

INSTRUCTION MANUAL

WGA-680A

INSTRUMENTATION AMPLIFIER

(FOR CC-Link OPTIONS)

AC model

WGA-680A-04: CC-Link

DC model

WGA-680A-14: CC-Link

Thank you for purchasing KYOWA's product WGA-680A Instrumentation Amplifier.

Read this Instruction Manual carefully in order to make full use of the high performance capabilities of the product.

Do not use the product in methods other than described in this Manual.

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The contents of the Instruction Manual are subjected to change without prior notice.

We assume no responsibility whatever for any damage resulting from the use of this product.

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STANDARD ACCESSORIES

The following accessories are packed with the WGA-680A-04 and WGA-680A-14.
When unpacking, check the contents to ensure that all accessories are enclosed.

Instruction Manual (For WGA-680A, For BCD/RS-232C/RS-485/TEDS, For CC-Link)	1 (CD-R)
Product Warranty	1
Unit label	1
Flat-head screw driver for control input/output terminal blocks	1

OPTIONAL ACCESSORIES

<CC-Link connector>	
Wire mount socket (3M Japan Limited)	35505-6000-B0M GF
Branch connector (type-Y, 3M Japan Limited)	35715-L010-B00 AK
Termination connector (type-Y, 3M Japan Limited)	35T05-6M00-B0M GF

SAFETY PRECAUTIONS (Do not forget to read the safety precautions prior to use.)

The WGA-680A-04 and WGA-680A-14 are designed to be used according to "3. CC-Link SPECIFICATIONS."

Do not use the product in an environment exceeding the specifications.

Or, it may cause troubles.

PRIOR TO USE

For safe use of the product, do not forget to read the "Safety Precautions" prior to use.

Kyowa Electronic Instruments Co., Ltd. assumes no liability for any damage resulting from the user's failure to comply with the safety precautions.

For safety operation of the product, the following symbol marks are used in the Instruction Manual.

	Indicates "PROTECTIVE GROUND TERMINAL." Be sure to connect the GND terminal to the ground.
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SAFETY SYMBOLS

For safety operation of the product, the following symbol marks are used in the Instruction Manual.

	WARNING	Improper operation of the system may result in death or severe injury of the operator.
	CAUTION	Improper operation of the system may result in injury of the operator and physical damage of the system.

 WARNING	
● Warning Be sure to observe the safety precautions described in the WGA-680A Instruction Manual. ● Power supply To prevent a fire hazard, ensure that the power supply voltage specified for the product matches the local line voltage before connecting the system to the power outlet. Power supply specs WGA-680A-00~04 (AC models) :AC100~240V, Power consumption: 20VA or less WGA-680A-10~14 (DC models) :DC10~30V, Power consumption: 10W or less ● Avoid using in environment with inflammable gas, etc. To prevent the risk of fire hazard or explosion, do not use the product in environment with inflammable gas, vapor, or dust. ● If any trouble occurs To prevent a fire hazards, if smoke is emerging from the product, immediately disconnect the USB cable or AC adapter to terminate the system operation. ● Protective ground Be sure to connect the GND terminal to the ground. Or, it may cause an electric shock hazard, lower the performance, and cause trouble.	

CAUTION

- **Caution**
Be sure to observe the safety precautions described in the WGA-680A Instruction Manual.
- Do not use the product outdoors.
Or, it may cause electric shock, fire hazard, lower the performance and cause troubles.
- Do not turn ON the power switch immediately after turning it OFF.
After turning OFF the power switch, wait (5 seconds) until the power supply is shut OFF before turning ON the power switch again.
If the power is repeatedly turned ON and OFF within 5 seconds, rush current generated by switching the power ON may damage the product.
- Use the product within temperature ranging from -10 to +50°C.
Use at temperatures exceeding the specified range may lower the performance and cause trouble.
If use under direct sunlight or in a cold place is inevitable, prepare a sunscreen or take proper measures to keep it warm.
- Use the product in the specified operating humidity of 20 to 80% .
Use in a humid place exceeding the specified range or where it is exposed to splashing water may lower the performance and cause trouble.
- Do not use the product immediately after the change in the environment.
Leave the product as it is until it becomes adaptable to the environment.
Abrupt change in ambient temperature due to transportation, etc. may cause dew condensation, which may result in lower performance and troubles.
- Use the product under environment without excessive vibration or high impact.
Vibration resistance: 19.6m/s² (2G), 10 to 200Hz (when in operation)
Use the product in an area where vibration and impact can be kept within the scope of specifications.
Continuous vibration or severe impact may cause deteriorated performance and system failure.
- Do not use the product in strong electromagnetic field.
Use the product in a magnetic field environment where the PC may be used.
Performance may be lowered and erroneous operation and troubles may result if it is used near a telemetry system, microwave oven, electronic furnace or any other equipment generating a strong magnetic field.
- Do not use the product under poor conditions.
Use a power source that is free from momentary power outages and noise.
Make sure that fluctuations in the power supply to the device do not exceed $\pm 10\%$ of the nominal voltage.
Operate the product within the range 50/60 Hz.
- Do not pull cords and cables.
Lay cords and cables with a certain allowance so that unreasonable force is not applied to the connections.
Or, it may interrupt the measurements, break the cables, and damage the connectors.
- Avoid installing sensors and products near a welding machine. Failure to do so will pose the risk of erroneous data, malfunction and failure.
- Do not disassemble or remodel the product. Or, it may cause electric shock hazards or damage the product. This warranty does not cover any damaged or defective parts that results from disassembling or remodeling.
- Do not use or strage the product under dusty or fine particles or corrosive gas environment.
Use or strage under these environment, may result in lower performance and troubles.
- Do not expose the product to the air if it is used and stored nearby sea. Air exposure nearby sea may cause lower performance and products failure.
- Take care when handling the CD-R.
Do not expose the CD-R to direct sun light, high temperature, or high humidity.
Do not apply pressure to the CD-R by laying object or bending.
Dust, scratches, and fingerprints on either side of the CD-R can cause write errors.
- Preheat the product before use.
After the power ON, always preheat the product for approximately 1 hour.
- Cleaning.
When the product gets dirty, clean the product with a dry soft cloth. When dust exists inside the WGA-680A, clean it by using an air blow gun. Do not touch electronic parts.

LIMITED LIFE PARTS AND PREVENTIVE MAINTENANCE

The product consists of various electronic components and those components, if not all, have a useful life. Using them exceeding the years specified according to each part type (useful life) may affect the characteristics of the product, resulting in a malfunction or a failure.

Particularly, when aluminum electrolytic capacitor life ends, the signal-noise ratio lowers due to capacity low or smoke is emitted due to liquid leak, resulting in a malfunction of the product.

To operate the product normally, finding a sign of the product failure early by daily/periodic inspections and taking the corrective action are required.

For inspection, contact KYOWA or our representatives.

- * Limited life parts used with the product are aluminum electrolytic capacitor.
- * All components do age and will fail.

WGA-680A REPLACEMENT BEFORE THE END OF SERVICE LIFE

Preventive maintenance and replacement parts are a cost-effective way of keeping the performance and extending the service life of the product. Regardless of the replacement parts, the product itself gradually deteriorates with age. Before the expected service life is reached, consider replacing the product with a new one or the latest series as preventive maintenance.

NOTATIONS USED IN THE INSTRUCTION MANUAL

The following notations are used in the Instruction Manual for convenience.

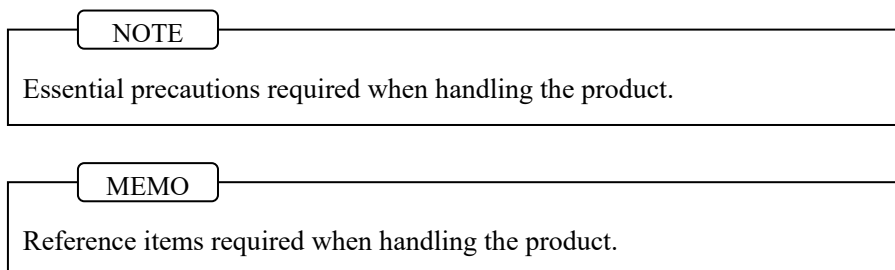
- Names described on the panel surface

Names described on the panel surface are expressed in double quotation mark " ".

- Informational notes

Certain notations are used as necessary to attract your attention to information that requires special care when handling the product, and to information provided for reference purposes.

Examples of Notations



PRECAUTIONS ON CE MARKING

NOTE

When satisfying the following conditions, we evaluated the compatibility against the requirements of the EU Directives and confirmed that the product satisfied the requirements.

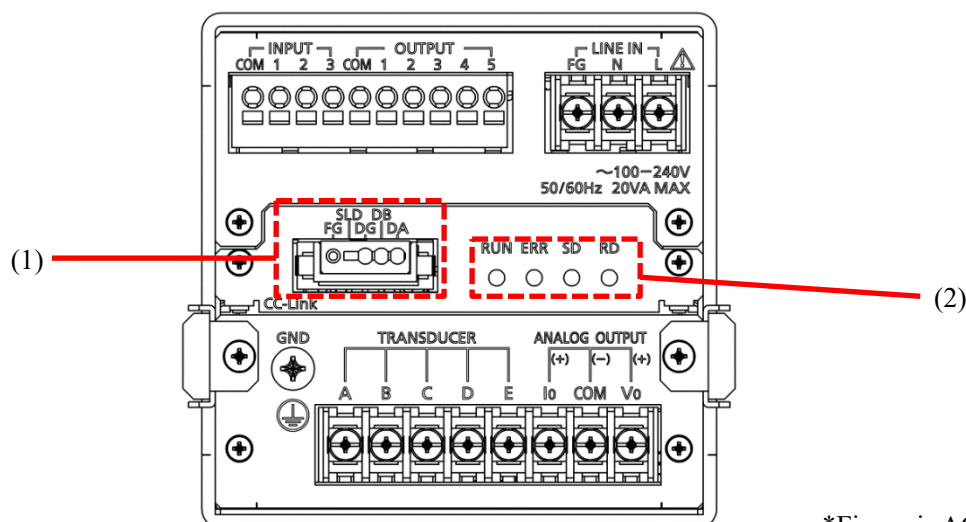
- To connect products, be sure to use the following cables.
Cables compatible to the CC-Link Ver.1.10 (3-conductor shielded twisted-pair cable)
- Before connecting the control cable, be sure to mount ferrite cores near the terminal block.
Recommended ferrite core GRFC-5 (KITAGAWA INDUSTRIES CO., LTD.)
- Be sure to wrap the CC-Link cable around the clamp-on ferrite core two turns near the connector.
Recommended ferrite core RFC-20 (KITAGAWA INDUSTRIES CO., LTD.)
- Be sure to mount the product on the control panel, etc. Before turning ON the power, make sure the terminal block on the back panel is covered to avoid contact with hands.
- The product connection should be executed by experts in electrical work.
- To immediately turn OFF the product, place switches or circuit breakers inside the building and near the product and display the functions as well.
Use switches and circuit breakers conforming to the IEC60947-1 and IEC60947-3.
- Use the product in area where elevation is 2000 m or below.
- When mounting the product in your system, approaches to satisfy the CE marking requirements vary with the configuration of the control panel to be used, the other devices to be connected, and wirings. Therefore, customers are required to check whether the CE marking requirements on the product are satisfied or not.
- Be sure to connect the GND terminal to the ground by using the optional ground wire.

1. OUTLINE OF PRODUCT

The WGA-680A-04(AC model) and WGA-680A-14(DC model) are instrumentation amplifier with the CC-Link options.

These products are able to control devices and able to load indicated values by using a PLC (or sequencer).

2. CONTROLS AND INDICATORS (REAR PANEL)



*Figure is AC model

- (1) Communication connectors Connects the CC-Link cable for the PLC.
For details, see "4. COMMUNICATION CONNECTORS."
- (2) Status LEDs Indicates the communication status. For details, see "5. STATUS LED."

3. CC-Link SPECIFICATIONS

	Specifications	Initial values
Version	Ver.1.10	
Station type	Remote device station	
Number of occupied stations	1 station, 2 stations, 4 stations	4 stations
Communication speed	10 Mbps, 5 Mbps, 2.5 Mbps, 625 kbps, 156 kbps	10Mbps
Station number	1 to 64	1 stations
Connection cable	Cables compatible to the CC-Link Ver.1.10 (3-conductor shielded twisted-pair cable)	

4. COMMUNICATION CONNECTORS

- The pins and signals are as follows.

Pin No.	Signal name	Signal content	Remarks
1	DA	Signal conductor DA	
2	DB	Signal conductor DB	
3	DG	Signal conductor ground	
4	SLD	Shield	The SLD and FG are connected internally.
5	FG	Frame ground	

The compatible connector of the CC-Link cables is as follows. (Optional accessories)

Name	Model	Manufacture
Wire mount socket	35505-6000-BOM-GF	3M Japan Limited
Branch connector (type-Y)	35715-L010-B00 AK	3M Japan Limited
Termination connector	35T05-6M00-BOM GF	3M Japan Limited

NOTE

- To locate the products at both ends of the CC-Link network, be sure to mount the termination connectors.
- The branch connector (type-Y) requires the wire mount socket.

- Connect cables as follows.
 - 1) Strip the coating of the wire for approx. 30 to 35 mm.
Twist the wires together tightly.
The available wires are as follows.
 Conductor size: 0.5 mm²(AWG20)
 Insulated jacket O.D.: φ2.2 to φ3.0 mm
 - 2) Insert the wires into the drain hole on the connector cover.
Push the connector cover into the body.

5. STATUS LED

Indicate the communication status as follows.

LED name	ON	OFF	Flickering
RUN	Working properly	Resetting..., communication error	----
SD	Sending...	----	----
RD	Receiving...	----	----
ERR	CRC error	Working properly	----

6. CC-Link SETTINGS

NOTE

DA output and control output are stopped when the instrument is in function selection mode(F-** is displayed) or during function setting.

When applying a load, pay attention to overload and control status.

For details of functions, see "4" in the WGA-680A INSTRUMENTATION AMPLIFIER INSTRUCTION MANUAL. To set the CC-Link, go to the FUNCTION SELECTING mode [F-18] (CC-Link).

FUNCTION SELECTING mode	Key operation and product movement in SETTING mode	Functional description
F-18 CC-Link	Display the following items(1), (2), (3) (1) Number of occupied stations 0: 1 station 1: 2 stations 2: 4 stations (initial value) (2) Communication speed 0: 10 Mbps (initial value) 1: 5 Mbps 2: 2.5 Mbps 3: 625 kbps 4: 156 kbps (3) Station number Range: 01 to 64 (initial value: 01) Select and change values in items (1), (2), and (3) and press the SET key.	Selects the number of occupied stations as the remote device station. The address map varies with the number of occupied stations. The range of the Station number varies with the Number of occupied stations. 01 to 64 Number of occupied stations: 1 01 to 63 Number of occupied stations: 2 01 to 61 Number of occupied stations: 4

7. BUFFER ADDRESS OF PLC

When the Number of occupied stations is "2" or "4", make sure each PLC (master) has unique address.

The buffer address, assigned to the remote device (WGA-680A), varies with the Station number as follows.

Station number	Remote input: RX		Remote output: RY		Remote register: M → R		Remote register: R → M	
	Address	Input RX	Address	Output RY	Address	Resistor M→R	Address	Resistor R→M
1	00E0 _H	RX0000	0160 _H	RY0000	01E0 _H	RW _w 0000	02E0 _H	RW _r 0000
2	00E2 _H	RX0020	0162 _H	RY0020	01E4 _H	RW _w 0004	02E4 _H	RW _r 0004
3	00E4 _H	RX0040	0164 _H	RY0040	01E8 _H	RW _w 0008	02E8 _H	RW _r 0008
4	00E6 _H	RX0060	0166 _H	RY0060	01EC _H	RW _w 000C	02EC _H	RW _r 000C

M: Master (PLC)

R: Remote (WGA-680A)

8. ADDRESS MAP

8-1. REMOTE REGISTER: M → R

8-1-1. Address map of the remote register M → R

M: Master (PLC) → R: Remote (WGA-680A)

NOTE

The buffer address is the value, when the Station number is "1".

● Number of occupied stations: 4 stations

Station No.	Buffer address	Remote register	Name		Bit configuration	Remarks
			MSB	LSB		
1	01E0 _H	RWw0000	[HI] comparator value_L		32 bits BCD	Operation pattern
	01E1 _H	RWw0001	[HI] comparator value_H			
	01E2 _H	RWw0002	[LO] comparator value_L		32 bits BCD	
	01E3 _H	RWw0003	[LO] comparator value_L			
2	01E4 _H	RWw0004	[HH] comparator value_L		32 bits BCD	
	01E5 _H	RWw0005	[HH] comparator value_L			
	01E6 _H	RWw0006	[LL] comparator value_L		32 bits BCD	
	01E7 _H	RWw0007	[LL] comparator value_H			
3	01E8 _H	RWw0008	Not in use			
	01E9 _H	RWw0009				
	01EA _H	RWw000A	Not in use			
	01EB _H	RWw000B				
4	01EC _H	RWw000C	Command data_L		32 bits BCD	Commands
	01ED _H	RWw000D	Command data_H			
	01EE _H	RWw000E	Command No.		16 bits BCD	
	01EF _H	RWw000F	"0" (12 bits)	Operation pattern	4 bits BCD	

● Number of occupied stations: 2 stations

Station No.	Buffer address	Remote register	Name		Bit configuration	Remarks
			MSB	LSB		
1	01E0 _H	RWw0000	[HI] comparator value_L		32 bits BCD	Operation pattern
	01E1 _H	RWw0001	[HI] comparator value_H			
	01E2 _H	RWw0002	[LO] comparator value_L		32 bits BCD	
	01E3 _H	RWw0003	[LO] comparator value_H			
2	01E4 _H	RWw0004	Command data_L		32 bits BCD	Commands
	01E5 _H	RWw0005	Command data_H			
	01E6 _H	RWw0006	Command No.		16 bits BCD	
	01E7 _H	RWw0007	"0" (12 bits)	Operation pattern	4 bits BCD	

● Number of occupied stations: 1 station

Station No.	Buffer address	Remote register	Name		Bit configuration	Remarks
			MSB	LSB		
1	01E0 _H	RWw0000	Not in use			
	01E1 _H	RWw0001				
	01E2 _H	RWw0002				
	01E3 _H	RWw0003				

8-1-2. Format of the remote register M → R

- Operation pattern limited data: 32 bits BCD

Buffer address (Station number: 1, Number of occupied stations: 4 stations): 01E0_H to 01E7_H

Writes the pre-set values of the operation pattern limited data by using the [Command processing request 1].

Pre-set values: [HH] comparator value_H/L, [HI] comparator value_H/L. [LO] comparator value_H/L. [LL] comparator value_H/L

MSB						LSB		
L	10 ³ th digit	4 bits	10 ² th digit	4 bits	10 ¹ th digit	4 bits	10 ⁰ th digit	4 bits
H	Sign	4 bits	All "0"	4 bits	All "0"	4 bits	10 ⁴ th digit	4 bits

Store the numerical values of each digit as the BCD data.

Example: 9 (Decimal) = $2^3 \times 1 + 2^2 \times 0 + 2^1 \times 0 + 2^0 \times 1 = 1001$

When a numerical value of each digit is larger than 9, the product treats the numerical value as "9."

You cannot set the decimal point position since it is based on the calibration data.

Indicate the sign as follows.

0000: Positive (+), 0001: Negative (-)

Example: Pre-set data of the [LO] comparator value: "-56789" →

0110 0111 1000 1001 (Upper row: 16 bits BCD of the L)

0001 0000 0000 0101 (Lower row: 16 bits BCD of the H)

- Command data (numerical values): 32 bits BCD

Buffer address (Station number: 1, Number of occupied stations: 4 stations): 01EC_H to 01ED_H

Write the pre-set values of the numerical values by using the [Command processing request 2].

MSB						LSB		
L	10 ³ th digit	4 bits	10 ² th digit	4 bits	10 ¹ th digit	4 bits	10 ⁰ th digit	4 bits
H	Sign	4 bits	All "0"	4 bits	All "0"	4 bits	10 ⁴ th digit	4 bits

Indicates the digits and signs in the same manner as that of the above operation pattern limited data.

Example: Pre-set data of the rated capacity: "06400" →

0110 0100 0000 0000 (Upper row: 16 bits BCD of the L)

0000 0000 0000 0000 (Lower row: 16 bits BCD of the H)

- Command data (assigned values): 32 bits BCD

Buffer address (Station number: 1, Number of occupied stations: 4 stations): 01EC_H to 01ED_H

Write the pre-set values of the assigned values by using the [Command processing request 2].

MSB						LSB		
L	All "0"	4 bits	All "0"	4 bits	10 ¹ th digit	4 bits	10 ⁰ th digit	4 bits
H	All "0"	4 bits	All "0"	4 bits	All "0"	4 bits	All "0"	4 bits

Indicate the digits in the same manner as that of the BCD data.

Example: Pre-set data of the number of moving averaging times: "11" (2048 times) →

0000 0000 0001 0001 (16 bits BCD of the upper row)

- Command No. 16 bits BCD

Buffer address (Station number: 1, Number of occupied stations: 4 stations): 01EE_H

Selects the command No. The [Command processing response 2 flag] does not appear when the command is invalid.

MSB						LSB	
10 ³ th digit	4 bits	10 ² th digit	4 bits	10 ¹ th digit	4 bits	10 ⁰ th digit	4 bits

Example: Command Number of the sensitivity registering calibration: "2003" →

0010 0000 0000 0011 (16 bits BCD)

- Operation pattern: 4 bits BCD

Buffer address (Station number: 1, Number of occupied stations: 4 stations): 01EF_H

Selects the operation pattern No.

MSB						LSB	
All "0"	4 bits	All "0"	4 bits	All "0"	4 bits	Operation pattern	4 bits

8-2. REMOTE REGISTER: R → M

8-2-1. Address map of the remote register R → M

R: Remote (WGA-680A) → M: Master (PLC)

NOTE

The buffer address is the value, when the Station number is "1".

- Number of occupied stations: 4 stations

Station No.	Buffer address	Remote register	Name		Bit configuration	Remarks
			MSB	LSB		
1	02E0 _H	RWr0000	Indicated value_Selection_L		32 bits BCD	
	02E1 _H	RWr0001	Indicated value_Selection_H			
	02E2 _H	RWr0002	Undefined			
	02E3 _H	RWr0003				
2	02E4 _H	RWr0004	Undefined			
	02E5 _H	RWr0005				
	02E6 _H	RWr0006	"0" (12 bits)	Error code	4 bits BCD	
	02E7 _H	RWr0007	"0" (12 bits)	Error auxiliary code	4 bits BCD	
3	02E8 _H	RWr0008	Holding value_L		32 bits BCD	
	02E9 _H	RWr0009	Holding value_H			
	02EA _H	RWr000A	Measured value_L		32 bits BCD	
	02EB _H	RWr000B	Measured value_H			
4	02EC _H	RWr000C	Command data response_L		32 bits BCD	Command response
	02ED _H	RWr000D	Command data response_H			
	02EE _H	RWr000E	Command No. response		16 bits BCD	
	02EF _H	RWr000F	"0" (12 bits)	Operation pattern response	4 bits BCD	

- Number of occupied stations: 2 stations

Station No.	Buffer address	Remote register	Name		Bit configuration	Remarks
			MSB	LSB		
1	02E0 _H	RWr0000	Indicated value_Selection_L *1		32 bits BCD	
	02E1 _H	RWr0001	Indicated value_Selection_H *1			
	02E2 _H	RWr0002	"0" (12 bits)	Error code	4 bits BCD	
	02E3 _H	RWr0003	"0" (12 bits)	Error auxiliary code	4 bits BCD	
2	02E4 _H	RWr0004	Command data response_L		32 bits BCD	Command response
	02E5 _H	RWr0005	Command data response_H			
	02E6 _H	RWr0006	Command No. response		16 bits BCD	
	02E7 _H	RWr0007	"0" (12 bits)	Operation pattern response	4 bits BCD	

- Number of occupied stations: 1 station

Station No.	Buffer address	Remote register	Name		Bit configuration	Remarks
			MSB	LSB		
1	02E0 _H	RWr0000	Indicated value_Selection_L *1		32 bits BCD	
	02E1 _H	RWr0001	Indicated value_Selection_H *1			
	02E2 _H	RWr0002	"0" (12 bits)	Error code	4 bits BCD	
	02E3 _H	RWr0003	"0" (12 bits)	Error auxiliary code	4 bits BCD	

MEMO

*1. When the Number of occupied stations is 1 or 2, the "Indicated value_Selection" (holding value / measured value) varies with the remote output [Value selection 1].

For details, see "8-3-2. Contents of the remote output RY (M → R) ."

8-2-2. Format of the remote register R → M

- Indicated value_Selection: 32 bits BCD

Buffer address (Station number: 1, Number of occupied stations: 4 stations): 02E0_H to 02E1_H

The data varies with the remote output [Value selection 1].

MSB						LSB		
L	10 ³ th digit	4 bits	10 ² th digit	4 bits	10 ¹ th digit	4 bits	10 ⁰ th digit	4 bits
H	Sign	4 bits	All "0"	4 bits	All "0"	4 bits	10 ⁴ th digit	4 bits

Indicate the same format with the command data (numerical values).

- Holding value: 32 bits BCD

Buffer address (Station number: 1, Number of occupied stations: 4 stations): 02E8_H to 02E9_H

Store the indicated values (when in operation) during the Hold mode.

MSB						LSB		
L	10 ³ th digit	4 bits	10 ² th digit	4 bits	10 ¹ th digit	4 bits	10 ⁰ th digit	4 bits
H	Sign	4 bits	All "0"	4 bits	All "0"	4 bits	10 ⁴ th digit	4 bits

Indicate the digits (BCD data) and signs in the same manner as that of the above.

MEMO

Store the holding values (indicated values) in the remote register, based on the following conditions.

- The updating rate is the same value, pre-set in the FUNCTION SELECTING mode [F-21] (Display updating rate).
- When the display mode is "Hold display mode" in the FUNCTION SELECTING mode [F-04] (Hold mode), the holding value (indicated value), immediately after turning ON the HOLD command, appears during the Detecting interval.
- The holding value (indicated value), when selecting the minimum scale in the FUNCTION SELECTING mode [F-07] (Smoothing), appears.

- Measured value: 32 bits BCD

Buffer address (Station number: 1, Number of occupied stations: 4 stations): 02EA_H to 02EB_H

Store the scaled calibration data (the same data during the tracking) of the sensor inputs, irrespective of the Hold mode.

MSB						LSB		
L	10 ³ th digit	4 bits	10 ² thdigit	4 bits	10 ¹ th digit	4 bits	10 ⁰ th digit	4 bits
H	Sign	4 bits	All "0"	4 bits	All "0"	4 bits	10 ⁴ th digit	4 bits

Indicate the digits (BCD data) and signs in the same manner as that of the above.

MEMO

Store the measured values (tracking values) in the remote register, based on the following conditions.

- The updating rate is 4000 times/sec (= sampling rate).
- Not affected by the settings of the FUNCTION SELECTING mode [F-04] (Hold mode).
- Not affected by the minimum scale of the FUNCTION SELECTING mode [F-07] (Smoothing).

- Error code: 4 bits BCD

Buffer address (Station number: 1, Number of occupied stations: 4 stations): 02E6_H

Store the WGA-680A error codes.

MSB						LSB	
All "0"	4 bits	All "0"	4 bits	All "0"	4 bits	Error code	4 bits

Indicate the error codes as follows.

0000: None, 0001: Over error (input), 0010: Over error (indicated value)
0011: Calibration error, 0100: Memory error

- Error auxiliary code: 4 bits BCD

Buffer address (Station number: 1, Number of occupied stations: 4 stations): 02E7_H

Store the WGA-680A error No. The "0000" indicates there is no error.

MSB			LSB		
All "0"	4 bits	All "0"	4 bits	All "0"	4 bits
				Error No.	4 bits

Suppose the error code is "0001, OVER error (input)."

0001: Exceeding the positive side of the input range

0010: Exceeding the negative side of the input range

Suppose the error code is "0010, OVER error (indicated value)."

0001: Exceeding the positive side of the indicated value

0010: Exceeding the negative side of the indicated value

Suppose the error code is "0011, calibration error."

0010: Sensitivity registering calibration error

Suppose the error code is "0100, memory error."

0001: RAM error

0010: EEPROM error

- Command data response 32 bits BCD

Buffer address (Station number: 1, Number of occupied stations: 4 stations): 02EC_H to 02ED_H

Store the data response, due to the reading of the pre-set values, by using the [Command processing request 2].

MSB						LSB	
L	10 ³ th digit	4 bits	10 ² th digit	4 bits	10 ¹ th digit	4 bits	10 ⁰ th digit
H	Sign	4 bits	All "0"	4 bits	All "0"	4 bits	10 ⁴ th digit

Indicate the digits (BCD data) and signs in the same manner as that of the Indicated value_Selection.

- Command No. response: 16 bits BCD

Buffer address (Station number: 1, Number of occupied stations: 4 stations): 02EE_H

Store the command No. response, due to the reading of the pre-set values, by using the [Command processing request 2].

MSB						LSB	
	10 ³ th digit	4 bits	10 ² th digit	4 bits	10 ¹ th digit	4 bits	10 ⁰ th digit
							4 bits

- Operation pattern response: 4 bits BCD

Buffer address (Station number: 1, Number of occupied stations: 4 stations): 02EF_H

Store the operation pattern response, due to the reading of the pre-set values, by using the [Command processing request 2].

MSB					LSB	
All "0"	4 bits	All "0"	4 bits	All "0"	4 bits	Operation pattern response
						4 bits

0000: Operation pattern 0 0001: Operation pattern 1 0010: Operation pattern 2 0011: Operation pattern 3

8-3. REMOTE INPUT AND REMOTE OUTPUT

8-3-1. Address map

NOTE

The buffer address is the value, when the Station number is "1".

- Number of occupied stations: 4 stations

Station No.	M: Master (PLC) → R: Remote (WGA-680A)			R: Remote (WGA-680A) → M: Master (PLC)		
	Buffer address	Remote output	Name	Buffer address	Remote input	Name
1	0160 _H	RY0000	Command processing request 1	00E0 _H	RX0000	Command processing response 1
		RY0001	(Reserved)		RX0001	(Reserved)
		RY0002	Command processing request 2		RX0002	Command processing response 2
		RY0003	WRITE/READ		RX0003	WRITE/READ response
		RY0004	(Reserved)		RX0004	(Reserved)
		RY0005	(Reserved)		RX0005	(Reserved)
		RY0006	(Reserved)		RX0006	CPU normal operation
		RY0007	Operation pattern 0		RX0007	Operation pattern 0 response
		RY0008	Operation pattern 1		RX0008	Operation pattern 1 response
		RY0009	Operation pattern 2		RX0009	Operation pattern 2 response
		RY000A	Operation pattern 3		RX000A	Operation pattern 3 response
		RY000B	(Reserved)		RX000B	Decimal point position 10 ⁰
		RY000C	Value selection 1		RX000C	Decimal point position 10 ¹
		RY000D	(Reserved)		RX000D	Decimal point position 10 ²
		RY000E	(Reserved)		RX000E	Decimal point position 10 ³
		RY000F	(Reserved)		RX000F	Decimal point position 10 ⁴
	0161 _H	RY0010	ZERO command	00E1 _H	RX0010	[HH] comparator (comparator3)
		RY0011	RESET command		RX0011	[HI] comparator (comparator1)
		RY0012	HOLD command		RX0012	Working properly (Passed)
		RY0013 to RY001F	(Reserved)		RX0013	[LO] comparator (comparator2)
					RX0014	[LL] comparator (comparator4)
					RX0015	(Reserved)
					RX0016	(Reserved)
					RX0017	Detecting
					RX0018	Holding
					RX0019	(Reserved)
					RX001A	(Reserved)
					RX001B	(Reserved)
					RX001C	OVER error (input)
					RX001D	OVER error (indicated value)
					RX001E	Calibration error
					RX001F	Memory error

Station No.	M: Master (PLC) → R: Remote (WGA-680A)			R: Remote (WGA-680A) → M: Master (PLC)		
	Buffer address	Remote output	Name	Buffer address	Remote input	Name
2	0162 _H	RY0020 to RY002F	(Reserved)	00E2 _H	RX0020 to RX002F	(Reserved)
	0163 _H	RY0030 to RY003F	(Reserved)	00E3 _H	RX0030 to RX003F	(Reserved)
3	0164 _H to 0165 _H	RY0060 to RY006F	(Reserved)	00E4 _H to 00E5 _H	RX0040 to RX005F	(Reserved)
4	0166 _H to 0167 _H	RY0060 to RY0079	(Reserved)	00E6 _H to 00E7 _H	RX0060 to RX006F	(Reserved)
		RY007A	Error reset request flag		RX007A	Error status flag
		RY007B to RY007F			RX007B	Remote READY
					RX007C to RX007F	(Reserved)

- Number of occupied stations: 2 stations

Station No.	M: Master (PLC) → R: Remote (WGA-680A)			R: Remote (WGA-680A) → M: Master (PLC)		
	Buffer address	Remote output	Name	Buffer address	Remote input	Name
1	0160 _H	RY0000	Command processing request 1	00E0 _H	RX0000	Command processing response 1
		RY0001	(Reserved)		RX0001	(Reserved)
		RY0002	Command processing request 2		RX0002	Command processing response 2
		RY0003	WRITE/READ		RX0003	WRITE/READ response
		RY0004	(Reserved)		RX0004	(Reserved)
		RY0005	(Reserved)		RX0005	(Reserved)
		RY0006	(Reserved)		RX0006	CPU normal operation
		RY0007	Operation pattern 0		RX0007	Operation pattern 0 response
		RY0008	Operation pattern 1		RX0008	Operation pattern 1 response
		RY0009	Operation pattern 2		RX0009	Operation pattern 2 response
		RY000A	Operation pattern 3		RX000A	Operation pattern 3 response
		RY000B	(Reserved)		RX000B	Decimal point position 10 ⁰
		RY000C	Value selection 1		RX000C	Decimal point position 10 ¹
		RY000D	(Reserved)		RX000D	Decimal point position 10 ²
		RY000E	(Reserved)		RX000E	Decimal point position 10 ³
		RY000F	(Reserved)		RX000F	Decimal point position 10 ⁴
	0161 _H	RY0010	ZERO command	00E1 _H	RX0010	[HH] comparator (comparator3)
		RY0011	RESET command		RX0011	[HI] comparator (comparator1)
		RY0012	HOLD command		RX0012	Working properly. (Passed)
		RY0013 to RY001F	(Reserved)		RX0013	[LO] comparator (comparator2)
					RX0014	[LL] comparator (comparator4)
					RX0015	(Reserved)
					RX0016	(Reserved)
	RX0017				Detecting	
RX0018	Holding					
		RX0019	(Reserved)			
		RX001A	(Reserved)			
		RX001B	(Reserved)			
		RX001C	OVER error (input)			
		RX001D	OVER error (indicated value)			
		RX001E	Calibration error			
		RX001F	Memory error			
2	0162 _H	RY0020 to RY002F	(Reserved)		00E2 _H	RX0020 to RX002F
3	0163 _H	RY0030 to RY0039	(Reserved)	00E3 _H	RX0030 to RX0039	(Reserved)
		RY003A	Error reset request flag		RX003A	Error status flag
		RY003B to RY003F	(Reserved)		RX003B	Remote READY
					RX003C to RX003F	(Reserved)

MEMO

Suppose the [Command processing request 1], [Command processing request 2], [Command processing response 1], and [Command processing response 2] are all OFF.

You are able to valid them by turning ON the [Command processing request 1] or [Command processing request 2].

- Number of occupied stations: 1 station

Station No.	M: Master (PLC) → R: Remote (WGA-680A)			R: Remote (WGA-680A) → M: Master (PLC)			
	Buffer address	Remote output	Name	Buffer address	Remote input	Name	
1	0160 _H	RY0000	ZERO command	00E0 _H	RX0000	[HH] comparator (comparator3)	
		RY0001	RESET command		RX0001	[HI] comparator (comparator1)	
		RY0002	HOLD command		RX0002	Working properly (Passed)	
		RY0003	(Reserved)		RX0003	[LO] comparator (comparator2)	
		RY0004	(Reserved)		RX0004	[LL] comparator (comparator4)	
		RY0005	(Reserved)		RX0005	(Reserved)	
		RY0006	(Reserved)		RX0006	CPU normal operation	
		RY0007	Operation pattern 0		RX0007	Operation pattern 0 response	
		RY0008	Operation pattern 1		RX0008	Operation pattern 1 response	
		RY0009	Operation pattern 2		RX0009	Operation pattern 2 response	
		RY000A	Operation pattern 3		RX000A	Operation pattern 3 response	
		RY000B	(Reserved)		RX000B	Detecting	
		RY000C	Value selection 1		RX000C	Holding	
		RY000D	(Reserved)		RX000D	OVER error (input)	
		RY000E	(Reserved)		RX000E	OVER error (indicated value)	
		RY000F	(Reserved)		RX000F	Calibration error	
	0161 _H	RY0010 to RY0019	(Reserved)	00E1 _H	RX0010 to RX0016		(Reserved)
					RX0017		(Reserved)
		RY001A	Error reset request flag		RX0018		(Reserved)
					RX0019		(Reserved)
					RX001A		Error status flag
	RY001B to RY001F	(Reserved)	RX001B		Remote READY		
			RX001C		(Reserved)		
			RX001D		(Reserved)		
					RX001E		(Reserved)
					RX001F		(Reserved)

8-3-2. Contents of the remote output RY (M → R)

Name	Contents
Command processing request 1	Turn ON when writing the pre-set values of the operation pattern limited data. Before turning OFF, make sure the [Command processing response 1] is ON. The [Command processing request 1] saves the per-set values.
Command processing request 2	Turn ON when writing the commands. Before turning OFF, make sure the [Command processing response 2] is ON. Although the [Command processing request 2] saves the pre-set values, the [Command processing request 2] clears the obtained values of the “command for the control input signals.”
WRITE_READ	Select the WRITE/READ of the commands. OFF: WRITE, ON: READ
Operation pattern 0 to 3	Change the operation pattern by turning ON one of the operation pattern 0 to 3.
ZERO command	Execute the DIGITAL ZERO function at the rising edge. During ON, keep executing the DIGITAL ZERO function. Cancel the DIGITAL ZERO function at the falling edge.
RESET command	Reset the Hold mode at the rising edge. During ON, Keep executing the DIGITAL ZERO function. Cancel the Hold mode reset at the falling edge.
HOLD command	Control the Hold mode at the rising edge and falling edge. When the Hold mode is "Interval-specified peak hold", in the same manner as the control input signals, the product operates as follows. Rising edge: Starts detecting data. During ON: Detecting interval Falling edge: Starts Holding interval
Value selection 1	Change the value to be output, into the [Indicated value_Selection] data area of the Remote register: R → M. (Valid when the No. of occupied stations is 1 or 2.) OFF: Measured value (tracking value) ON: Holding value (indicated value)
Error reset request flag	Error state flag was turned ON by any error occurred. Turn ON the error reset request flag when the error state flag is turned OFF.

8-3-3. Contents of the remote input RX (R → M)

Name	Contents
Command processing response 1	Turn ON when the writing of the pre-set values finished. Before turning OFF, make sure the [Command processing request 1] is OFF.
Command processing response 2	Turn ON when the writing of the commands finished. Before turning OFF, make sure the [Command processing request 2] is OFF.
WRITE_READ response	Become the same status as that of the READ/WRITE signal, at the same timing when the [Command processing response 2] turns ON.
CPU normal operation	You are able to check whether the product CPU is working properly by using the normal operation signal. The CPU normal operation turns ON and OFF every second when the product is working properly.
Operation pattern 0 to 3 response	Indicate the current operation pattern No.
Decimal point position 10 ⁰ to 10 ³	Indicate the decimal point position.
[HH]_Comparator3	Turn ON when satisfying the setting conditions of the [HH] comparator (comparator3).
[HI]_Comparaor1	Turn ON when satisfying the setting conditions of the [HI] comparator (comparator1).
Working properly_Passed	Turn ON when not satisfying the setting conditions of all comparators.
[LO]_Comparator2	Turn ON when satisfying the setting conditions of the [LO] comparator (comparator2).
[LL]_Comparator4	Turn ON when satisfying the setting conditions of the [LL] comparator (comparator4).
Detecting	Turn ON during the detecting interval.
Holding	Turn ON during the holding interval.
OVER error (input)	Turn ON when the sensor input is exceeding the input range.
OVER error (indicated value)	Turn ON when the indicated value is lower than -99999 or is exceeding +99999.
Calibration error	Turn ON when the sensitivity registering value is exceeding the specified range.
Memory error	Turn ON when the RAM error or EEPROM error was occuoured.
Error status flag	Turn ON when any of the above error was occurred.
Remote READY	Turn ON when the initialization is finished and the [Error status flag] was OFF. Turn OFF when the [Error status flag] turns ON.

9. LIST OF COMMANDS

All commands are compatible to the [Command processing request 2] / [Command progress response 2].

9-1. COMMANDS FOR THE OPERATION PATTERN

Function	Item	Command				Pre-set value
Comparator function	[HI] (comparator_1)	0	5	1	1	-99999 to +99999
	[LO] (comparator_2)	0	5	2	1	-99999 to +99999
	[HH] (comparator_3)	0	5	3	1	-99999 to +99999
	[LL] (comparator_4)	0	5	4	1	-99999 to +99999

9-2. COMMANDS FOR THE GENERAL SETTINGS

Function	Item	Command				Pre-set value
Sensitivity registering calibration	Rated output	2	1	0	1	-3.2000 to +3.2000 mV/V (Sensitivity registering calibration only)
	Rated capacity	2	1	0	2	-99999 to +99999
Decimal point position	Decimal point position	2	1	0	3	0:None 1:0.0 2:0.00 3:0.000 4:0.0000
Actual load calibration	Rated capacity	2	1	0	6	-99999 to +99999
Numeric value registering calibration	Initial value of transducer	2	1	1	1	-3.2000 to +3.2000 mV/V
BV selection		2	1	2	1	0: 10 V, 1: 2 V
Smoothing	The number of moving averaging times	2	2	0	1	0:None 1:2 times 2:4 times 3:8 times 4:16 times 5:32 times 6:64 times 7:128 times 8:256times 9:512 times 10:1024 times 11:2048 times
	Minimum scale	2	2	0	2	0:1 1:2 2:5 3:10 4:20 5:50 6:100 7:200 8:500 9:1000
	Analog filter	2	2	0	3	0:300 Hz 1:100 Hz 2:30 Hz 3:10 Hz
Additional value	Additional value	2	3	0	1	-99999 to +99999
Hold mode	Hold mode	0	7	0	1	0:Tracking 1:Arbitrary point hold 2:Peak hold, 3:Interval-specified peak hold 4:Time-specified peak hold 5:Bottom hold 6:Interval-specified bottom hold 7:Time-specified bottom hold 8:Peak-to-peak hold 9:Interval-specified peak-to-peak hold 10:Time-specified peak-to-peak hold
	Display mode	0	7	0	2	0:Normal display mode 1:Hold display mode
	Comparison mode	0	7	0	3	0:Normal comparison mode 1:Hold comparison mode
	Delay time	0	7	0	4	0.00 to 9.99 sec
	Detect time	0	7	0	5	0.01 to 9.99 sec
Analog output (D/A) scaling	Automatic scaling	0	4	1	1	0:Manual setting 1:Automatic setting
	ZERO indicated value	0	4	1	2	-99999 to +99999
	FULL-SCALE indicated value	0	4	1	3	-99999 to +99999
Automatic ZERO compensation	Automatic ZERO compensation range	0	9	0	1	0 to +99999
	Determination Time	0	9	0	2	0.0 to 9.9 sec
	Zero-near-zero	0	9	0	3	0 to 9
Hysteresis		0	5	0	0	0 to +99999

Function	Item	Command				Pre-set value
Display updating rate		0	9	6	1	0:15.60 times/sec 1:7.80 times/sec 2:3.90 times/sec 3:1.95 times/sec 4:0.98 times/sec 5:0.49 times/sec 6:0.24 times/sec 7:0.12 times/sec
LEVEL TEST signals	Display Additional Function	0	3	1	1	0: Invalid 1: Valid
	LEVEL TEST values	0	3	1	2	-99999 to +99999
	LEVEL TEST ON/OFF	0	3	1	3	0: LEVEL TEST OFF 1: LEVEL TEST ON
Comparator functions	Comparator1 High/Low Limit assignment	0	5	5	1	0: High limit 1: Low limit
	Comparator2 High/Low Limit assignment	0	5	6	1	0: High limit 1: Low limit
	Comparator3 High/Low Limit assignment	0	5	7	1	0: High limit 1: Low limit
	Comparator4 High/Low Limit assignment	0	5	8	1	0: High limit 1: Low limit

9-3. COMMANDS FOR THE CONTROL INPUT SIGNALS

Function	Item	Command				Pre-set value
Control input signals	ZERO command ON	0	0	0	0	11
	RESET command ON	0	0	0	0	13
	HOLD command ON	0	0	0	0	15

9-4. ERROR CODES

Error message	Contents	Countermeasures
OFL1	The measured value is exceeding the input range to the minus side.	Decrease the input signal. Use the input signal within ± 3.2 mV/V.
OFL2	The measured value is exceeding the input range to the plus side.	
OFL3	The indicated value is below -99999.	Decrease the input signal or re-set the sensitivity registering value.
OFL4	The indicated value is above +99999.	
E-00	The sensitivity registering value is exceeding the specified range.	Use the sensitivity registering value 10000 or less per 0.1 mV/V.
E-01	RAM error	Failure
E-02	EEPROM error	Contact KYOWA or our representatives for repair.
E-04	A read error or checksum error occurs in the pre-set data area at startup.	To clear error messages, press the CANCEL key. When the error messages are not cleared, the product is failure. Contact KYOWA or our representatives for repair.
E-EP	A read error or checksum error is detected in the pre-set data area at startup.	
E-E0	An error occurs while writing the data in the pre-set data area.	
E-E1	An error occurs while writing the data in the calibration data area.	

10. SETTING PROCEDURES

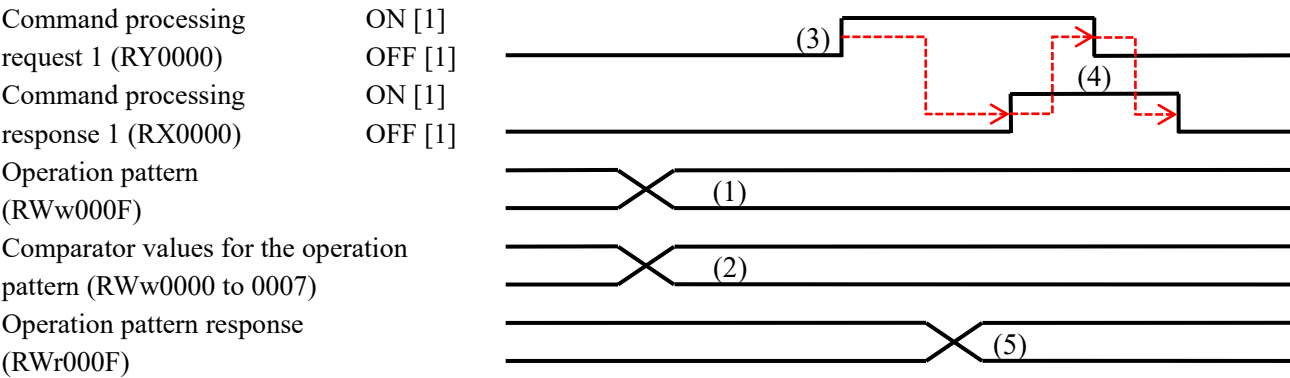
MEMO

Indicate the buffer address when the No. of occupied stations is "4."

10-1. TO WRITE THE PRE-SET VALUES OF THE OPERATION PATTERN LIMITED DATA (BY USING TRE REQUEST 1)

The [command processing request 1] writes the pre-set values (comparator values) of the operation pattern limited data. When the product turns ON the [Command processing request 1] with the [Command processing request 1], [Command processing request 2], [Command processing response 1], and [Command processing response 2] are all OFF, the command writes the pre-set values in the product. The [command processing request 1] saves the comparator values in the specified operation pattern No.

- (1) Enter the operation pattern No. in the [Operation pattern] of the Remote register M → R.
- (2) Enter the comparator values in the [[HH] comparator value_H/L, [HI] comparator value_H/L, [LO] comparator value_H/L, [LL] comparator value_H/L] of the Remote register M → R.
- (3) Change the [Command processing request 1] of the remote output. OFF [0] → ON [1]
- (4) Make sure the change of the [Command processing response 1] of the remote input. OFF [0] → ON [1]
Then change the [Command processing request 1] of the remote output. ON [1] → OFF [0]
- (5) The product stores the response in the [Operation pattern response] of the remote register R → M.

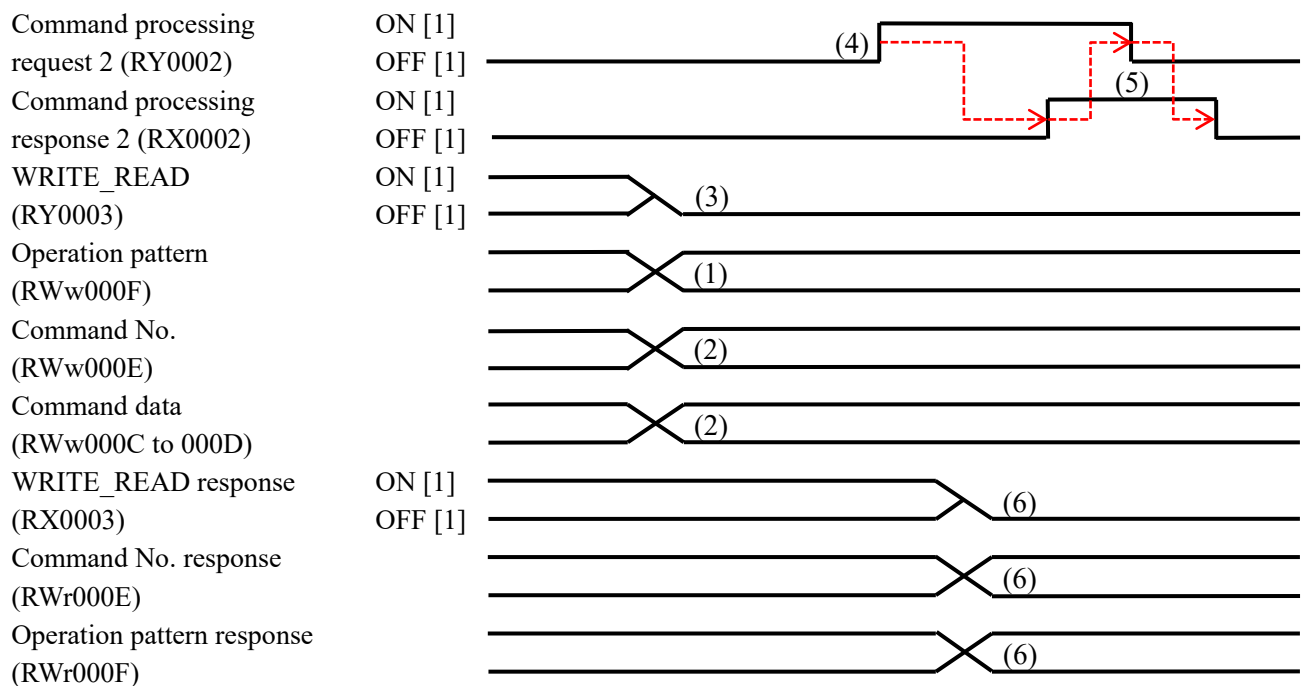


10-2. TO WRITE THE PRE-SET VALUES OF THE COMMANDS (BY USING THE REQUEST 2)

To write the pre-set value in the product, set the [WRITE_READ] to "OFF."

When the product turns ON the [Command processing request 2] with the [Command processing request 1], [Command processing request 2], [Command processing response 1], and [Command processing response 2] are all OFF, the command writes the pre-set values in the product

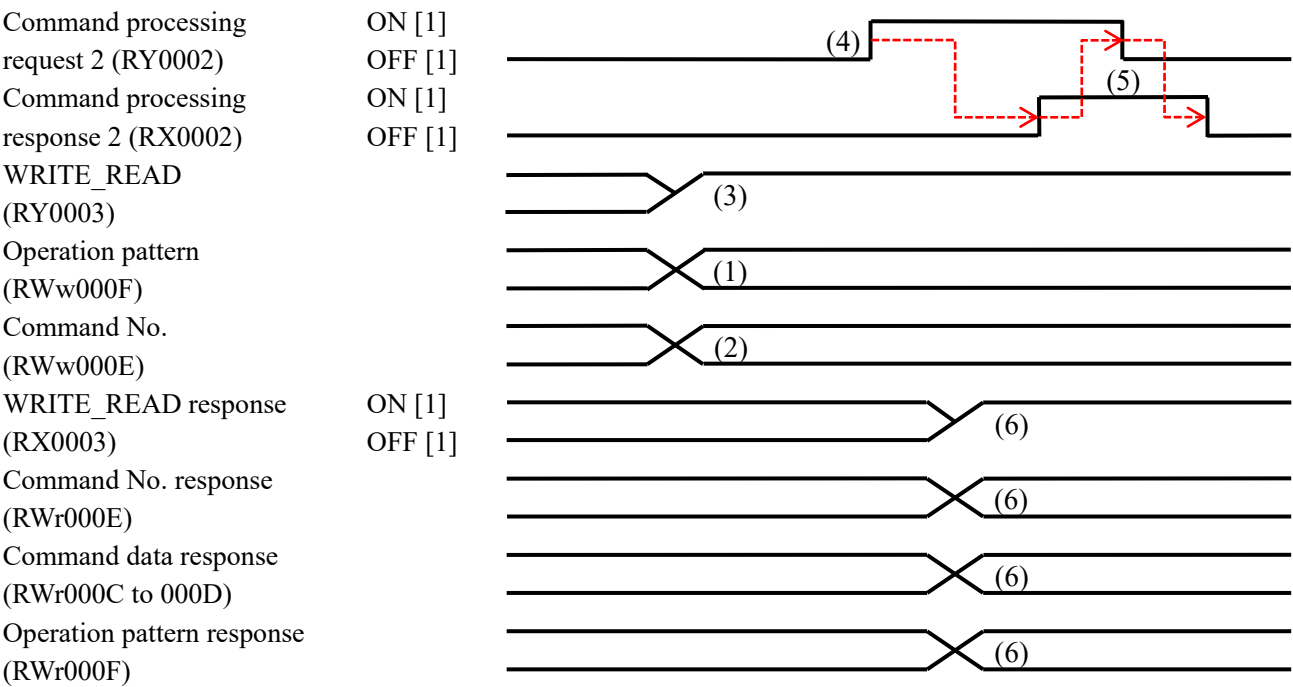
- (1) With the commands for the operation pattern (for details, see "9-1. COMMANDS FOR THE OPERATION PATTERN"), enter the operation pattern in the [Operation pattern] of the remote register M → R. You are not required to set the item with the commands for the general settings and commands for the control input signals.
- (2) Enter values in the [Command No.] and [Command data] of the remote register M → R.
- (3) Change the [WRITE_READ] of the remote output is OFF.
- (4) Change the [Command processing request 2] of the remote output. OFF [0] → ON [1]
- (5) Make sure the change of the [Command processing response 2] of the remote input. OFF [0] → ON [1]
- Then change the [Command processing request 1] of the remote output. ON [1] → OFF [0]
- (6) The product stores the response in the [WRITE_READ response] of the remote input and in the [Command No. response] and [Operation pattern response] of the remote register R → M.



10-3. TO READ THE PRE-SET VALUES OF THE COMMANDS (BY USING THE REQUEST 2)

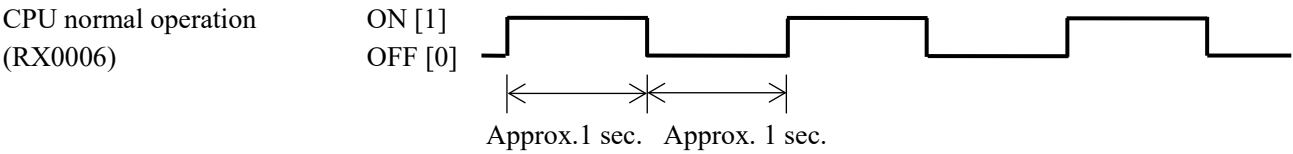
To read the pre-set values from the product, set the [WRITE/READ] to "ON." The product outputs the pre-set values. Before reading the [Command data response], make sure the [Command processing response 2] is "ON."

- (1) With the commands for the operation pattern (for details, see "9-1. COMMANDS FOR THE OPERATION PATTERN"), enter the operation pattern in the [Operation pattern] of the remote register M → R. You are not required to set the item with the commands for the general settings and commands for the control input signals.
- (2) Enter the commands in the [Command No.] of the remote register M → R.
- (3) Make sure the [WRITE/READ] of the remote output is ON.
- (4) Change the [Command processing request 2] of the remote output. OFF [0] → ON [1]
- (5) Make sure the change of the [Command processing response 2] of the remote input. OFF [0] → ON [2]
Then change the [Command processing request 2] of the remote output. ON [1] → OFF [0]
- (6) The product stores the response in the [WRITE/READ response] of the remote input and in the [Command No. response], [Command data response], and [Operation pattern response] of the remote register R → M. Check the contents of the [Command data response].



10-4. CPU NORMAL OPERATION

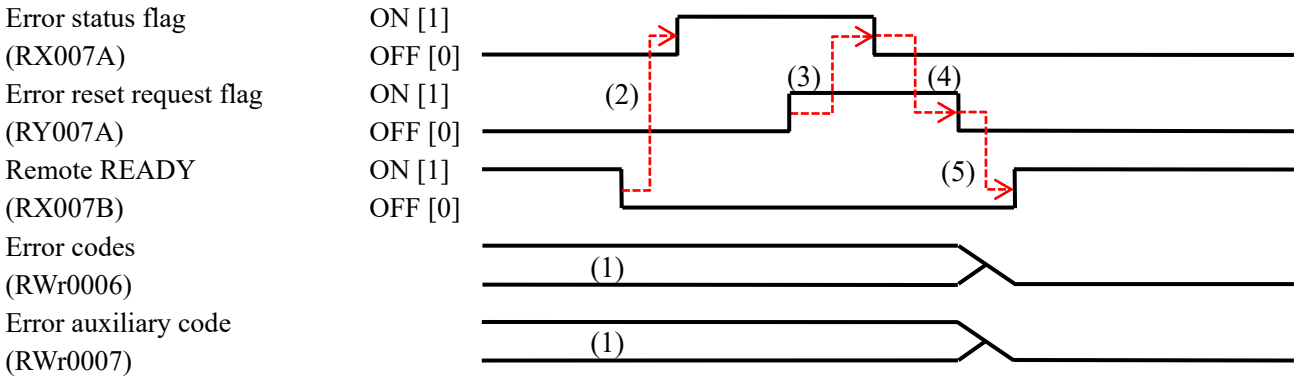
You are able to check whether the product is working properly by using the CPU normal operation. The product turns ON and OFF the CPU normal operation every second when the product is working properly.



10-5. ERROR STATUS FLAG

When an error (for details, see "9-4. ERROR CODES") occurs ((1)) on the product, the product turns OFF the [Remote READY] and turns ON the [Error status flag] ((2)).

Turn ON the [Error reset request flag] ((3)) from the master, to turn OFF the [Error status flag] ((4)) and to turn ON the [Remote READY] ((5)).



11. TROUBLE SHOOTING

In the event that the product would not operate as expected or in a stable manner, you should trace the factor(s) that may be causing such a condition before concluding that the system has failed.

Items to be checked and countermeasure against various phenomena are described in the following table.

If troubles are not solved despite countermeasures, contact KYOWA or our representative.

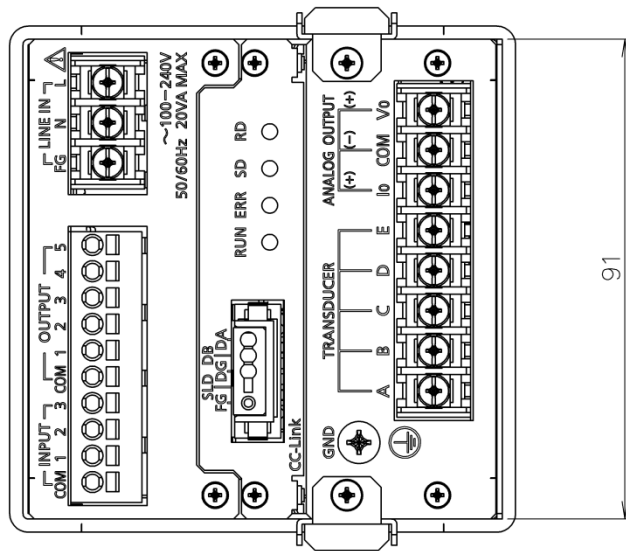
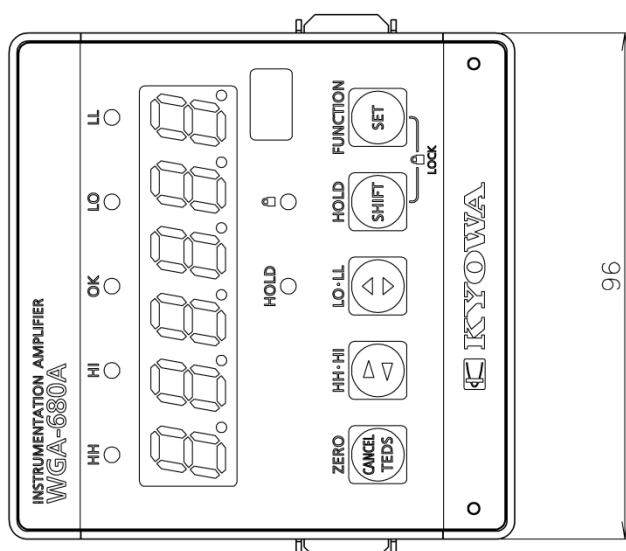
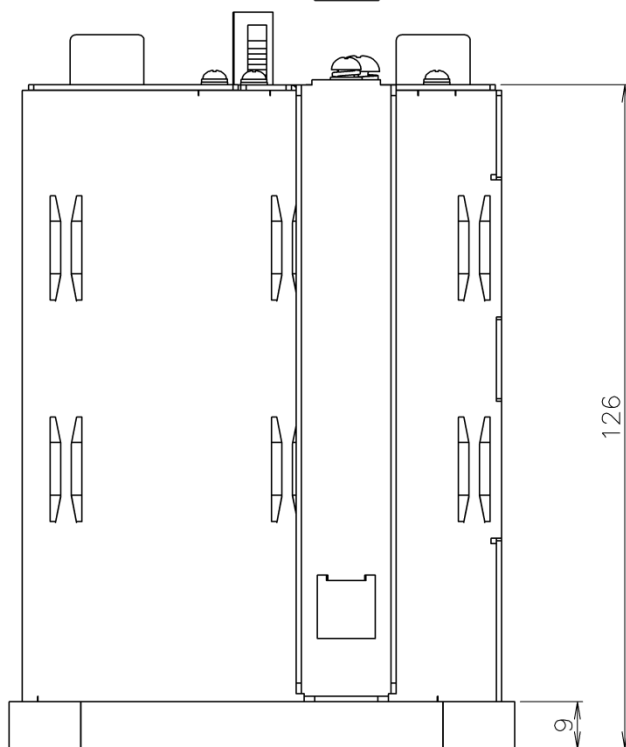
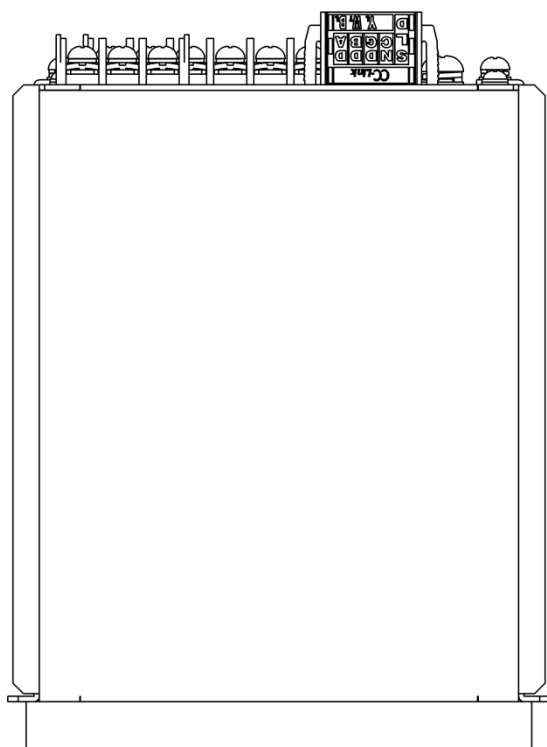
If the product is damaged due to any causes other than as written in the Instruction Manual or if the user has disassembled or remodeled the product, Kyowa Electronic Instruments Co., Ltd. may not be able to offer repair service.

Trouble	Checked Items and Countermeasures
The setting isn't changed by the commands.	● Make sure the value of the command are correct. ⇒ The [Command processing response 2 flag] does not appear when the command is invalid. See the "9" in this manual and make sure the setting value. ● Make sure the error code in the buffer address ⇒ See "8-2-2" and make sure the error code. See "8-3-3" and make sure the error content to make the countermeasure. ● Make sure the value of the indicator is correct. ⇒ When the indicator displays the error code, see "9-4" and make the countermeasure.
Operation stops and accepts no instruction at all.	● The operation failed due to noise. ⇒ Turn OFF the power and turn ON again. If the same phenomenon still generates due to noise, take appropriate countermeasures for removing the noise from operating environment, power supply, etc. For details, see the following "Noisy" part.
The measured value varies.	● For details, see "6" in the INSTRUCTION MANUAL. The operation failed due to noise. ⇒ Take appropriate countermeasures for removing the noise. For details, see the following "Noisy" part.
The measured value is incorrect.	● Make sure the transducer connections are correct. ⇒ Correctly set and connect them. ● Make sure the calibration settings and bridge excitation settings, by the control commands, are correct. ⇒ Correctly set them based on the transducer specifications.
Noisy	● For details, see "6" in the INSTRUCTION MANUAL. ● connect the shield of CC-Link cable to the GND terminal.

12. OUTSIDE DRAWING

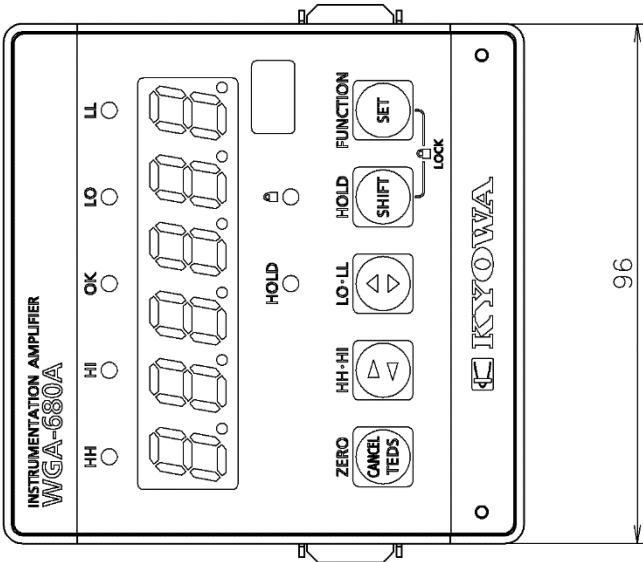
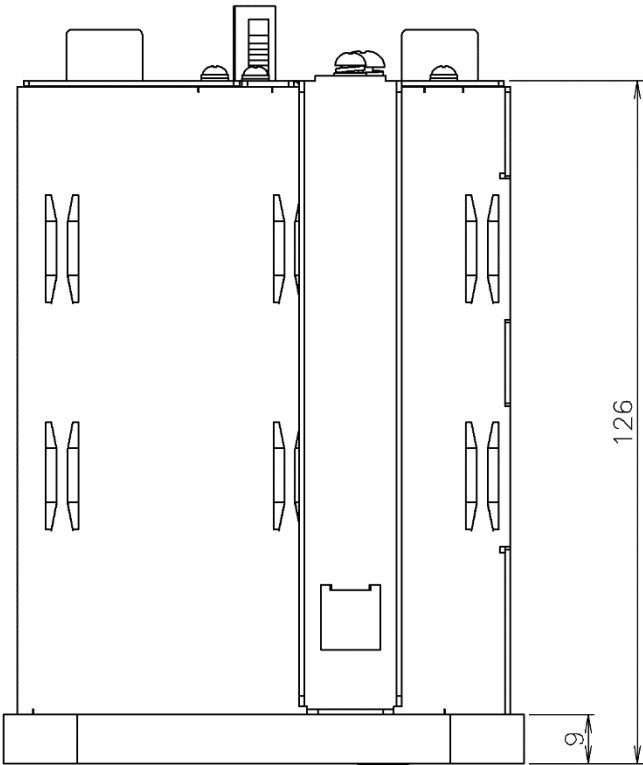
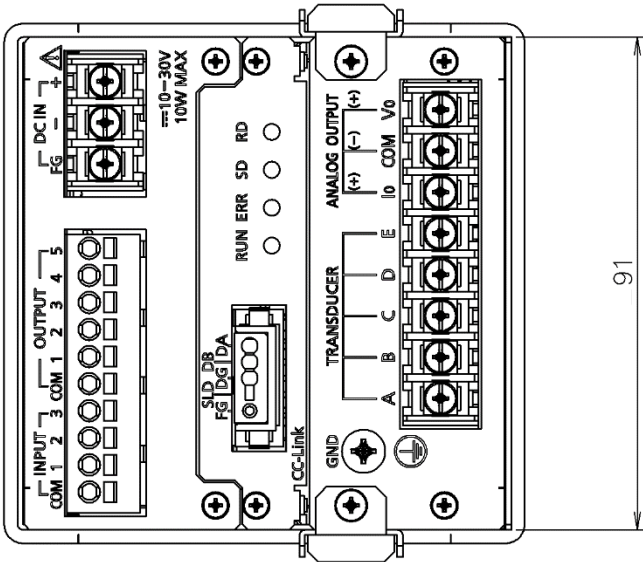
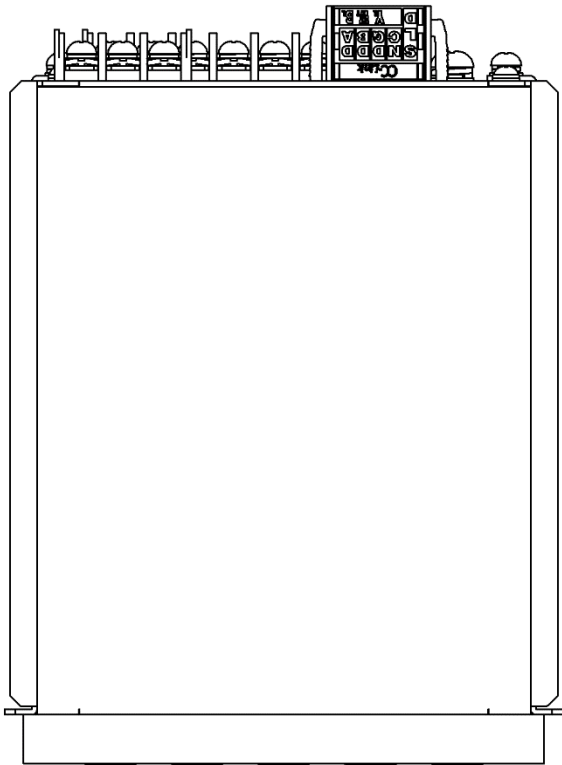
12-1. WGA-680A-04: CC-Link OPTION (AC model)

Unit: mm



12-2. WGA-680A-14: CC-Link OPTION (DC model)

Unit: mm





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