73 57 49 01 6b 01 06



Write Response

02 02 02 02 00 00 00 05 73 57 41 01 6b 0f

DADISICK corresponding relationship:



3.5.71 ssiResolution (0x016c)

Data Type:

UInt8

meaning:

Select distance resolution

0:0.1mm,
1:0.125mm,
2:1mm,
3:10mm,
4:100mm

default value:

0, means 0.1mm.

Data format:

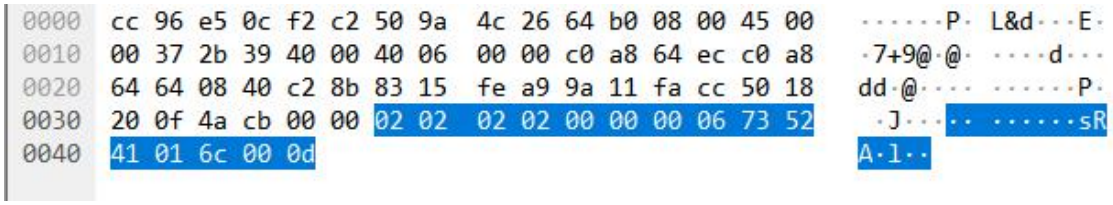
read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 01 6c 05

Read Response:

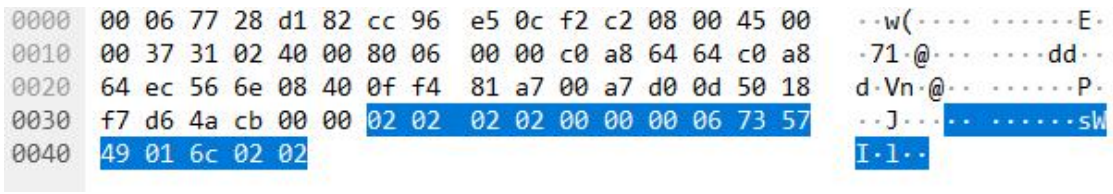
02 02 02 02 00 00 00 06 73 52 41 01 6c 00 0d



Write

Write Request

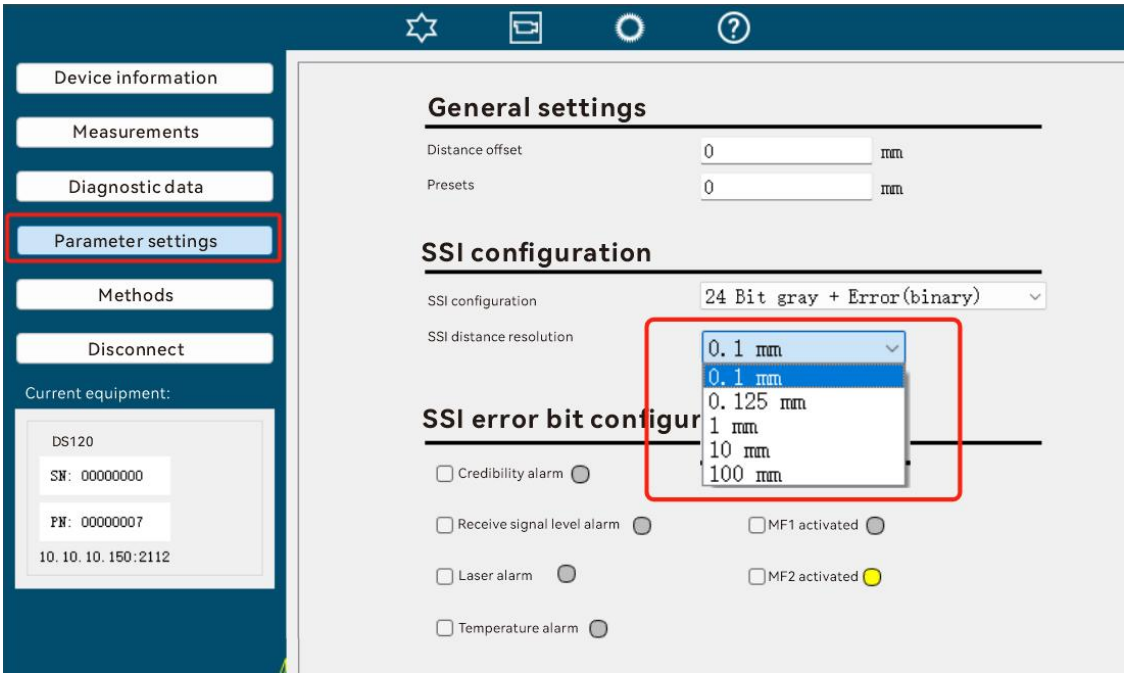
02 02 02 02 00 00 00 06 73 57 49 01 6c 02 02



Write Response

02 02 02 02 00 00 00 05 73 57 41 01 6c 08

DADISICK corresponding relationship:



3.5.72 ssiLaserServiceSetup (0x016d)

Data Type:

Bool

meaning:

SSI error code configuration, whether to alarm when there is LaserWarning.

Data format:

default value:

0

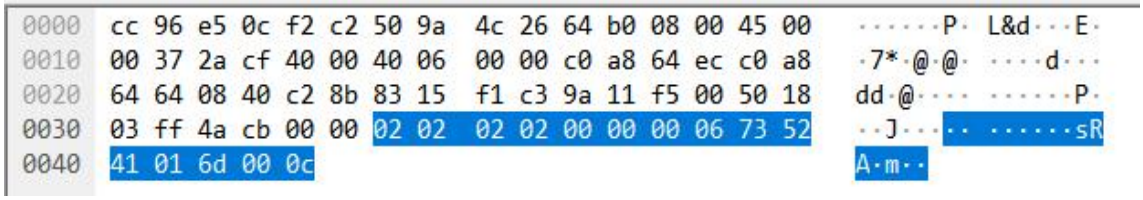
read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 01 6d 04

Read Response:

02 02 02 02 00 00 00 06 73 52 41 01 6d 00 0c



Write

Write Request

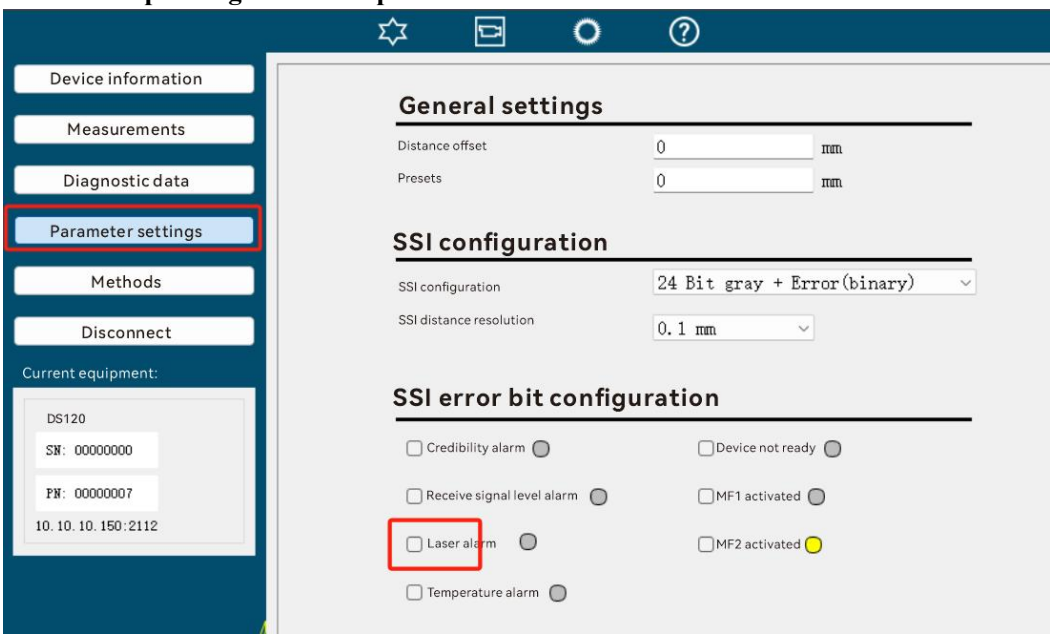
02 02 02 02 00 00 00 06 73 57 49 01 6d 01 00

```
00 06 77 28 d1 82 cc 96  e5 0c f2 c2 08 00 45 00   ··w(···· ·····E·
00 37 c8 34 40 00 80 06  00 00 c0 a8 64 64 c0 a8   ·7·4@··· ····dd··
64 ec 56 6e 08 40 10 0d  a4 0d 00 c3 41 56 50 18   d·Vn·@·· ····AVP·
fa 27 4a cb 00 00 02 02  02 02 00 00 00 06 73 57   ·'J····· ······sW
49 01 6d 01 00                                     I·m··
```

Write Response

02 02 02 02 00 00 00 05 73 57 41 01 6d 09

DADISICK corresponding relationship:



3.5.73 ssiTemperatureServiceSetup (0x016e)

Data Type:

Bool

meaning:

SSI error code configuration, whether to alarm when there is a TemperatureWarning.

default value:

0

Data format:

read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 01 6e 07

Read Response:

02 02 02 02 00 00 00 06 73 52 41 01 6e 00 0f

```
0000  cc 96 e5 0c f2 c2 50 9a  4c 26 64 b0 08 00 45 00   ......P. L&d...E.
0010  00 37 2b 83 40 00 40 06  00 00 c0 a8 64 ec c0 a8   .7+.@.@. ....d...
0020  64 64 08 40 c2 8b 83 16  04 37 9a 11 fe d8 50 18   dd.@.... .7....P.
0030  20 11 4a cb 00 00 02 02  02 02 00 00 00 06 73 52    .J..... ......sR
0040  41 01 6e 00 0f                                    A.n..
```

Write

Write Request

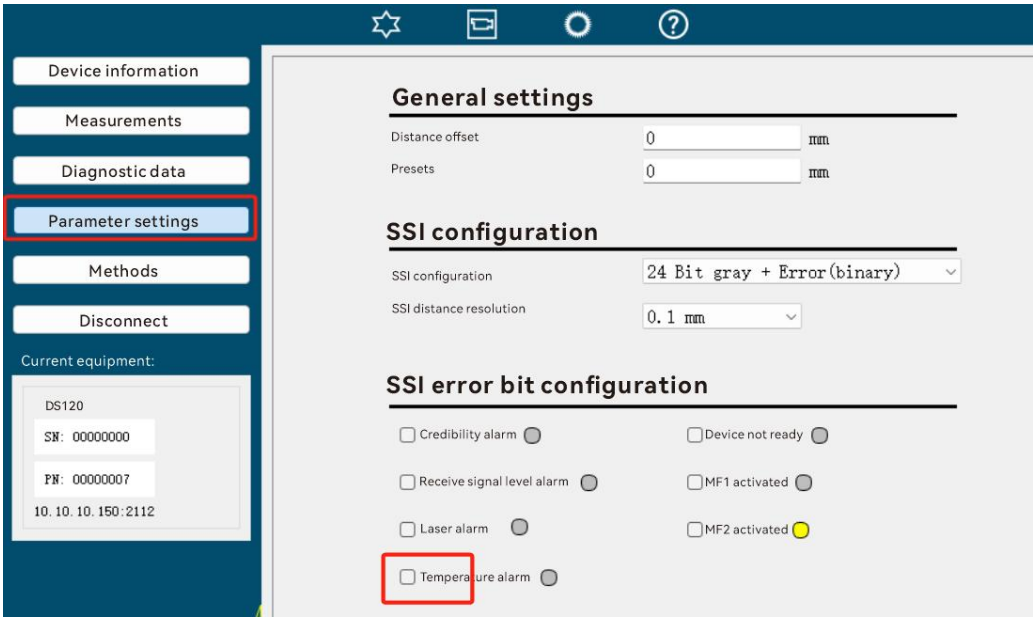
02 02 02 02 00 00 00 06 73 57 49 01 6e 01 03

```
00 06 77 28 d1 82 cc 96  e5 0c f2 c2 08 00 45 00   ..w(.... ......E.
00 37 e7 18 40 00 80 06  00 00 c0 a8 64 64 c0 a8   .7..@... ....dd..
64 ec 56 6e 08 40 10 0e  7c 4a 00 c4 2d 5d 50 18   d.Vn.@.. |J..-]P.
f9 18 4a cb 00 00 02 02  02 02 00 00 00 06 73 57   ..J..... ......sW
49 01 6e 01 03                                     I.n..
```

Write Response

02 02 02 02 00 00 00 05 73 57 41 01 6e 0a

DADISICK corresponding relationship:



3.5.74 ssiLevelServiceSetup (0x016f)

Data Type:

Bool

meaning:

SSI error code configuration, whether to alarm when there is LevelWarning.

default value:

0

Data format:

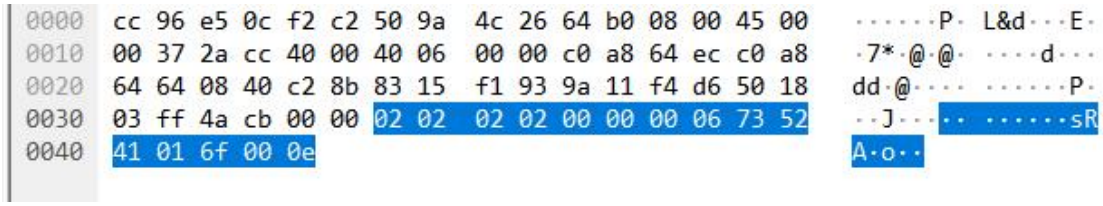
read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 01 6f 06

Read Response:

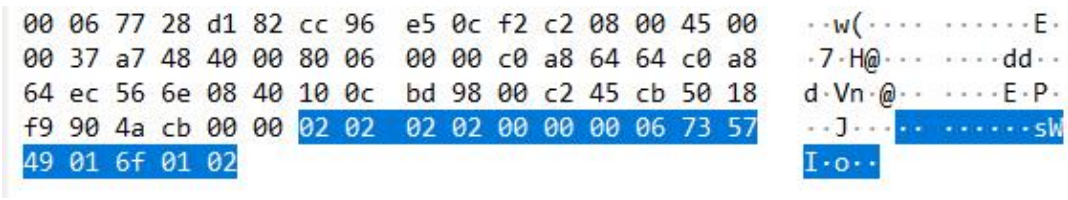
02 02 02 02 00 00 00 06 73 52 41 01 6f 00 0e



Write

Write Request

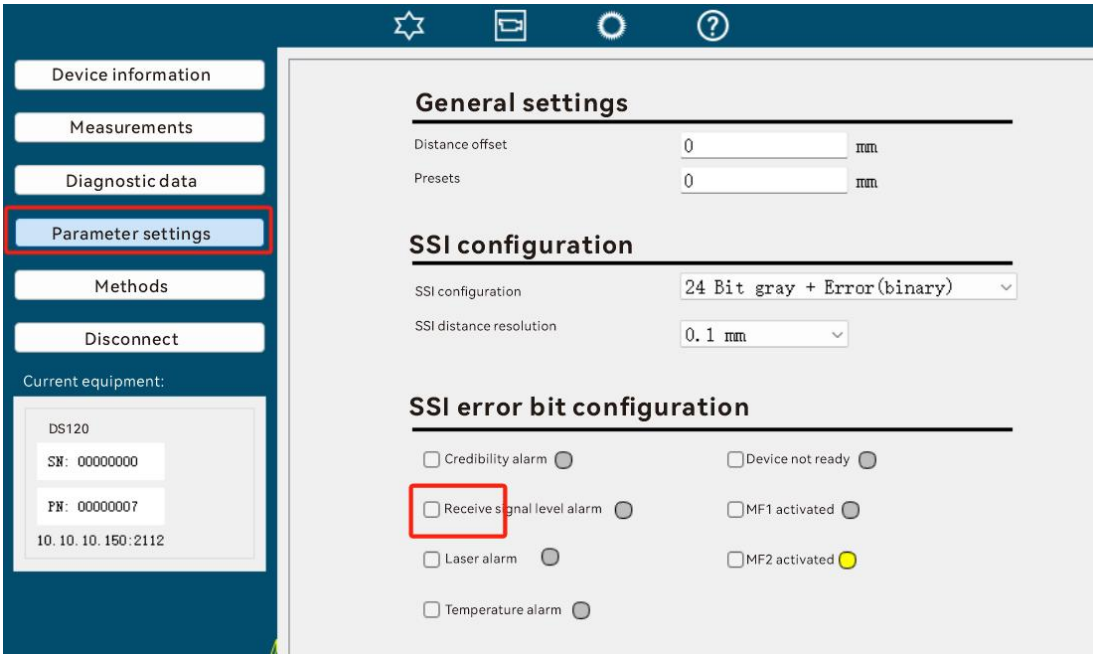
02 02 02 02 00 00 00 06 73 57 49 01 6f 01 02



Write Response

02 02 02 02 00 00 00 05 73 57 41 01 6f 0b

DADISICK corresponding relationship:



3.5.75 ssiReadyServiceSetup (0x0170)

Data Type:

Bool

meaning:

SSI error code configuration, whether to alarm when there is DeviceNotReadyWarning.

default value:

0

Data format:

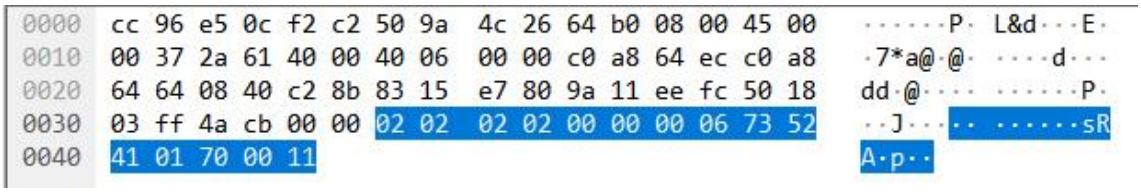
read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 01 70 19

Read Response:

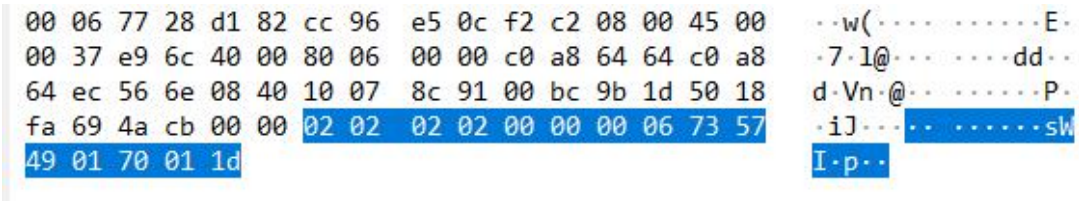
02 02 02 02 00 00 00 06 73 52 41 01 70 00 11



Write

Write Request

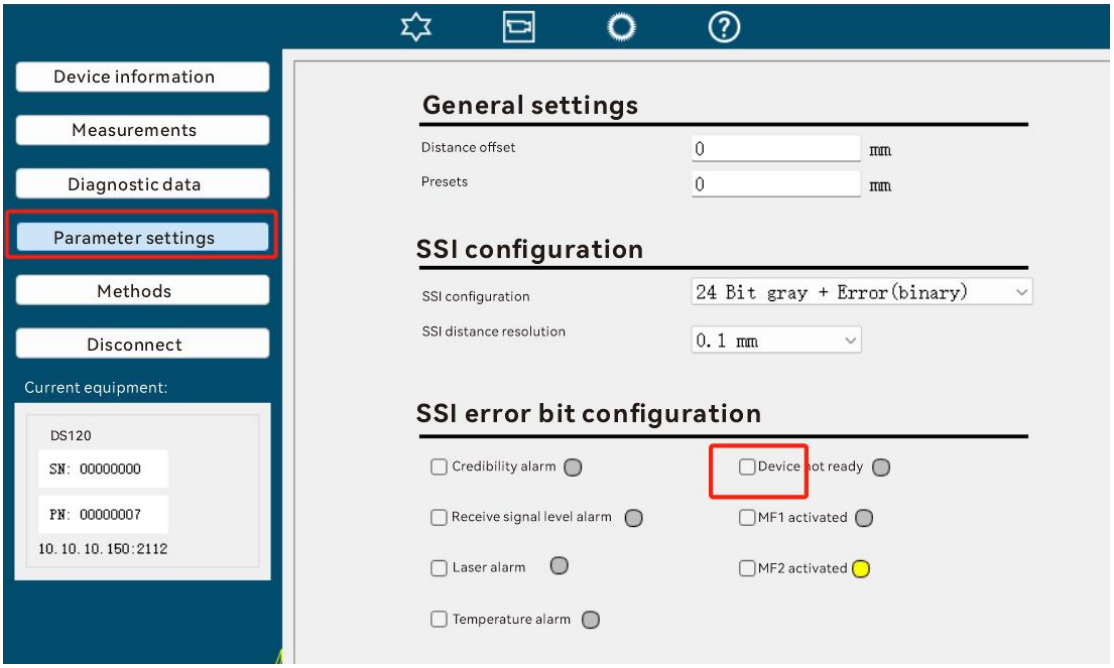
02 02 02 02 00 00 00 06 73 57 49 01 70 01 1d



Write Response

02 02 02 02 00 00 00 05 73 57 41 01 70 14

DADISICK corresponding relationship:



3.5.76 ssiPlausibilityServiceSetup (0x0171)

Data Type:

Bool

meaning:

SSI error code configuration, whether to alarm when PlausibilityWarning occurs.

default value:

0

Data format:

read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 01 71 18

Read Response:

02 02 02 02 00 00 00 06 73 52 41 01 71 00 10

```
0000  cc 96 e5 0c f2 c2 50 9a  4c 26 64 b0 08 00 45 00   ......P· L&d···E·
0010  00 37 2b 21 40 00 40 06  00 00 c0 a8 64 ec c0 a8   ·7+!@·@· ····d···
0020  64 64 08 40 c2 8b 83 15  fc ee 9a 11 f9 7c 50 18   dd·@···· ·····|P·
0030  20 11 4a cb 00 00 02 02  02 02 00 00 00 06 73 52    ·J······ ······sR
0040  41 01 71 00 10                                     A·q··
```

Write

Write Request

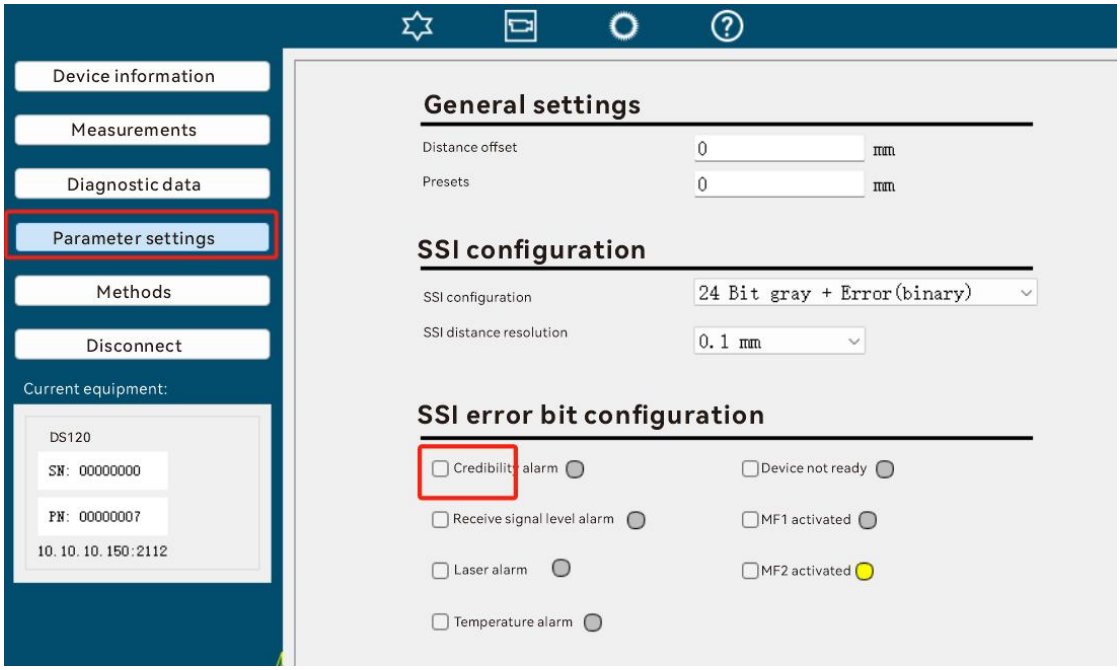
02 02 02 02 00 00 00 06 73 57 49 01 71 01 1c

```
00 06 77 28 d1 82 cc 96  e5 0c f2 c2 08 00 45 00   ··w(···· ·····E·
00 37 9f c8 40 00 80 06  00 00 c0 a8 64 64 c0 a8   ·7··@··· ····dd··
64 ec 56 6e 08 40 10 05  89 14 00 ba 68 73 50 18   d·Vn·@·· ····hsP·
f5 bf 4a cb 00 00 02 02  02 02 00 00 00 06 73 57   ··J····· ·····sW
49 01 71 01 1c                                     I·q··
```

Write Response

02 02 02 02 00 00 00 05 73 57 41 01 71 15

DADISICK corresponding relationship:



3.5.77 ssiMf1ServiceSetup （ 0x0173 ）

Data Type:

Bool

meaning:

SSI error code configuration, whether to alarm when MF1 is triggered.

default value:

0

Data format:

read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 01 73 1a

Read Response:

02 02 02 02 00 00 00 06 73 52 41 01 73 01 13

```
0000  cc 96 e5 0c f2 c2 50 9a  4c 26 64 b0 08 00 45 00   ......P· L&d···E·
0010  00 37 2a 88 40 00 40 06  00 00 c0 a8 64 ec c0 a8   ·7*·@·@· ····d···
0020  64 64 08 40 c2 8b 83 15  ea 64 9a 11 f1 1e 50 18   dd·@···· ·d····P·
0030  03 fd 4a cb 00 00 02 02  02 02 00 00 00 06 73 52   ··J····· ······sR
0040  41 01 73 01 13                                     A·s··
```

Write

Write Request

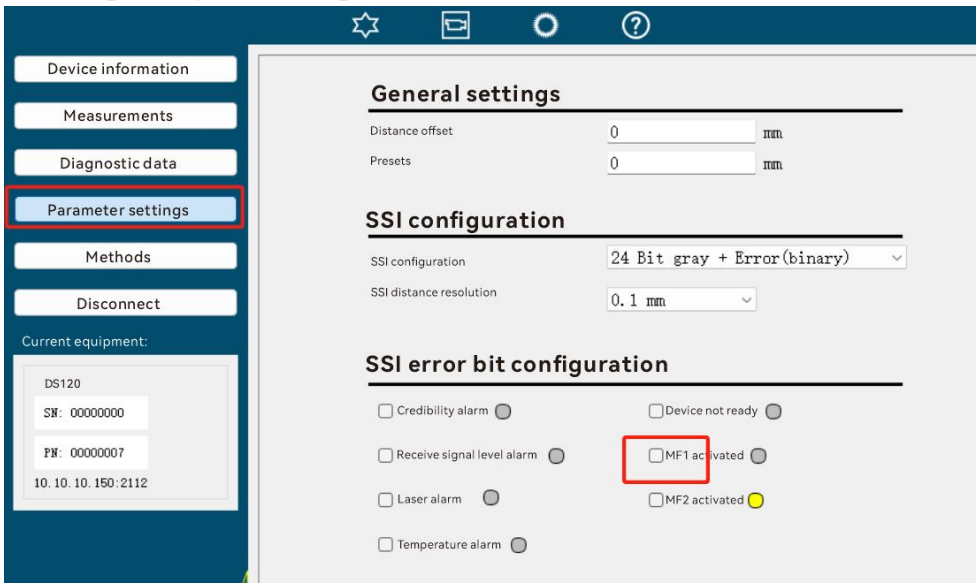
02 02 02 02 00 00 00 06 73 57 49 01 73 01 1e

```
00 06 77 28 d1 82 cc 96  e5 0c f2 c2 08 00 45 00   ··w(···· ·····E·
00 37 09 5c 40 00 80 06  00 00 c0 a8 64 64 c0 a8   ·7·\@··· ····dd··
64 ec 56 6e 08 40 10 0f  6c 27 00 c5 33 2b 50 18   d·Vn·@·· l'··3+P·
fa e1 4a cb 00 00 02 02  02 02 00 00 00 06 73 57   ··J····· ·····sW
49 01 73 01 1e                                     I·s··
```

Write Response

02 02 02 02 00 00 00 05 73 57 41 01 73 17

DADISICK corresponding relationship:



3.5.78 ssiMf2ServiceSetup （ 0x0174 ）

Data Type:

Bool

meaning:

SSI error code configuration, whether to alarm when MF2 is triggered.

default value:

0

Data format:

read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 01 74 1d

Read Response:

02 02 02 02 00 00 00 06 73 52 41 01 74 01 14

```
0000  cc 96 e5 0c f2 c2 50 9a  4c 26 64 b0 08 00 45 00   ......P. L&d...E.
0010  00 37 2b 3c 40 00 40 06  00 00 c0 a8 64 ec c0 a8   .7+<@.@. ....d...
0020  64 64 08 40 c2 8b 83 15  fe d6 9a 11 fa f6 50 18   dd.@.... ......P.
0030  20 0f 4a cb 00 00 02 02  02 02 00 00 00 06 73 52    .J..... ......sR
0040  41 01 74 01 14                                     A.t..
```

Write

Write Request

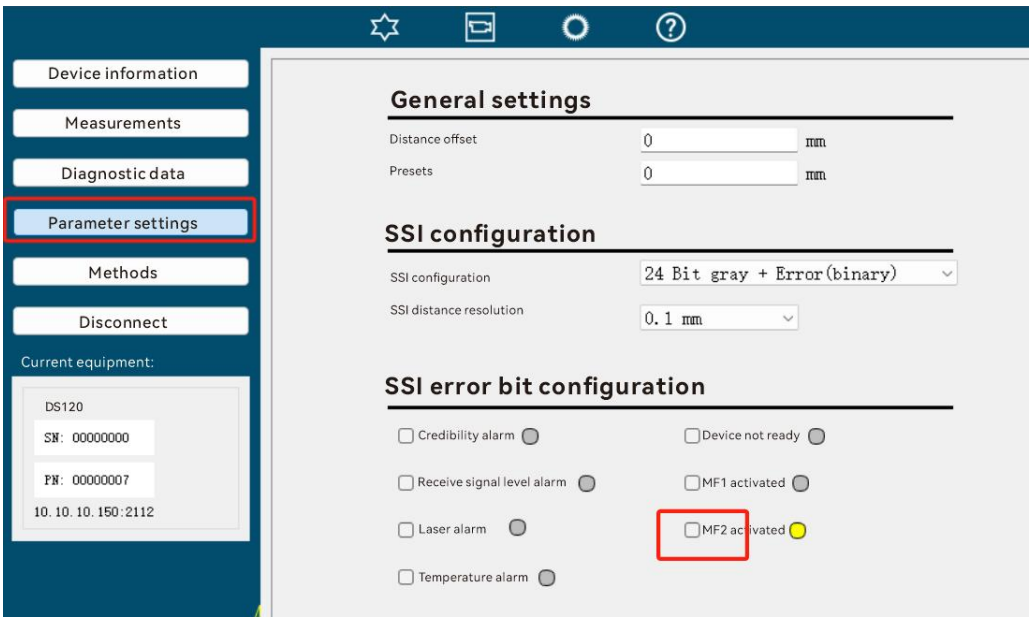
02 02 02 02 00 00 00 06 73 57 49 01 74 01 19

```
00 06 77 28 d1 82 cc 96  e5 0c f2 c2 08 00 45 00   ..w(.... ......E.
00 37 3a 24 40 00 80 06  00 00 c0 a8 64 64 c0 a8   .7:$@... ....dd..
64 ec 56 6e 08 40 10 10  c1 a0 00 c6 a7 e6 50 18   d.Vn.@.. ......P.
fa a5 4a cb 00 00 02 02  02 02 00 00 00 06 73 57   ..J..... ......sW
49 01 74 01 19                                     I.t..
```

Write Response

02 02 02 02 00 00 00 05 73 57 41 01 74 10

DADISICK corresponding relationship:



3.5.79 averageFilterVelocity(0x01a0)

Data Type:

UInt8

meaning:

Selecting filter characteristics for speed measurements

0: Fast filtering

1: Medium speed filtering

2: Slow filtering

default value:

1: Medium speed filtering

Data format:

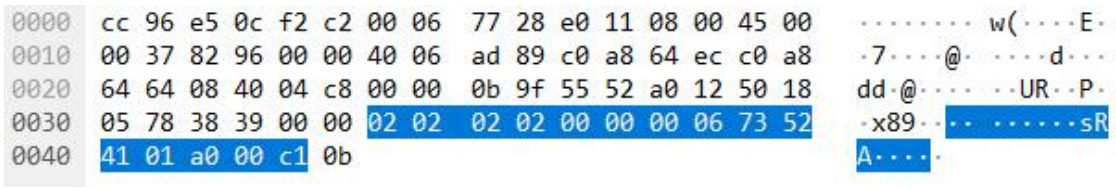
read

Read Request:

02 02 02 02 00 00 00 05 73 52 49 01 a0 c9

Read Response:

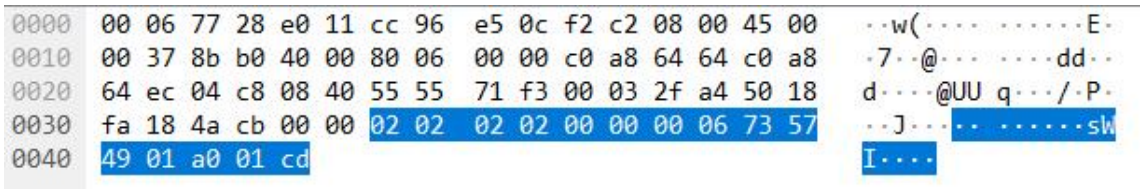
02 02 02 02 00 00 00 06 73 52 41 01 a0 00 c1



Write

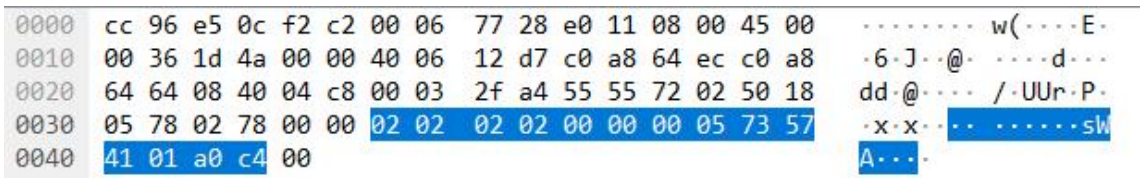
Write Request

02 02 02 02 00 00 00 06 73 57 49 01 a0 01 cd

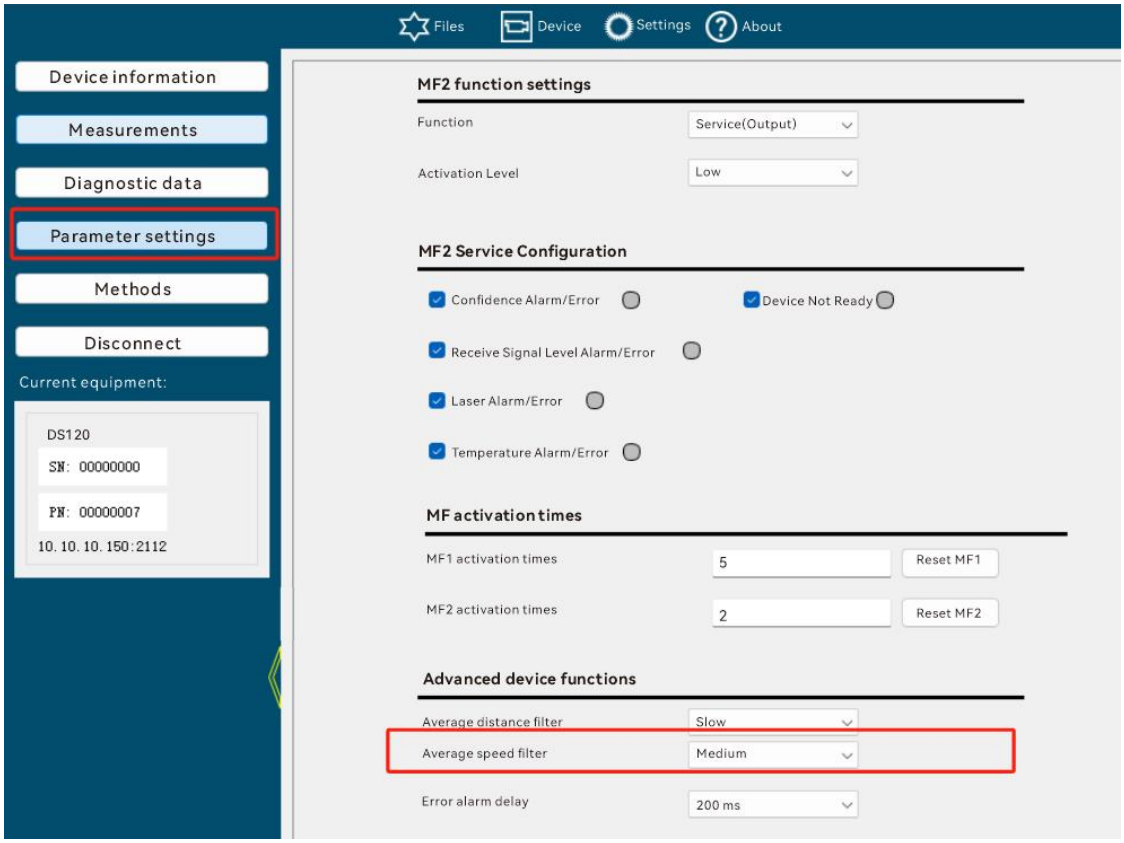


Write Response

02 02 02 02 00 00 00 05 73 57 41 01 a0 c4



DADISICK corresponding relationship:



3.6 method

Used to operate the radar, similar to a function.

3.6.1 ResetMf1Activations(0x00da)

parameter:

none

Return value:

none

meaning:

Reset MF1 excitation times. This parameter is automatically initialized to 0 when powered on.

Format:

Call:

02 02 02 02 00 00 00 05 73 4d 49 00 da ad

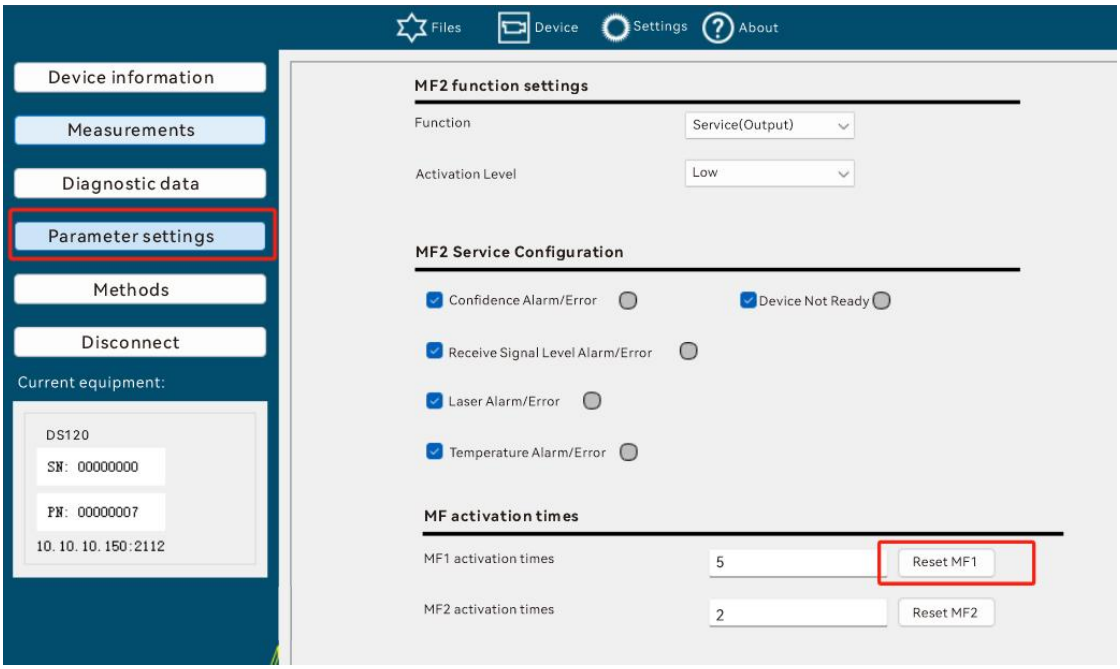
```
00 06 77 28 d1 82 cc 96  e5 0c f2 c2 08 00 45 00   ··w(···· ·····E·
00 36 2b 27 40 00 80 06  00 00 c0 a8 64 64 c0 a8   ·6+'@··· ····dd··
64 ec 25 a4 08 40 40 1f  54 84 00 07 a8 74 50 18   d·%··@@· T····tP·
f9 91 4a ca 00 00 02 02  02 02 00 00 00 05 73 4d   ··J····· ·····sM
49 00 da ad                                        I···
```

Return:

02 02 02 02 00 00 00 05 73 41 49 00 da a1

```
cc 96 e5 0c f2 c2 00 06  77 28 d1 82 08 00 45 00   ·····w(····E·
00 36 6c 8f 00 00 40 06  c3 91 c0 a8 64 ec c0 a8   ·6l···@· ····d···
64 64 08 40 25 a4 00 07  a8 74 40 1f 54 92 50 18   dd·@%··· ·t@·T·P·
05 78 59 a7 00 00 02 02  02 02 00 00 00 05 73 41   ·xY····· ·····sA
49 00 da a1 00                                     I····
```

DADISICK corresponding relationship:



3.6.2 ResetMf2Activations(0x00db)

parameter:

none

Return Value

none

meaning:

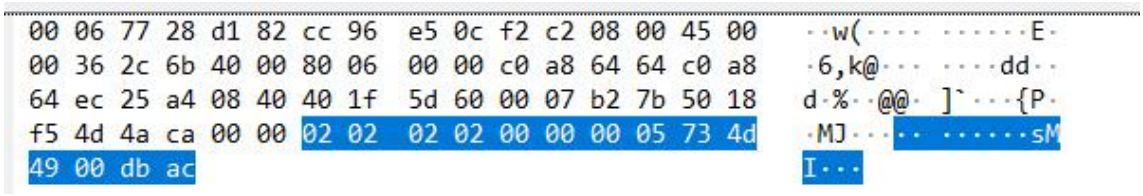
Reset the MF2 excitation times. This parameter is automatically initialized to 0 when

powered on.

Format:

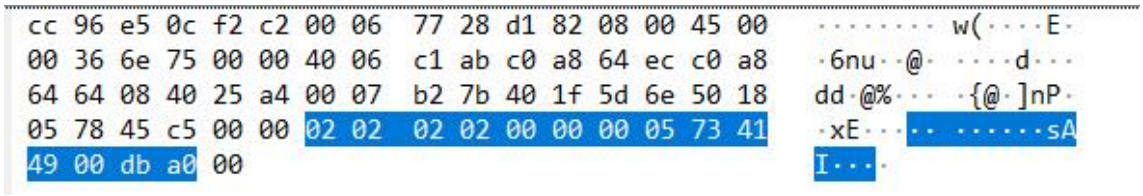
Call:

02 02 02 02 00 00 00 05 73 4d 49 00 db ac

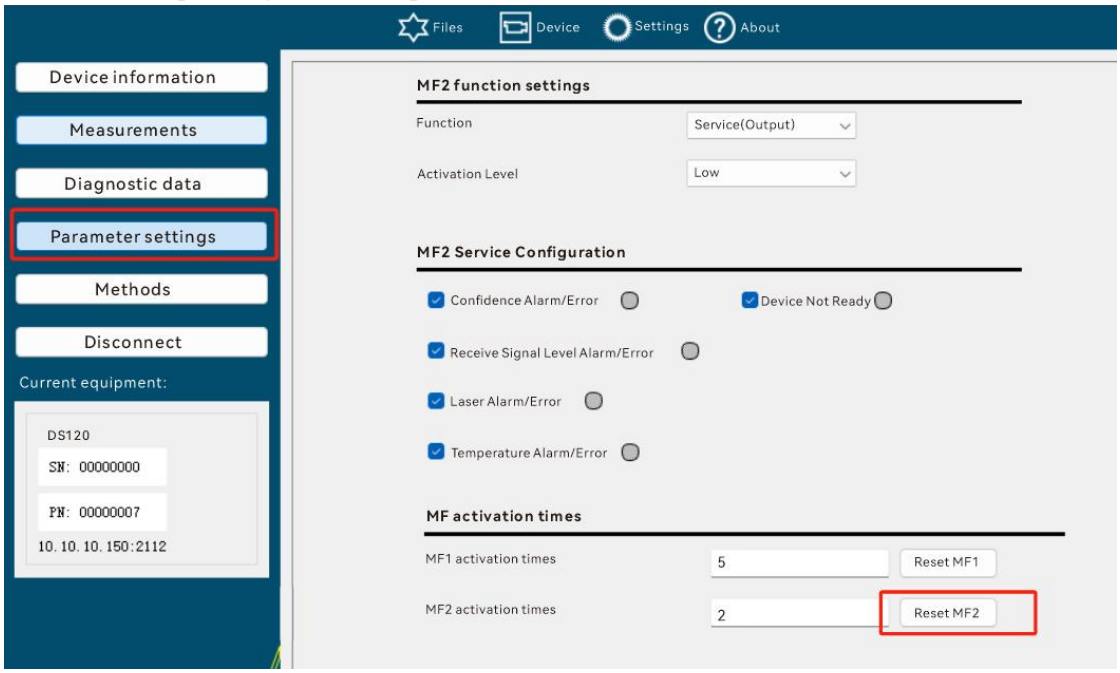


Return:

02 02 02 02 00 00 00 05 73 41 49 00 db a0



DADISICK corresponding relationship:



3.6.3 ResetParamters(0x00ce)

parameter:

none

Return Value

none

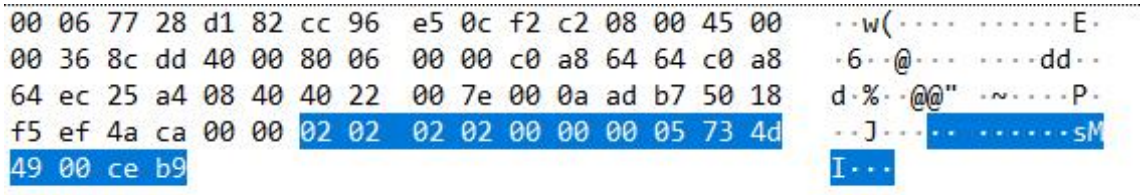
meaning:

Reset parameters to default values. The default values here refer to the default values saved in the device when the device is manufactured.

Format:

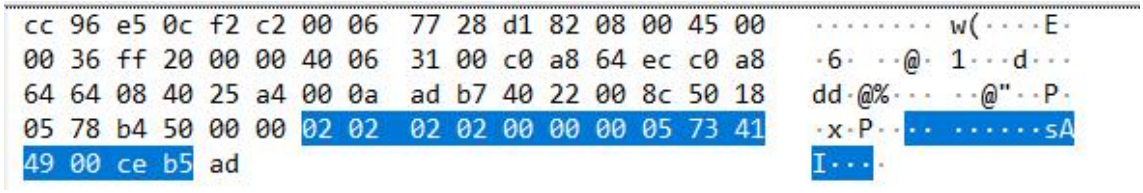
Call:

02 02 02 02 00 00 00 05 73 4d 49 00 ce b9

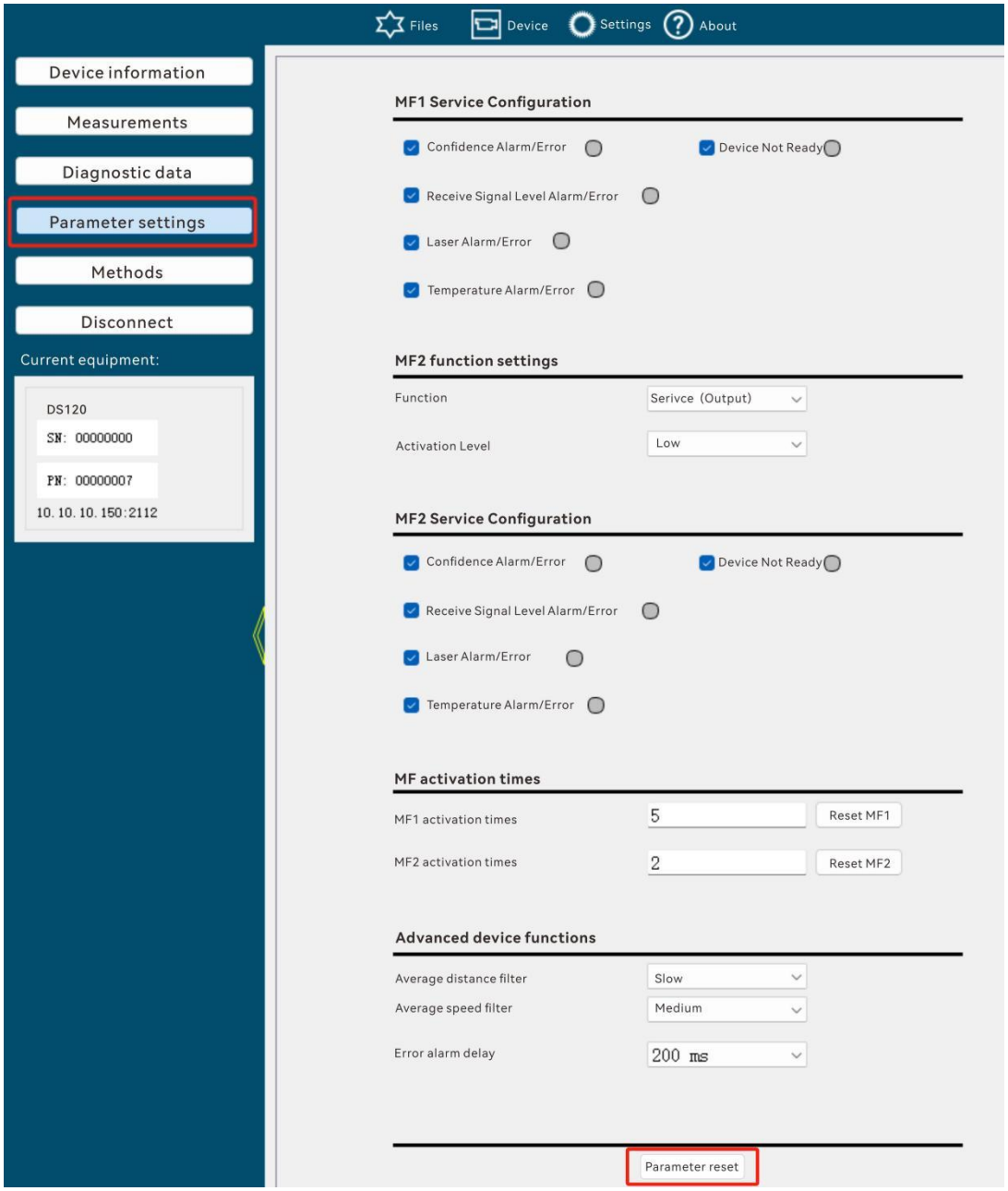


Return:

02 02 02 02 00 00 00 05 73 41 49 00 ce b5



DADISICK corresponding relationship:



3.6.4 Reboot (0x00c8)

parameter:

none

Return Value

none

meaning:

Restart your device

Format:

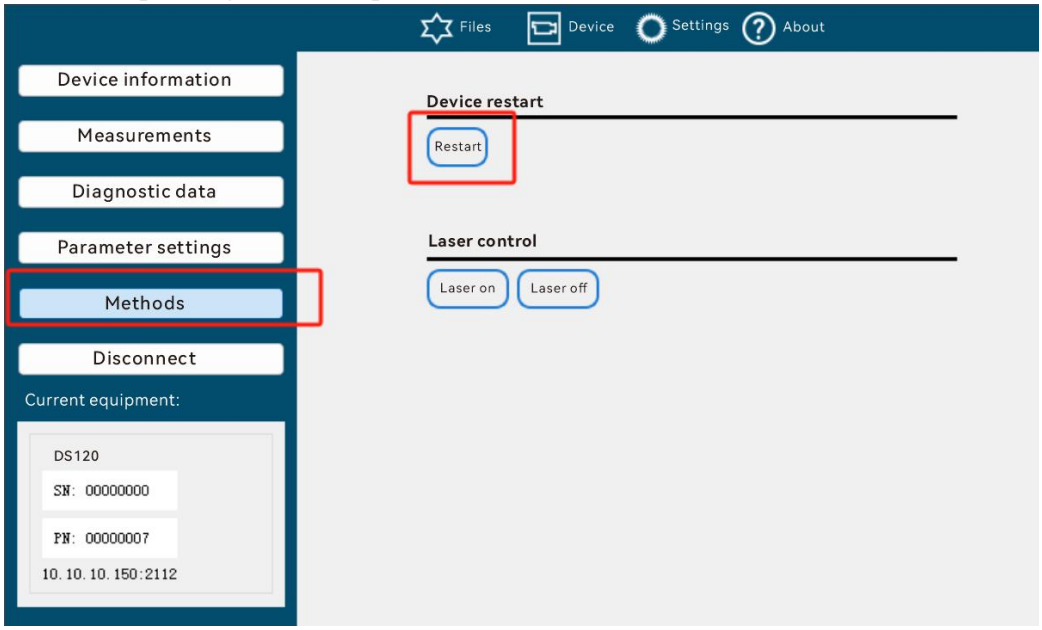
Call:

02 02 02 02 00 00 00 05 73 4d 49 00 c8 bf

```
0000  00 06 77 28 d1 82 cc 96  e5 0c f2 c2 08 00 45 00   ··w(···· ·····E·
0010  00 36 2b 89 40 00 80 06  00 00 c0 a8 64 64 c0 a8   ·6+·@··· ····dd··
0020  64 ec 05 44 08 40 07 bd  a9 f7 00 00 00 8c 50 18   d··D·@·· ·····P·
0030  fa 65 4a ca 00 00 02 02  02 02 00 00 00 05 73 4d   ·eJ····· ·····sM
0040  49 00 c8 bf                                       I···
```

No Return.

DADISICK corresponding relationship:



3.6.5 LaserOn (0x00e0)

parameter:

none

Return Value

none

meaning:

Start the laser (the laser emits light at this time)

Format:

Call:

02 02 02 02 00 00 00 05 73 4d 49 00 e0 97

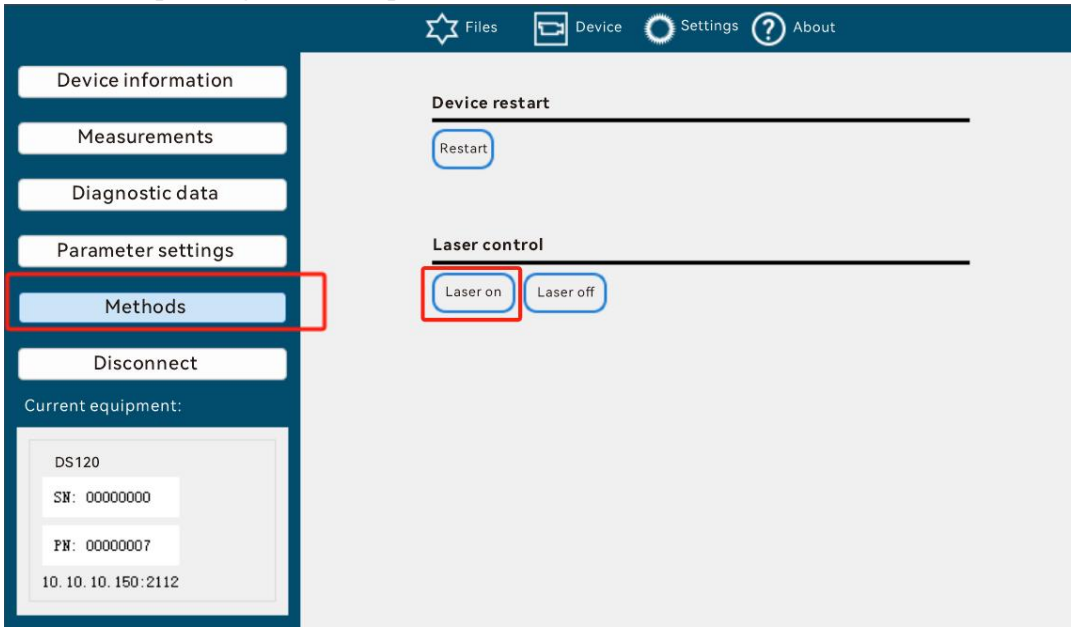
```
0000  00 06 77 28 d1 82 cc 96  e5 0c f2 c2 08 00 45 00   ··w(···· ·····E·
0010  00 36 2b 77 40 00 80 06  00 00 c0 a8 64 64 c0 a8   ·6+w@··· ····dd··
0020  64 ec 04 eb 08 40 45 31  75 97 00 00 00 af 50 18   d····@E1 u·····P·
0030  fa 42 4a ca 00 00 02 02  02 02 00 00 00 05 73 4d   ·BJ····· ·····sM
0040  49 00 e0 97                                       I···
```

Return:

02 02 02 02 00 00 00 05 73 41 49 00 e0 9b

```
0000  cc 96 e5 0c f2 c2 00 06  77 28 d1 82 08 00 45 00   ·····w(····E·
0010  00 36 00 ef 00 00 40 06  2f 32 c0 a8 64 ec c0 a8   ·6····@· /2··d···
0020  64 64 08 40 04 eb 00 00  00 af 45 31 75 a5 50 18   dd·@···· ··E1u·P·
0030  05 78 f6 0d 00 00 02 02  02 02 00 00 00 05 73 41   ·x····· ·····sA
0040  49 00 e0 9b 05                                    I····
```

DADISICK corresponding relationship:



3.6.6 LaserOff (0x00e1)

parameter:

none

Return Value

none

meaning:

Turn off the laser (the device does not emit light at this time)

Format:

Call:

02 02 02 02 00 00 00 05 73 4d 49 00 e1 96

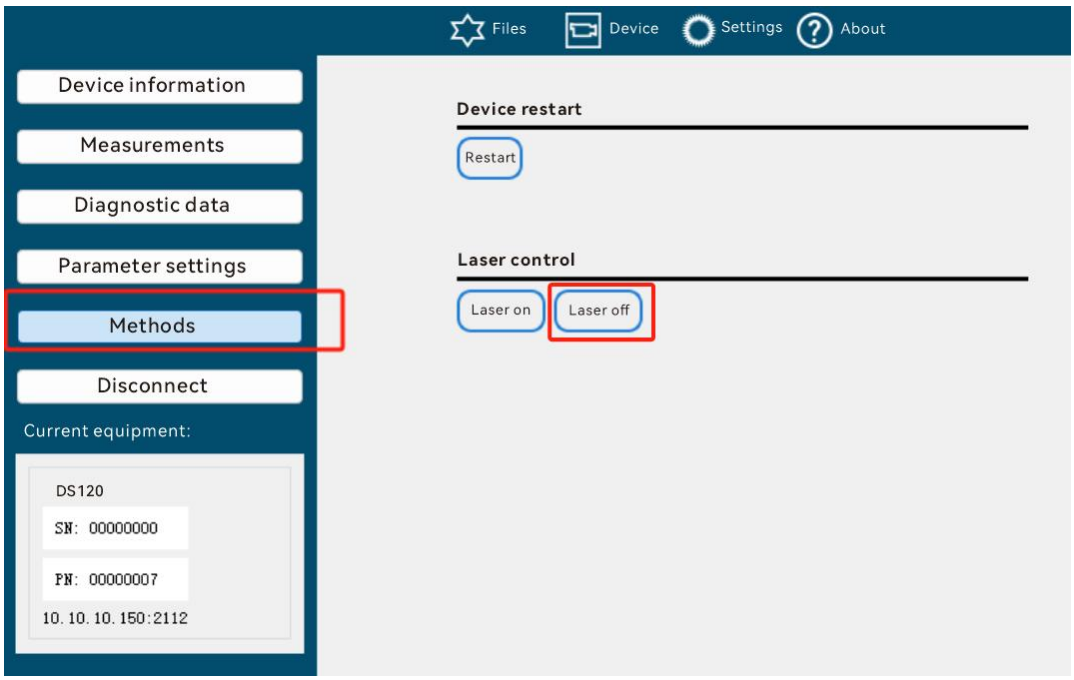
```
0000  00 06 77 28 d1 82 cc 96  e5 0c f2 c2 08 00 45 00   ··w(···· ·····E·
0010  00 36 2b 63 40 00 80 06  00 00 c0 a8 64 64 c0 a8   ·6+c@··· ····dd··
0020  64 ec 04 a5 08 40 f8 33  90 73 00 00 00 8c 50 18   d····@·3 ·s····P·
0030  fa 65 4a ca 00 00 02 02  02 02 00 00 00 05 73 4d   ·eJ····· ·····sM
0040  49 00 e1 96                                       I···
```

Return:

02 02 02 02 00 00 00 05 73 41 49 00 e1 9a

```
0000  cc 96 e5 0c f2 c2 00 06  77 28 d1 82 08 00 45 00   ······ w(····E·
0010  00 36 00 d4 00 00 40 06  2f 4d c0 a8 64 ec c0 a8   ·6····@· /M··d···
0020  64 64 08 40 04 a5 00 00  00 8c f8 33 90 81 50 18   dd·@···· ···3··P·
0030  05 78 27 99 00 00 02 02  02 02 00 00 00 05 73 41   ·x'····· ·····sA
0040  49 00 e1 9a 4c                                    I···L
```

DADISICK corresponding relationship:



4 SSI Protocol

4.1 Base

The SSI (Synchronous Serial Interface) interface provides absolute information about the position via serial data transmission. Both the clock signal and the data are transmitted via this interface.

The data transmission takes place at the request of the control system, where the cycle time and the transmission speed can be set within a wide range of limits. For this purpose, the connected control system adds a clock sequence to the receive input of the device. With each positive clock edge, a data bit is pushed to the transmit cable of the device, starting with the bit with the highest value. There is a clock pause of at least 30 µs between two clock sequences. The bit clock is between 70 kHz and 500 kHz, depending on the cable length.

Cable length [m]	Transmission speed [kBd]
< 25	< 500
< 50	< 400
< 100	< 300
< 200	< 200
< 400	< 100

One of the performance parameters of the device is **"measurement cycle time: 1ms"**, so the maximum rate of the device must be adapted to 1000 distance value transmissions per second. Considering that the future data format has 24Gr + 8E and 24B + 8E mode extensions, the maximum data transmission rate should not be less than 1000 * 32 bps ≈ 32kbps.

According to the table above, when the cable length is less than 25m, the transmission speed is required to reach 500kBd (kBd here can be understood as 500kbps). Within a measurement cycle, the external device may read the distance value multiple times through SSI. The device must handle the situation where the external device reads data according to the following logic:

1. If the device keeps valid measurement and the reading frequency of the external device is greater than the measurement frequency, the device outputs the last valid

measurement data.

2. If the device maintains valid measurement all the time, but the reading frequency of the external device is less than the measurement frequency, the device discards the original measurement data and keeps the latest measurement data.

3. If the device measurement fails (i.e. the level is lower than the effective value, which means that the laser does not hit the reflector), the effective measurement value is retained for 2ms (this parameter corresponds to another performance parameter of the device, **response time/measurement value aging: 2ms**).

4.2 Data Format

The SSI communication protocol supports the following types:

*0: twenty four Bit gray + Error(binary)
*1: twenty four Bit gray
*2: 25 Bit gray
*3: twenty four Bit binary + Error(binary)
*4: twenty four Bit binary
*5: 25 Bit binary

The various formats of data are as follows:

Gry24E and Bin24E: 24 data bits, Gray code/binary code + 1 error bit, binary

MSB								LSB
Bit24	Bit23	Bit22	Bit21	...	Bit3	Bit2	Bit1	Bit0
D24	D23	D22	D21	...	D3	D2	D1	E

Gry24 and Bin24: 24 data bits, Gray code/binary code

MSB							LSB
Bit23	Bit22	Bit21	Bit20	...	Bit2	Bit1	Bit0
D24	D23	D22	D21	...	D3	D2	D1

Gry25 and Bin25: 25 data bits, Gray code/binary code

MSB								LSB
Bit24	Bit23	Bit22	Bit21	...	Bit3	Bit2	Bit1	Bit0
D25	D24	D23	D22	...	D4	D3	D2	D1

4.2.1 Resolution

The SSI communication data resolution can be set to 0.1mm, 0.125mm, 1mm, 10mm, and 100mm.

There are two ways to set the resolution:

1. Through the communication protocol between the host computer and the MCU.

2. By operating directly on the machine.

4.2.2 Error bit

When SSI selects the Gry24+E or Bin24+E format, the last digit (i.e., E) indicates that an error has occurred in the device. The errors include:

DeviceNotReady

Plausibility Warning

Level Warning

Laser Warning

Temperature Warning

MF1 activation

MF2 Activation

If any of the above events or warnings occurs, the E bit is set to 1, otherwise it is 0.

4.2.3 Data Expression

There are 3 types of measurement values for this device:

1. distance

2. speed

3. Acceleration

Data D0~D24, D0~D25 represent the measured **distance value** , not the speed and acceleration.

The data format is divided into 24-bit and 25-bit, and is logically encoded in binary.

The device range is designed to be 300m, so the maximum value is 300 * 1000 / 0.1 = 3,000,000 = 0x2D C6C0. Therefore, from MSB to LSB, all unused bits are set to 0.

example

1. The measurement data resolution of DS series is 0.1mm. For example, the actual measurement data is 2.5388m. Select Bin24 type. The transmission value at 0.1mm resolution is 25388/1=25388, and the corresponding binary is 0000 0000 0110 0011 0010 1100.

2. At a resolution of 0.125mm, the transmission value is 25388/1.25=20310, and the corresponding binary value is 0000 0000 0100 1111 0101 0110. At a resolution of 1mm, the transmission value is 25388/10=2538, and the corresponding binary value is 0000 0000 0000 1001 1110 1010.

3. At a resolution of 10mm, the transmission value is 25388/100=253, and the corresponding binary value is 0000 0000 0000 0000 1111 1101. At a resolution of 100mm, the transmission value is 25388/1000=25, and the corresponding binary value is 0000 0000 0000 0000 0001 1001.

The FPGA is only responsible for data measurement and transmission to the MCU. The resolution setting and SSI expression of the data are handled by the MCU.