Magnescale

Ethernet Interface Module

MG80-NE

Read all the instructions in the manual carefully before use and strictly follow them.
Keep the manual for future references.

Operating Manual

1. Overview of This Product

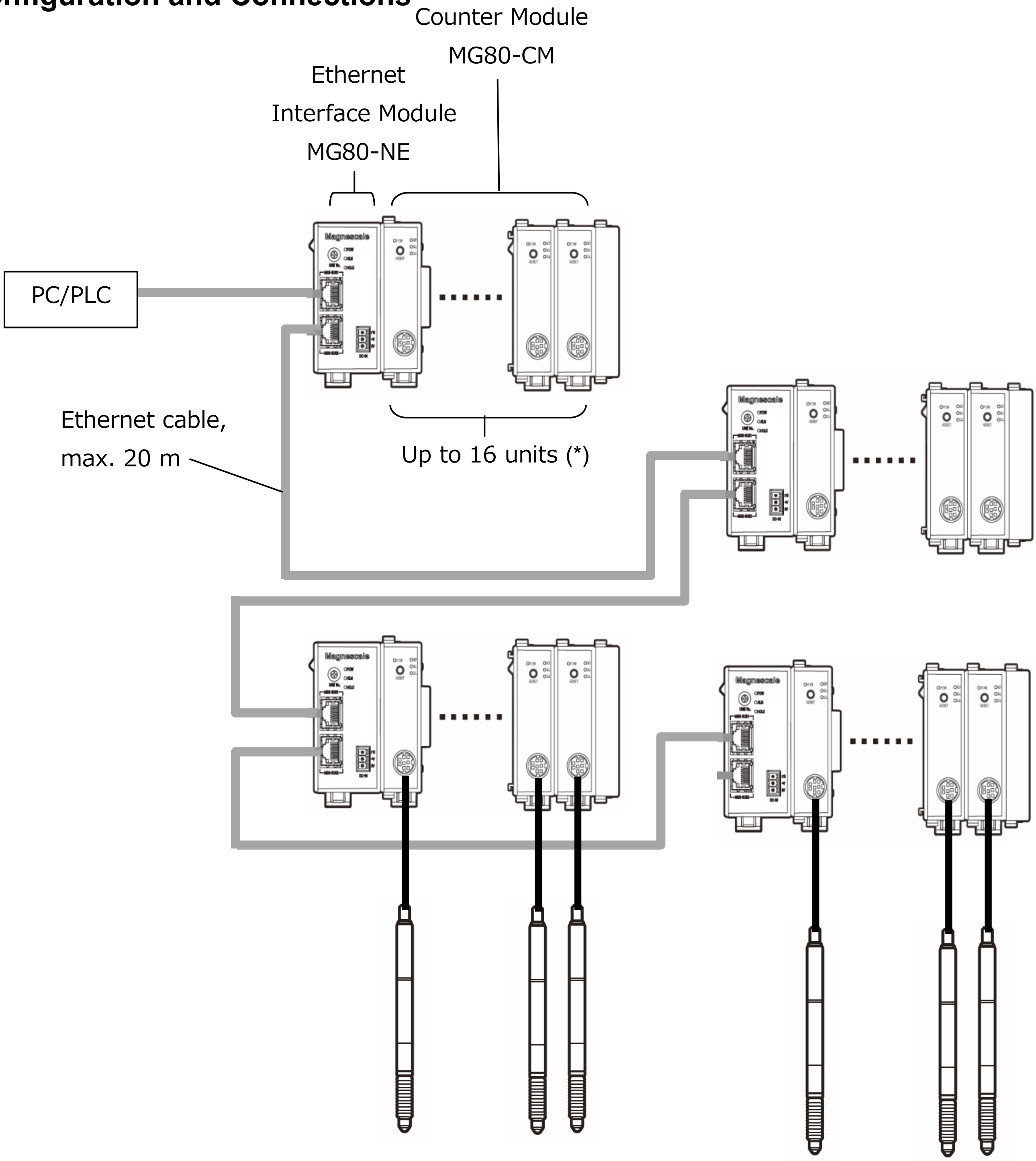
This product (MG80-NE) is an interface module for measuring systems that can easily acquire multi-axis measurement data by connection with a computer or PLC via general-purpose Ethernet.

This product uses common commands with existing MG40 series products, so MG40 series users can continue to use the programming environment.

Up to 16 MG80-CM (counter module) can be connected to each MG80-NE.

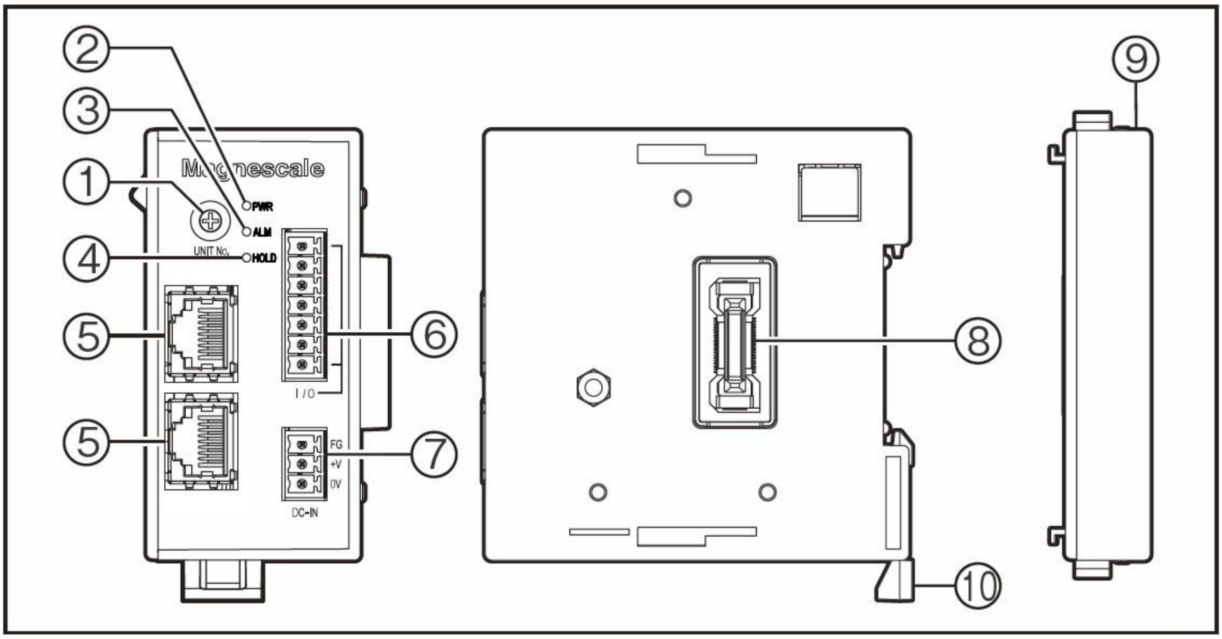
Up to four MG80-NE can be connected in the entire system, for an overall configuration of up to 64 axes of measuring units.

2. Configuration and Connections



(*): Up to 16 MG80-CM can be connected to each MG80-NE.
This enables an overall configuration of up to 64 modules.

3. Name and Function of Each Part



① **Module number setting switch**

Sets the module number 1 to 7; Master unit, 8 to A: Slave unit (B to E: Reserved)*.

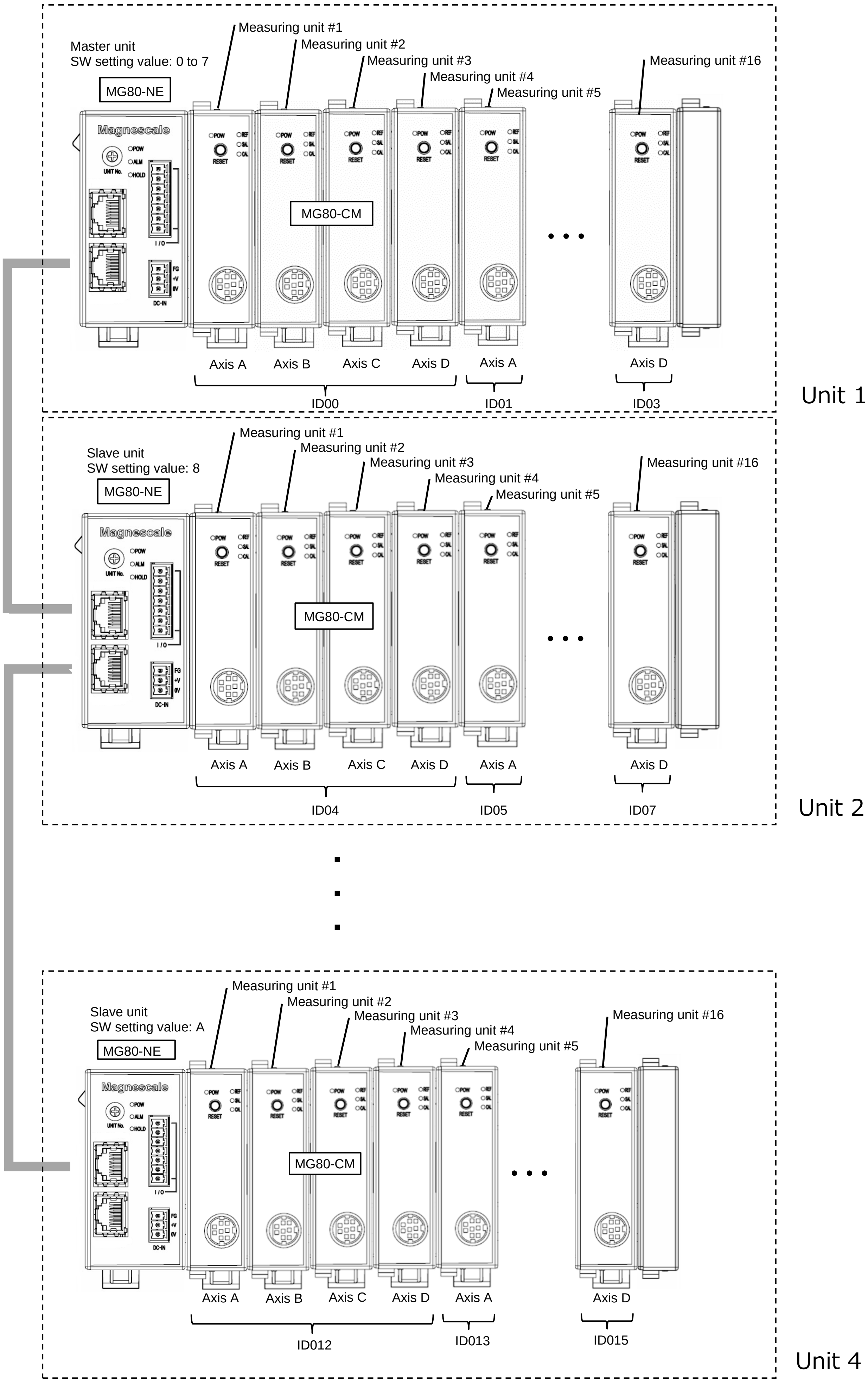
* F: Setup mode. Used to make settings during setup in the default status.

The MG80-CM has one ID number for the four axes in order to maintain compatibility with the MG40 series.

3-1. Rotary switch setting table

MG80-NE setting	Switch setting value	"1" to "7" (Master unit)	"8" (Slave unit)	"9" (Slave unit)	"A" (Slave mode unit)
MG80-CM settings	ID No.	0,1,2,3	4,5,6,7	8,9,10,11	12,13,14,15
	Measuring unit #1	ID = 00, A axis	ID = 04, A axis	ID = 08, A axis	ID = 12, A axis
	Measuring unit #2	ID = 00, B axis	ID = 04, B axis	ID = 08, B axis	ID = 12, B axis
	Measuring unit #3	ID = 00, C axis	ID = 04, C axis	ID = 08, C axis	ID = 12, C axis
	Measuring unit #4	ID = 00, D axis	ID = 04, D axis	ID = 08, D axis	ID = 12, D axis
	Measuring unit #5	ID = 01, A axis	ID = 05, A axis	ID = 09, A axis	ID = 13, A axis
	Measuring unit #6	ID = 01, B axis	ID = 05, B axis	ID = 09, B axis	ID = 13, B axis
	Measuring unit #7	ID = 01, C axis	ID = 05, C axis	ID = 09, C axis	ID = 13, C axis
	Measuring unit #8	ID = 01, D axis	ID = 05, D axis	ID = 09, D axis	ID = 13, D axis
	Measuring unit #9	ID = 02, A axis	ID = 06, A axis	ID = 10, A axis	ID = 14, A axis
	Measuring unit #10	ID = 02, B axis	ID = 06, B axis	ID = 10, B axis	ID = 14, B axis
	Measuring unit #11	ID = 02, C axis	ID = 06, C axis	ID = 10, C axis	ID = 14, C axis
	Measuring unit #12	ID = 02, D axis	ID = 06, D axis	ID = 10, D axis	ID = 14, D axis
	Measuring unit #13	ID = 03, A axis	ID = 07, A axis	ID = 11, A axis	ID = 15, A axis
	Measuring unit #14	ID = 03, B axis	ID = 07, B axis	ID = 11, B axis	ID = 15, B axis
	Measuring unit #15	ID = 03, C axis	ID = 07, C axis	ID = 11, C axis	ID = 15, C axis
	Measuring unit #16	ID = 03, D axis	ID = 07, D axis	ID = 11, D axis	ID = 15, D axis

Setting assignments and names



② **POWER lamp (PWR)**

Lights up when the power is on, turns off when the power is off.

③ **ALARM lamp (ALM)**

Lights up red when any counter module within the unit is in the alarm status.

④ **HOLD lamp (HOLD)**

Lights up orange when the hold function (in which the current value output updating is stopped) is activated in any counter module within the unit.

⑤ **Dedicated Ethernet/MGS-BUS port**

This port is used for computer/PLC and slave unit connection.

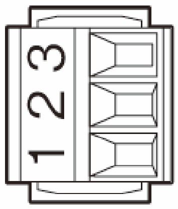
⑥ **Maintenance connector (not used)**

⑦ **Power input**

This connector is used to supply external power. (DC + 12 to 24 V)

Tighten the screws to secure the wires.

Conforming wire: AWG 28-16



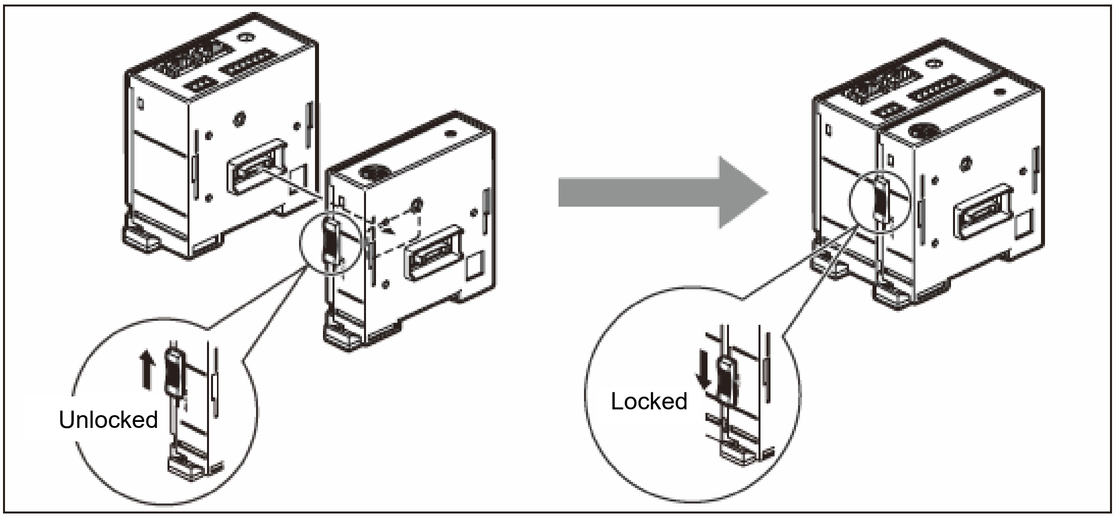
No.	Name	Description
1	FG	Frame ground
2	Vin	DC +12 V to 24 V
3	0 V	0 V

⑧ **Module connector**

Connects a counter module (MG80-CM).

Unlock the slide locks of the counter module to be connected and couple the modules.

Connect the connectors of the interface module and the counter module, and then return the top and bottom slide locks to the locked positions to secure the module.



⑨ **Termination module**

Connect to the endmost position (the right side when viewed from the front) of the unit.

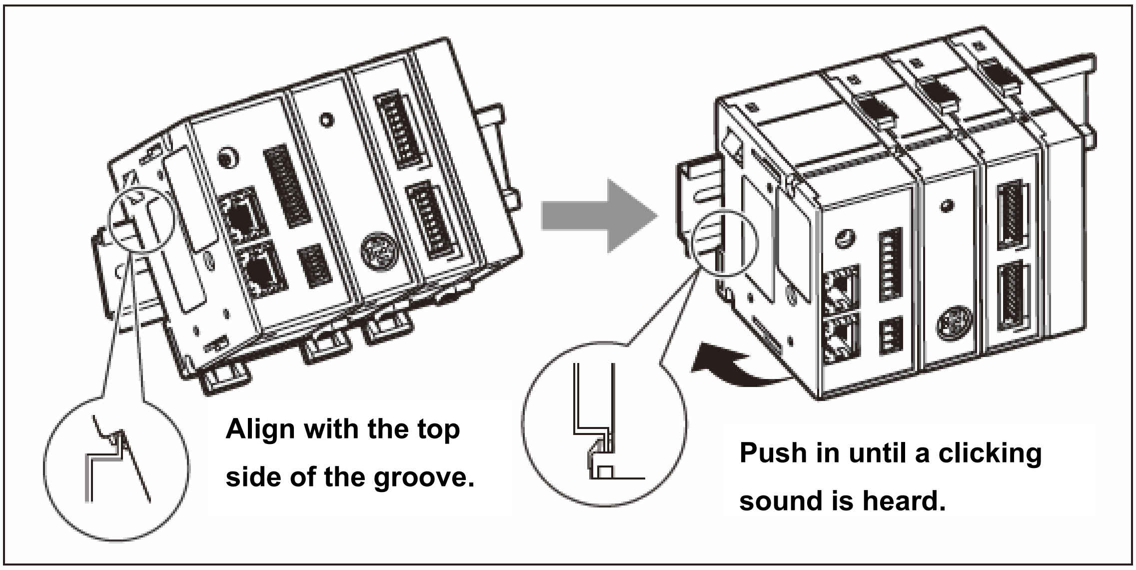
⑩ **DIN rail anchoring lever**

This lock mechanism secures the main unit to the DIN rails.

Installing the Unit on the DIN Rails

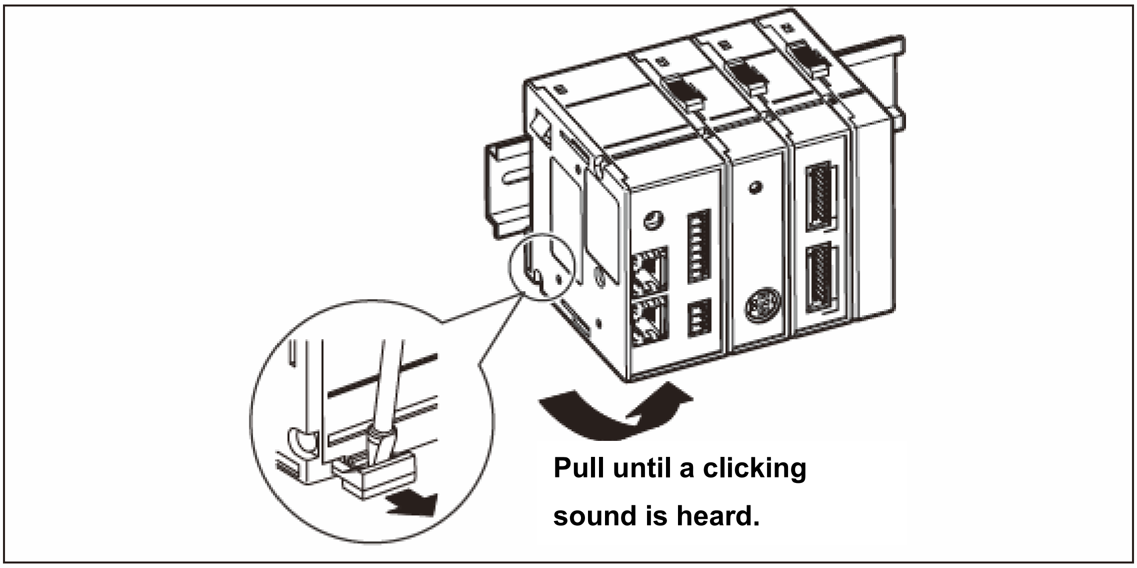
This product supports 35 mm wide DIN rails.

When the interface unit is shipped from the factory, the tabs on the DIN rail anchoring levers are locked. Align the top side of the groove in the unit's rear panel with the top of the DIN rails, and install the unit by pushing it into position until a clicking sound is heard so that the bottom side of the groove fits snugly on the DIN rails.



Removing the Unit from the DIN Rails

While holding the unit in place so that it will not fall, pull down the DIN rail anchoring levers of all the modules until a clicking sound is heard.



4. Connections and Setting Method

4-1. Precaution before Network Connection

Important

If connecting to an existing network, special settings may be required for the network equipment that is already installed. Therefore, consult with the network administrator beforehand.

4-2. Items Required to Set up the MG80-NE

- Personal computer

  Recommended specifications

  CPU: Intel Core i3 or higher

  RAM: 4 GB or more

  OS: Windows10 (32bit/64bit of each edition)

- LAN cable

  A category 5e or higher cross or straight Ethernet cable is recommended.

4-3. Setup Procedure

Important

Do not supply power until all of the connections are complete.

- Power input connector connection
- Connections of each module
- Link connection between interface modules (Ethernet cable)
- Connection between the computer or PLC and the interface module (Ethernet cable)

Procedure

4-3-1 MG80-NE setting
Make the hardware setting.

4-3-2 Computer settings
Make the computer (Master unit) settings.

4-3-3 Ethernet communication check and measuring system settings
Connect the computer and the MG80-NE via Ethernet (telnet).

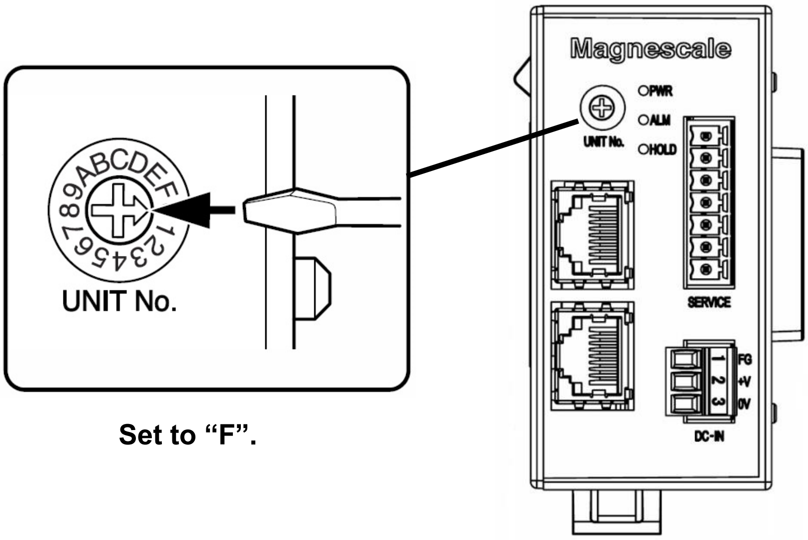
4-3-4 Acquisition of data using Telnet
Acquire the MG80-NE measurement data to the computer via Ethernet (telnet).

4-3-5 Acquisition of data using TCP/UDP
Acquire the MG80-NE measurement data to the computer via Ethernet (TCP or UDP).

4-3-1. MG80-NE setting

Hardware setting

1	**MG80-NE setting** Set the rotary switch located on the front of the MG80-NE to "F: Setup mode".



Set to “F”.

4-3-2. Computer settings

Set the parameters related to the IP address.

Setting item	Computer	Interface module MG80-NE (Factory setting)
IP address	192.168.1.1	192.168.1.100
Subnet mask	255.255.255.0	255.255.255.0
Gateway	---.---.---.---	192.168.1.1
Port No.	-	23 (Fixed: telnet)

Notes

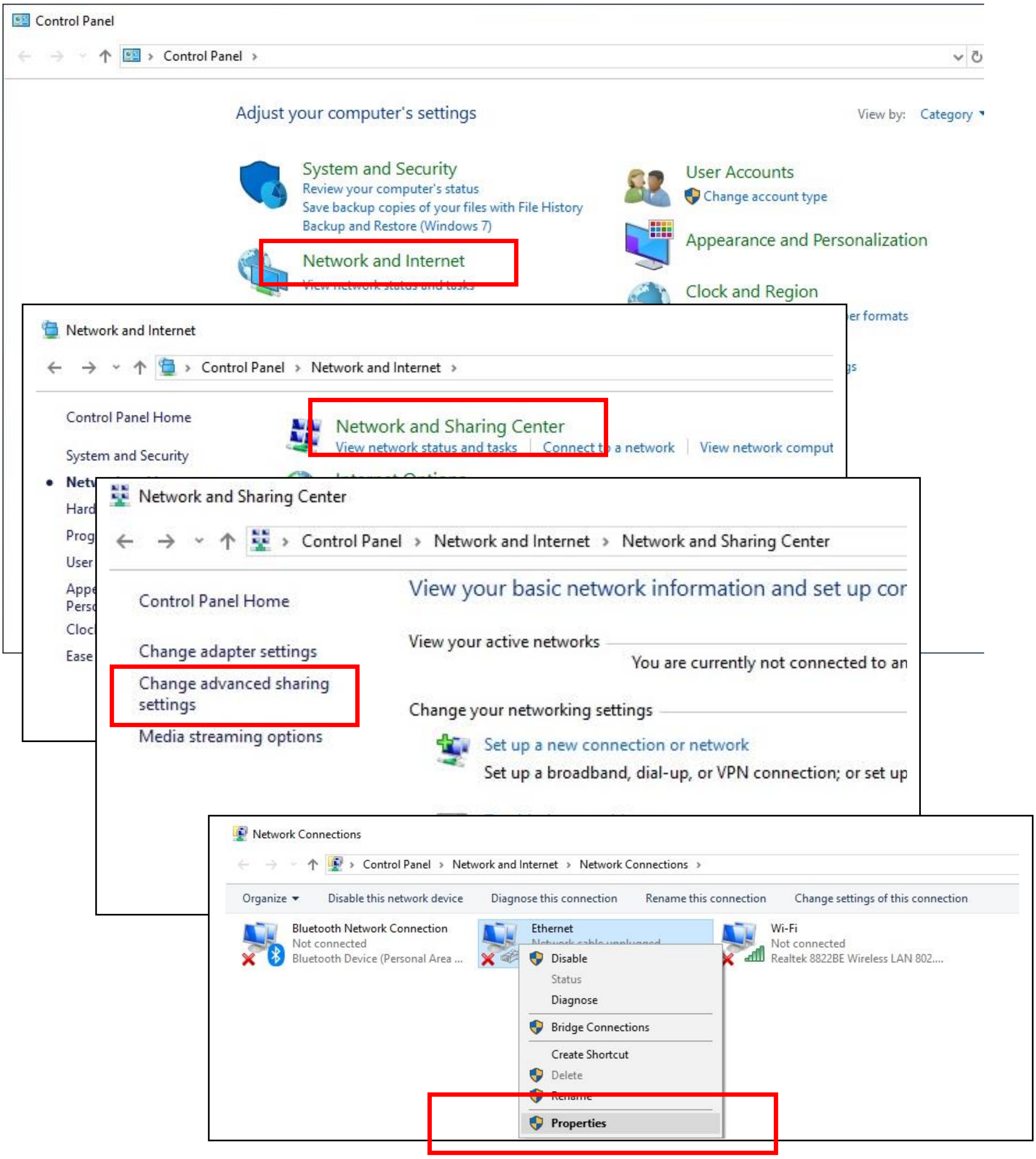
- Set the lowermost address of the IP address to 240 or less.
- 192.168.10.255 is the broadcast address, so setting is prohibited.

2-1

Computer settings

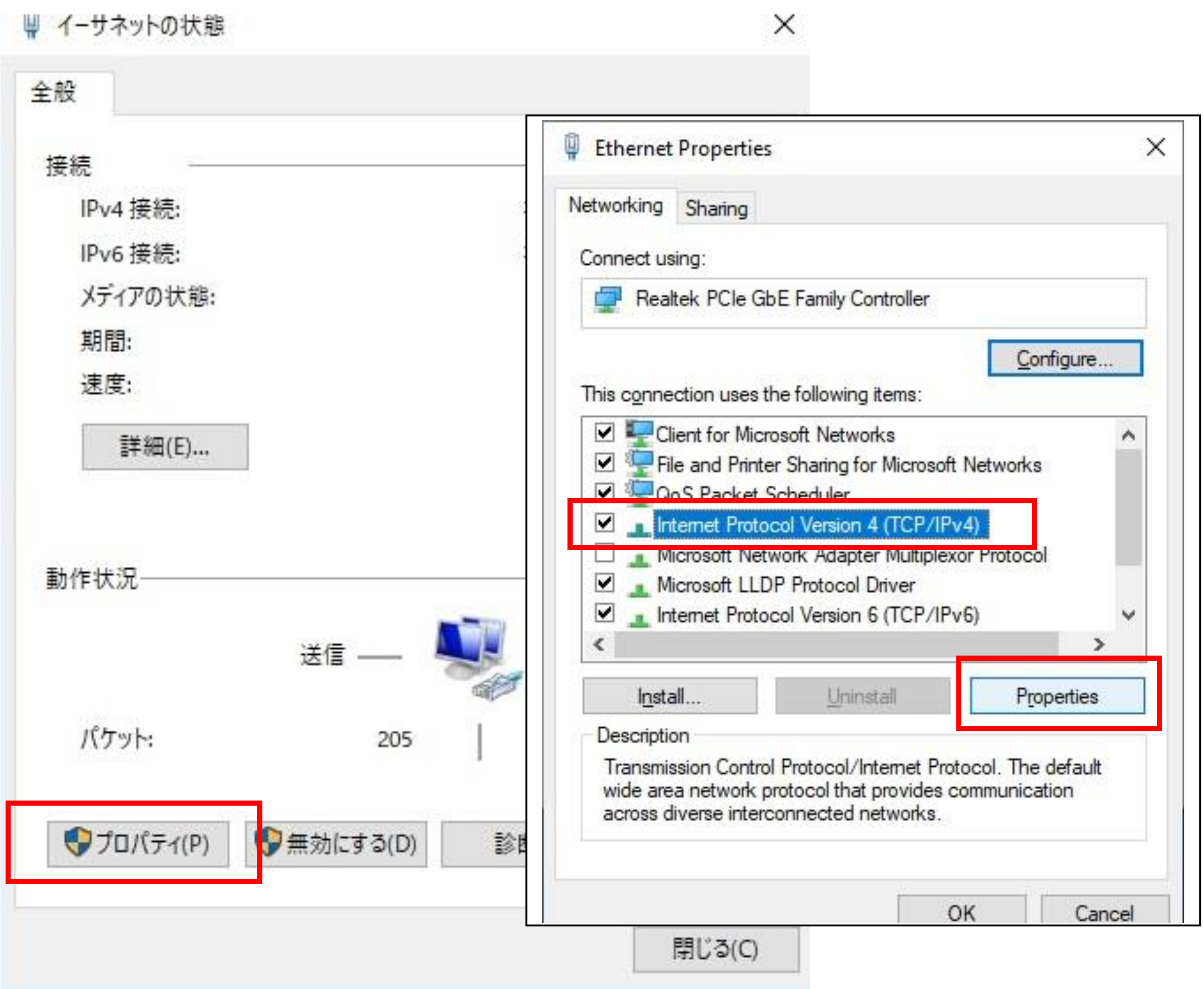
Set the parameters of the computer to be used.

Click "Control Panel" → "Network and Internet" → "Network and Sharing Center"
→ "Network Connections" → "Properties."



2-2

Next, select "Properties" → "Internet Protocol Version 4 (TCP/IPv4)" and click "Properties."



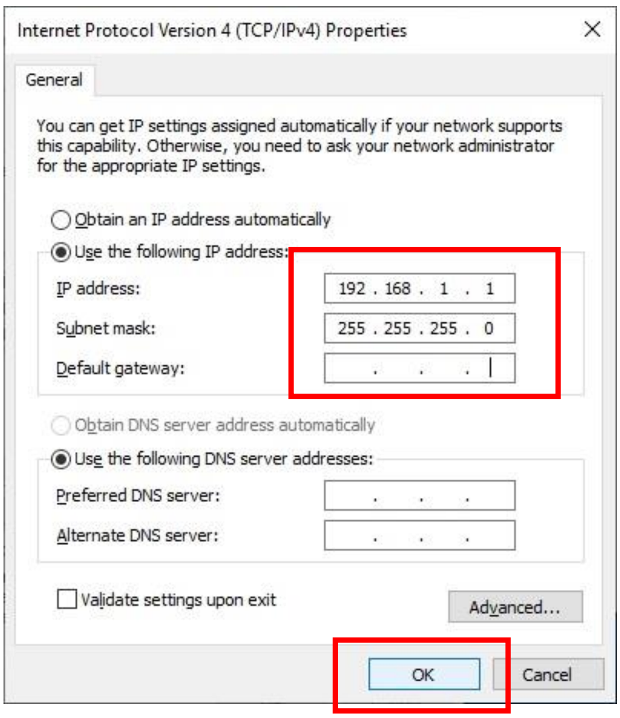
2-3

Set the IP address of the computer to be used to 192.168.1.1.

Set the subnet mask to 255.255.255.0.

After making the settings, click "OK."

* These settings are needed to operate in setup mode.
Change the IP address setting in accordance with the environment.

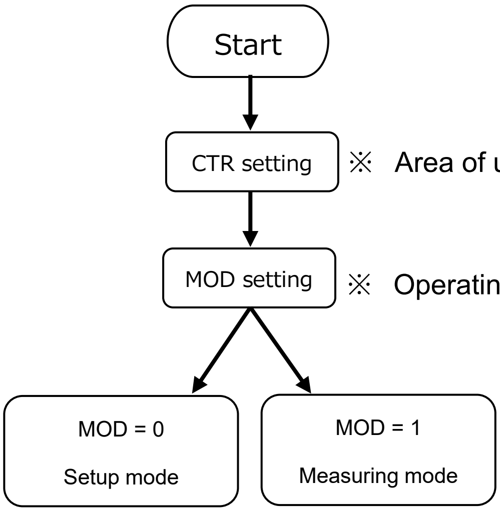


4-3-3. Ethernet communication check and measuring system settings

Changing the measuring system parameters

When changing parameter settings related to the IP address of the measuring system, connect with the computer and use the command to change the settings.

MG80-NE boot-up flow



※ Area of use set only the first time the MG80-NE is booted

※ Operating mode set each time the MG80-NE is booted

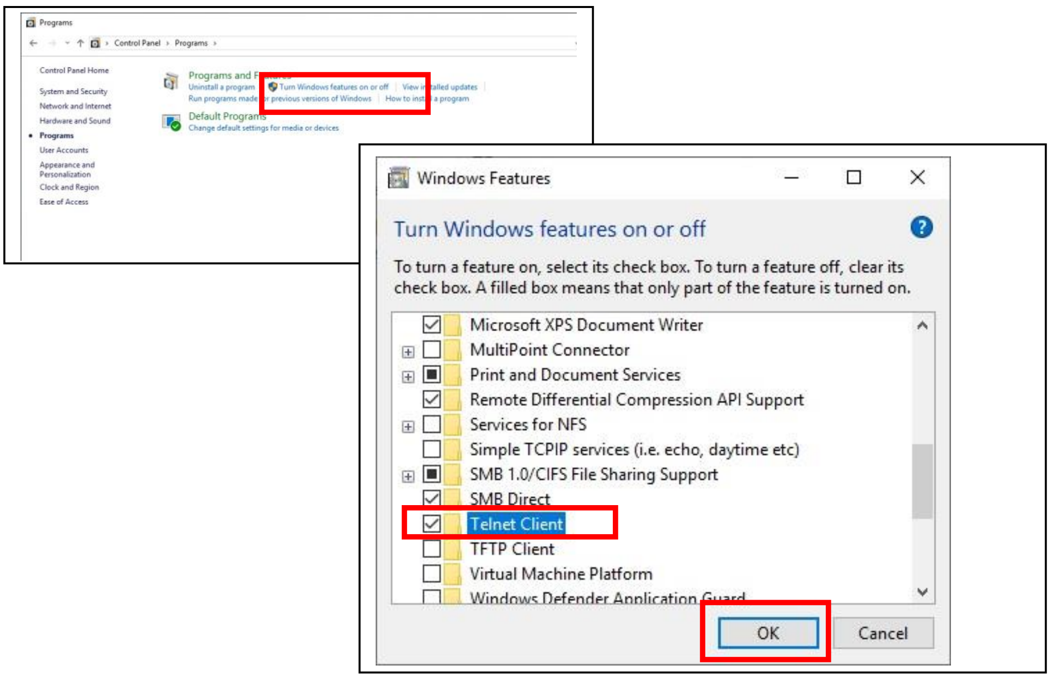
MG80-NE has the two operating modes of setup mode and measuring mode.

Some commands are available in only one operating mode.

For details, see "5-4. List of Commands."

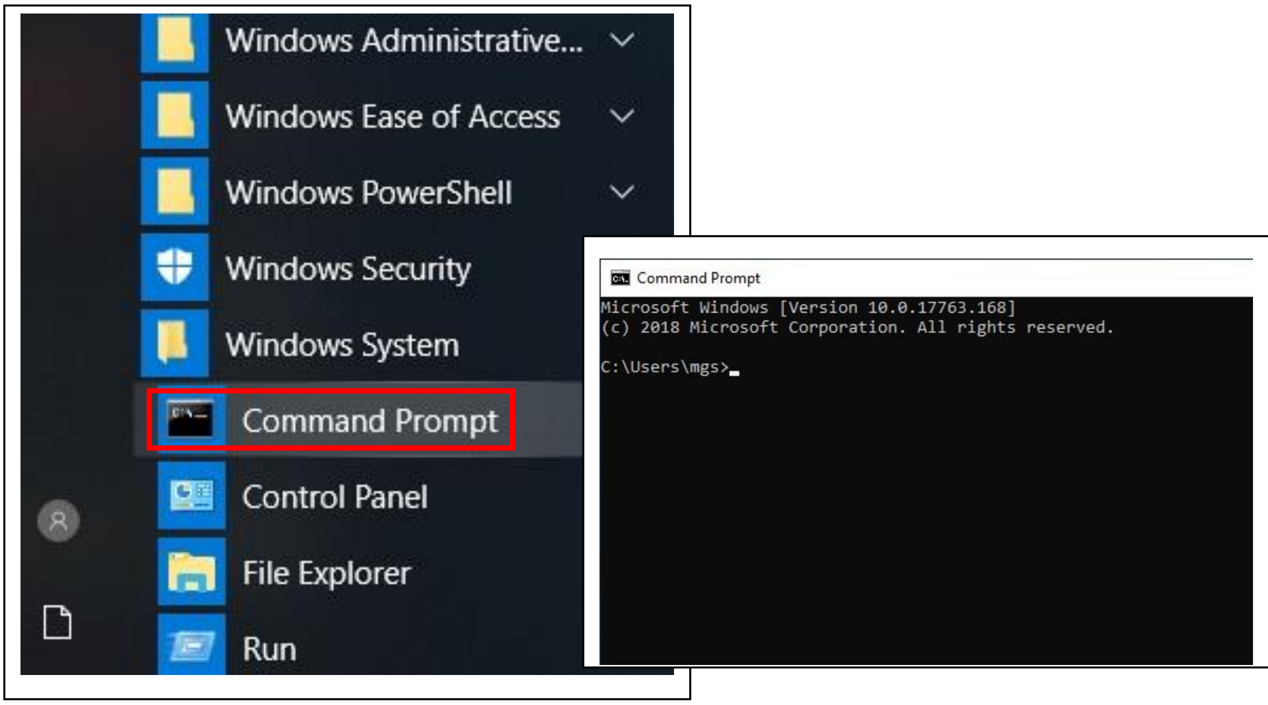
The MG80-NE always operates in setup mode when the power is turned on.

3-1	Check Ethernet communication between the MG80-NE and the computer. Connect the MG80-CM and the measuring unit, check the LAN cable connection, and then turn on the power.
3-2	**Computer settings** Set the parameters of the computer to be used. Click "Control Panel" → "Programs" → "Turn Windows features on or off." Next, add a check mark to "Telnet Client" and click "OK."



3-3 **Communication with the computer**

Select "Start Menu" → "Windows System Tools" → "Command Prompt" to open the Command Prompt window.



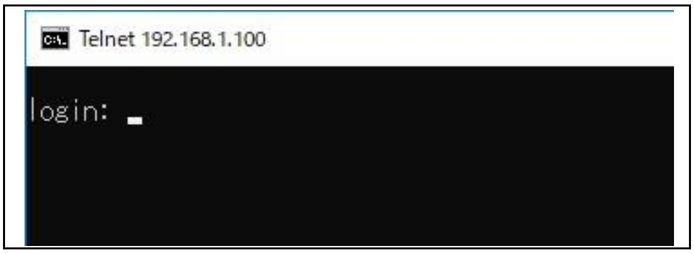
3-4 Enter "telnet 192.168.1.100" in the opened Command Prompt window and press the Enter key.

The Telnet window opens, and then the text "login:" for the MG80-NE appears.

Enter "MG80" following "login:" and press the Enter key.

If write is successful, "Password" appears.

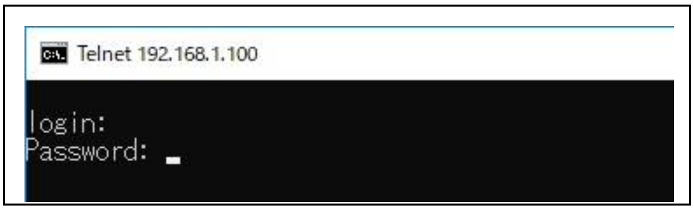
* Entered characters are not displayed.



3-5 Enter "MG80" following "Password:" and press the Enter key.

* Entered characters are not displayed.

* If login is successful, nothing is displayed.



3-6

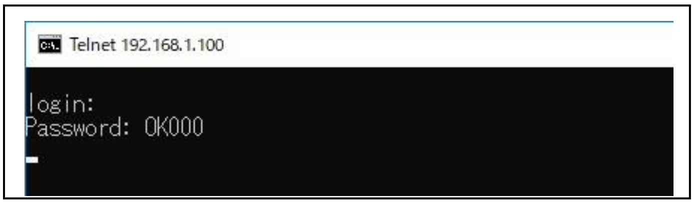
The area of use must be set only when the power is turned on for the first time.

Enter "CTR=2" or "CTR=3" and press the ENTER key.

If write is successful, "OK000" appears.

If CTR=3 is set, the values in parentheses described in the output resolution item of the setup commands will be used.

* Entered characters are not displayed.
* If the area of use is already set, "ER214" appears and setting is unnecessary.
  There is no need for error processing, so proceed to the next step.



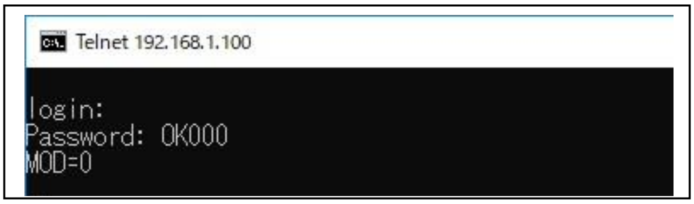
3-7

Check that the operating mode is setup mode.

Enter "MOD?" and press the Enter key.

If write is successful, "MOD=0" appears.

* Entered characters are not displayed.
* If "MOD=1" appears, enter "MOD=0" to change to setup mode.



3-8

Changing the IP address

* Perform this step when it is necessary to change the IP address.
  The example below shows the case when changing the IP address to 192.168.250.2.

Enter "NIP=192.168.250.2" and press the Enter key.

If write is successful, "OK000" appears.

* Entered characters are not displayed
* Write will take several seconds.

3-9	Save the settings. Enter "SAV" and press the Enter key. If write is successful, "OK000" appears. * Entered characters are not displayed. * Write will take several seconds. 
3-10	Check the setting contents. Enter "NIP?" and press the Enter key. "NIP=192.168.250.2" appears. 
3-11	Enter "quit" and press the Enter key. The Telnet window closes.
3-12	After turning off the power, change the rotary switch from "F: Setup mode" to the setting to be used. Operation is now possible. See "3-1. Rotary Switch Setting Table."

4-3-4. Acquisition of Data Using Telnet

Follow the procedure below to set the measuring system to measuring mode and acquire measurement data using telnet.

4-1

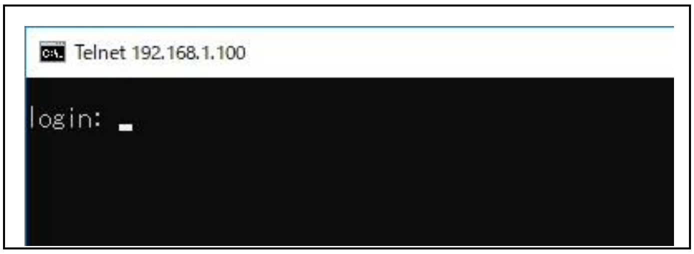
Enter "telnet 192.168.1.100" in the opened Command Prompt window and press the Enter key.

The Telnet window opens, and then the text "login:" for the MG80-NE appears.

Enter "MG80" following "login:" and press the Enter key.

If write is successful, "Password" appears.

* Entered characters are not displayed.

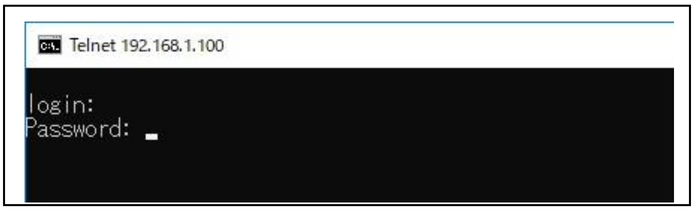


4-2

Enter "MG80" following "Password:" and press the Enter key.

* Entered characters are not displayed.

* If login is successful, nothing is displayed.



4-3

Set the operating mode to measuring mode.

Enter "MOD=1" and press the Enter key.

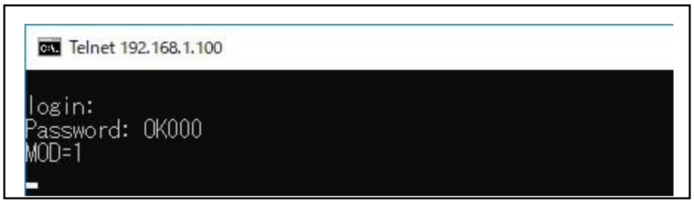
If write is successful, “OK000” appears.

Enter "MOD?" and press the Enter key.

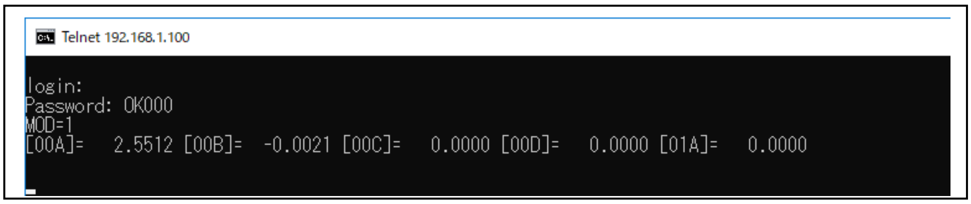
If write is successful, "MOD=1" appears.

* Entered characters are not displayed.

* "MOD=0" appears, enter "MOD=1" to change to measuring mode.



4-4	Acquire the measurement data. Enter "R" and press the Enter key. The measurement data of connected units is output. * Entered characters are not displayed. * The output type differs according to the header setting.

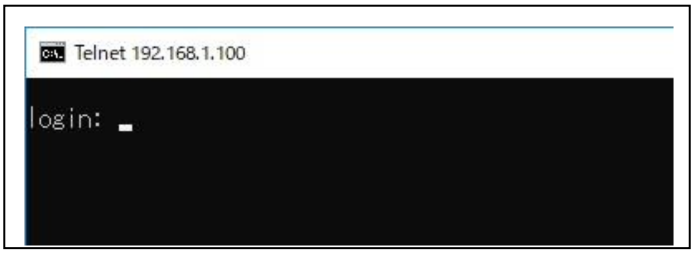


4-5	**Quitting** Enter "quit" and press the Enter key. The Telnet window closes.

4-3-5. Acquisition of data using TCP/UDP

Follow the procedure below to set the measuring system to measuring mode and acquire measurement data using TCP/UDP.

4-6	Enter "telnet 192.168.1.100" in the opened Command Prompt window and press the Enter key. The Telnet window opens, and then the text "login:" for the MG80-NE appears. Enter "MG80" following "login:" and press the Enter key. If write is successful, "Password" appears. * Entered characters are not displayed.



4-7	Enter "MG80" following "Password:" and press the Enter key. * Entered characters are not displayed. * If login is successful, nothing is displayed.

4-8	Set the data transmission setting to TCP or UDP. To transmit as TCP, enter "NPC=0" and press the Enter key. To transmit as UDP, enter "NPC=1" and press the Enter key. If write is successful, "OK000" appears.
4-9	Set the operating mode to measuring mode. Enter "MOD=1" and press the Enter key. If write is successful, “OK000” appears. Enter "MOD?" and press the Enter key. If write is successful, "MOD=1" appears. * Entered characters are not displayed. * If "MOD=0" appears, enter "MOD=1" to change to measuring mode. 
4-10	Start data transmission. The following example sets an interval time of 100 ms. Enter "NDT=1 100" and press the Enter key. If write is successful, "OK000" appears and data transmission starts.
4-11	Stop data transmission. Enter "NDT=0 100" and press the Enter key. If write is successful, "OK000" appears and data transmission stops.
4-12	**Quitting** Enter "quit" and press the Enter key. The Telnet window closes.

5. Overview of Data

5-1. Communication Protocol

The MG80-NE supports the following three types of communication protocols (Ethernet).
In principle, all protocols can be used at the same time, but data (TCP) or data (UDP) is selected by the command, so these cannot be used at the same time.

Table 5.1 Ethernet protocol used by the MG80-NE

Interface	Protocol	Purpose	
		Command transmission/ reception	Data acquisition
Command	telnet compliant	Possible	Single-shot transfer of ASCII data by commands for computer/PLC
Data (TCP)	TCP	Not possible*	Binary data is continuously transferred. (All data is transferred.)
Data (UDP)	UDP	Not possible*	Binary data is continuously transferred. (Updated to the latest data)

* See 5-2 for the data formats and procedures.
TCP/UDP selection and data output control are performed using telnet-based commands

Telnet is a simple character-based command communication protocol specified by RFC854 of the Internet Engineering Task Force (IETF), and realizes one-to-one character communication between a client (computer, etc.) and a host (MG80). Once communication is established, interactive communication is possible in the same manner as the RS-232C communication of previous models.
The telnet client is installed as standard on typical Windows computers, so the MG80 can be operated without the need to prepare special software.

The telnet command line is capable of only character-based communication, so binary data transfer can be performed using the TCP protocol or UDP protocol to achieve high-speed data communication.
TCP/UDP selection and data output control are performed using telnet-based commands.
TCP is the abbreviation of Transmission Control Protocol, and is a transport layer protocol specified by RFC793 of IETF. TCP establishes a connection with the other communication party, and realizes reliable data transfer while performing handshakes. TCP supports resend requests when a transmission packet gets lost, and also resend when the resend request itself gets lost, etc.
TCP is used to ensure that all data is actually transferred, but handshake overhead occurs, so the transfer speed is slower compared to UDP.

UDP is the abbreviation of User Datagram Protocol, and is a transport layer protocol specified

by RFC768 of IETF. UDP performs communication without establishing a connection with the other communication party or performing handshakes.
The receive side checks that the received data is not corrupted.
UDP is used to quickly transfer the latest data, but handshakes are not used in order to achieve high speed, so there is no guarantee with respect to data loss.

5-2. Data Formats

When using Store datum point offset value, Relocate datum point, Relocate master calibration value, or Master calibration function, it is not possible to perform Data request or Memory data output until the reference point is passed. Also, just after the reference point is passed, the peak value becomes unsettled, and should not be used until it is settled.

The ASCII data format is used for responses to the Data request and Memory data output commands of the command interface.
Also, the binary format is used when using the function for continuous data transmission via Ethernet.

5-2-1. ASCII Data

When a setting command or an acquisition command is transmitted, the MG80-NE checks the command syntax and the parameters and returns the results.
The measurement data of a single axis is configured as shown below:

Header Data CR+LF

The measurement data of multiple axes is configured as shown in the example for three axes below:

Header Data Separator Header Data Separator Header Data CR+LF

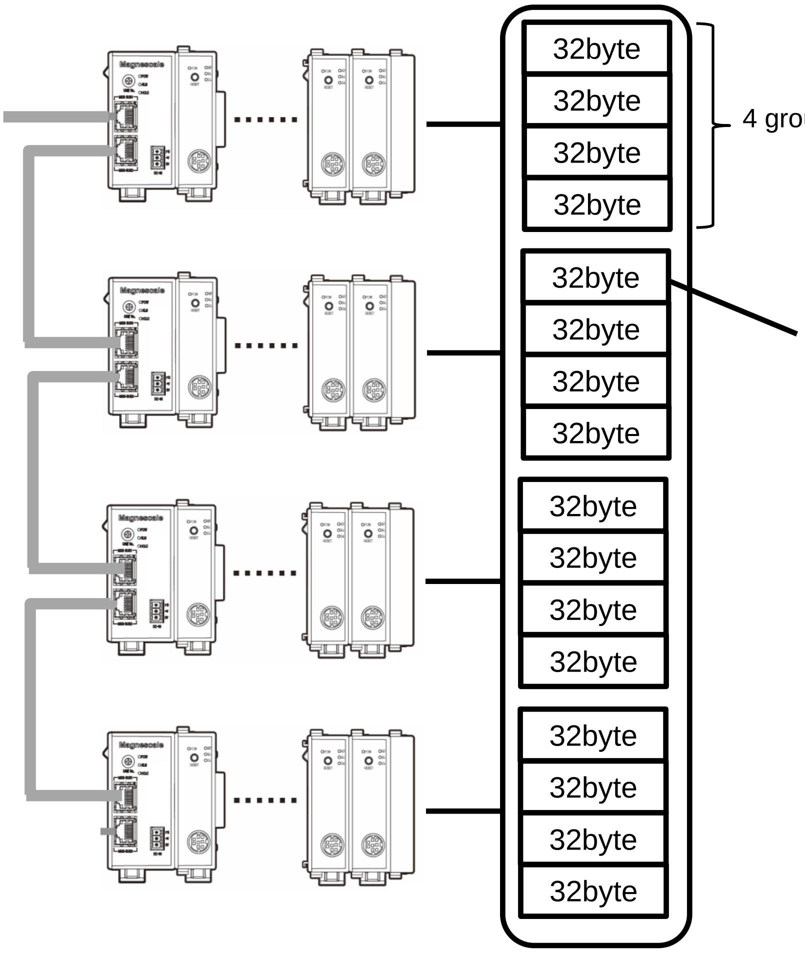
The headers can be selected by the HDR command and the axis separators by the SEP command.

5.2 Header Types and Example of Output

Header type	Header specification	Example of output
None	(No headers are output.)	(No headers are output.)
Type 1	Designated axis=	[00A]= [03B]= [15D]=
Type 2	Designated axis<Comparator results><Output data><Error information><Reference point information>=	[00A]02C00= [03B]14P00= [15D]00B02=

5-2-2. Binary Data

In the binary format, 32-byte fixed length data is output for groups of four axes in which even one valid axis is connected.
The maximum size is 16 groups, or 512 bytes of data.
All zeros are used for the status and data of an axis that is not connected.



4 groups (16 axes) = Data for MG80-NE × 1 unit

Max. 512 bytes (64 axes) = Data for MG80-NE × 4 units

Contents of 32-byte (4 axes) data

Byte	Description
0x00	Axis A status
0x01	
0x02	Axis A measurement data
0x03	
0x04	
0x05	
0x06	Axis B status
0x07	
0x08	Axis B measurement data
0x09	
0x0A	
0x0B	
0x0C	Axis C status
0x0D	
0x0E	Axis C measurement data
0x0F	
0x10	
0x11	
0x12	Axis D status
0x13	
0x14	Axis D measurement data
0x15	
0x16	
0x17	
0x18	Unit ID
0x19	Axis A comparator results
0x1A	Axis B comparator results
0x1B	Axis C comparator results
0x1C	Axis D comparator results
0x1D	Time stamp
0x1E	
0x1F	

<Axis statuses> The axis statuses are stored in the following format.

Byte	7 6 5 4	3 2 1 0
0	Axis label	Decimal point position
1	Error information	Reference point position

<Axis label> 0: Not connected, 1: Axis A, 2: Axis B, 3: Axis C, 4: Axis D

<Decimal point position> 10^{-n} is stored here as the value of n = 0 to 7.

<Error information> These are the coefficients for converting the measurement data stored as integers into a length unit.
bit0: Speed alarm, bit1: Level alarm, and bit2: Communication error are stored here. (bit3 is reserved.)

<Reference point position> 0: Reference point not detected, 1: Wait to go past reference point, or 2: Reference point detected is stored here.

<Unit ID> Target unit ID (0 to 31)

<Axis data> The measurement results of the axes are stored here using the 32-bit signed little endian order*.

If the error information for the axis status is not 0, it means that an error has occurred so do not use the axis data.

Byte \ bit	7	6	5	4	3	2	1	0
0	Axis data 32-bit integers in little endian order							
1								
2								
3								

* Little endian is a method in which numerical data broken down into 1-byte units is stored in the memory in order from the lowermost byte (LSB).

For example, when storing the hexadecimal value 0x12345678 in the memory using the little endian method, this value broken down into 1-byte units becomes 0x12, 0x34, 0x56, 0x78.

When stored at each memory address in order from the LSB 0x78 to the MSB 0x12, the data is stored in the order 0x78, 0x56, 0x34, 0x12, and the corresponding binary data that can be checked using the memory editor is 78563412.

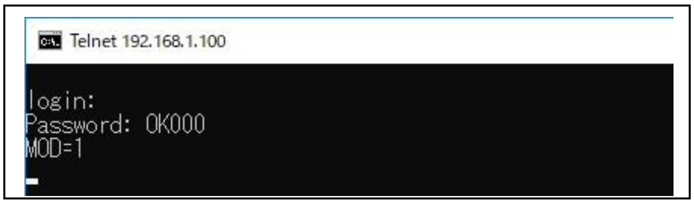
<Comparator results>

0 : Measurement value < Setting value 1
1 : Setting value 1 ≤ Measurement value < Setting value 2
|
15 : Setting value 15 ≤ Measurement value < Setting value 16
16 : Setting value 16 ≤ Measurement value

<Time stamp> This is the time counter value of the MG80-NE, and is a value in 1/128 s units referenced to AM 0:00. The value range is from 0x000000 to 0xA8BFFF.

5-2-3. Setting the Data Format

5-1	Refer to "4-3-3. Ethernet communication check and measuring system settings" and establish a connection via telnet communication.
5-2	**Gateway address setting** Make this setting when it is necessary to set the gateway address in the network to be used. * An example of changing the setting to 192.168.1.256 is shown below. Enter "MOD?" and press the Enter key. Check that MOD=0*. Enter "NGW=192.168.1.256" and press the Enter key. Check that "OK000" is returned. * If "MOD=1" appears, enter "MOD=0" to change to setup mode.
5-3	**Data transmission protocol setting** Enter "NPC=0" and press the Enter key. Check that "OK000" is returned.
5-4	Reference Port numbers 1 to 1023: These may already be reserved by general internet services. Port numbers 1024 to 49151: These may already be used by some system. An example of changing the setting to 49154 is shown below. **Data transmission port number setting** Enter "NPN=49154" and press the Enter key. Check that "OK000" is returned.
5-5	**Communication with the computer or PLC** Establish a TCP connection. Set the computer or PLC as shown below. Protocol: TCP IP address: Same as the command interface Port number: Port number designated by the command

5-6	**Switching the measuring mode** Enter "MOD=1" and press the Enter key. Enter "MOD?" and press the Enter key. Check that MOD=1* * If "MOD=0" appears, enter "MOD=1" to change to measuring mode. 
5-7	**Starting data output** Enter "NDT=1" and press the Enter key. * The data is sent continuously, so perform the necessary procesing with the software. The data is binary format. For details, see "5-2. Data Formats."
5-8	**Stopping data output** Enter "NDT=0" and press the Enter key.

5-3. Overview of Commands

Commands comprise character strings consisting of letters, numbers and symbols, and are used by the controller (computer or sequencer) and device (MG80 series) to make settings, get statuses, and exchange data via the telnet protocol.
Command communication follows the format of starting from the controller side with the device responding.

5-3-1. Command Classification

Commands are classified into the groups and targets shown below.

Command group	Purpose
Setup commands	Basic settings such as preparations for measurements
Operation commands	Operations and settings while measurements are underway
Data request commands	Acquisition of measurement result data

Command targets
Entire system
Measurement axes
Measuring unit

5-3-2. Command Syntax

Commands use the order of command, designated axis, setting value/parameter as a single syntax.

Group	Target	Transmission		Return
Setup commands/ operation commands	Entire system	Settings	□□■=◆$\boxed{\text{CR}}$ $\boxed{\text{LF}}$	Execution results
		Acquisition	□□■?$\boxed{\text{CR}}$ $\boxed{\text{LF}}$	□□■=◆$\boxed{\text{CR}}$ $\boxed{\text{LF}}$
	Measurement axes / Measuring unit	Settings	□□■$\boxed{\text{Designated axis}}$=◆$\boxed{\text{CR}}$ $\boxed{\text{LF}}$	Execution results
		Acquisition	□□■$\boxed{\text{Designated axis}}$?$\boxed{\text{CR}}$ $\boxed{\text{LF}}$	□□■=◆$\boxed{\text{CR}}$ $\boxed{\text{LF}}$
Data request commands	Measurement axes	Acquisition	R $\boxed{\text{CR}}$ $\boxed{\text{LF}}$	→ Data format
			R $\boxed{\text{Designated axis}}$ $\boxed{\text{CR}}$ $\boxed{\text{LF}}$	→ Data format

□□■ : Command

◆ : Command

$\boxed{\text{CR}}$ $\boxed{\text{LF}}$: Line feed (CR + LF)

$\boxed{\text{Designated axis}}$: Designated axis

Example of unit and axis designation

[□□■]

Designates the unit.　　Designates the axis.

*: All axes targeted.

[***] = All axes

[00*] = 4 axes (Axes A to D) for MG80-NE unit ID0

[01*] = 4 axes (Axes A to D) for MG80-NE unit ID1

[02*] = 4 axes (Axes A to D) for MG80-NE unit ID2

[03*] = 4 axes (Axes A to D) for MG80-NE unit ID3

[04*] = 4 axes (Axes A to D) for MG80-NE unit ID4

· ·

· ·

· ·

[15*] = 4 axes (Axes A to D) for MG80-NE unit ID15

[00A] = Axis A for MG80-NE unit ID0

[00B] = Axis B for MG80-NE unit ID0

[00C] = Axis C for MG80-NE unit ID0

[00D] = Axis D for MG80-NE unit ID0

· ·

· ·

· ·

[15D] = D axis for MG80-NE unit ID15

5-3-3. Execution Results and Errors

When a setting command or acquisition command is sent, the MG80-NE checks the command syntax and parameters, and returns the result.

The execution results are returned in 5 characters + CR LF.

Example:

OK000

Execution results

OK: Successful completion

ER: Error occurrence

Error level

0: Successful completion/acknowledgement

1: Error

2: Fatal error

Error code

Refer to "5-3-3 Table of error codes."

5-3-3 Table of error codes

Classification	Code	Type	Description
Numbers in the 00s: General information, additional information	00	No error/ no additional information	Normally used when there are no errors.
Numbers in the 10s: Command related errors	10	Command error	There is no command or the command has illegal syntax.
	12	Mode error	The mode does not permit the execution of the command in question.
	13	Target error	The target designated as the command target is not connected to the system or the wrong method was used to designate it (such as in cases where all the axes were designated with a command for which all the axes cannot be designated.)
	14	Parameter error	The parameter does not exist or is not within the range or the wrong method was used to designate it.
Numbers in the 20s: Ethernet communication related errors	20	Network setting error	There is a problem in the network settings.
	21	Command interface connection error	Connection with the command interface has failed.
	22	Data interface connection error	Connection with the data interface has failed.
Numbers in the 30s to 90s: Not used	–	–	–
Numbers in the A0s: Main module hardware errors	A0	Communication timeout	A communication timeout occurred. A disconnected cable, broken cable, power supply trouble, or equipment failure may be to blame.
	A1	Communication error	There is an error in the communication contents. Noise, cable trouble, or equipment failure may be to blame.
Numbers in the C0s: Measuring unit related errors	C0	Measuring unit error	The measuring unit has a disconnected cable, broken cable, power supply trouble, or has failed.
	C1	System error	System trouble has been detected.
Numbers in the D0s to F0s: Not used			

5-4. List of Commands

List of operation commands

Function		Command	Setup mode	Measurement mode	Compatible with MG40
Operation mode	Set	MOD=<Operation mode>	○	○	○
	Acquire	MOD?	○	○	○
Reset	Set	SVZ Designated axis	×	○	○
Preset	Set	PSS Designated axis =<Value>	×	○	○
	Acquire	PSS Designated axis?	×	○	○
	Call	PSR Designated axis	×	○	○
Datum point	Set	DPT Designated axis =<Value>	×	○	○
	Acquire	DPT Designated axis?	×	○	○
	Store datum point offset value	DPS Designated axis	×	○	○
	Relocate datum point	DPR Designated axis	×	○	○
	Release wait to go past reference point status	DPC Designated axis	×	○	○
Reference point information	Acquire	STR Designated axis?	×	○	○
Master	Set master calibration value	MCV Designated axis =<Value>	×	○	○
	Acquire master calibration value	MCV Designated axis?	×	○	○
	Relocate master calibration value	MCR Designated axis	×	○	○
Start	Set	STA Designated axis	×	○	○
Pause	Set pause	PAU Designated axis =<Setting Value>	×	○	○
	Acquire pause status	PAU Designated axis?	×	○	○
Latch	Set latch	LCH Designated axis =<Setting Value>	×	○	○
	Acquire latch status	LCH Designated axis?	×	○	○
Output data	Set output data	OPD Designated axis =<Value>	○	○	○
	Acquire output data	OPD Designated axis?	○	○	○

Comparator group number	Set	CMS Designated axis =<Group number>	○	○	○
	Acquire	CMS Designated axis?	○	○	○
Data request	Request data of all axes	R	×	○	○
	Request data of designated axis	r Designated axis	×	○	○
Memory data output	Current values	MRC Designated axis?	×	○	○
	Maximum values	MRA Designated axis?	×	○	○
	Minimum values	MRI Designated axis?	×	○	○
	Peak to peak values	MRP Designated axis?	×	○	○
	ABS values	MRB Designated axis?	×	○	○
Data transmission control	Set	NDT=<Value> <Standby time>	×	○	○
	Acquire	NDT?	○	○	○

List of setup commands

Function		Command	Setup mode	Measurement mode	Compatible with MG40
Output resolution	Set	OPR Designated axis =<Polarity> <Resolution>	○	×	○
	Acquire	OPR Designated axis ?	○	○	○
Input resolution	Set	IPR Designated axis =<Polarity> <Resolution>	○	×	**New**
	Acquire	IPR Designated axis ?	○	○	○
Master calibration function	Set	MCM=<Value>	○	×	○
	Acquire	MCM?	○	○	○
Area of use	Set	C TR=<Value>	○	×	○
	Acquire	CTR?	○	○	○
Comparator mode	Set	CMM Designated axis =<Mode> <Target value>	○	×	○
	Acquire	CMM Designated axis ?	○	○	○
Comparator value	Set	CMV Designated axis <Group number><Level number>=<Value>	○	×	○
	Acquire	CMV Designated axis <Group number><Level number>?	○	○	○
Data header	Set data header	HDR=<Header>	○	×	○
	Acquire data header	HDR?	○	○	○
Data axis separator	Set	SEP=<Value>	○	×	○
	Acquire	SEP?	○	○	○
Axis calculation function	Set	ADD=<Sign 1> Primary axis <Sign 2> Reference axis	○	×	○
	Acquire	ADD Primary axis ?	○	○	○
Configuration information	Acquire	CFG Target equipment ?	○	○	○
Setting initialization	Set	INI Designated axis =<Initialization level>	○	×	○
Save setting values	Save setting values	SAV	○	×	○
Version information	Acquire	VER Target equipment ?	○	○	○
Error information	Acquire	ERR?	○	○	○
Internal clock	Set	CLK=<Value>	○	×	○
	Acquire	CLK?	○	○	○
Command response	Set	CRP=<Value>	○	×	○
	Acquire	CRP?	○	○	○

Function		Command	Setup mode	Measurement mode	Compatible with MG40
Ethernet station number	Acquire	NID?	○	○	×
IP address	Set	NIP=<IP address>	○	×	○
	Acquire	NIP?	○	○	○
MAC address	Acquire	NMC?	○	○	○
Gateway address	Set	NGW=<Address>	○	×	○
	Acquire	NGW?	○	○	○
Subnet mask	Set	NSM=<Subnet mask>	○	×	○
	Acquire	NSM?	○	○	○
Data transmission protocol	Set	NPC=<Value>	○	×	○
	Acquire	NPC?	○	○	○
Data transmission port number	Set	NPN=<Value>	○	×	○
	Acquire	NPN?	○	○	○

5-5. Operation Commands

●Operation mode

This function is used to switch between the setup mode and measurement mode and acquire the current statuses.

Set

Setup mode | Measurement mode

The command is used to switch between the setup mode and measurement mode.

Command format **MOD=<Operation mode>**

<Operation mode>	0 : Setup mode (Factory setting)
	1 : Measurement mode

Return format Execution results

Target Master unit

Save setting values Setting values not saved.

Examples of use Transmission : **MOD=1** (Set the measurement mode.)

Return : OK000 (Successfully completed.)

Compatible command None

Acquire

Setup mode | Measurement mode

The command is used to acquire the current operation mode.

Command format **MOD?**

Return format MOD=<Operation mode>

<Operation mode>	0 : Setup mode
	1 : Measurement mode

Target Master unit

Example of use Transmission : **MOD?** (Acquire the current operation mode.)

Return : MOD=1 (Current mode is measurement mode.)

Compatible command None

●Reset

This function is used to set the measurement values to zero.
When the speed error status is established, it releases the error.
In the wait to go past reference point status, it releases the status. However, in the wait to go past reference point status for master calibration, it does not release this status, and a mode error results.

Set

Measurement mode

This command initiates reset.

Command format	**SVZ** $\boxed{\textbf{Designated axis}}$
Return format	Execution results
Target	Designated axis, ID, all axes
Examples of use	Transmission : **SVZ[00A]** (Reset axis A for ID00.)
	Return : OK000 (Successfully completed.)
	Transmission : **SVZ[03*]** (Reset all the axes for ID03.)
	Return : OK000 (Successfully completed.)
	Transmission : **SVZ[***]** (Reset all the axes for the system.)
	Return : OK000 (Successfully completed.)
Compatible command	$\boxed{\text{Designated axis}}$ RES

●Preset

This function is used to set numerical values in the measurement values.

Note

- In the wait to go past reference point status, a mode error results, and values can neither be set nor called.
- Values can neither be set nor called for an axis in the error status.

Set

Measurement mode

The command sets the numerical values in the current values.

Command format	**PSS [Designated axis] =<Value>**
	<Value> : Corresponds to output resolution (Factory setting: Zero)
Return format	Execution results
Target	Designated axis, ID, all axes
Save setting values	Setting values saved.
Examples of use	Transmission : **PSS[01B]=123.2315** (Set axis B for ID01 to 123.2315.)
	Return : OK000 (Successfully completed.)
Compatible command	[Designated axis] P=<Value>

Acquire

Measurement mode

The command acquires the preset values.

Command format	**PSS [Designated axis] ?**
Return format	PSS [Designated axis] =<Value>
	<Value> : Corresponds to output resolution
Target	Designated axis
Examples of use	Transmission : **PSS[00A]?** (Acquire the preset value of axis A for ID00.)
	Return : PSS[00A]=100.0000 (The preset value is 100.0000.)
Compatible command	None

Call

Measurement mode

The command calls the preset values.

Command format	**PSR [Designated axis]**
Return format	Execution results
Target	Designated axis, ID, all axes
Examples of use	Transmission : **PSR[***]** (Call the preset values for all the axes.)
	Return : OK000 (Successfully completed.)
Compatibility command	[Designated axis] RCL

●Datum point

This function is used to set the datum point. This function cannot be used when the master calibration function is on. It cannot be used for axes for which the axis calculation function has been set.

Set

Measurement mode

The command sets the datum point position.

Command format	**DPT [Designated axis] =<Value>**
	<Value> — Corresponds to output resolution (Factory setting: Zero)
Return format	Execution results
Target	Designated axis
Save setting values	Setting values saved.
Examples of use	Transmission: **DPT[15D]=10.12345** (Set the datum point of axis D for ID15 to 10.12345.)
	Return : OK000 (Successfully completed.)
Compatible command	[Designated axis] M=<Value>

Acquire

Measurement mode

The command acquires the value set as the datum point position.

Command format	**DPT [Designated axis] ?**
Return format	DPT [Designated axis] =<Value>
	<Value> — Corresponds to output resolution
Target	Designated axis
Examples of use	Transmission: **DPT[00D]?** (Acquire the datum point of axis D for ID00.)
	Return : DPT[00D]=11.0000 (The datum point of axis D for ID00 is 11.0000.)
Compatible command	None

Store datum point offset value

Measurement mode

This stores the datum point offset value.

* After the command has been transmitted, the wait to go past reference point status is established so initiate the go past reference point operation. After the reference point has been passed, the datum point offset value is stored in the memory.

Command format	**DPS [Designated axis]**
Return format	Execution results
Target	Designated axis
Examples of use	Transmission: **DPS[03B]** (Save the datum point offset value for axis B for ID03.)
	Return : OK000 (Successfully completed.)
Compatible command	None

Relocate datum point

Measurement mode

The command relocates the datum point position.

* After the command has been transmitted, the wait to go past reference point status is established so initiate the go past reference point operation. After the reference point has been passed, the datum point position is relocated.

Command format	**DPR [Designated axis]**
Return format	Execution results
Target	Designated axis
Examples of use	Transmission: **DPR[03B]** (Relocate the datum point for axis B for ID03.)
	Return : OK000 (Successfully completed.)
Compatible command	None

Release wait to go past reference point status

Measurement mode

The command releases the wait to go past reference point status.

Command format	**DPC [Designated axis]**
Return format	Execution results
Target	Designated axis
Examples of use	Transmission: **DPC[03B]** (Release the wait to go past reference point status for axis B for ID03.)
	Return : OK000 (Successfully completed.)
Compatible command	None

●Reference point information

This function is used to acquire the reference point detection status.

Acquire

Measurement mode

The command acquires the reference point detection status.

Command format **STR $\boxed{\text{Designated axis}}$?**

Return format STR $\boxed{\text{Designated axis}}$ =<Value>

<Value>	0 : Reference point not detected
	1 : Wait to go past reference point status
	2 : Reference point detected

Target Designated axis

Example of use Transmission : **STR[00A]?** (Acquire the reference point status of axis A for ID00.)

Return : STR[00A]=1 (Wait to go past reference point status)

Compatible command None

●Master

This function is used to set and execute master calibration.
This function can be used when the master calibration function is on.

Set master calibration value

Measurement mode

The command sets the master calibration value.

Command format	**MCV** $\boxed{\textbf{Designated axis}}$ **=<Value>**
	<Value> — Corresponds to output resolution (Factory setting: Zero)
Return format	Execution results
Target	Designated axis
Save setting values	Setting values saved.
Examples of use	Transmission: **MCV[01B]=123.2315** (Set the master calibration value of axis B for ID01 to 123.2315.)
	Return : OK000 (Successfully completed.)
Compatible command	$\boxed{\text{Designated axis}}$ MS=<Value>

Acquire master calibration value

Measurement mode

The command acquires the master calibration value.

Command format	**MCV** $\boxed{\textbf{Designated axis}}$ **?**
Return format	MCV $\boxed{\text{Designated axis}}$ =<Value>
	<Value> — Corresponds to output resolution
Target	Designated axis
Examples of use	Transmission: **MCV[00A]?** (Acquire the master calibration value of axis A for ID00.)
	Return : MCV[00A]=100.0000 (The master calibration value is 100.0000.)
Compatible command	None

Relocate master calibraiton value

Measurement mode

The command relocates the master calibration value.

* After the command has been transmitted, the wait to go past reference point status is established so initiate the go past reference point operation. After the reference point has been passed, the master calibration value is relocated.

Command format	**MCR** $\boxed{\textbf{Designated axis}}$
Return format	Execution results
Target	Designated axis
Examples of use	Transmission: **MCR[01B]** (Relocate the master calibration value of axis B for ID01.)
	Return : OK000 (Successfully completed.)
Compatible command	$\boxed{\text{Designated axis}}$ MR

●Start

This function is used to restart the peak calculation.

Set

Measurement mode

The command starts updating the peak.

Command format	**STA Designated axis**
Return format	Execution results
Target	Single axis, ID, all axes
Examples of use	Transmission : **STA[***]** (Restart the peak calculation for all the axes.)
	Return : OK000 (Successfully completed.)
Compatible command	Designated axis START

●Pause

This function is used for the pause-related settings and acquisition.
The latch status cannot be established during pause; nor can the pause status be established during latching. Use the memory data output command for the output of the data in the pause status. The data request command cannot be used.

Set pause

Measurement mode

The command sets the pause status.

Command format **PAU Designated axis =<Setting value>**

<Setting value>	0 : Off (Factory setting)
	1 : On

Return format Execution results

Target Single axis, ID, all axes

Save setting values Setting values not saved.

Examples of use Transmission : **PAU[00*]=1** (Set pause for all the axes for ID00.)

Return : OK000 (Successfully completed.)

Compatible command None

Acquire pause status

Measurement mode

The command acquires the current pause status.

Command format **PAU Designated axis ?**

Return format PAU Designated axis =<Setting value>

<Setting value>	0 : Off
	1 : On

Target Single axis

Examples of use Transmission : **PAU[00A]?** (Acquire the pause status of axis A for ID00.)

Return : PAU[00A]=1 (Pause “On” status)

Compatible command None

Pause On (Compatible command only)

Measurement mode

The command establishes the pause status.

Command format **None**

Return format Execution results

Target Single axis, ID, all axes

Examples of use Transmission : **[15*]PAUON** (Set pause to “On” for all the axes for ID15.)

Return : OK000 (Successfully completed.)

Compatible command Designated axis PAUON

Pause Off (Compatible command only)

Measurement mode

The command releases the pause status.

Command format **None**

Return format Execution results

Target Single axis, ID, all axes

Examples of use Transmission : **[01*]PAUOFF** (Set pause to “Off” for all the axes for ID01.)

Return : OK000 (Successfully completed.)

Compatible command Designated axis PAUOFF

●Latch

This function is used for the display latch-related settings and acquisition.
The latch status cannot be established during pause; nor can the pause status be established during latching. Use the memory data output command for the output of the data in the latch status. The data request command cannot be used.

Set latch

Measurement mode

The command sets the latch status.

Command format **LCH Designated axis =<Setting value>**

<Setting value>	0 : Off (Factory setting)
	1 : On

Return format Execution results
Target Single axis, ID, all axes
Save setting values Setting values not saved.
Examples of use Transmission : **LCH[00*]=1** (Set latch for all the axes for ID00.)
Return : OK000 (Successfully completed.)
Compatible command None

Acquire latch status

Measurement mode

The command acquires the current latch status.

Command format **LCH Designated axis ?**
Return format LCH Designated axis =<Setting value>

<Setting value>	0 : Off
	1 : On

Target Single axis
Examples of use Transmission : **LCH[00A]?** (Acquire the latch status of axis A for ID00.)
Return : LCH[00A]=1 (Latch "On" status)
Compatible command None

Latch On (Compatible command only)

Measurement mode

The command establishes the latch status.

Command format **None**
Return format Execution results
Target Single axis, ID, all axes
Examples of use Transmission : **[15*]LCHON** (Set latch to "On" for all the axes for ID15.)
Return : OK000 (Successfully completed.)
Compatible command Designated axis LCHON

Latch Off (Compatible command only)

Measurement mode

The command releases the latch status.

Command format **None**
Return format Execution results
Target Single axis, ID, all axes
Examples of use Transmission : **[01*]LCHOFF** (Set latch to "Off" for all the axes for ID01)
Return : OK000 (Successfully completed.)
Compatible command Designated axis LCHOFF

●Output data

This function is used to set and acquire the types of output data to be acquired by the data request command.

Set output data

Setup mode | Measurement mode

The command sets the type of data to be output by the data request command.

Command format **OPD [Designated axis] =<Value>**

<Value>	0 : Current value (Factory setting)
	1 : Maximum value
	2 : Minimum value
	3 : Peak to peak value
	4 : ABS value

Return format Execution results

Target Single axis, ID, all axes

Save setting values Setting values saved.

Examples of use Transmission : **OPD[00A]=3** (Output the peak to peak value for axis A for ID00.)

Return : OK000 (Successfully completed.)

Compatible command None

Acquire output data

Setup mode | Measurement mode

The command acquires the type of data to be output by the data request command.

Command format **OPD [Designated axis] ?**

Return format OPD [Designated axis] =<Value>

<Value>	0 : Current value
	1 : Maximum value
	2 : Minimum value
	3 : Peak to peak value
	4 : ABS value

Target Single axis

Examples of use Transmission : **OPD[00B]?** (Acquire the output data of axis B for ID00.)

Return : OPD=1 (The output data is the maximum value.)

Compatible command None

●Comparator group number

This function is used to select and acquire the comparator group number to be used.

Set

Setup mode | Measurement mode

The command sets the comparator group number to be used.

Command format: **CMS [Designated axis] =<Group number>**

<Group number>	01 : Comparator group number 01 (Factory setting)
	02 : Comparator group number 02
	· · ·
	16 : Comparator group number 16

Return format: Execution results

Target: Designated axis, ID, all axes

Save setting values: Setting values saved.

Examples of use: Transmission : **CMS[01B]=05** (Set the comparator group number for axis B for ID01 to 5.)

Return : OK000 (Successfully completed.)

Compatible command: [Designated axis] SCN=<Group number>

Acquire

Setup mode | Measurement mode

The command acquires the comparator group number which has been set.

Command format: **CMS [Designated axis] ?**

Return format: CMS [Designated axis] =<Group number>

<Group number>	01 : Comparator group number 01
	02 : Comparator group number 02
	· · ·
	16 : Comparator group number 16

Target: Designated axis

Examples of use: Transmission : **CMS[00A]?** (Acquire the comparator group number for axis A for ID00.)

Return : CMS[00A]=16 (The group number is 16.)

Compatible command: None

●Data request

This function is used to re-calculate and output the data.
Since the data request command cannot be used in the latch or pause status, use the memory data output command.

Request data of all axes

Measurement mode

The command re-calculates the data, and outputs the data of all the axes.

Command format	**R**
Return format	Data *
Target	All axes
Examples of use	Transmission : **R**
	Return : [00A]02=-123.4567 ... (omitted)
Compatible command	R

Request data of designated axis

Measurement mode

The command re-calculates the data, and outputs the data of the designated axis.

Command format	**r Designated axis**
Return format	Data *
Target	Designated axis, ID
Examples of use	Transmission : **r[00B]**
	Return : [00B]=3.4567
Compatible command	Designated axis r

---

* For further details, refer to the "5-2. Data Formats".

●Memory data output

This function is used to output the memory data.
The data in the memory is output without re-calculating it.

Current values

Measurement mode

The command outputs the memory data of the current values.

Command format	**MRC** **Designated axis** **?**
Return format	Data*
Target	Designated axis, ID, all axes
Examples of use	Transmission: **MRC[00*]?** (Acquire the current value memory data for all the axes for ID00.)
Compatible command	Designated axis MN

Maximum values

Measurement mode

The command outputs the memory data of the maximum values.

Command format	**MRA** **Designated axis** **?**
Return format	Data*
Target	Designated axis, ID, all axes
Examples of use	Transmission: **MRA[00*]?** (Acquire the maximum value memory data for all the axes for ID00.)
Compatible command	Designated axis MA

Minimum values

Measurement mode

The command outputs the memory data of the minimum values.

Command format	**MRI** **Designated axis** **?**
Return format	Data*
Target	Designated axis, ID, all axes
Examples of use	Transmission: **MRI[00*]?** (Acquire the minimum value memory data for all the axes for ID00.)
Compatible command	Designated axis MI

Peak to peak values

Measurement mode

The command outputs the memory data of the peak to peak values.

Command format	**MRP** **Designated axis** **?**
Return format	Data*
Target	Designated axis, ID, all axes
Examples of use	Transmission: **MRP[00*]?** (Acquire the peak to peak value memory data for all the axes for ID00.)
Compatible command	Designated axis MP

ABS values

Measurement mode

The command outputs the memory data of the ABS values.

Command format	**MRB** **Designated axis** **?**
Return format	Data*
Target	Designated axis, ID, all axes
Examples of use	Transmission: **MRB[00*]?** (Acquire the ABS value memory data for all the axes for ID00.)
Compatible command	None

* For further details, refer to the “5-2. Data Formats”.

●Data transmission control

This function is used to set start or stop for the data transmission and acquire the current transmission status.

Set

Measurement mode

The command sets start or stop for the data transmission.

Command format **NDT=<Value> <Standby time>**

<Value>	0 : Stop transmission (Factory setting)
	1 : Start transmission
<Standby time> (ms)	10 to 1000 (factory setting: 10 ms)

Standby time: Length of interval time between data transmissions
When the specified value is omitted: 10 ms

Return format Execution results

Target Master unit

Save setting values Setting values not saved.

Examples of use
Transmission : **NDT=1 100**
Return : OK000
Transmission : **NDT=0 100**
Return : OK000

Compatible command None

Acquire

Setup mode | Measurement mode

The command acquires the current data transmission status.

Command format **NDT?**

Return format NDT=<Value> <Standby time>

<Value>	0 : Transmission stopped
	1 : Transmission underway
<Standby time> (ms)	10 to 1000

Target Master unit

Examples of use
Transmission : **NDT?**
Return : NDT=0 100

Compatible command None

5-6. Setup Commands

●Output resolution

This function is used to set and acquire the output resolution.
A value lower than the input resolution cannot be set for the output resolution.
When STD2 serves as the Area of use setting, the value in parentheses ( ) is used as the output resolution setting.
The scale differs between JPN/STD1 and STD2. When the setting has been established for an area with a different scale, the setting values related to the output resolution will be restored to the factory statuses.

Set

Setup mode

The command sets the output resolution.

Command format **OPR Designated axis =<Polarity><Resolution>**

<Polarity>	+ : Plus
	– : Minus
<Resolution> (Input resolution ≦ Output resolution)	1 : 0.1 μm (0.000005”)
	2 : 0.5 μm (0.00001”)*
	3 : 1 μm (0.00005”)
	4 : 5 μm (0.0001”)
	5 : 10 μm (0.0005”)

*0.00002" when the input resolution is 0.5 μm

Return format Execution results
Target Designated axis
Save setting values Setting values saved.
Examples of use Transmission : **OPR[00A]=+3**
Return : OK000
Compatible command Designated axis SDR=<Polarity><Resolution>

Acquire

Setup mode Measurement mode

The command acquires the output resolution.

Command format **OPR Designated axis ?**
Return format OPR Designated axis =<Polarity><Resolution>

<Polarity>	+ : Plus
	– : Minus
<Resolution>	1 : 0.1 μm (0.000005”)
	2 : 0.5 μm (0.00001”)*
	3 : 1 μm (0.00005”)
	4 : 5 μm (0.0001”)
	5 : 10 μm (0.0005”)

*0.00002" when the input resolution is 0.5 μm

Target Designated axis
Examples of use Transmission : **OPR[00A]?**
Return : OPR[00A]=+3
Compatible command Designated axis SDR?

●Input resolution

The function is used to set and acquire the input resolution.

Set

Setup mode

The command sets the input resolution.
The resolution of connected measuring units must be set.

Command format **IPR Designated axis =<Polarity><Resolution>**

<Polarity>	+ : Plus
	– : Minus
<Resolution> (Input resolution ≦ Output resolution)	1 : 0.1 µm
	2 : 0.5 µm
	3 : 1 µm
	4 : 5 µm
	5 : 10 µm

Return format Execution results

Target Designated axis

Save setting values Setting values saved.

Examples of use Transmission : **IPR[00A]=+3**

Return : OK000

Compatible command Designated axis SDR=<Polarity><Resolution>

Acquire

Setup mode Measurement mode

The command acquires the input resolution.

Command format **IPR Designated axis ?**

Return format IPR Designated axis =<Polarity><Resolution>

<Polarity>	+ : Plus
	– : Minus
<Resolution>	1 : 0.1 µm
	2 : 0.5 µm
	3 : 1 µm
	4 : 5 µm
	5 : 10 µm

Target Designated axis

Examples of use Transmission : **IPR[00A]?**

Return : IPR[00A]=+3

Compatible command Designated axis SDR?

●Master calibration function

This function is used to set whether the master calibration function is to be used and acquire the setting. The master calibration funciton setting is reflected the next time the equipment is started up. When the master calibration function is to be used, neither the datum point function nor the axis calculation function can be used.

Set

Setup mode

The command sets the master calibration function to On or Off.

Command format **MCM=<Value>**

<Value>	0 : Off (Master calibration is not used.) (Factory setting)
	1 : On (Master calibration is used.)

Return format Execution results

Target Master unit

Save setting values Setting values saved.

Examples of use Transmission : **MCM=1**

Return : OK000

Compatible command None

Acquire

Setup mode Measurement mode

The command acquires the current master calibration function status.

Command format **MCM?**

Return format MCM=<Value>

<Value>	0 : Off (Master calibration is not used.)
	1 : On (Master calibration is used.)

Target Master unit

Examples of use Transmission : **MCM?**

Return : MCM=0

Compatible command None

●Area of use

This function is used to set and acquire the area where the MG80 series is to be used.
If it is not set, it will not be possible to transfer from the setup mode to the measuring mode.
When STD2 serves as the Area of use setting, the value in parentheses ( ) is used as the output resolution setting.
The scale differs between JPN/STD1 and STD2. When the setting has been established for an area with a different scale, the setting values related to the output resolution will be restored to the factory statuses.

Set

Setup mode

The command sets the area where the MG80 series is to be used.

Command format **CTR=<Value>**

<Value>	0 : Not set (Factory setting)
	1 : JPN (This setting must be used if the MG80 series is to be used in Japan.)
	2 : STD1
	3 : STD2

Return format Execution results
Target Master unit
Save setting values Setting values saved.
Examples of use Transmission : **CTR=1**
Return : OK000
Compatible command None

Acquire

Setup mode Measurement mode

The command acquires the setting for the area where the MG80 series is to be used.

Command format **CTR?**
Return format CTR=<Value>

<Value>	0 : Not set
	1 : JPN
	2 : STD1
	3 : STD2

Target Master unit
Examples of use Transmission : **CTR?**
Return : CTR=2
Compatible command None

●Comparator mode

This function is used to set and acquire the number of comparator level and number of group.
When the mode is changed, the comparator value for the target axis is cleared, and the "not set" status is established.

Set

Setup mode

The command sets the number of comparator level and number of comparator group as well as the value targeted.

Command format **CMM $\boxed{\text{Designated axis}}$ =<Mode> <Target value>**

<Mode>	0 : 2 levels (16 groups) (Factory setting)
	1 : 4 levels (8 groups)
	2 : 8 levels (4 groups)
	3 : 16 levels (2 groups)
<Target value>	0 : Current value (Factory setting)
	1 : Maximum value
	2 : Minimum value
	3 : Peak to peak value

Return format Execution results
Target Designated axis, ID, all axes
Save setting values Setting values saved.
Examples of use Transmission : **CMM[00A]=1 0**
Return : OK000
Compatible command None

Acquire

Setup mode Measurement mode

The command acquires the comparator mode setting.

Command format **CMM $\boxed{\text{Designated axis}}$?**
Return format CMM $\boxed{\text{Designated axis}}$ =<Mode> <Target value>

<Mode>	0 : 2 levels (16 groups)
	1 : 4 levels (8 groups)
	2 : 8 levels (4 groups)
	3 : 16 levels (2 groups)
<Target value>	0 : Current value
	1 : Maximum value
	2 : Minimum value
	3 : Peak to peak value

Target Designated axis
Examples of use Transmission : **CMM[00A]?**
Return : CMM[00A]=3 1
Compatible command None

●Comparator value

This function is used to set and acquire the comparator values.
The setting range differs depending on the comparator mode.

Precautions when setting the comparator values

- Set the comparator values in sequence from level 1 starting with the lowest value.
  (Level 1 setting value < Level 2 setting value < Level 3 setting value < ... < Level 16 setting value)
- The comparator value of each level to be set cannot be lower than the setting value of the previous level.
  (Example: An error will result if "5" is set for level 2 when "10" has been set for level 1.)
- If, when the settings are to be changed, the setting value is higher than that of the subsequent level, all the setting values of the subsequent levels will be canceled.
  (Example: If, when "10" is set for level 1, "20" is set for level 2, "30" is set for level 3 and "40" is set for level 4, the setting value for level 2 is changed to 40, the setting values for level 3 and 4 will be canceled.)

Set

Setup mode

The command sets the comparator values.

Command format **CMV** **Designated axis** **<Group number><Level number>=<Value>**

<Group number>	01 : Group 1 to 16 : Group 16
<Level number>	01 : Level 1 to 16 : Level 16
<Value>	Corresponds to output resolution digit (setting cleared when no value is input).

There are no factory settings.

Return format: Execution results
Target: Designated axis, ID, all axes
Save setting values: Setting values saved.
Examples of use:
Transmission : **CMV[00A]0101=12.3335** (Set 12.3335 for group number 01 and level number 01 of axis A for ID00.)
Return : OK000
Transmission : **CMV[00B]0101=** (Clear the comparator setting value for group number 01 and level number 01 of axis B for ID00.)
Return : OK000
Compatible command: None

Acquire

Setup mode | Measurement mode

The command acquires the comparator values.

Command format **CMV** **Designated axis** **<Group number><Level number>?**
Return format CMV Designated axis <Group number><Level number>=<Value>

<Group number>	01 : Group 1 to 16 : Groups 16
<Level number>	01 : Level 1 to 16 : Level 16
<Value>	Corresponds to output resolution digit (no output when the value has not been set).

Target: Designated axis
Examples of use:
Transmission : **CMV[00A]0101?**
Return : CMV[00A]0101=12.3335 (12.3335 is the comparator value.)
Transmission : **CMV[00B]0101?**
Return : CMV[00B]0101= (No setting)
Compatible command: None

●Data header

This function is used to set and acquire the data header.

Set data header

Setup mode

The command sets the data header.

Command format **HDR=<Header>**

<Header>	00 : None
	01 : Type 1 (Factory setting)
	02 : Type 2 For details on the types, refer to “5-2. Data Formats”.

Return format Execution results
Target Master unit
Save setting values Setting values saved.
Examples of use Transmission : **HDR=01**
Return : OK000
Compatible command None

Acquire data header

Setup mode | Measurement mode

The command acquires the data header setting.

Command format **HDR?**
Return format HDR=<Header>

<Header>	00 : None
	01 : Type 1
	02 : Type 2

Target Master unit
Examples of use Transmission : **HDR**?
Return : HDR=01
Compatible command None

Data header On (Compatible command only)

Setup mode

The command sets the data header to type 1.

Command format **None**
Return format Execution results
Target Master unit
Examples of use Transmission : **HON**
Return : OK000
Compatible command HON

Data header Off (Compatible command only)

Setup mode

The command sets the data header to “None.”

Command format **None**
Return format Execution results
Target Master unit
Examples of use Transmission : **HOF**
Return : OK000
Compatible command HOF

●Data axis separator

This function is used to set and acquire the axis separator character used when data is to be output.

Set

Setup mode

The command sets the axis separator used when data is to be output.

Command format **SEP=<Value>**

<Value>	0 : Space (Factory setting)
	1 : Line feed (CR+LF)

Return format Execution results

Target Master unit

Save setting values Setting values saved.

Examples of use Transmission : **SEP=1**

Return : OK000

Compatible command None

Acquire

Setup mode Measurement mode

The command acquires the axis separator used when data is to be output.

Command format **SEP?**

Return format SEP=<Value>

<Value>	0 : Space
	1 : Line feed (CR+LF)

Target Master unit

Examples of use Transmission : **SEP?**

Return : SEP=1

Compatible command None

●Axis calculation function

This function is used to set and acquire the axis calculation.
The axis calculation function can be set for axes which satisfy two conditions, that is to say, they must be in the same unit and they must have the same input resolution.
The calculation results are output as the primary axis data.
The axis which has been set as the primary axis cannot be set as the reference axis.
To clear the axis calculation setting, only the plus sign and axis labels are sent.
Neither the datum point function nor the master calibration function can be used for an axis which has been set as the primary axis.
Reset/Preset/Datum point function/Master calibration function/Start/Pause/Latch/Output data/Comparator functions/Data request/Memory data output and Output resolution command cannot be used for an axis which has been set as the reference axis.

Set

Setup mode

The command sets the axis calculation.

Command format **ADD=<Sign 1> Primary axis <Sign 2> Reference axis**
ADD=+ Primary axis (Clear the settings.)

<Sign 1><Sign 2>	+ : Plus – : Minus
Primary axis , Reference axis	Axis labels

There are no factory settings.

Return format Execution results
Target Designated axis
Save setting values Setting values saved.

Examples of use
Transmission : **ADD=+[00A]+[00B]**
Return : OK000
Transmission : **ADD=–[15A]+[15D]**
Return : OK000
Transmission : **ADD=+[15A]** (Clear the setting.)
Return : OK000

Compatible command None

Acquire

Setup mode Measurement mode

The command acquires the axis calculation setting.

Command format **ADD Primary axis ?**
Return format ADD=<Sign 1> Primary axis <Sign 2> Reference axis

<Sign 1><Sign 2>	+ : Plus – : Minus
Primary axis , Reference axis	Axis labels

Target Designated axis, ID, all axes

Examples of use
Transmission : **ADD[00A]?**
Return : ADD=+[00A]+[00B]
Transmission : **ADD[15A]?**
Return : ADD=–[15A]+[15D]
Transmission : **ADD[15A]?**
Return : ADD=+[15A] (No settings)

Compatible command None

●Configuration information

This function is used to acquire the equipment configuration information.

Acquire

Setup mode | Measurement mode

The command acquires the equipment configuration information.

[00*] : Master unit
[01*] : Slave unit
[02*] : Slave unit

Command format **CFG Target equipment ?**

Target equipment	00*: ID00 module 00*: ID00 module 00*: ID00 module . . . 00*: ID00 module *** : Entire system

Return format CFG Target equipment =<No. of units> <Total no. of axes> <Connection MAP>

Target equipment	00*: ID00 module 00*: ID00 module 00*: ID00 module . . . 00*: ID00 module *** : Entire system
<No. of units>	01-04 : Total number of units - MG80-NE which configure the system
<Total no. of axes>	000-064 : Total number of axes which are connected to the system and are recognized
<Connection MAP>	{<Model code> <ID> <Connection pattern> ...} (Space separators enclosed in braces)
<Model code>	11 : MG80-NE
<ID>	00–15 : Unit ID (“00” for the MG80-NE)
<Connection pattern>	00–0F : Bit pattern using the locations connected as “1”

Target Entire system, units with target IDs designated

Examples of use

Transmission : **CFG[***]?** (Acquire the configuration information of the entire system.)

Return : CFG[***]=04 008 {110003 21050A 21210C 213106}

Transmission : **CFG[00*]?** (Acquire the configuration information of the ID00.)

Return : CFG[00*]=04 008 {110003}

Transmission : **CFG[05*]?** (Acquire the configuration information of ID05.)

Return : CFG[05*]=04 008 {11050A}

Transmission : **CFG[15*]?** (Acquire the configuration information of ID15.)

Return : CFG[15*]=04 008 {15150C}

Compatible command None

●Setting initialization

This function is used to initialize the settings.
When initializing the entire system to the factory status, set INI[***]=0.
To store the initialized settings in the non-volatile memory of the MG80-NE master unit, initiate the save setting values operation.

Set

Setup mode

The command initializes the settings.

Command format	**INI $\boxed{\text{Designated axis}}$ =<Initialization level>**

<Initialization level>	
	0 : Factory status
	1 : Initializes the numerical value setting (Preset/Datum point/Master calibration value/ Comparator value/Comparator group number)

Return format	Execution results	
Target	Factory status	:Entire system
	Initializes the numerical value setting	:Designated axis, all axes
Examples of use	Transmission :	**INI[***]=0** (The entire system is initialized to the factory status.)
	Return :	OK000
	Transmission :	**INI[03*]=1** (The numerical value settings of all axes for ID03 are initialized.)
	Return :	OK000
Compatible command	None	

●Save setting values

This saves the current setting values in the non-volatile memory of the MG80-NE master unit.
The saved setting values are retained even after the power has been turned off.
Use caution with the following points since the setting values will be lost when the power of the MG80-NE master unit is turned off while setting values are being saved.

When a command response is returned

Do not turn off the power until the command execution results are returned.

When a command response is not returned

Do not turn off the power for at least three seconds after the save setting value command has been transmitted.

Save setting values

Setup mode

The command saves the setting values.

Command format	**SAV**
Return format	Execution results
Target	Entire system
Save setting values	Setting values saved.
Examples of use	Transmission : **SAV**
	Return : OK000
Compatible command	None

●Version information

This function is used to acquire the version information of the MG80-NE master unit.

Acquire

Setup mode | Measurement mode

The command acquires the version information.

Command format **VER $\boxed{\text{Target equipment}}$?**

$\boxed{\text{Target equipment}}$	[00*] : ID00 module
	[01*] : ID01 module
	[02*] : ID02 module
	. . .
	[15*] : ID15 module

Return format VER $\boxed{\text{Target equipment}}$ =<Version number>

$\boxed{\text{Target equipment}}$	[00*] : ID00 module
	[01*] : ID01 module
	[02*] : ID02 module
	. . .
	[15*] : ID15 module
<Version information>	Version information

Target Master unit

Examples of use Transmission : **VER[00*]?**

Return : VER[00*]=S010000 F010100 P010000 B122

Compatible command None

●Error information

This function is used to acquire the error information.
The errors listed in the log but not yet sent are sent in sequence starting with the latest one.

Acquire

Setup mode | Measurement mode

The command acquires the error information.

Command format **ERR?**

Return format ERR=<Date/time of occurrence> <Area of occurrence> <Error code>

ERR= (When there are no errors which have yet to be sent)

<Date/time of occurrence>	DDHHMMSS format (8 characters)
<Area of occurrence>	Target equipment code or designated axis code (5 characters)
<Error code>	Refer to "Table of error codes" (2 characters).

Target Entire system

Examples of use

Transmission : **ERR?**

Return : ERR=28123456 [01*] A0
(An A0 error occurred in ID01 at 12 hours 34 minutes 56 seconds on 28th.)

Transmission : **ERR?**

Return : ERR=28203400 [01B] 61
(A 61 error occurred in axis B for hub unit ID01 at 20 hours 34 minutes 00 seconds on 28th.)

Transmission : **ERR?**

Return : ERR= (No error)

Compatible command None

Up to eight error information can be listed in the log, and the log is updated by deleting in order from the oldest information.
Bear in mind that error information is deleted when read or when the power is turned off.

●Internal clock

This function is used to set the clock inside the MG80-NE master unit and acquires its information.
With this product, the year must be indicated using two digits.

Set

Setup mode

The command sets the clock inside MG80-NE.

Command format **CLK=<Value>**

<Value>	YYMMDDHHMMSS format

Return format Execution results

Target Master unit

Examples of use Transmission : **CLK=081212145632** (Set the time to 14 hours 56 minutes 32 seconds on December 12, 2008.)

Return : OK000

Compatible command None

Acquire

Setup mode | Measurement mode

The command acquires the current time of the clock inside MG80-NE.

Command format **CLK?**

Return format CLK=<Value>

<Value>	YYMMDDHHMMSS format

Target Master unit

Examples of use Transmission : **CLK?**

Return : CLK=090228143012
(14 hours 30 minutes 12 seconds on February 28, 2009.)

Compatible command None

The MG80-NE does not have an internal clock, so when using the clock function, input the time using the CLK setting command each time the equipment is started up.

●Command response

This function is used to set whether or not the execution results are to be returned in response to each command.
Even when it is set to “no response,” the response to the CRP command itself is returned.

Set

Setup mode

The command sets whether to return the execution results in response to each command.

Command format **CRP=<Value>**

<Value>	0 :	No response
	1 :	Response (Factory setting)

Return format Execution results

Target Master unit

Save setting values Setting values saved.

Examples of use Transmission : **CRP=0**

Return : OK000

Transmission : **CRP=1**

Return : OK000

Compatible command None

Acquire

Setup mode Measurement mode

The command acquires whether or not the execution results are to be returned.

Command format **CRP?**

Return format CRP=<Value>

<Value>	0 :	No response
	1 :	Response

Target Master unit

Examples of use Transmission : **CRP?**

Return : CRP=1

Compatible command None

●Ethernet station number

This function is used to acquire the Ethernet station number. The setting is established using the rotary switches on the MG80-NE.

Acquire

Setup mode | Measurement mode

The command acquires the Ethernet station number.

Command format **NID?**

<Station number>	00 to 07

Return format NID=<Station number>

Target Master unit

Examples of use Transmission : **NID?**

Return : NID=03

Compatible command None

●IP address

This function is used to set and acquire the Ethernet source station IP address.
The IP address setting is reflected the next time the equipment is started up.
When an IP address is acquired after its setting has been changed, the IP address set before the change is reflected will be acquired.

Set

Setup mode

The command sets the Ethernet source station IP address.

Command format **NIP=<IP address>**

<IP address>	1.0.0.1 to 223.255.255.254 (excluding 127.x.x.x) (Factory setting: 192.168.1.100)

Return format Execution results

Target Master unit

Save setting values Setting values saved. (The setting values are saved at the same time as the setting command is executed.)

Examples of use Transmission : **NIP=192.168.1.10**

Return : OK000

Compatible command None

Acquire

Setup mode Measurement mode

The command acquires the Ethernet source station IP address.

Command format **NIP?**

Return format NIP=<IP address>

<IP address>	1.0.0.1 to 233.255.255.254

Target Master unit

Examples of use Transmission : **NIP?**

Return : NIP=192.168.1.10

Compatible command None

●MAC address

This function is used to acquire the Ethernet MAC address.

Acquire

Setup mode | Measurement mode

The command acquires the Ethernet MAC address.

Command format	**NMC?**
Return format	NMC=<MAC address>

<MAC address>	xx:xx:xx:xx:xx:xx ("x" is a number from 0 to 9 or a letter from A to F)

Target	Master unit
Examples of use	Transmission : **NMC?**
	Return : NMC=00:12:44:CE:3E:F5
Compatible command	None

●Gateway address

This function is used to set and acquire the Ethernet gateway address.
The gateway address setting is reflected the next time the equipment is started up.

Set

Setup mode

The command sets the Ethernet gateway address.

Command format **NGW=<Address>**

<Address>	1.0.0.1 to 223.255.255.254 (excluding 127.x.x.x) (Factory setting: 192.168.1.1)

Return format Execution results

Target Master unit

Save setting values Setting values saved. (The setting values are saved at the same time as the setting command is executed.)

Examples of use Transmission : **NGW=192.168.1.1**

Return : OK000

Compatible command None

Acquire

Setup mode | Measurement mode

The command acquires the gateway address.

Command format **NGW?**

Return format NGW=<Address>

<Address>	1.0.0.1 to 223.255.255.254

Target Master unit

Examples of use Transmission : **NGW?**

Return : NGW=192.168.1.1

Compatible command None

●Subnet mask

This function is used to set and acquire the subnet mask.
The value which has been set is reflected the next time the system is started up.
When the subnet mask is acquired after its setting has been changed, the subnet mask set before the change is reflected will be acquired.

Set

Setup mode

The command sets the subnet mask.

Command format	**NSM=<Subnet mask>**

<Subnet mask>	0.0.0.0 to 255.255.255.255 (Factory setting: 255.255.255.0)

Return format	Execution results
Target	Master unit
Save setting values	Setting values saved. (The setting values are saved at the same time as the setting command is executed.)
Examples of use	Transmission: **NSM=255.255.0.0**
	Return : OK000
Compatible command	None

Acquire

Setup mode | Measurement mode

The command acquires the subnet mask.

Command format	**NSM?**
Return format	NIP=<Subnet mask>

<Subnet mask>	0.0.0.0 to 255.255.255.255

Target	Master unit
Examples of use	Transmission: **NSM?**
	Return : NIP=255.255.255.0
Compatible command	None

●Data transmission protocol

This function is used to set the protocol which is to be used by the data interface.

Set

Setup mode

The command sets the protocol which is to be used by the data interface.

Command format	**NPC=<Value>**

<Value>	0 : TCP (Factory setting)
	1 : UDP

Return format	Execution results
Target	Master unit
Save setting values	Setting values saved.
Examples of use	Transmission : **NPC=0**
	Return : OK000
Compatible command	None

Acquire

Setup mode | Measurement mode

The command acquires the protocol which is used by the data interface.

Command format	**NPC?**
Return format	NPC=<Value>

<Value>	0 : TCP
	1 : UDP

Target	Master unit
Examples of use	Transmission : **NPC?**
	Return : NPC=0
Compatible command	None

●Data transmission port number

This function is used to set the number of the port which is to be used by the data interface.
With internet, since port numbers 1 to 1023 are generally used by regular internet services and port numbers 1024 to 49151 may have already been registered, 49152 or a higher number is usually used as the port number.
However, this does not apply for a network operating inside a company so the MG80 series supports all the port numbers in the range of 1 to 65535 under the IP standards with the exception of numbers 20, 21, 23 and 80.
When an error occurs in the setting command, it may be that the port number concerned cannot be used, so try a different port number.

Set

Setup mode

The command sets the number of the port which is to be used by the data interface.

Command format **NPN=<Value>**

<Value>	1 to 65535 (with the exception of numbers 20, 21, 23, 80, 52023 and 52024) (Factory setting: 49154)

Return format Execution results

Target Master unit

Save setting values Setting values saved.

Examples of use Transmission: **NPN=49153**

Return : OK000

Compatible command None

Acquire

Setup mode | Measurement mode

The command acquires the number of the port used by the data interface.

Command format **NPN?**

Return format NPN=<Value>

<Value>	1 to 65535 (with the exception of numbers 20, 21, 23, 80, 52023 and 52024)

Target Master unit

Examples of use Transmission: **NPN?**

Return : NPN=49153

Compatible command None

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6. Functions

6-1. Peak Hold

The MG80-NE holds the peak values (maximum value, minimum value, P-P value) of each axis at all times.

Each time the current value is acquired, the values are updated in a manner that satisfies the two formulas shown below and stored in the internal memory.

Minimum value ≤ Current value ≤ Maximum value

P-P value = Maximum value - Minimum value

6-2. Preset

This function sets the set preset value to the current value when preset recall is performed.

6-3. Master Calibration

The reference point function of the measuring unit can be used to relocate the master calibration value. This function is exclusive with the datum point function.

When the master calibration value is input after reference point has been loaded for the first time, the distance from the master calibration value to the reference point is calculated.

The reference point offset value is calculated and then stored in the internal memory.

The stored reference point offset value is applied when the reference point is loaded thereafter. (If the master calibration function is set to OFF, the reference point offset is cleared.)

The master calibration procedure is shown below.

1. Set the master calibration function to ON beforehand.
2. Turn on the power, and go past the reference point of the measuring unit.
3. Align the measuring unit with the master work to be measured.
4. Set the master value using the master calibration value setting command.

6-4. Datum Point (Reference Point Function)

The datum point function stores the datum point position and checks the absolute position from the datum point position. This function is exclusive with the master calibration function.

Execute the following procedure to store the datum point position.

1. Execute the datum point setting command at the position serving as the basis for measurement.
2. Execute the store datum point offset value command.
3. Go past the reference point.

Execute the following procedure to relocate the datum point position.

1. Turn on the power, and execute the relocate datum point command.
2. Go past the reference point.

6-5. Start

This function starts measurement of the peak value.

The minimum and maximum values are set to the current value and the P-P value is set to 0.

6-6. Comparator

32 (8 groups of 4 levels) comparator setting values are stored for each axis and can be used in combinations to make comparison judgments.

The comparator group number setting command is used to select which comparator group and target value (current value, maximum value, minimum value, P-P value) to use among the combinations.

6-7. Axis Calculation

The measurement data of the measuring unit that is the reference axis can be added to or subtracted from the measurement data of the measuring unit that is the primary axis.

The axis calculation function constraints are shown below.

- The axes must be in the same unit and have the same input resolution.
- The calculation results are output as the primary axis data.
- The axis that has been set as the primary axis cannot be set as the reference axis.
- The datum point function and the master calibration function cannot be used for the primary axis.
- Reset, Preset, Datum point, Master calibration, Start, Pause, Latch, Output data, Comparator, Data request, Memory data output, and Output resolution function commands cannot be used for the reference axis.
- When the axis calculation function has been set, Preset, Datum point, Master calibration value, Comparator value, Comparator group number, Pause status, and Latch status will be cleared.

6-8. Hold

6-8-1. Latch

In current value mode, the output data and comparator output for that value are held.

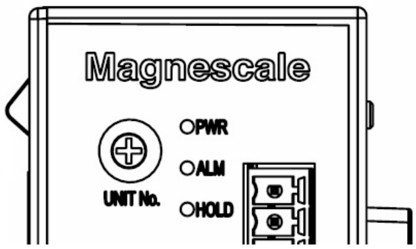
6-8-1. Pause

This function holds the peak values.

6-9. LED Indicators

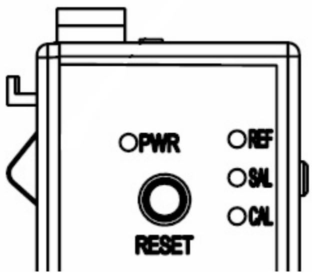
6-9-1. MG80-NE

- PWR LED: Lit when the power is ON
- ALM LED: Lit when an internal error has occurred.
- HOLD LED: Lit when Hold is ON.



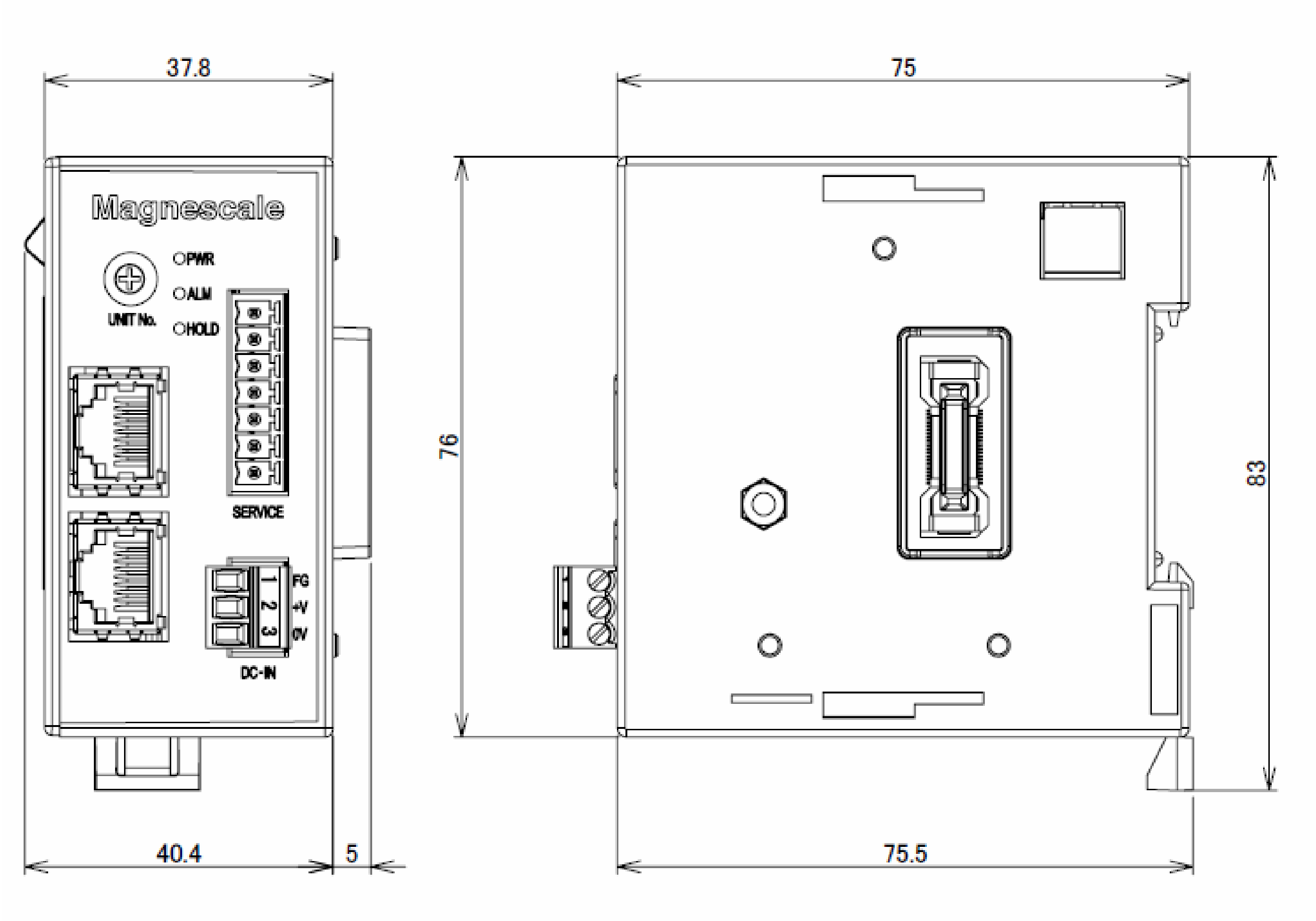
6-9-2. MG80-CM

- PWR LED: Lit when the power is ON
- CAL LED: Lit when a counter error has occurred.
- SAL LED: Lit when a gauge error has occurred.
- REF LED: Lit when the reference point has been passed.



7. Dimensions

Specifications and appearances of products are subject to change for improvement without prior notice.



Unit: mm

8. Notes on MG40 Compatibility

8-1. Commands

Measuring units used with the MG80-NE are AB signal output models, so the measuring unit information cannot be acquired.

This means that the three commands AXP, AXM, and AXU that are related to the measuring unit information cannot be used.

Also, command-based input is needed to set the resolution.

IPR has been added as the resolution setting command.

The MG80-NE does not have an internal clock, so when using the clock function, input the date and time information using the CLK setting command each time the equipment is started up.

Changed commands

Configuration details		**MG41-NE/MG42-4**	**MG80-NE**
Deleted commands (Commands related to information written in the measuring unit)	Internal clock	CLK	None
	Measuring unit product information	AXP	None
	Measuring unit maintenance information	AXM	None
	Measuring unit user information	AXU	None
Function added with the MG80-NE	Input resolution	None	IPR

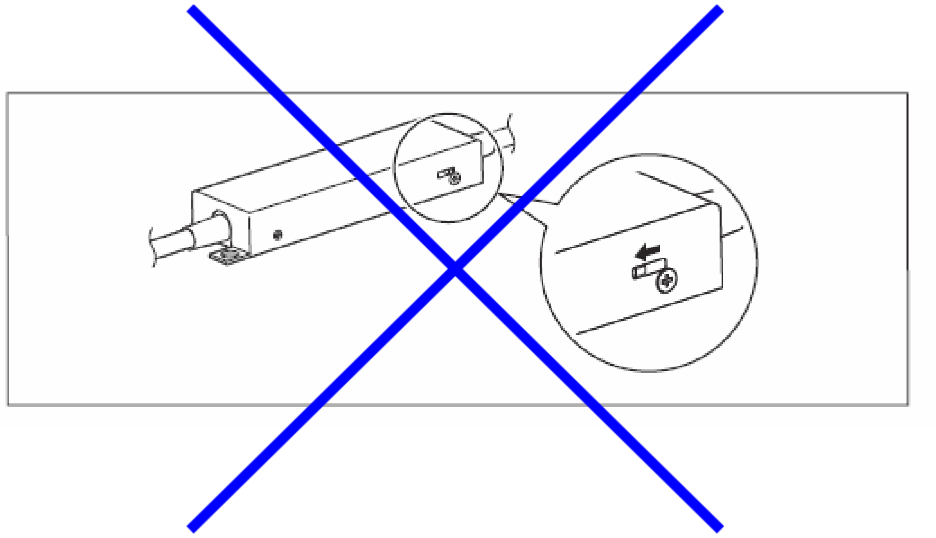
8-2. Measuring Unit Operation Method

Measuring units used with the MG41/42 are initialized for the MG41/42, so they cannot be used with the MG80 series.

To continue using measuring units used with the MG41/42 with the MG80 series, contact a Magnescale Co., Ltd. representative or service center.

There is no need to initialize measuring units with the MG80 series.

MG41/42 specification



* There is no need to switch this with the MG80 series.

9. Troubleshooting

When the unit does not work properly, check the following before calling a Magnescale Co., Ltd. representative for service.

Symptom	Check		
An error occurred in the counter module (MG80-CM), and data cannot be obtained.	Check the counter module MG80-CM status lamps.		
	SAL LED lit red	Turn off the system power, reconnect the measuring unit, and then restart it.	
		A speed error is occurring in the measuring unit. • The input response frequency is exceeded. • Noise or other interference is mixing into the signal.	
		A level error is occurring in the measuring unit. • There may be a broken wire or faulty contact. • Noise or other interference is mixing into the signal. • The sensor is damaged.	
	CAL LED lit red	Turn off the system power, reconnect the counter module, and then restart it.	
		A communication error is occurring in the counter module. • Noise or other interference is mixing into the signal at the connectors between modules.	
		A level error is occurring in the measuring unit. • There may be a broken wire or faulty contact. • Noise or other interference is mixing into the signal. • The sensor is damaged.	
The master unit or a slave unit cannot be recognized.	• Check to see if the power is turned on. • Check to see if a cable is disconnected. • Check that the IP address is correct. • Check that the switch settings are correct.		

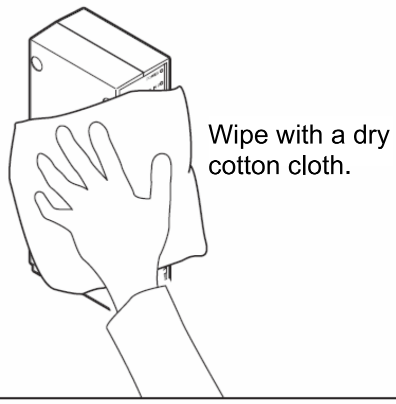
Symptom	Action
Error data is output.	• Check to see if the measuring unit signal connector is loosely coupled. • Check that the cable is not damaged or disconnected. • Check to see if the measuring unit has moved faster than the maximum response speed, or if there was a large vibration. • Check for high noise levels. (Try replacing with a normal axis.) • Turn off the power, and then turn it on again after 1 to 2 minutes. • Perform resetting operation.
No counting	• Turn off the power, and then turn it on again after 1 to 2 minutes. • Check to see if the measuring unit signal connector is loosely coupled. (Try replacing with a normal axis.)
Erroneous counting (The unit sometimes miscounts.)	• Turn off the power, and then turn it on again after 1 to 2 minutes. • Check to see if the measuring unit signal connector is loosely coupled. • Check that the ground wire is properly connected to the ground. Also check for rust or breakage. • Check that the power voltage is within the specified range. (Use an automatic AC voltage regulator (AVR) to keep the power within the specified range.) • Check that the unit is grounded correctly.
Accuracy cannot be obtained.	• Check to see if the unit occasionally miscounts. • Check for any mechanical trouble that may affect accuracy. (Any trouble due to machine adjustment, sagging, or play, etc.) • Check to see if there is a significant temperature difference between the measuring unit, machine, and work.
Cannot detect reference point.	• Check that the reference point detection position is correct. • Check that the reference point detection direction is correct.

When the cause of the above is known, take appropriate measures.

If you suspect a malfunction, check the serial number and software version and contact the service center.

■ Cleaning

To clean the display and casing:



To remove heavy dirt:

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