Magnescale

RS-232C Interface module

MG80-SC1/MG80-SC2

Specifications

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Magnescale Co., Ltd.

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1. Overview

MG80-SC is an RS-232C interface module for measuring systems that can acquire multi-axis measurement data. It is used in combination with counter module and provides the PLC link function in addition to data output via RS-232C.
This product used common data format with existing MG10/10A products, so MG10/10A users can continue to use the programming environment by simply changing the setting.
Up to 16 MG80-CM can be connected to MG80-SC.

2. Applied Standard

This product is compatible with following standards.

EMI : EN61000-6-4
EMS : EN61000-6-2
FCC Part 15 Subpart B Class A
ICES-003 Class A Digital Apparatus

When using this device with equipment governed by Machine Directives (about installation, location and protection) measures should be taken to ensure conformance with those directives.

3. Operating cautions

Before and during operations, be sure to check that our products function properly.

Provide adequate safety measures to prevent damages in case our products should develop malfunctions.

Use out of indicated specifications or purposes and by modification of our products will void any warranty of the functions and performance as specified for our products. When using our products in combination with other equipment, the functions and performances as noted in this manual may not be attained, depending on operating and environmental conditions.

Be sure to turn off the power before connecting or disconnecting connectors in order to prevent damage or misoperation.

Fix. the cable in a suitable position to prevent possible cable breakage. Never handle the cable by forcibly pulling or bending it. (Inside bend : R=20mm or more)

Place the Interface module more than 0.5m away from a high voltage source. large current source, large power relay etc,.

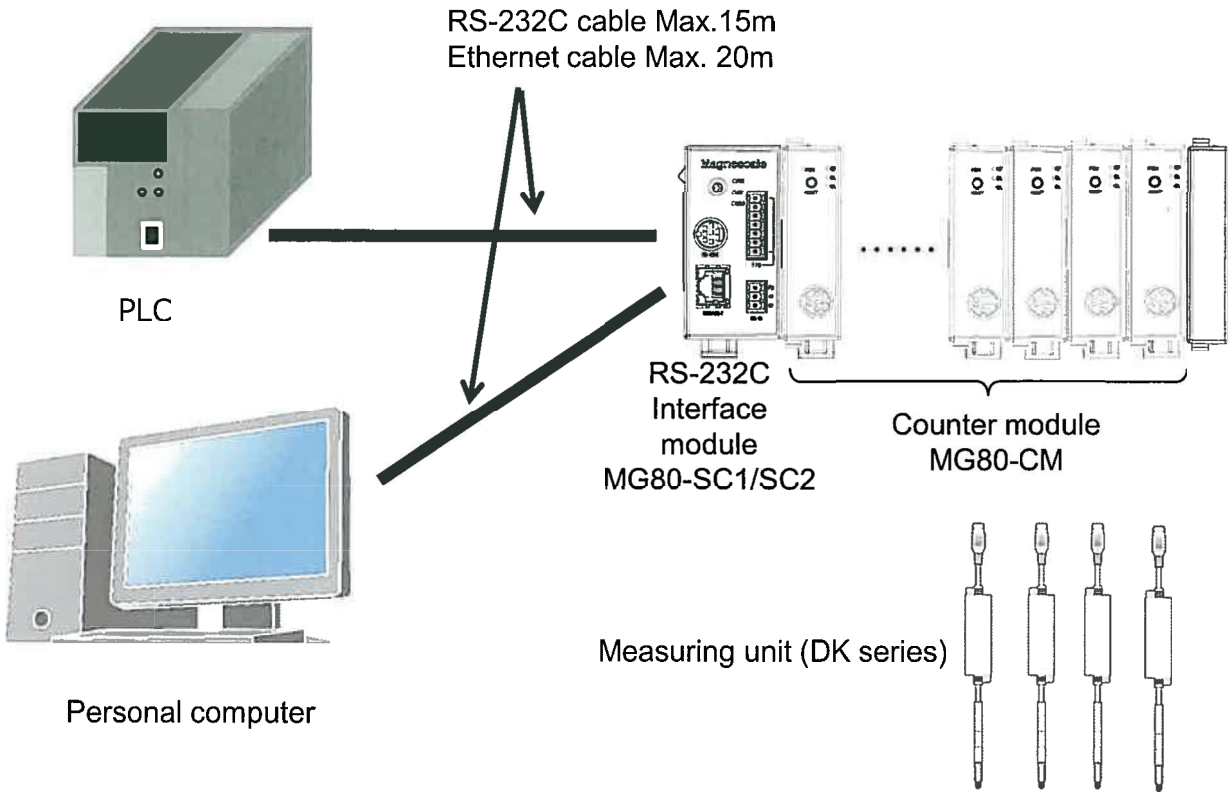
Do not route the connecting cable through the same duct as the machine power line.

Please take measures to prevent noise for relays, solenoids, motors etc., connected to this system.

Be sure to ground the FG terminal of the Interface module before use.

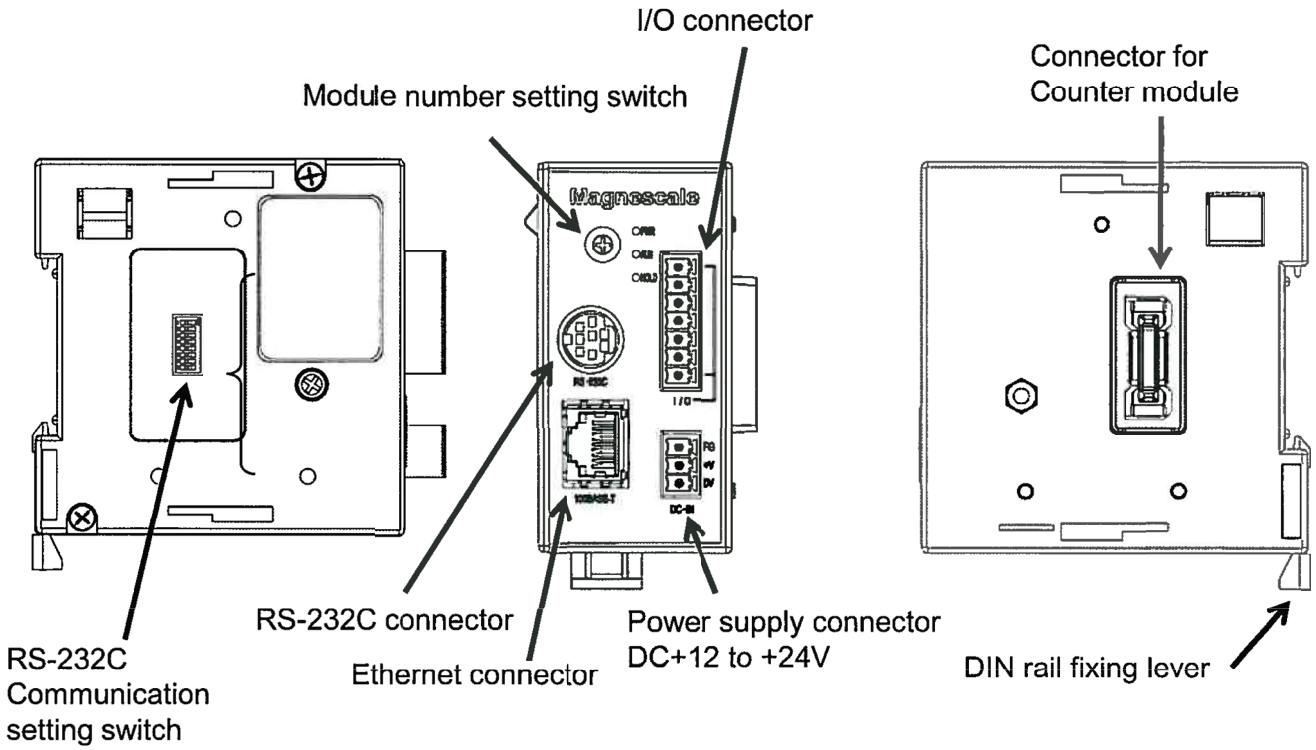
4. System configurations

MG80-SC1	RS-232C Interface module (I/O : Current sink type)
MG80-SC2	RS-232C Interface module (I/O : Current source type)
MG80-CM	Counter module for MG80 series.

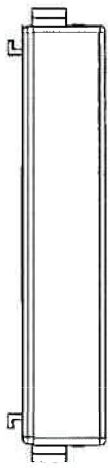


- Maximum number of connectors and configuration
  Up to sixteen MG80-CM counter modules can be connected to MG80-SC
  LZ80-K1 / K2 and MG80-LM cannot be connected.
- Ethernet connection
  Available for MG80-SC setup using "SettingTool" program or by sending commands, also for PLC link communication with PLC.

5. Name of each part

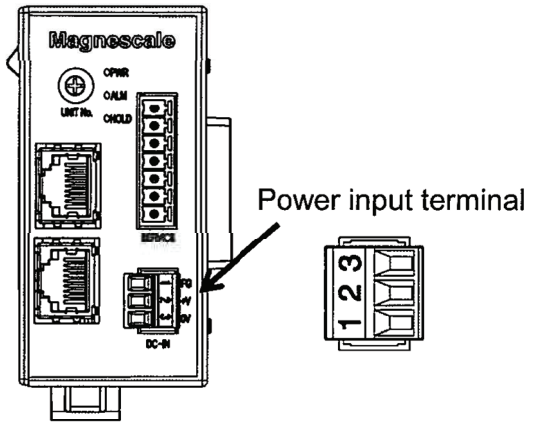


Termination module



6. Pin assignment of connectors

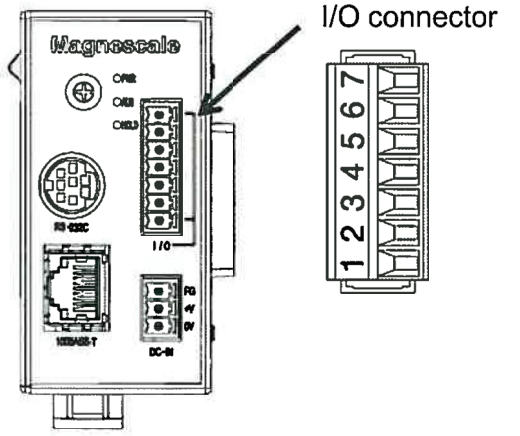
•Power supply input connector and the pin assignment.



No.	Signal name	signal
1	FG	Frame ground
2	Vin	DC+12 to 24V
3	0V	0V

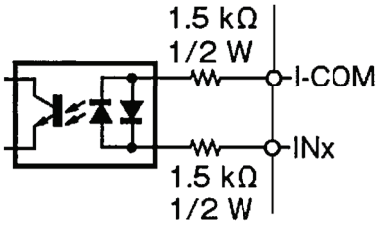
※Power supply to MG80-CM is supplied through the main module MG80-SC.
Required power supply: MG80-SC (2.4W) + power for counter modules and measuring units.

•I/O connector
The MG80-SC has I/O terminal with 4 input and 1 output.
MG80-SC1 : Current sink type, MG80-SC2 : Current source type

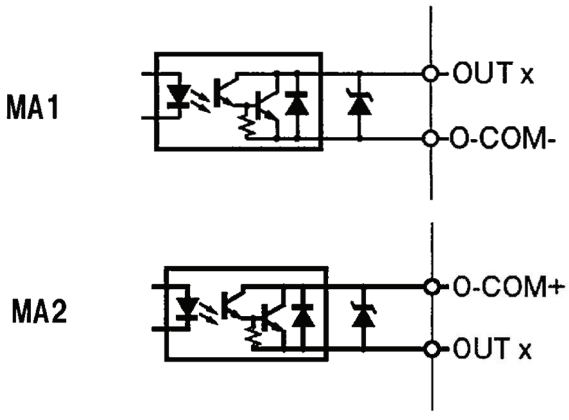


No.	Signal name	Signal
1	IN1	Reset
2	IN2	RS-232C Input trigger
3	IN3	Pause
4	IN4	Start / Latch
5	I-COM	Common for input
6	OUT1	Alarm
7	O-COM	Common for output

•Equivalent circuit of Input (SC1, SC2)
ON voltage 10.8V ore more
OFF voltage 2V or less

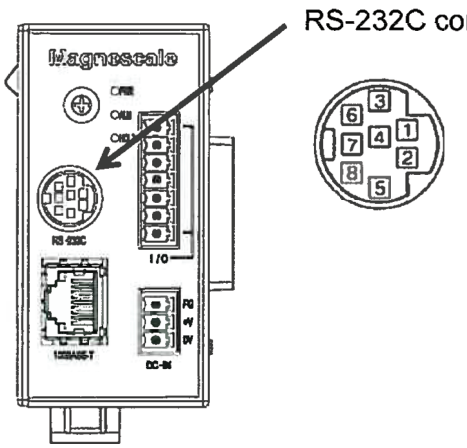


•Equivalent circuit of Output
Load voltage DC48V max.
Load current DC9mA max.



•RS-232 connector pin assignment

•Automatically recognizes with / without flow control (RTS / CTS).
Use DZ-252 communication cable (sold separately).



No.	I/O	Description
1		N.C
2		SG(Signal GND)
3	IN	RXD(Receive data)
4	OUT	TXD(Transmit data)
5	IN	CTS(Clear to send)
6	OUT	RTS(Request to send)
7		N.C
8		N.C

7. Specifications

Model name	MG80-SC1/MG80-SC2
Product name	RS-232C Interface module
Power supply	DC10.8 to 26.4.V
Power consumption	2.4W or less
Max. number of connections of MG80-CM	16 units※1
Connectable measuring unit	Voltage differential line driver output (conforms to EIA-422) A / B / Reference ※ Reference can be unused
Power supply connector	Input terminal x1 (3pole),
I/O connector	7-pin connector, photocoupler-insulated, 4 inputs, 1 output MG80-SC1 : Current sink type, MG80-SC2 : Current source type
Interface connector	RS-232C : mini-DIN 8P Ethernet : RJ45 x2 (with shield)
Communication protocol	RS-232C (2,400bps to 230,400bps)
Communication speed	RS232C: 2400bps、9600bps、19200bps、38400bps、 57600bps、115200bps、230400bps Ethernet: 100 Mbps
Max. cable length	RS-232C: 15m※2 Ethernet: 20m (CAT5e shield type recommended※3)
Setting switch	Module number : Rotary switch RS-232C communication : 8bit slide switch
Indicator	Power LED : green×1, Alarm LED :redx1, Hold LED :orange x1
Operating temperature	0 to 50℃ (No condensation)
Storage temperature	-20 to 60℃ (20 to 90%RH)
Operating ambient atmosphere	No corrosive gas
Mass	Approx. 130g
Mounting method	DIN rail
Accessory	Termination module, Instruction manual
Applied standard	EMI : EN61000-6-4 EMS : EN61000-6-2 FCC Part 15 Subpart B Class A ICES-003 Class A Digital Apparatus

※1 The number of connections indicates the number of measurement units, as one MG80-CM is required for each measurement unit.
LZ80-K1 / K2 and MG80-LM cannot be used.

※2 Use a DZ252 communication cable (sold separately).

※3 Please prepare the communication cable by the customer.

8. Command List

For details on the command, refer to the instruction manual posted on the website.

Setup commands from PC/PLC to MG80-SC with RS-232C/Ethernet communication

Function	Command	Remarks
Start the parameter set up.	SETUP	
Set the resolution value.	①②RSL=③ / ①②RSL=?	
Set the polarity mode.	①②POL=③ / ①②POL=?	
Set the measuring mode.	①②MODE=③ / ①②MODE=?	
Set the preset value.	①②P=③ / ①②P=?	
Set the comparator upper limit.	①②CH③=④ / ①②CH③=?	
Set the comparator lower limit.	①②CL③=④ / ①②CL③=?	
Set the comparator set number.	①②SCN=③ / ①②SCN=?	
Set whether the reference point is to be used or not.	①②REF=③ / ①②REF=?	
Clear the reference point setting (reference point offset value).	①②LCLR	
Select the external start input function.	①STTERM=③ / ①STTERM=?	
Select the RS-232C data transfer format(separator).	①RSSEP=③ / ①RSSEP=?	
Select the RS-232C output data format.	①RSFORM=③ / ①RSFORM=?	
Select the RS-232C trigger or internal timer.	①RSTRG=③ / ①RSTRG=?	
Select the scale unit (mm/other).	①SCALE=③ / ①SCALE=?	
Close the parameter setup.	CLOSE	
Load the reference point offset value.	①②LO=?	
Load the software version.	①VER=?	

Operation commands from PC/PLC to MG80-SC with RS-232C/Ethernet communication

Function	Command	Remarks
Load the data(All the channel)	R	
Load the data(Specific the channel)	①②r	
Measuring mode	①②MODE=③ / ①②MODE=?	
Peak-to-peak value mode	①②P-P	
Maximum value mode	①②MAX	
Minimum value mode	①②MIN	
Current value mode	①②REAL	
Recall the preset value	①②RCL	
Reset	①②RES	
Start	①②START	
Pause	①②PAU③	
Latch	①②LCH③	
Load the reference point	①②L	

PLC link setup commands from PC/PLC to MG80-SC with Ethernet communication

Function	Command	Remarks
IP address	NIP=③ / NIP=?	
Subnet mask	NMS=③ / NMS=?	
PLC link port	LPN=③ / LPN=?	
PLC link mode	LMD=③ / LMD=?	
PLC link Protocol	LPC1=③ / LPC1=? LPC2=③ / LPC2=? LPC3=③ / LPC3=?	
PLC IP address	RIP=③ / RIP=?	
Control flag start address	FLA=③ / FLA=?	
Setup parameter start address	②PRA=③ / ②PRA=?	
Measurement data start address	MDA=③ / MDA=?	
FINS DNA/SNA	FINSDNA=③	
FINS DA1	FINSDA1=③	
FINS SA1	FINSSA1=③	
C mode unit number	CMUNITNO=③	

9. PLC Link

The PLC link is a function that enables MG80-SC to Read and Writes on to the PLC memory. It is unnecessary to make communication programs, but only Read or Write the data in to the PLC memory to control or acquire measurement data from MG80-SC.
For details, refer to the instruction manual posted on the Magnescale website.

MG80-SC PLC link supports the following protocols.
Refer to each maker PLC specification for compatibility.

PLC Maker	Communication Protocol	Binary/ASCII	Connection type
Mitsubishi Electric Corp.	1C Frame	ASCII	RS-232C
	3C Frame	ASCII	RS-232C
	1E Frame	ASCII/Binary	TCP/UDP
	3E Frame	ASCII/Binary	TCP/UDP
	3E Frame for iQ-R	ASCII/Binary	TCP/UDP
OMRON Corp.	C mode command	ASCII	RS-232C
	FINS command	Binary	TCP/UDP
KEYENCE CORP.	KV Host Link Mode	ASCII	RS-232C
	Host-link Communication	ASCII	TCP/UDP

PLC link command by each PLC maker for Writing and Reading its own memory

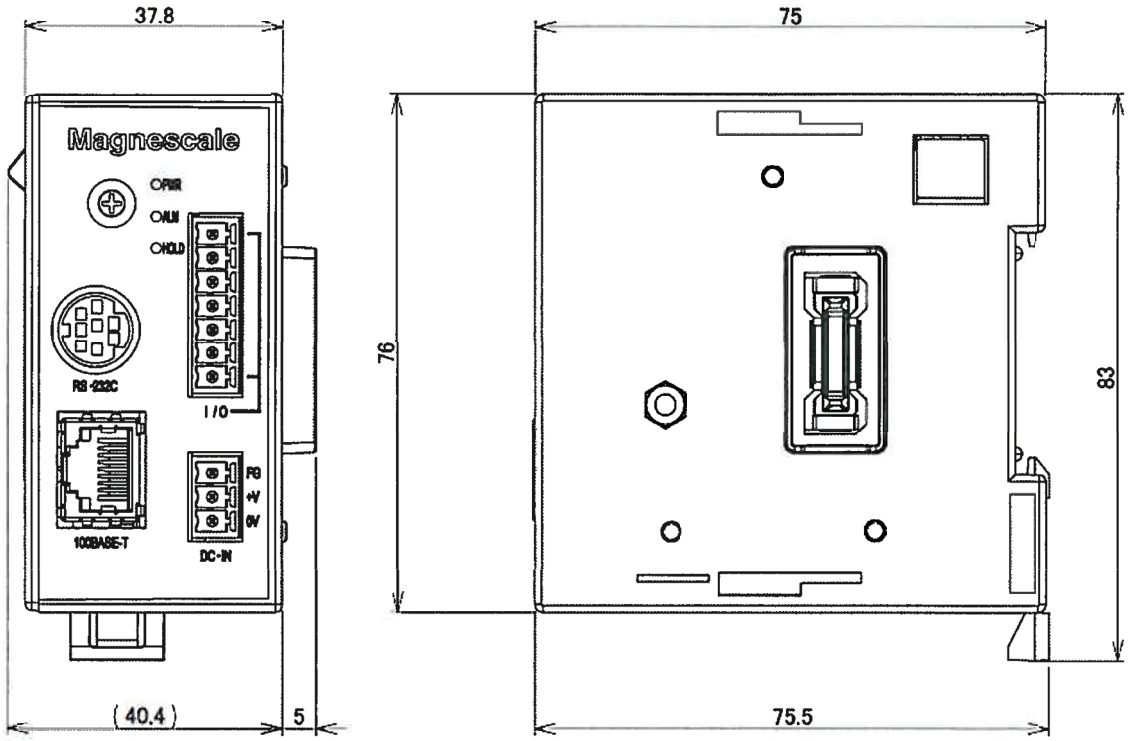
Protocol	Command	Remarks
1C Frame Format4	Write : QW Read : QR	Data memory
1E Frame	Write : 03 Read : 01	
3C Frame Format4 3E Frame	Write : 1401 Read : 0401	
C Mode Command	Write : WD Read : RD	
FINS Command	Write : 0102 Read : 0101	
KV Host Link Mode Host-link Communication	Write : WRS Read : RDS	

10. Notes on MG10/10A/MG20 compatibility

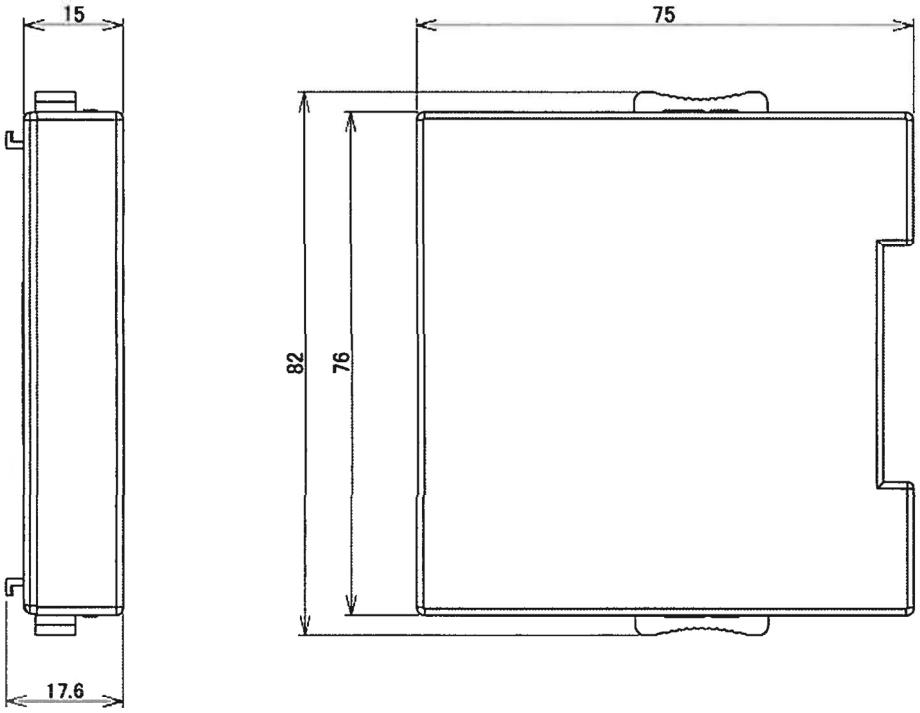
The resolution setting of MG80-SC is different from MG10/10A/20/30 series. You will need to use a Windows PC with "MG80-SC Setting Tool Program" or command from the PLC to change setting of input resolution of the measuring units, where MG10/10A/20 was hardware DIP switches.

11. Dimensions

MG80-SC1/MG80-SC2



Termination module



Unit : mm