

## MW100 Setting for Data Communications via Modbus Protocol

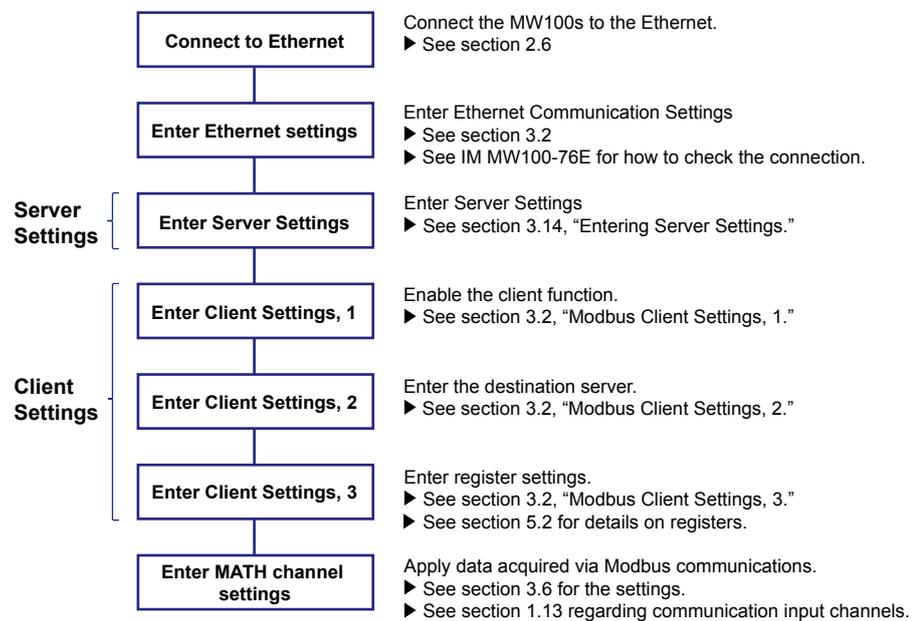
### Overview

This is an explanation of the procedure for entering settings for Modbus communications with the DAQMASTER MW100.

This manual describes the procedure for data transmission and reception based on a configuration in which two MW100s are connected for Modbus communications (Modbus/TCP) over an Ethernet. Note that the MATH function (/M1 option) is required to use the Modbus client function.

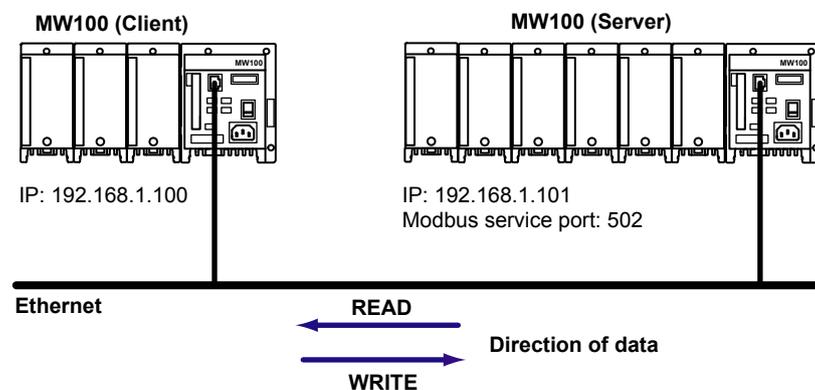
### Setup Procedure

The following shows the procedures for entering settings, from connecting to the Ethernet to applying the data acquired via Modbus communications. For detailed instructions and specifications on each function, see the MW100 Data Acquisition Unit user's manual.



### Example System

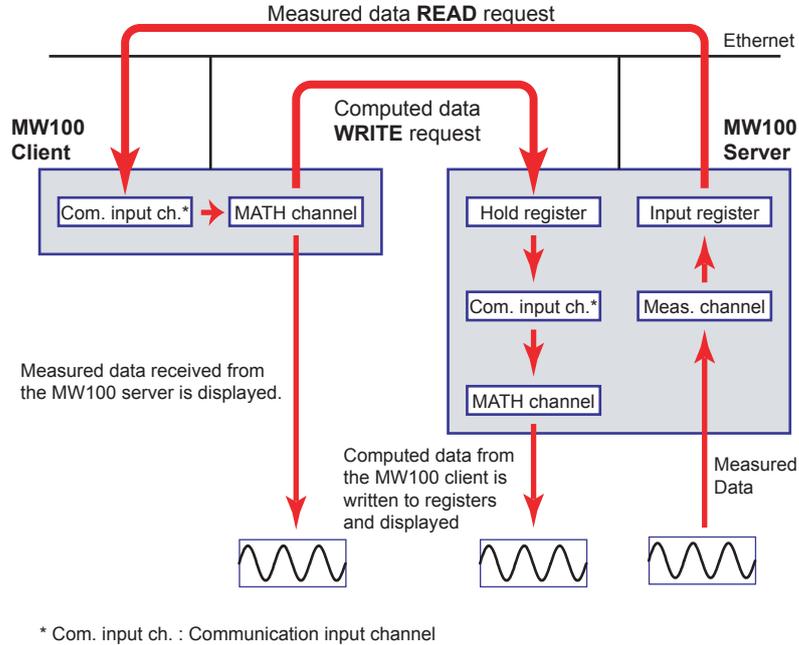
In this example, the system comprises one client MW100 and one server MW100 connected via Ethernet.



The MW100 set up as the client in the above system diagram is referred to as the MW100 client. Likewise, the MW100 set up as the server is referred to as the MW100 server.

## Setup Example

Data is sent and received between the MW100 client and MW100 server. The MW100 client loads and displays measured data from measurement channels 001 to 004 of the MW100 server, and also writes that data to the MW100 server. The following is an example in which the data written to the MW100 server is displayed.

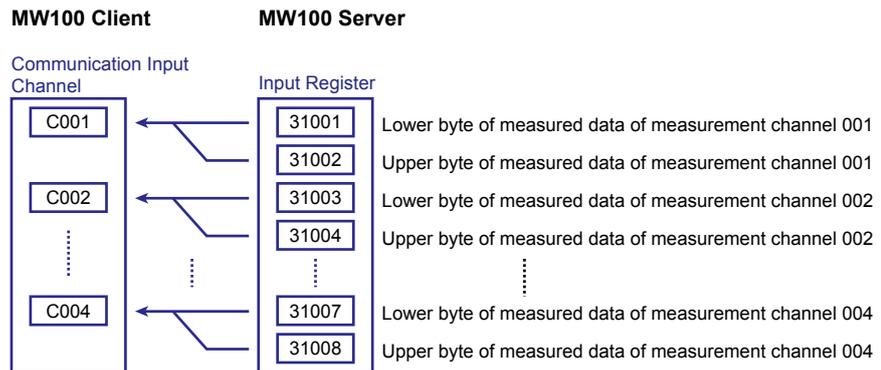


### Data in the Example

The data that is sent and received in this setting example is as follows.

1. Measured data from measurement channels 001 to 004 of the MW100 server are written to communication input channels C001 to C004 of the MW100 client as 32-bit floating point (float) type data.

#### For READ (client loads data from server)

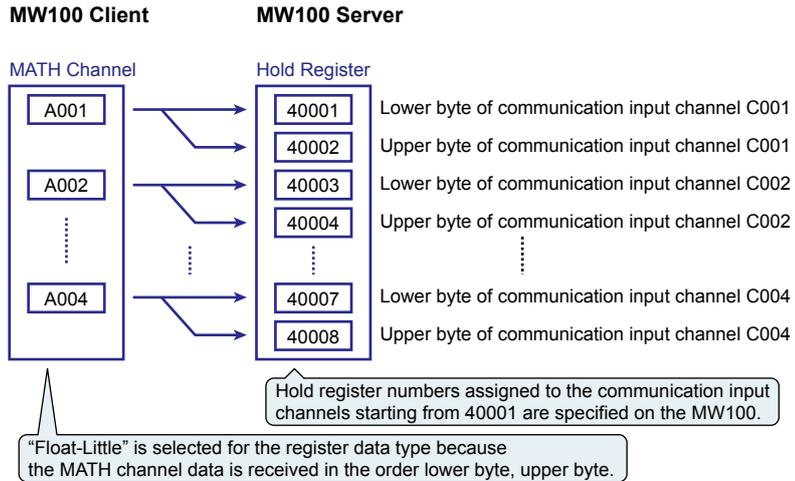


Input register numbers starting from 31001 are specified to acquire 32-bit floating point type measured data.

"Float-Little" is selected for the register data type because the 32-bit floating point type measured data is received in the order lower byte, upper byte.

2. Computed data from MATH channels A001 to A004 of the MW100 client are written to communication input channels C001 to C004 of the MW100 server.

**For WRITE (client writes data to the server)**



**Client/Server Settings for READ**

**Server-Side Settings**

**Server Settings**

Set the MW100 server as the server device.

Top > Communication Setting > Server Setting

TCP Keep Alive  Enable  
 Application Timeout  Enable  
 Timeout  min

Server List

Server	Action	Port
MODBUS	On	502
FTP	On	21
HTTP	On	80
SNTP	On	123
GENE	On	34318
DIAG	On	34317

Apply

**Application timeout setting**

Set as needed. Timeout time for the Modbus server is fixed to 30 s.

**Turn on Action on the server**

Turn the MODBUS server action "ON."

**Enter the server port number**

Enter the Modbus server port number. Use the default value unless otherwise necessary. In the example, the default value is "502."

**Client-Side Settings**

**Client Setting 1**

Set the MW100 client as the client device.

Top > Communication Setting > Modbus Client Setting 1

Client Function  enable  
 Communication  
 Cycle 1 s  
 Connection  Close  
 Connection Timeout 5 s  
 Recovery Action  
 Wait Time 10 s

Apply

**Select**

The setting is applied on the client device.

**Set according to network environment**

- **Cycle:** Select a cycle appropriate for the unit's performance.
- **Connection:** Disconnect when no response is received from the server.
- **Connection Timeout:** Enter the time to wait before disconnecting.
- **Wait Time:** Enter the time to wait between disconnection and sending of commands.

## Client Setting 2

Enter settings for the destination server.

[Top > Communication Setting > Modbus Client Setting 2](#)

Server List			
No.	Server	Port	Unit
01	192.168.1.101	502	255
02		502	255
03		502	255
04		502	255
05		502	255
06		502	255
07		502	255
08		502	255
09		502	255
10		502	255

Apply

**Enter the IP address of the server**

Enter the IP address or host name of the destination server. In the example, an IP address of "192.168.1.101" is entered.

**Enter the server unit number**

Only Modbus/TCP connections are used in the example, therefore the default unit number of "255" is used.

**Enter the server port number**

Enter the port number of the destination server. In the example, "502" is entered.

## Client Setting 3

Enter settings for registers to be used for receiving data. For data types, see "Register Data Types."

[Top > Communication Setting > Modbus Client Setting 3](#)

Command List						
001 - 010						
No.	Function	Server	Register	Data Type	Channel	
					First	Last
001	Read	1	31001	Float - Little	C001	C004
002	Write	1	40001	Float - Little	A001	A004
003	Off					
004	Off					
005	Off					
006	Off					
007	Off					
008	Off					
009	Off					
010	Off					

Apply

**Select the register function (read or write)**

If the client will be reading from the server, select "Read."

• for Read

No.	Function	Server	Register	Data Type	Channel	
					First	Last
001	Read	1	31001	Float - Little	C001	C004
002	Write	1	40001	Float - Little	A001	A004
003	Off					

**Enter the number of the destination server**

Enter the number set in Client Setting 2. In the example, "1" is entered.

**Enter the communication input channels on which to read by the client**

In the example, the client will read on communication input channels "C001" to "C004."

**Select the data type for the registers on the destination server that will be read.**

In the example, "Float-Little" is entered indicating that the register data type is 32-bit floating point and the order is lower byte, upper byte.

**Enter the number of the first input register on the destination server that will be read.**

In the example, "31001" is entered since the measured data read out from measurement channels 001 to 004 is of the 32-bit floating point type.

## MATH Channel Settings

In order to display data loaded to the communication input channels from the MW100 server, enter the communication input channel numbers in the MATH channel expression entry area.

[Top > Channel Setting > MATH Channel Setting](#)

Channel List						
A001 - A010						
No.	Action	Expression	Span			Unit
			D.P.	Lower	Upper	
A001	On	C001	2	0.00	100.00	
A002	On	C002	2	0.00	100.00	
A003	On	C003	2	0.00	100.00	
A004	On	C004	2	0.00	100.00	
A005	Off					

# Client/Server Settings for WRITE

## Server-Side Settings

### Server Settings

Set the MW100 server as the server device. These are the same as the server-side settings for READ.

### MATH Channel Settings

In order to display data written to the hold registers from the MW100 client, enter the communication input channel numbers in the MATH channel expression entry area. These are the same as the MATH channel settings for READ.

## Client-Side Settings

### Client Setting 1

Set the MW100 client as the client device. These are the same as the client-side settings for READ.

### Client Setting 2

Enter settings for the destination server. These are the same as the client-side settings for READ.

### Client Setting 3

Enter settings for registers to be used for sending data.

Top > Communication Setting > Modbus Client Setting 3

Command List: 001 - 010

No.	Function	Server	Register	Data Type	Channel	
					First	Last
001	Read	1	31001	Float-Little	C001	C004
002	Write	1	40001	Float-Little	A001	A004
003	Off					
004	Off					
005	Off					
006	Off					
007	Off					
008	Off					
009	Off					
010	Off					

Apply

**Select the register function (read or write)**

If the client will be writing to the server, select Write.

#### • for Write

No.	Function	Server	Register	Data Type	Channel	
					First	Last
001	Read	1	31001	Float-Little	C001	C004
002	Write	1	40001	Float-Little	A001	A004
003	Off					

**Enter the number of the destination server**

Enter the number set in Client Setting 2. In the example, "1" is entered.

**Enter the channels on the client that will be written to the destination server**

In the example, "A001" to "A004" is entered since computed data from MATH channels 001 to 004 are written.

**Select the data type for the hold registers of the destination server.**

In the example, "Float-Little" is entered indicating that the register data type is 32-bit floating point.

**Enter the number of the first hold register that is written to on the destination server.**

In the example, "40001" is entered since the client will write to communication input channels C001 to C004 on the server.

## Starting Communication

### Starting Measurement and Computation

MATH channels must be displayed to show transmitted data. After starting measurement, start computation.

### Displaying Data

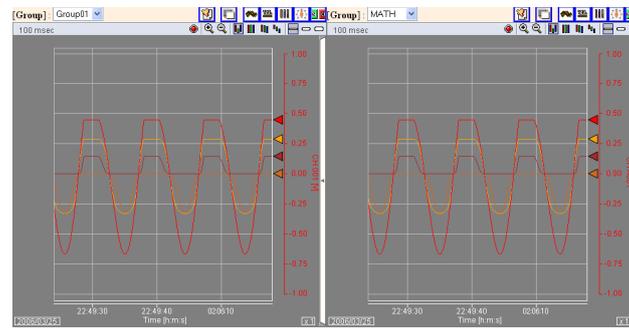
When data is sent/received via Modbus communication, the following waveform is displayed on the monitor screen of a Web browser.

- **Displaying MW100 Client Data (Trend)**



Computed data (data received via Modbus communications)

- **Displaying MW100 Server Data (Trend)**

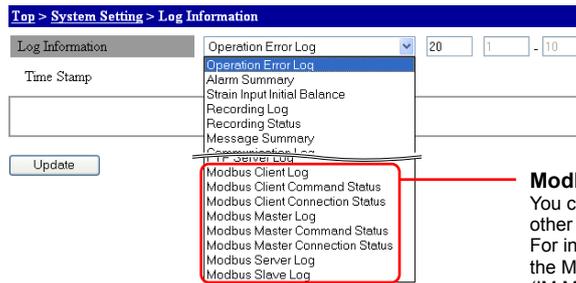


Measured data

Computed data (data received via Modbus communications)

## Checking the Communication Status

You can view log information to check the status of Modbus communications.



### Modbus communication log information

You can check the status of communication and other information by selecting items here. For information about displayed contents, see the MW100 Communication Command Manual (IM MW100-17E).

## Register Data Types

The figure below describes specification of data types for registers used during Modbus communications. Registers are fixed to 16-bits in length. Data longer than 16 bits are stored using multiple registers. In this case, the data sequence (Endian) must be specified. The MW100 can process 32-bit data. Specify "Little" to store data from the least significant byte, and "Big" to store data from the most significant byte.

Register	Assignment	Data Type	Data Type Specification
30001	Signed integer	(16bit)	Int16 ----- Int16
30001	Unsigned integer	(16bit)	UInt16 ----- UInt16
30001 30002	Signed integer	(Lower 16bit) (Upper 16bit)	Int32 ----- Int32 - Little
30001 30002	Signed integer	(Upper 16bit) (Lower 16bit)	Int32 ----- Int32 - Big
30001 30002	Unsigned integer	(Lower 16bit) (Upper 16bit)	UInt32 ----- UInt32 - Little
30001 30002	Unsigned integer	(Upper 16bit) (Lower 16bit)	UInt32 ----- UInt32 - Big
31001 31002	Floating point real number	(Lower 16bit) (Upper 16bit)	Float ----- Float - Little
31001 31002	Floating point real number	(Upper 16bit) (Lower 16bit)	Float ----- Float - Big

\* MW100 data are all Little Endian, and assigned to Modbus registers. When loading MW100 data, specify "Little."

For the available MW100 register numbers, Modbus protocol specifications, and other information, see chapter 5 of the MW100 User's Manual (IM MW100-01E).