

General Specifications

GCCU MarkII Gas Chromatograph Computing Unit (For GC1000 MarkII)

GC1000 MarkII

GS 11B03S02-02E

■ General

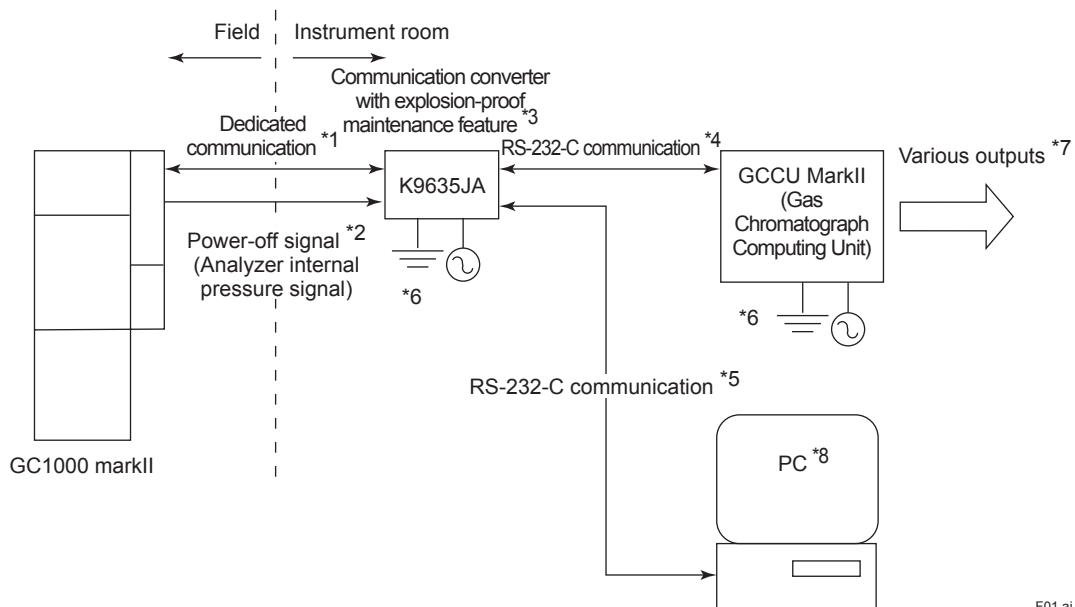
The GC1000 MarkII process gas chromatograph unit features PC communication, analog hold output, digital I/O, and communication with a supervisory computer. For analog hold output from the GC1000 MarkII, many signal lines should be installed between the field and instrument room.

Since the GCCU MarkII can be connected to the GC1000 MarkII via communication and the GCCU MarkII can output various signals, the number of signal lines to be installed can be reduced.

The GCCU MarkII (Gas Chromatograph Computing Unit) offers such features as analog hold output, analog serial output, trend output, digital output, digital input, and communication with a supervisory computer.

All parameter setting is executed in the GC1000 MarkII and no setting is required at the GCCU MarkII.

■ Schematic Wiring Diagram



- *1: 0.5 mm² or larger 4-pin shielded cable (Phonix terminal type), 1 km or shorter (or 2-pin shielded cable + 2-or-more-pin cable without shield)
- *2: Two lines
- *3: An accessory of GC1000 MarkII. The PIN is K9635JB when area class is FM-Y or CSA-Y.
- *4: 3-m dedicated cable provided
- *5: D-SUB9P (Female) to D-SUB9P (Female) cross cable
- *6: JIS Class D independent grounding (grounding resistance of 100Ω or less) or equivalent
- *7: Dedicated cable provided
- *8: GCMT software(option) can be operated on PC

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■ Standard Specifications

- Ambient temperature:
0 to 50°C
- Installation:
Panel installation
- Power supply:
100 to 240 VAC, 50/60 Hz
- Range of Power fluctuation:
85 to 250 VAC, 50/60 Hz ± 3 Hz
- Power consumption:
120 VA
- Mass: Approx. 10 kg
- Number of output components:
Max. 24 components/stream
- Number of output streams:
Max. 24

● External I/O

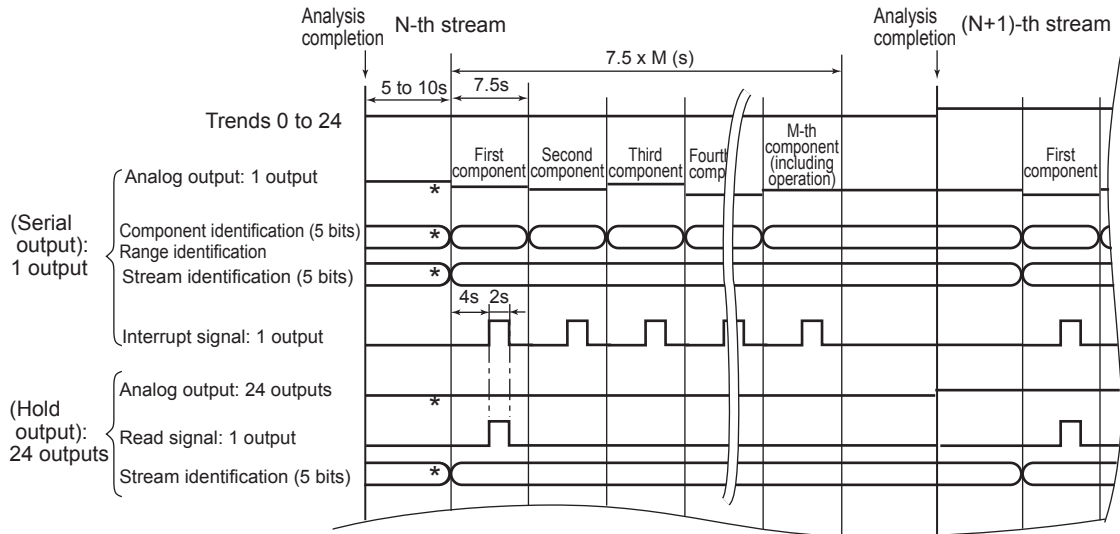
- Alarm output:
 - System alarm (level 1, 2; fixed alarms only):
2 contact outputs (Rated load voltage, current: 24 V DC, 0.1 A)
 - Component alarm: 1 contact output (Rated load voltage, current: 24 V DC, 0.1 A)
NO or NC (open upon power-off for NO)
- Trend output:
 - Analog output : Up to 24 outputs
4 to 20 mA DC, load resistance 600Ω or lower or 1 to 5 V DC, permissible load resistance 5 kΩ or higher
- Analog serial:
 - Analog output : 1 output
4 to 20 mA DC, load resistance 600Ω or lower or 1 to 5 V DC, permissible load resistance 5 kΩ or higher
- Contact output (stream identification):
5 outputs (rated load voltage, current: 24 V DC, 0.1 A)
- Contact output (component identification):
5 outputs (rated load voltage, current: 24 V DC, 0.1 A)
- Contact output (range identification):
5 outputs (rated load voltage, current: 24 V DC, 0.1 A)
- Contact output (interrupt signal):
1 output (rated load voltage, current: 24 V DC, 0.1 A)

- Analog hold:
 - Analog output : Up to 24 outputs
4 to 20 mA DC, load resistance 600Ω or lower or 1 to 5 VDC, permissible load resistance 5 kΩ or higher
- Contact output (stream identification):
5 outputs (rated load voltage, current: 24 V DC, 0.1 A)
- Contact output (read signal):
1 output (rated load voltage, current: 24 V DC, 0.1 A)
- Digital input:
 - Contact input: 16 inputs (contact rating: 5 V DC or higher, 20 mA or higher)
 - CAL command (CAL request STD1, 2): 2 points
 - Stream change command (stream change request: Up to 15 streams): 1 point
 - Range change command (range change request: Up to 15 components): 1 point
- Digital output:
 - Contact output:
15 outputs (rated load voltage, current: 24 V DC, 0.1 A)
 - Stream No. code (4 bits Up to 15 streams): 4 points
 - Component No. code (4 bits Up to 15 components): 4 points
 - Component list code (4 bits Up to 15 lists): 4 points
 - Stream change answerback: 1 point
 - Range change answerback: 1 point
 - CAL change answerback: 1 point
 - Analysis completion signal: 1 point
 - Data byte identification: 2 points
 - Data transmission: 1 point
 - Component identification, stream identification, range identification, data lower byte, data upper byte: 8 points (8 bits)
- Computer ON/OFF:
 - Contact output:
1 output (rated load voltage, current: 30 V DC, 50 mA)

• External I/O Signal Timing

(1) Trend output

Analog serial output, Analog hold output



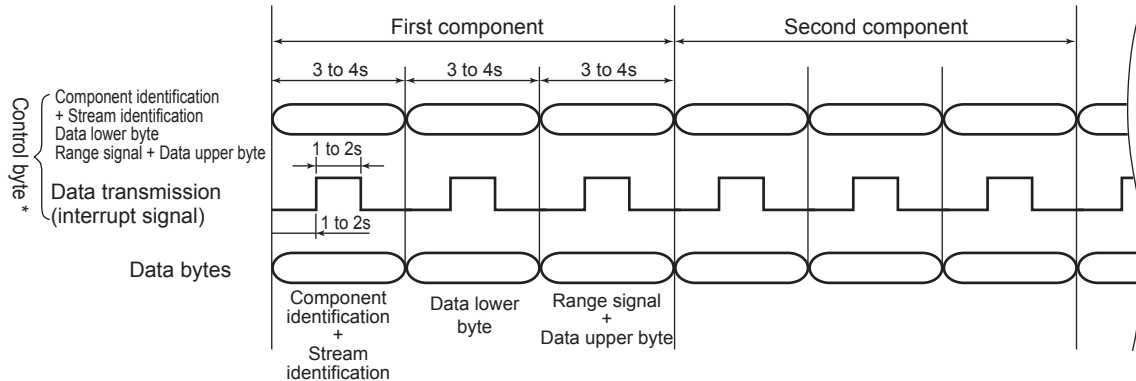
*: Final analysis value in previous output

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Note: With regard to the timing of the analysis completion, it is when final peak-off time comes, but it becomes the calculation stop time if the final peak cannot be detected.

(2) Digital I/O (for a supervisory computer)

(a) Output timing

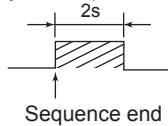


*: For the answerback signal, see "Digital input."

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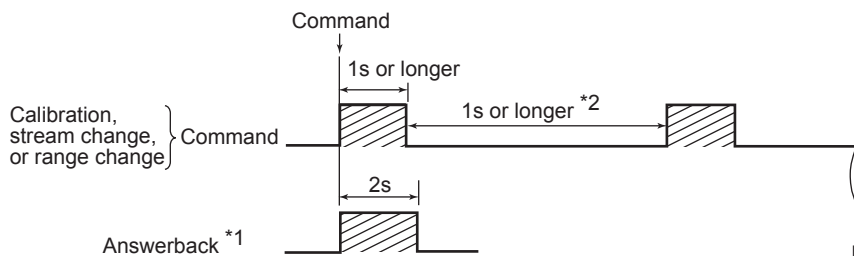
Note: The output timing of the analysis completion signal is the end of sequence.

Analysis completion signal



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(b) Input timing and answerback output timing



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*1: Answerback is output for each command when the command is accepted, regardless of command execution.

*2: At least a 1-second interval is required between requests.

(3) Correspondence of alarm between GCCU MarkII and GC1000 MarkII

The GC1000 MarkII alarms are output as System alarm when Digital output is selected.

(a) System alarm (Level 1)

The following GC1000 MarkII alarms are output as Level 1 alarm from GCCU MarkII.

No.	Alarm No. and Name in GC1000 MarkII
1	No.2 EEPROM CS ERR
2	No.3 DRAM ERR
3	No.1 SYS-ERR
4	No.4 EXCE ERR
5	No.5 BUS ERR
6	No.6 DEV INIT ERR
7	No.7 WDOG TIMER ERR
8	No.11 BUFF INIT ERR
9	No.12 BUFF FULL ERR
10	No.21 INNER TMP COM ERR
11	No.22 OUTER TMP COM ERR
12	No.23 LSV1 TMP COM ERR
13	No.24 LSV2 TMP COM ERR
14	No.25 FID1 TMP COM ERR
15	No.26 FID2 TMP COM ERR
16	No.27 FPD TMP COM ERR
17	No.28 INNER TMP CTL ERR
18	No.29 INNER TMP OVER
19	No.30 OUTER TMP OVER
20	No.31 LSV1 TMP OVER
21	No.32 LSV2 TMP OVER
22	No.33 FID1 TMP OVER
23	No.34 FID2 TMP OVER

No.	Alarm No. and Name in GC1000 MarkII
24	No.35 FPD TMP OVER
25	No.36 TMP HEATER ERR
26	No.37 TMP SENSOR ERR
27	No.43 DET1 FIRE OFF
28	No.53 DET1 CURRENT ERR
29	No.44 DET2 FIRE OFF
30	No.54 DET2 CURRENT ERR
31	No.45 DET1 CAL ERR
32	No.49 DET1 ROM ERR
33	No.51 DET1 RAM ERR
34	No.55 DET1 ICL7109 ERR
35	No.57 DET1 NO RESPONSE
36	No.59 DET1 ERR
37	No.63 DET1 BUFF ERR
38	No.46 DET2 CAL ERR
39	No.50 DET2 ROM ERR
40	No.52 DET2 RAM ERR
41	N.56 DET2 ICL7109 ERR
42	No.58 DET2 NO RESPONSE
43	No.60 DET2 ERR
44	No.64 DET2 BUFF ERR
45	No.47 AIR SW1 ERR
46	No.48 AIR SW2 ERR

Also a level 1 alarm(Name: POF) is output when GC1000 MarkII is powered down. Because GCCU MarkII recognizes that GC1000 MarkII has no power if it does not get any data from GC1000 MarkII within 1 min, so this alarm occurs when the communication is cut due to wiring problem. Note that no alarm is output when the contact is used as NC.

(b) System alarm (Level 2)

The following GC1000 MarkII alarms are output as Level 2 alarm from GCCU MarkII.

No.	Alarm No. and Name in GC1000 MarkII
1	No.151 INNER TMP VAR ERR
2	No.152 OUTER TMP VAR ERR
3	No.153 LSV1 TMP VAR ERR
4	No.154 LSV2 TMP VAR ERR
5	No.155 FID1 TMP VAR ERR
6	No.156 FID2 TMP VAR ERR
7	No.157 FPD TMP VAR ERR
8	No.158 OVERRIDE
9	No.171 COM INIT ERR
10	No.172 AO INIT ERR
11	No.173 AI INIT ERR
12	No.180, 275 C-OVER
13	No.181, 276 C-REPT
14	User set alarm (External contact input)

(c) Component alarm

The concentration alarm which is set in GC1000 MarkII as concentration alarm is output as "Component alarm" from GCCU MarkII.

No.	Alarm No. and Name in GC1000 MarkII
1	User set alarm (concentration)

• **Analog Output Code Table for Supervisory Computer**

(1) **Analog Serial Output**

(a) **Component identification: 5 bits**

Component No.	Pin symbol				
	12 (MSB)	11	10	8	7 (LSB)
1	0	0	0	0	1
2	0	0	0	1	0
3	0	0	0	1	1
4	0	0	1	0	0
5	0	0	1	0	1
6	0	0	1	1	0
7	0	0	1	1	1
8	0	1	0	0	0
9	0	1	0	0	1
10	0	1	0	1	0
11	0	1	0	1	1
12	0	1	1	0	0
13	0	1	1	0	1
14	0	1	1	1	0
15	0	1	1	1	1
16	1	0	0	0	0
17	1	0	0	0	1
18	1	0	0	1	0
19	1	0	0	1	1
20	1	0	1	0	0
21	1	0	1	0	1
22	1	0	1	1	0
23	1	0	1	1	1
24	1	1	0	0	0

(b) **Stream identification: 5 bits**

Stream No.	Pin symbol				
	6 (MSB)	5	4	3	2 (LSB)
1	0	0	0	0	1
2	0	0	0	1	0
3	0	0	0	1	1
4	0	0	1	0	0
5	0	0	1	0	1
6	0	0	1	1	0
7	0	0	1	1	1
8	0	1	0	0	0
9	0	1	0	0	1
10	0	1	0	1	0
11	0	1	0	1	1
12	0	1	1	0	0
13	0	1	1	0	1
14	0	1	1	1	0
15	0	1	1	1	1
16	1	0	0	0	0
17	1	0	0	0	1
18	1	0	0	1	0
19	1	0	0	1	1
20	1	0	1	0	0
21	1	0	1	0	1
22	1	0	1	1	0
23	1	0	1	1	1
24	1	1	0	0	0

(c) Range identification: 5 bits

Component No.	Pin symbol				
	17 (MSB)	16	15	14	13 (LSB)
1	0	0	0	0	1
2	0	0	0	1	0
3	0	0	0	1	1
4	0	0	1	0	0
5	0	0	1	0	1
6	0	0	1	1	0
7	0	0	1	1	1
8	0	1	0	0	0
9	0	1	0	0	1
10	0	1	0	1	0
11	0	1	0	1	1
12	0	1	1	0	0
13	0	1	1	0	1
14	0	1	1	1	0
15	0	1	1	1	1
16	1	0	0	0	0
17	1	0	0	0	1
18	1	0	0	1	0
19	1	0	0	1	1
20	1	0	1	0	0
21	1	0	1	0	1
22	1	0	1	1	0
23	1	0	1	1	1
24	1	1	0	0	0

(2) Analog Hold Output
Stream identification: 5 bits

Stream No.	Pin symbol				
	15 (MSB)	14	13	12	11 (LSB)
1	0	0	0	0	1
2	0	0	0	1	0
3	0	0	0	1	1
4	0	0	1	0	0
5	0	0	1	0	1
6	0	0	1	1	0
7	0	0	1	1	1
8	0	1	0	0	0
9	0	1	0	0	1
10	0	1	0	1	0
11	0	1	0	1	1
12	0	1	1	0	0
13	0	1	1	0	1
14	0	1	1	1	0
15	0	1	1	1	1
16	1	0	0	0	0
17	1	0	0	0	1
18	1	0	0	1	0
19	1	0	0	1	1
20	1	0	1	0	0
21	1	0	1	0	1
22	1	0	1	1	0
23	1	0	1	1	1
24	1	1	0	0	0

• **Digital I/O Code Table for Supervisory Computer**

(1) **Digital Output**

(a) **Control byte**

Data byte identification code: 2 bits

	Pin symbol	
	31 (MSB)	30 (LSB)
Component identification + Stream identification	0	0
Data lower byte	0	1
Range signal + Data upper byte	1	0

(b) **Data byte**

Data output

	Upper 4 bits				Lower 8 bits								
	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	
100 %	1	0	0	0	0	0	0	0	0	0	0	0	0
0 %	0	0	0	0	0	0	0	0	0	0	0	0	0

(c) **Component identification: 4 bits**

Component No.	Pin symbol			
	4 (MSB)	3	2	1 (LSB)
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1
10	1	0	1	0
11	1	0	1	1
12	1	1	0	0
13	1	1	0	1
14	1	1	1	0
15	1	1	1	1

(d) **Stream identification: 4 bits**

Stream No.	Pin symbol			
	8 (MSB)	7	6	5 (LSB)
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1
10	1	0	1	0
11	1	0	1	1
12	1	1	0	0
13	1	1	0	1
14	1	1	1	0
15	1	1	1	1

(e) **Range identification: 4 bits**

Range No.	Pin symbol			
	13 (MSB)	12	11	10 (LSB)
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1
10	1	0	1	0
11	1	0	1	1
12	1	1	0	0
13	1	1	0	1
14	1	1	1	0
15	1	1	1	1

(2) Digital Input

(a) Stream No. code: 4 bits

Stream No.	Pin symbol			
	8 (MSB)	7	6	5 (LSB)
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1
10	1	0	1	0
11	1	0	1	1
12	1	1	0	0
13	1	1	0	1
14	1	1	1	0
15	1	1	1	1

(b) Component No. code: 4 bits

Component No.	Pin symbol			
	13 (MSB)	12	11	10 (LSB)
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1
10	1	0	1	0
11	1	0	1	1
12	1	1	0	0
13	1	1	0	1
14	1	1	1	0
15	1	1	1	1

(c) Range No. code: 4 bits

(specified component list No. code)

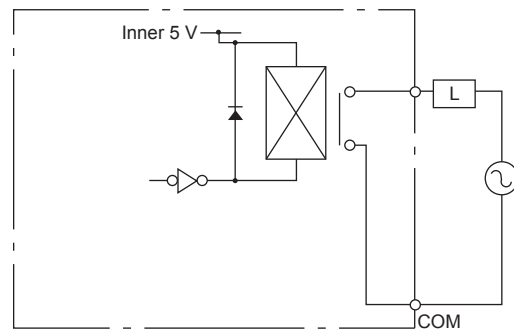
Range signal No.	Pin symbol			
	4 (MSB)	3	2	1 (LSB)
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1
10	1	0	1	0
11	1	0	1	1
12	1	1	0	0
13	1	1	0	1
14	1	1	1	0
15	1	1	1	1

Note: 1: Short, 0: Open

● **I/O Circuit**

(1) Contact Output Circuit

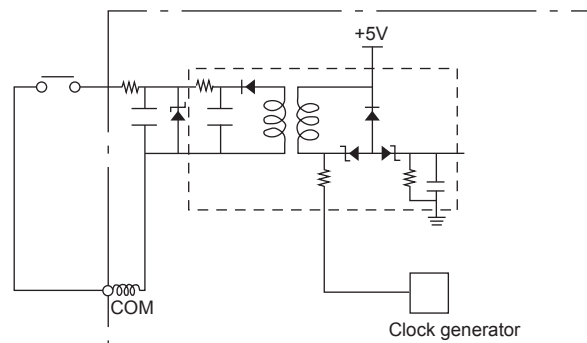
Alarm, Analog serial, Analog hold, Digital, Computer ON/OFF



Rated load Voltage, current: 24 V DC, 0.1 A

(2) Contact Input Circuit

Digital input



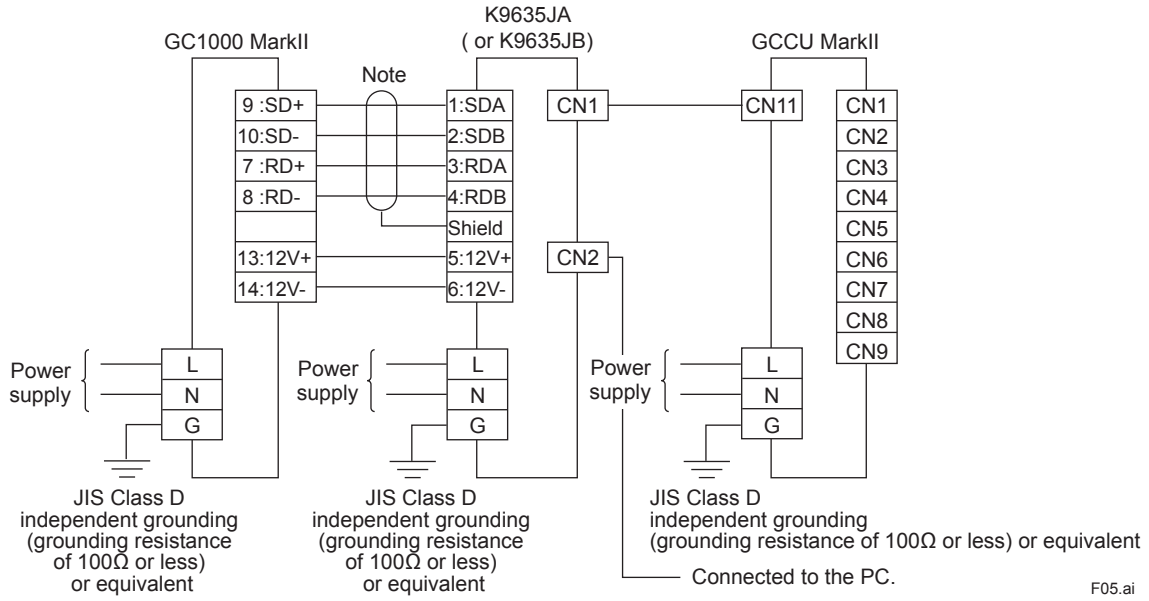
Contact input: OFF signal 100 kΩ or higher
 ON signal 200 Ω or lower
 Contact Ratings: 5 V DC, 20 mA or higher
 No-voltage contact

■ Model and Suffix Codes

Model	Suffix code	Option code	Description
GCCU	.....	.....	Gas Chromatograph Computing Unit
Installation	-P	.....	Panel installation
Trend output *	0 1 2 3 4 5 6 A B C D E F	..... ..... ..... ..... ..... ..... ..... ..... ..... ..... ..... ..... .....	None 1 to 4 outputs (4 to 20 mA DC) 5 to 8 outputs (4 to 20 mA DC) 9 to 12 outputs (4 to 20 mA DC) 13 to 16 outputs (4 to 20 mA DC) 17 to 20 outputs (4 to 20 mA DC) 21 to 24 outputs (4 to 20 mA DC) 1 to 4 outputs (1 to 5 V DC) 5 to 8 outputs (1 to 5 V DC) 9 to 12 outputs (1 to 5 V DC) 13 to 16 outputs (1 to 5 V DC) 17 to 20 outputs (1 to 5 V DC) 21 to 24 outputs (1 to 5 V DC)
Analog hold output *	0 1 2 3 4 5 6 A B C D E F	..... ..... ..... ..... ..... ..... ..... ..... ..... ..... ..... ..... .....	None 1 to 4 outputs (4 to 20 mA DC) 5 to 8 outputs (4 to 20 mA DC) 9 to 12 outputs (4 to 20 mA DC) 13 to 16 outputs (4 to 20 mA DC) 17 to 20 outputs (4 to 20 mA DC) 21 to 24 outputs (4 to 20 mA DC) 1 to 4 outputs (1 to 5 V DC) 5 to 8 outputs (1 to 5 V DC) 9 to 12 outputs (1 to 5 V DC) 13 to 16 outputs (1 to 5 V DC) 17 to 20 outputs (1 to 5 V DC) 21 to 24 outputs (1 to 5 V DC)
Analog serial output *	0 1 A	..... ..... .....	None Provided (4 to 20 mA DC) Provided (1 to 5 V DC)
Communication output	0	.....	None
Digital output *	0 1 2	..... ..... .....	Alarm only Contact input answerback and analysis completion signal Bit parallel output
Digital input	0 1 2	..... ..... .....	None Provided (External contact) Provided (Internal SW)
Power supply	-N -2	..... .....	100 to 120 V AC 200 to 240 V AC
Language and attached software	N P E F	..... ..... ..... .....	Japanese language, attached software not provided Japanese language, attached software provided English language, attached software not provided English language, attached software provided
Option		/MCMP	For 2--streams and 150-components

*: If "1 to 6" or "A to F" is selected for trend output, "0" is selected for analog hold output.
 If "1 to 6" or "A to F" is selected for analog hold output, "0" is selected for trend output.
 If "1" or "A" is selected for analog serial output, "0" or "1" is selected for digital output.
 If "2" is selected for digital output, "0" is selected for analog serial output.

■ Pin Connections

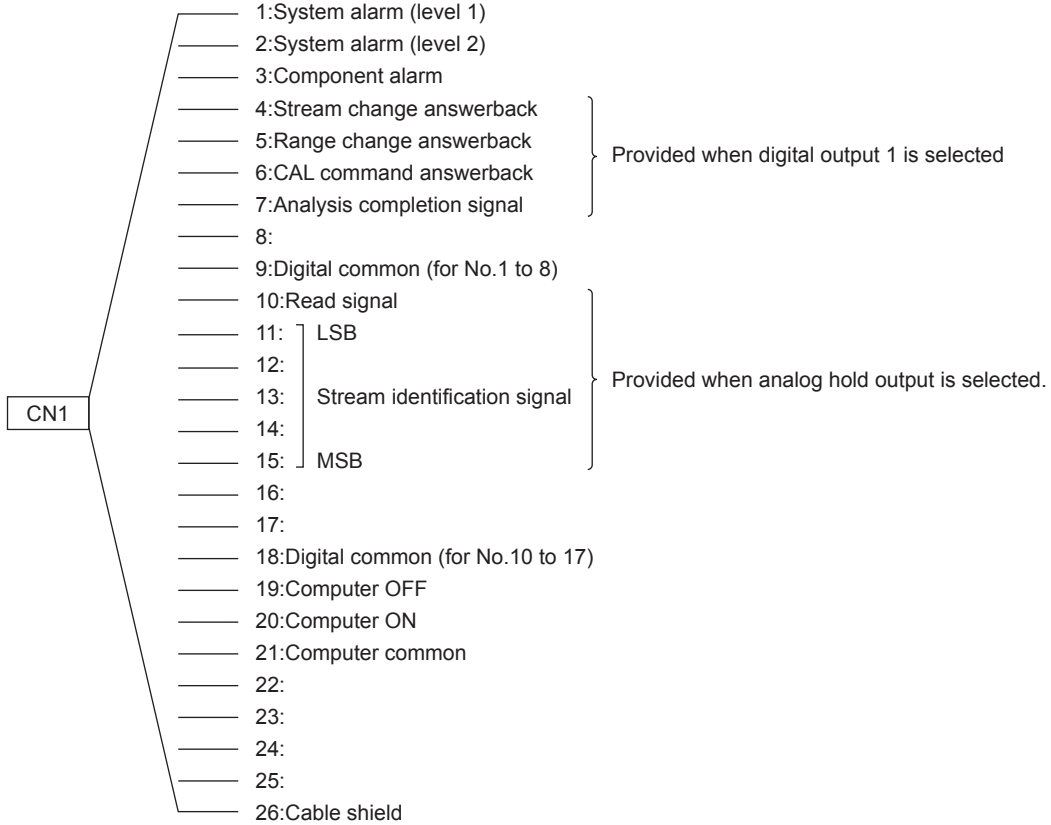


CN1 to CN3 are D-sub 25-pin female connectors and CN4 to CN11 are D-sub 9-pin male connectors. Dedicated cables are attached for CN1 to CN9 and CN11. Dedicated cables for CN1 to CN9 are connected by using the crimped terminal for M4. The dedicated cable for CN11 is a D-sub 9-pin cross cable. The crimped terminal for M4 are used for the wiring of the power supply.

The connections of CN1 to CN11 pins are shown below.

Note: The shield is used for SD in case of 2 core shield cable. 6 core shield cable also can be used.

● CN1

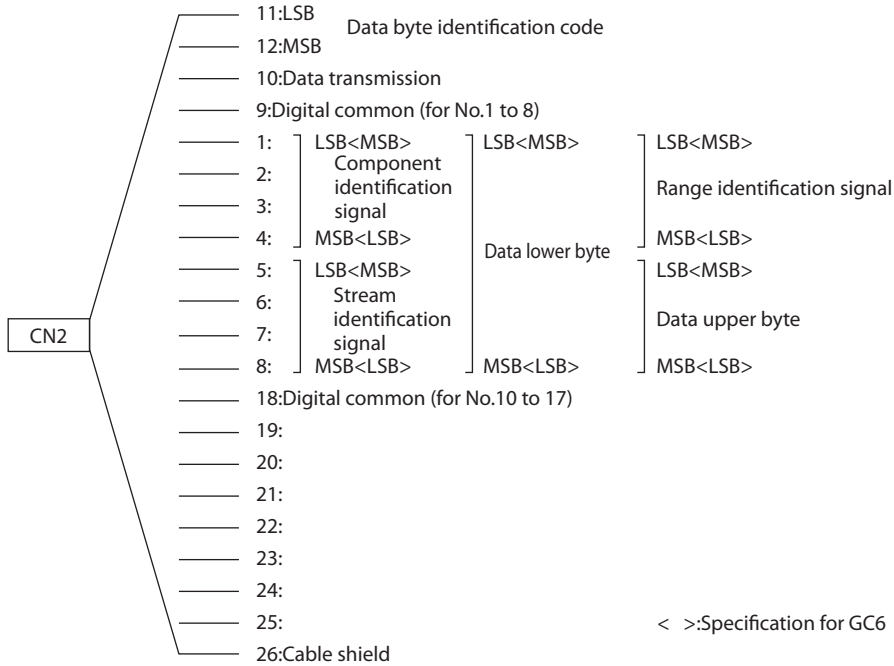


• **CN2**

There are two types of connections depending on the specifications:

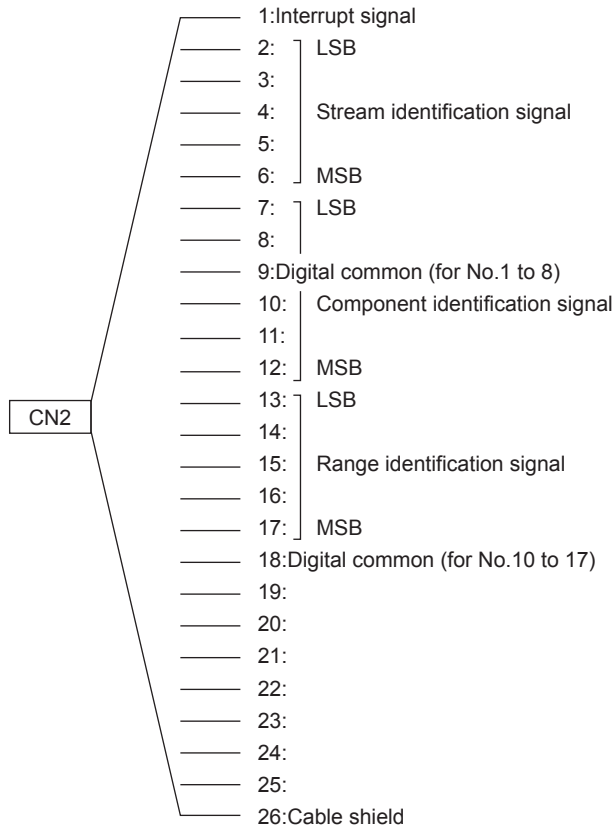
(1) Pattern 1

Provided when digital output 2 is selected.



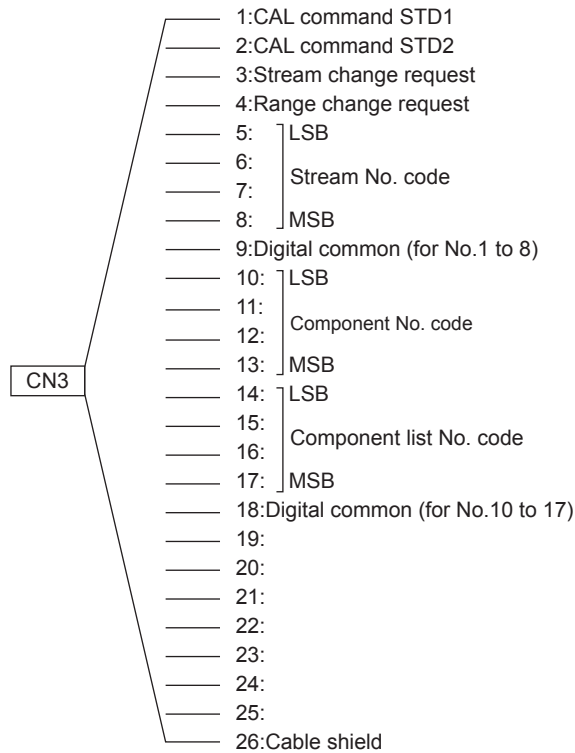
(2) Pattern 2

Provided when analog serial output is selected.



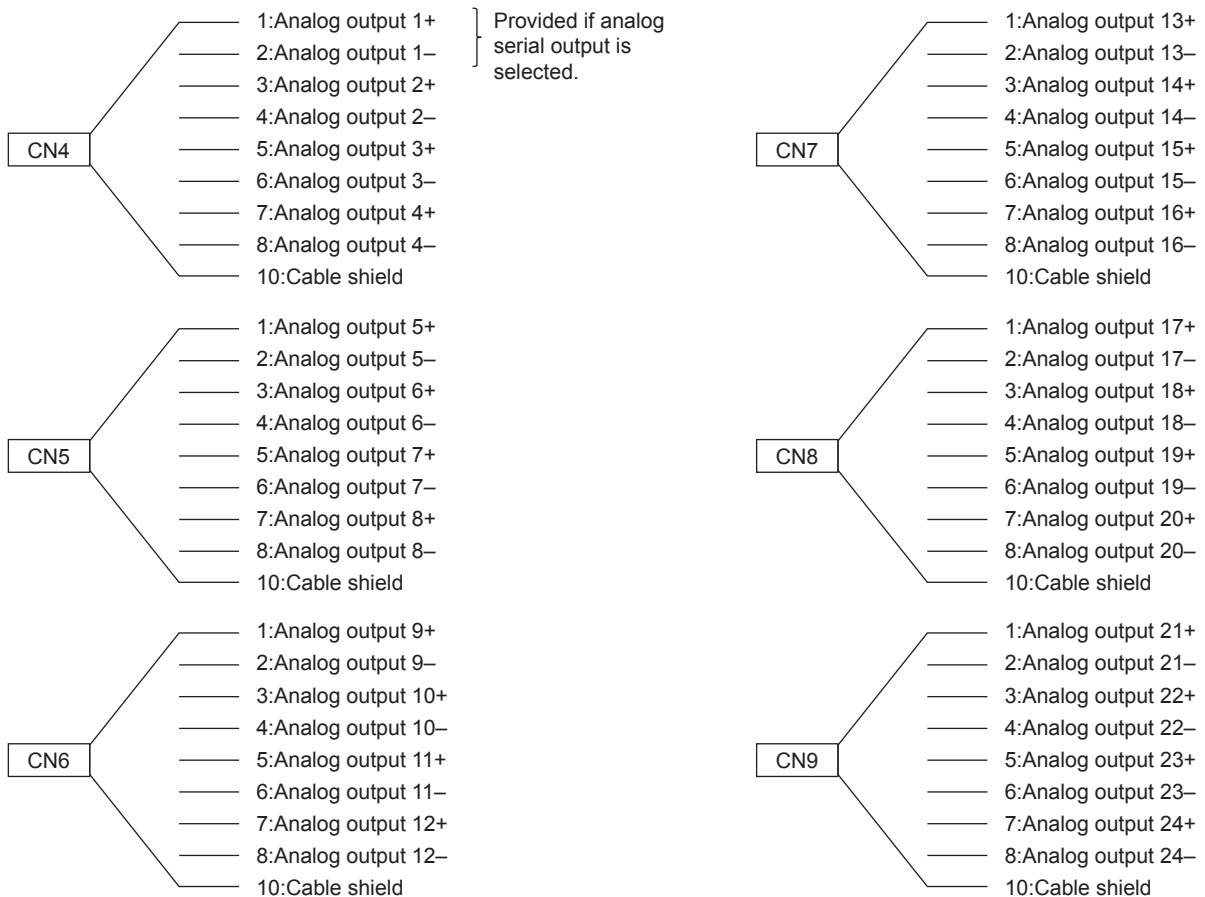
● **CN3**

Provided when digital input is selected.



● **CN4 to CN9**

Provided when analog hold output, analog serial output, or trend output is selected. CN4 to CN9 are provided depending on the number of outputs.



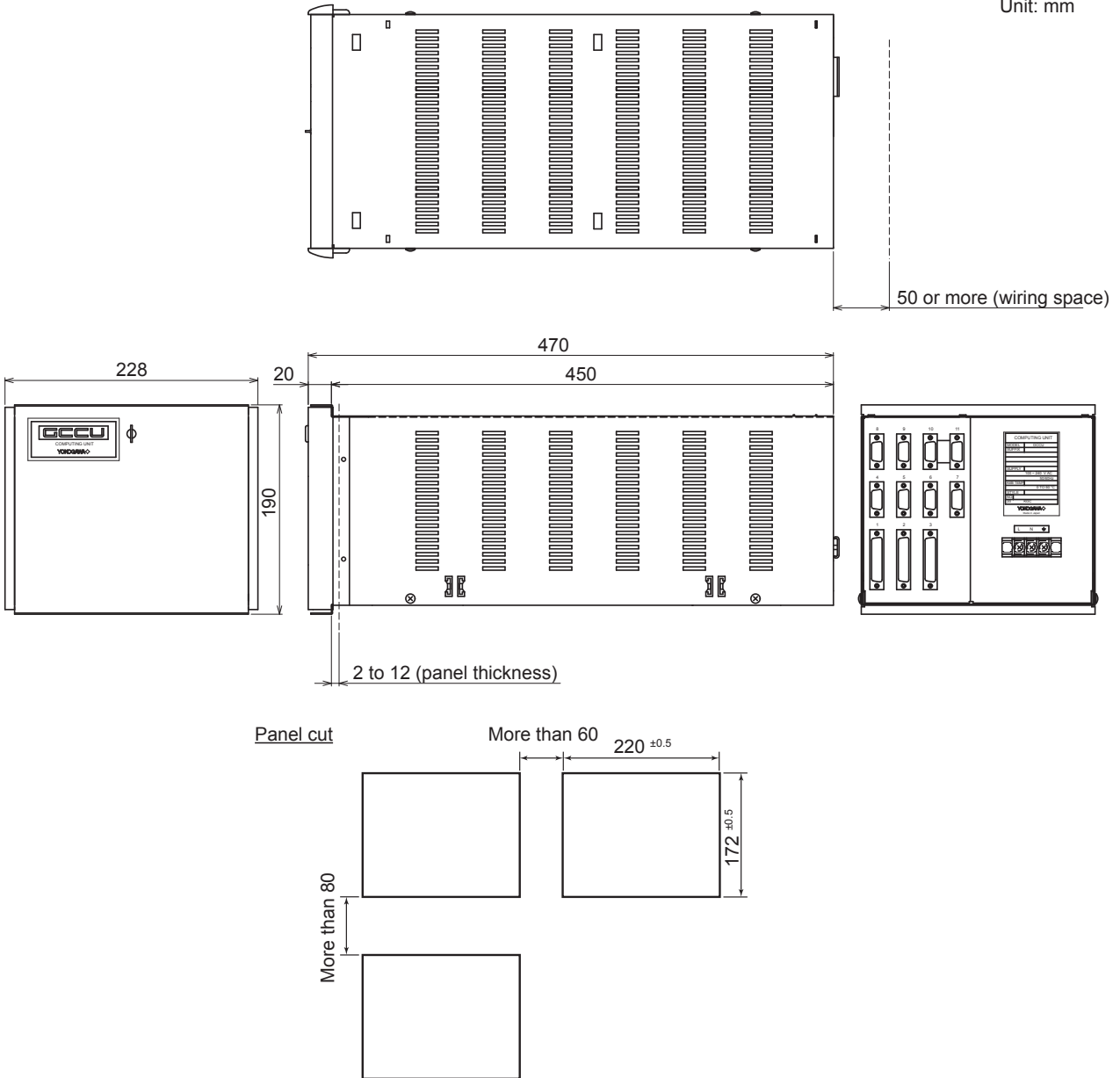
● CN11

Connect to CN1 on the communication converter (K9635JA or K9635JB).

■ External Dimensions

(1) GCCU MarkII

Unit: mm



(2) Communication Converter (K9635JA/K9635JB)

Unit: mm

