Technical Information

TI 11B05B02-01E

GCAS Analyzer Server Installation Manual

Contents

TI 11B05B02-01E

2nd Edition Dec. 2006(YK)

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Notice

● Regarding This Manual

1. This Manual should be passed on to the end user.
2. Read this manual carefully and fully understand how to operate this product before you start operation.
3. Yokogawa makes no warranty of any kind with regard to this material, but not limited to, implied warranties of merchantability for particular purpose.
4. All rights reserved. No part of this manual may be reproduced in any form without Yokogawa's written permission.
5. The contents of this manual are subject to change without prior notice.

● Regarding Protection, Safety, and Prohibition Against Unauthorized Modification.

1. For the protection and safe use of the product and the system controlled by it, be sure to follow the instructions on safety described in this manual when handling the product. In addition, if you handle the product in contradiction to these instructions, our company does not guarantee safety.
2. The following safety symbol marks are used on the product concerned or in this Manual :

A **WARNING** sign denotes a hazard. It calls attention to procedure, practice,condition or the like, which, if not correctly performed or adhered to, could result in injury or death of personnel.

A **CAUTION** sign denotes a hazard. It calls attention to a procedure, practice, condition or the like, which, if not correctly performed or adhered to, could result in damage to or destruction of part or all of the product.

IMPORTANT:

Indicates that operating the hardware or software in this manner may damage it or lead to system failure.

NOTE:

Draws attention to information essential for understanding the operation and features.

TIP:

Gives information that complements the present topic.

See Also:

Gives the reference locations for further information on the topic.

Protective ground terminal:

In order to provide protection against electrical shock in case of a fault. This symbol indicates that the terminal must be connected to ground prior to operation of equipment.

Function ground terminal:

In order to provide protection against noise.
This symbol indicates that the terminal must be connected to ground prior to operation of equipment.

Alternating current

Indicates the power switch state “**ON**”.

Indicate the power switch state “**OFF**”.

3. If protection / safety circuits are to be used for the product or the system controlled by it, they should be installed outside of the product.
4. When you replace parts or consumables of the product, use those specified by our company.
5. Do not modify the product.

● Exemption from Responsibility

1. Yokogawa Electric Corporation does not make any warranties regarding the product except those mentioned in the WARRANTY that is provided separately.
2. Yokogawa Electric Corporation assumes no liability to any party for any loss or damage, direct or indirect, caused by the use or any unpredictable defect of the product.

Introduction

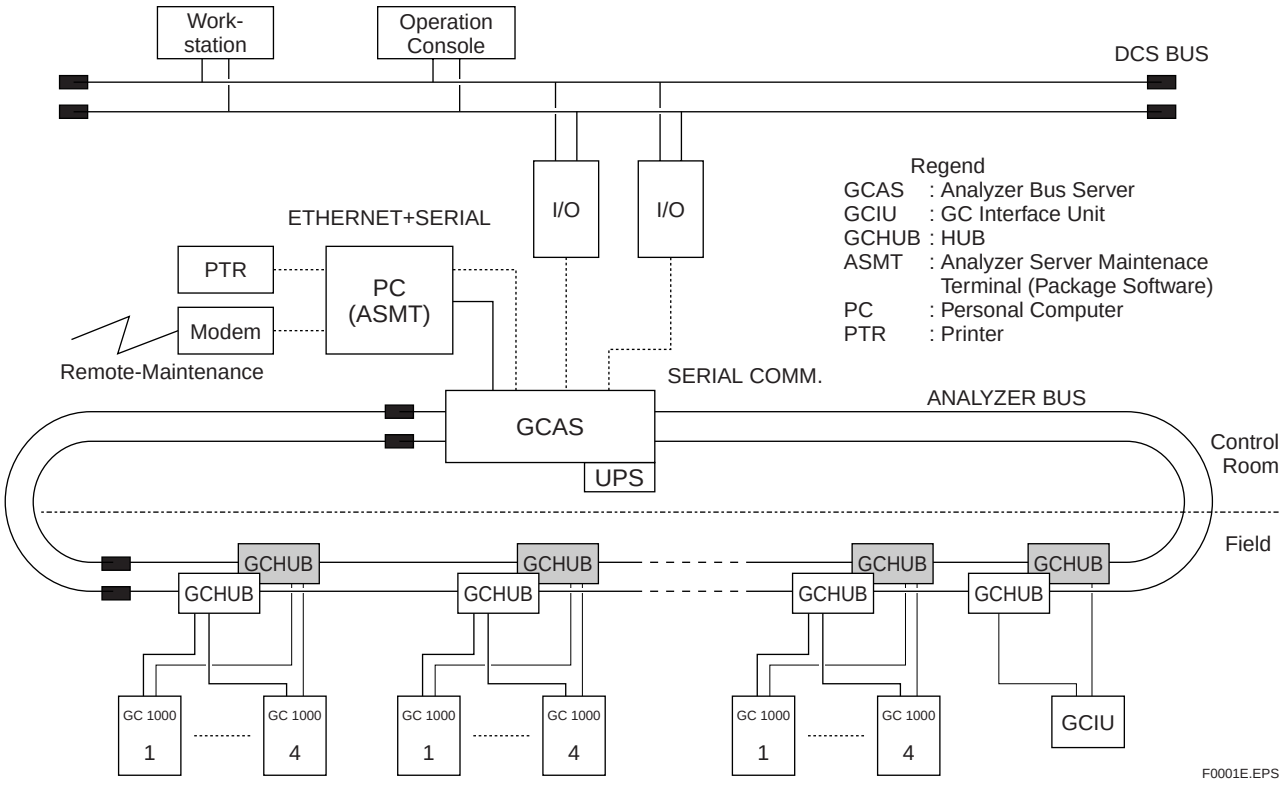
Thank you for purchasing the GCAS Analyzer Server.

This manual describes the technical information to install the GCAS.

Please read the respective cautions before installing the GCAS.

> **⚠ WARNING**
>
> This instrument must be installed by expert engineer or skilled personnel.The procedures described this manual are not permitted for operators.

● System Configuration



Analyzer bus system: Used to connect analyzers based on gas chromatograph in the field to a network. The system has a total redundant configuration for safety.

GCAS (Analyzer Server): The monitor/control center for the entire network. It also saves necessary data automatically. Moreover it joints with DCS for serial communication and digital output, etc.

ASMT (Analyzer Server Maintenance Terminal): When this package software is installed on an ordinary personal computer, the computer acts as a human interface dedicated to this system.
The operator can thus operate gas chromatograph in the field from the computer via GCAS.

GCIU (Interface Unit): The information of the field sensor except GC is input as the analog data and can be monitor on ASMT and DCS by the analyzer bus.

GCHUB: The device which diverge the network is called HUB. One HUB can connect four gas chromatographs or GCIU. HUB also can be used for the divergence the line.

UPS (Uninterruptible Power Supply unit):
This is the unit to protect the harddisk drive in GCAS from the accidental power down.

● Documents Related to the Analyzer Bus System

■ Operation Data

Operationg equipment is supplied with the operation manuals in the delivered package and contain the following.

- Instrument specifications
- General connection diagram

■ Related products

(1) GCIU Interface Unit Installation Manual (TI 11B05B02-02E)

(2) GCIU GC Interface Unit (IM 11B5B2-01E)

(3) Analyzer Bus System (GS 11B5A1-01E)

(4) GC1000 Analyzer Bus System (TI 11B5A1-03E)

(5) ASMT Analyzer Server Maintenance Terminal Operation Guide (IM 11B5A1-01E)

(6) Analyzer Server User's Manual (IM 11B5B1-01E)

(7) Hub GCHUB Installation Manual (TI 11B5C1-01E)

(8) GCMT Gas Chromatograph Maintenance Terminal Software Package Operation Guide (IM 11B3G1-02E)

(9) Capture It! Manual (IM 11B3G1-02E)

(10) GCRB Relay Box Installation Manual (TI 11B05B02-03E)

● Is the System Ready?

Before reading this manual, the following preparations must have been completed.

- The system must be unpacked and installed in the correct place.
- The piping for the purging air must be completed.
- The wiring for the power supply and others must be completed.

Please read the following General Precautions, before installing and using the GCIU.

● General Precautions

⚠ **CAUTION:**

(1) **Take great care when carrying and installing the GCAS. The GCAS must be carried and installed very carefully (including wiring) by more than one person (at least two people are recommended).**

(2) **Use the GCAS within the range of your purchase specifications.**
Yokogawa assumes no responsibility for problems resulting from use by the customer outside the purchase specifications.

(3) **Since the GCAS is precision instrument, take care when handling not to jolt of knock them.**

(4) If the GCAS needs to be modified or repaired, please contact your nearest Yokogawa representative. Yokogawa assumes no responsibility for results where the customer or any third party has attempted to modify or repair these products.

IMPORTANT

(1) Read the attached instruction manual before operating the GCAS

(2) The instruments must be installed and operated according to the instruction manual, approved drawings, and operation data.

(3) **Do not hesitate to ask Yokogawa to modify or repair the instrument. Yokogawa assumes no responsibility for defects resulting from modification or repair by the customer or unauthorized manufactures.**

(4) **Maintenance and Repair**
The instrument modification or parts replacement by other than authorized representative of Yokogawa Electric Corporation is prohibited.

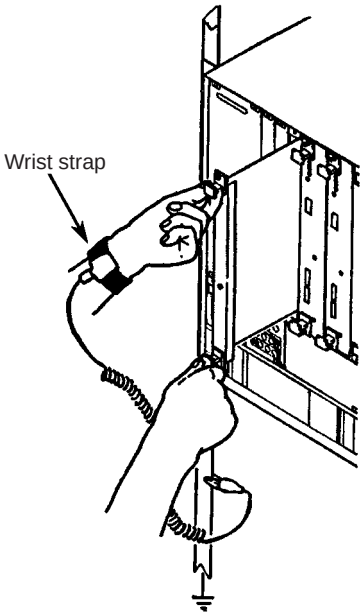
● Precautions Against Electrostatic Problems

The GCAS uses numerous IC components. When handling cards with IC components mounted on them for maintenance or setting changes, take full precautions against electrostatic problems.

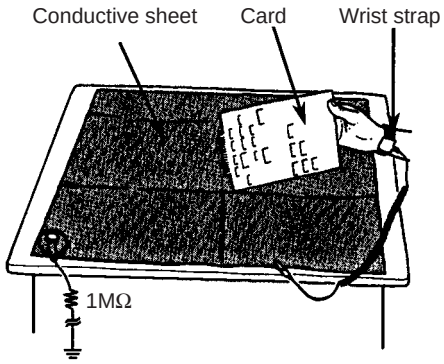
These precautions are summarized below.

(a) When storing or carrying cards, enclose them in a conductive bag or antistatic bag. (Cards as shipped by Yokogawa are enclosed in a conductive bag or antistatic bag labeled with cautions against electrostatic problems.)

(b) Whenever mounting or demounting cards into or from a product, wear a wrist strap grounded via a 1 MΩ resistance. Connect the wrist strap to any ground terminal near the ground wire or to any unpainted part of the grounded frame.



Using a wrist strap and conductive sheet



Using a conductive Sheet

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(c) When servicing cards on the bench, place them on a conductive sheet grounded via a 1 MΩ resistance, wearing a wrist strap as in (2) above. Keep easily-chargeable plastic materials away from the bench.

(d) Never touch components mounted on the cards, the pattern side, connectors, pin components, etc. with bare hands, unless using a wrist strap and a conductive sheet.

(e) Wrist straps and conductive sheets are available from Yokogawa Engineering Service (YSV).

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1. OVERVIEW

The GCAS analyzer server is a computer system that is connected to an analyzer bus. The server has a host system gateway function, data saving function for GC1000 maintenance, and communication function for the ASMT maintenance terminal. Usually, this server is installed in a room such as a central measuring instrument room.

1.1 Description and Ratings

Power supply:	100 to 240 VAC +/-10%, 50/60Hz +/-5%
Power consumption:	Max. 70 W
Operating ambient conditions:	0 to 40°C 80%R.H. or less
Storage conditions:	-40 to 85°C, No moisture condensation
Weight:	Approximately 20 kg
Installation location:	Well-ventilated place indoors, free of vibration

1.2 MS Code

Table 1.1

Type	Basic Specification Code	Option Code	Specification
GCAS	----------	----------	Analyzer server
1. Function	-1	----------	GCAS type
2. Supply voltage	M	----------	100 to 240 VAC
3. Channel	S	----------	Single channel
	D	----------	Dual channel
4. DCS communication	N	----------	None
	2	----------	2 channels
	4	----------	4 channels (max.)
5. Always -NN	-NN	----------	Always -NN
6. Installation method	1	----------	19-inch rack
	2	----------	Desktop
7. Expanded Memory	N	----------	None
	1	----------	DRAM 4M *1
8.Analyzer bus connection	-N	----------	Coaxial *2
	-1	----------	Twisted pair
9. Always N	-N	----------	Always N
10. Option code		/CE	CE marking

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*1: Must be selected when the total number of connected analyzers is 17 or more.
*2: This cannot be specified when “10. Option code” specified “CE marking”.

<Selection example>
GCAS-1MD4-NN11-1N/CE

1.3 Connecting Examples

Loop Network Example (for repeater connection type HUB used)

If HUb"Ⓔ" is something wrong, there is no effect for the communication between other HUB and GCAS.

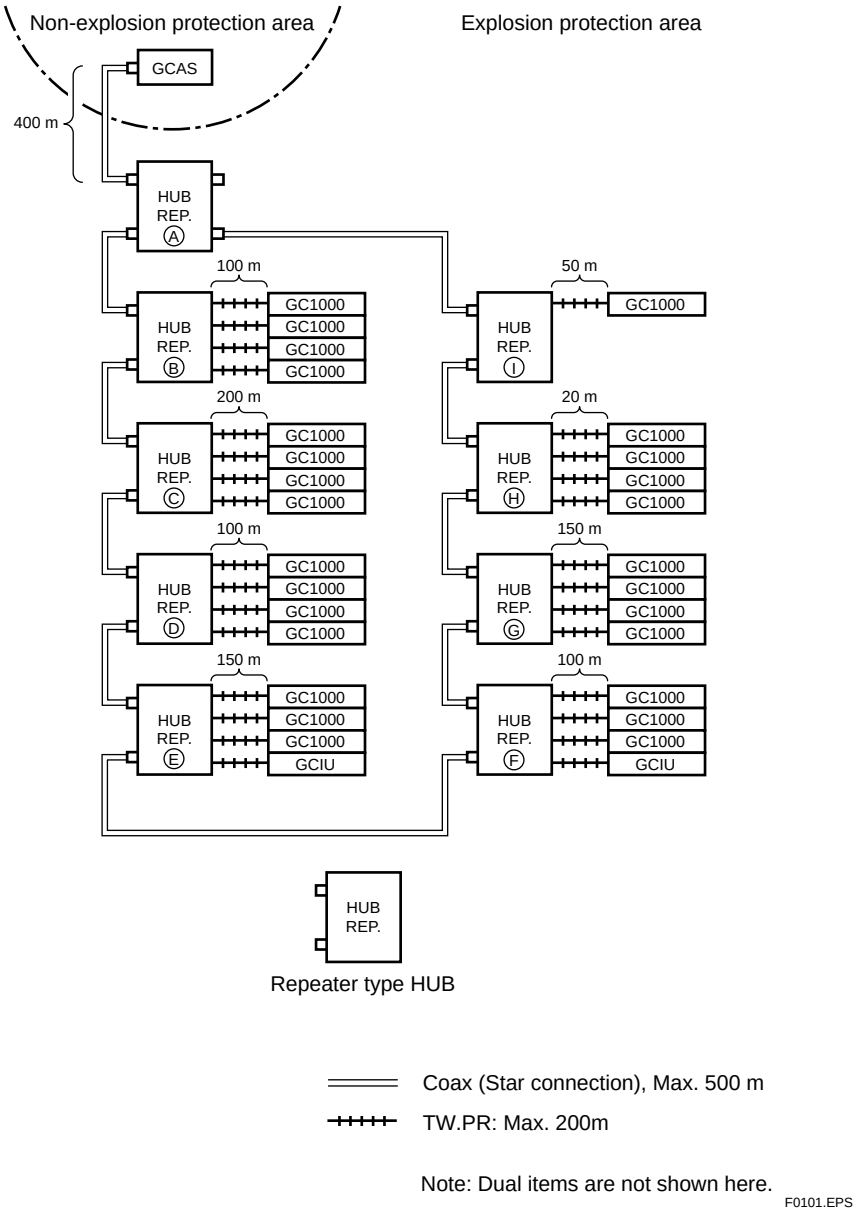

Figure 1.1

Condition of the connection

Total network length <6,000 (m)

Length (m) = Main loop + (Max. length of Branch network connected to loop) + (2nd Max. length of Branch network connected to loop) + (Number of Repeater HUB)x 60

- Total loop length: 3,000 m
  (HUBⒶ to HUBⒾ)
- Total length (m) = 3,000 + 400 + 200 + 9 x 60
  = 4,140 < 6,000

1.4 External Dimensions

Unit: mm

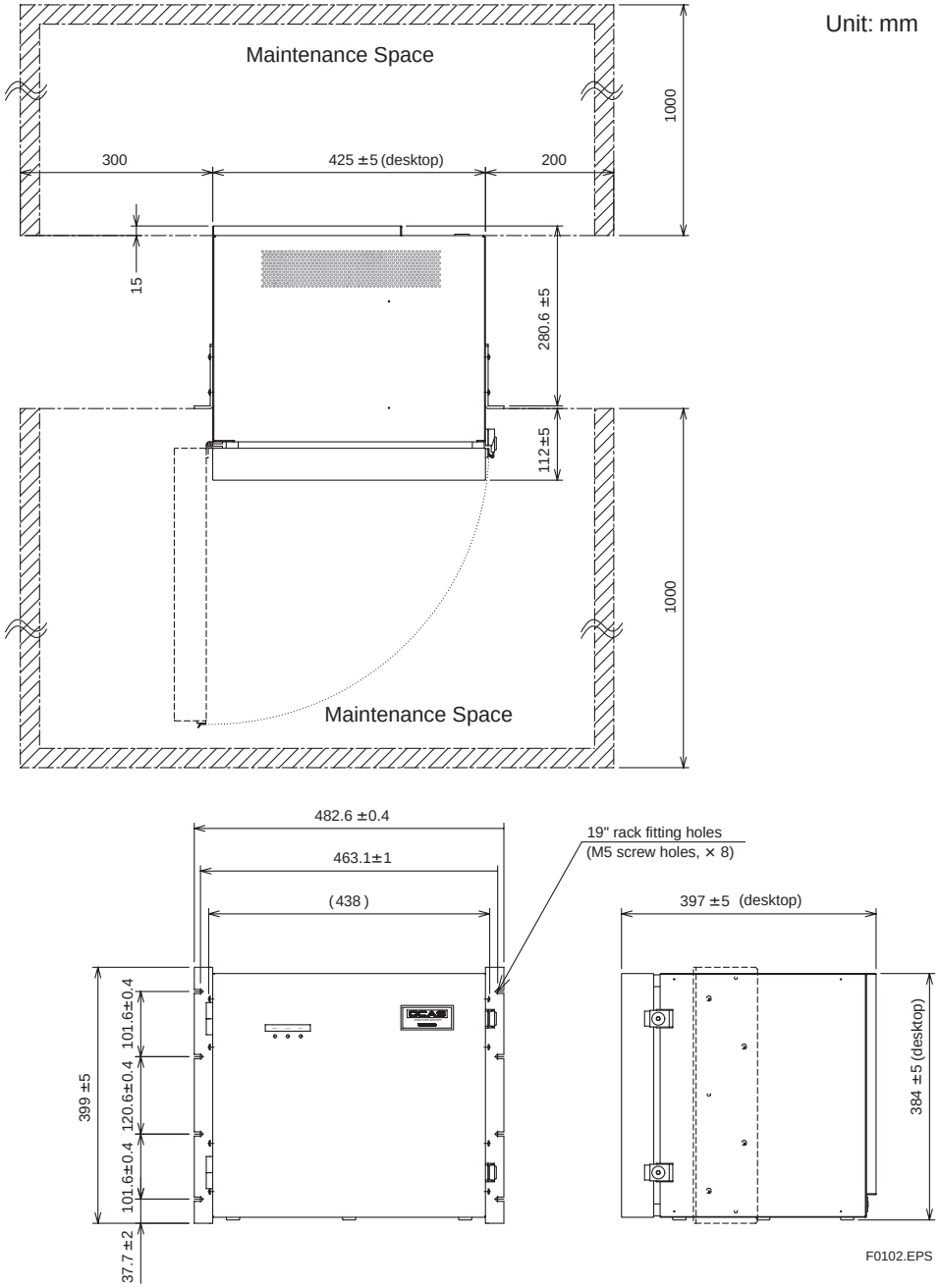

Figure 1.2

1.5 Standard Performance

(1) Safety Standard

Complying Standard : EN61010-1

AItitude at installation side : Max.2000m above sea level

- Installation category based on IEC61010 : II (See Note)
- Pollution level based on IEC61010 : 2 (See Note)

Note :

- The "Installation category" implies the reguration for impulse withstand voltage. It is also called the "Overvoltage category". "II" applies to electrical equipment.
- "Pollution level" describes the degree to which a solid, liquid or gas which deteriorates dielectric strengh is adhering. "2" applies to a normal indoor atmosphere.

(2) EMC standard

Emission

Complying Standard : EN55011 Group 1 Class A
EN61326 Class A
C-tick

No.	Test Item	Frequency Range	Basic Standard
1	Electromagnetic radiation disturbance	30MHz - 1GHz	Class A CISPR16-1 and CISPR16-2
2	Main terminal disturbance voltage	0.15MHz - 30MHz	

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Signal Cable requirement: Use shielded cable.

Harmonics Current Emission

Complying Standard : EN61326 Class A

No.	Harmonics	Harmonic Order n	Maximum Permissible Harmonic Current A	Basic Standard
1	Odd Harmonics	3 5 7 9 11 13 15<=n<=39	2.30 1.14 0.77 0.40 0.33 0.21 0.15 x 15/n	IEC 61000-3-2 Class A
2	Even Harmonics	2 4 6 8<=n<=40	1.08 0.43 0.30 0.23 x 8/n	

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Voltage fluctuations and flicker

Complying Standard : EN61326 Class A

Test Item		Limits	Basic Standard
Voltage change characteristic	Dc	3%	IEC 61000-3-3
Maximum voltage charge	Dmax	4%	
Steady-state voltage charge	D(t)	3% for more than 200ms	
Short-term flicker	Pst	1.0	
Long-term flicker	Plt	0.65	

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Immunity

Complying Standard : EN61326 Class A

No.	Test Item	Test specification	Basic Standard	Preformance Criteria*
1	Electrostatic discharge	4kV(contact) 8kV(air)	IEC 61000-4-2	A
2	Ratio-frequency electromagnetic field Amplitude modulated	80 to 1000MHz 1.4 to 2GHz 10V/m (unmodulated) 80% AM (1kHz)	IEC 61000-4-3	A
3	Fast transients common mode	2kV 5/50 Tr/Th ns 5kHz REP.	IEC 61000-4-4	A
4	Surge	Input power supply and power supply network 1kV (Line to Line) 2kV (Line to Ground) I/O signal/control 1kV (Line to Ground)	IEC 61000-4-5	A
5	Radio-frequency common mode Amplitude modulated	0.15 to 80MHz 3V (unmodulated) 80% AM (1kHz) Source impedance 150Ω	IEC 61000-4-6	A
6	Voltage dips / Short interruption	0.5 cycle, each polarity / 100%	IEC 61000-4-11	A

* See Note

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Note: Definition of performance criteria

Performance criterion A: During testing, normal performance within the specification limits.

Performance criterion B: During testing, temporary degradation, or loss of function or performance which is self-recovering

Performance criterion C: During testing, temporary degradation, or loss of function or performance which requires operator intervention or system reset occurs.

Signal Cable requirement: Use shielded cable

2. INSTALLATION AND WIRING

2.1 Installation

(1) Installation Site

Install the GCAS where the following conditions are met :

Well-ventilated place indoors, free of vibration.

(2) Unpacking

The model GCAS weights about 20kg. Unpacking it near the instlallation site.

Handle it carefully so that it does not fall.

(3) Installation

To securely install the GCAS

2.2 Wiring

2.2.1 General Cautions on Wiring

CAUTION

- Lay the signal wiring and electrical wiring inseparate conduit pipes or duct, respectively.
- Make independent grounding having a grounding resistance of 100 Ω or less.

NOTE

The door is locked by special tool. In the case of opening the door, please use the attached tool.
Before performing wiring, remove the nuts of cable outlets at the back side of GCAS, and install the grommets which are included in the accessory kit.

2.2.2 Kinds of Wiring

The following kinds of wiring are required for GCAS.

The wiring required varies with the specification.

(A) Electrical wiring for power circuit

(B) Gounding circuit

(C) Analyzer Bus (Twisted Pair cable)

Analyzer Bus (Coaxial cable)

(D) Contact input/output

(E) DCS communication

(F) Ethernet

(G) PC communication

CAUTION

This product complies with CE marking.
Where a performance suit for CE marking is necessary, the following wiring procedure is necessary.

1. Install an external switch or circuit breaker to the power supply of the equipment.
2. Use an external switch or circuit breaker rated 5A and conforms to IEC 947-1 or IEC 947-3.
3. It is recommended that the external switch or circuit breaker be mounted in the same room as the equipment.
4. The external switch or circuit breaker should be installed within the reach of the operator, and marked as the power supply switch of this equipment.

2.2.3 Recommended Cables

(A) Electrical wiring for power circuit: 1.25mm^2 to 2.0mm^2

(B) Gounding circuit: 2.0mm^2

(C) Analyzer Bus (Twisted Pair cable): 0.2mm^2 to 1.25mm^2 , 200m (650ft.) or less

Cable shield is required

Resistance (DC): 28.6-ohm / 300m (1000ft.) max.

Characteristic impedance: 105-ohm at 1MHz

Reduction: 16.0dB / 300m (1000ft.) max. at 5MHz

Analyzer Bus (Coaxial cable): RG-62A/U 500m (1650ft.) or less

This cannot be specified in the case of CE marking.

(D) Contact input/output: 0.75mm^2 to 1.5mm^2 , 1000m or less

Cable shield is required

(E) DCS communication: 0.75mm^2 to 1.5mm^2 , 10m or less

Cable shield is required

(F) Ethernet: In the case of CE marking, this cable is attached.

In the case of General purpose, 10 BASET cable.

(G) Serial communication: RS232C straight cable, 10m or less

D-sub 25-pin male – D-sub 9-pin fermale

Note 1: Use “MKKDSN” Series terminals (manufactured by Phoenix Contact K. K.) for the contact input/output (D), DCS communication (E).
For these wiring connections, use AI series crimp-on terminals also manufactured by the company. Four types of crimp-on terminals are used to meet wire diameters (see the table below).
Please peel off the cover of wire by 5mm if you do not use the terminal and contact with the terminal. 5mm is the manufacturer’s recommendation values.

Table 2.1

Wire Diameter	Outside Diameter	Terminal Type
0.75mm^2	Less than 2.8mm^2	AI 0.75-6GY
1.0mm^2	Less than 3.0mm^2	AI 1-6RD
1.5mm^2	Less than 3.4mm^2	AI 1.5-6BK

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2.2.4 Power Cable Termination and Grounding Wire

⚠ CAUTION

- Wire the power supply cable keeping the distance of 1 cm or more from other signal wires.
- Power supply cable must conform to UL or CSA.
- Do wiring after you do protective grounding securely.

(1) Cable termination

Use solderless lugs for all power cables (See Figure 2.1).

(2) Solderless (crimp-on) lug specifications

The solderless lug to use must have the dimensions given in Table 2.2 according to the nominal cross sectional area of the power cable for which the lug is to be used.

Table 2.2 Solderless Lug Dimensions

Nominal cross sectional area	Screw used (mm)	Hole diameter (mm)	Lug outside diameter (mm)	Lug length (mm)	Insulation covering inside diameter (mm)	Remarks (Note) (Example of applicable solderless lug)
1.25mm^2	4	4.3 or more	8.7 or less	About 21	5.8 or less	AMP 170781-1 JST V1.25-4
2.0mm^2	4	4.3 or more	8.7 or less	About 21	5.8 or less	AMP 170782-1 JST V2-4

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*1: Solderless lugs vary in outside diameter depending on teh type of teh equipment for which the power cable is used.

Note :

AMP: Japan AMP Co., Ltd.

JST: JST Co., Ltd. (Insulators 0.8 mm^2 or more in size are optionally available.)

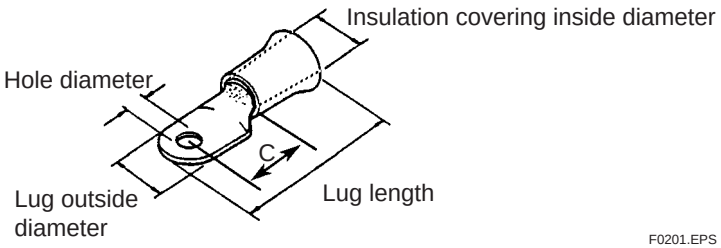

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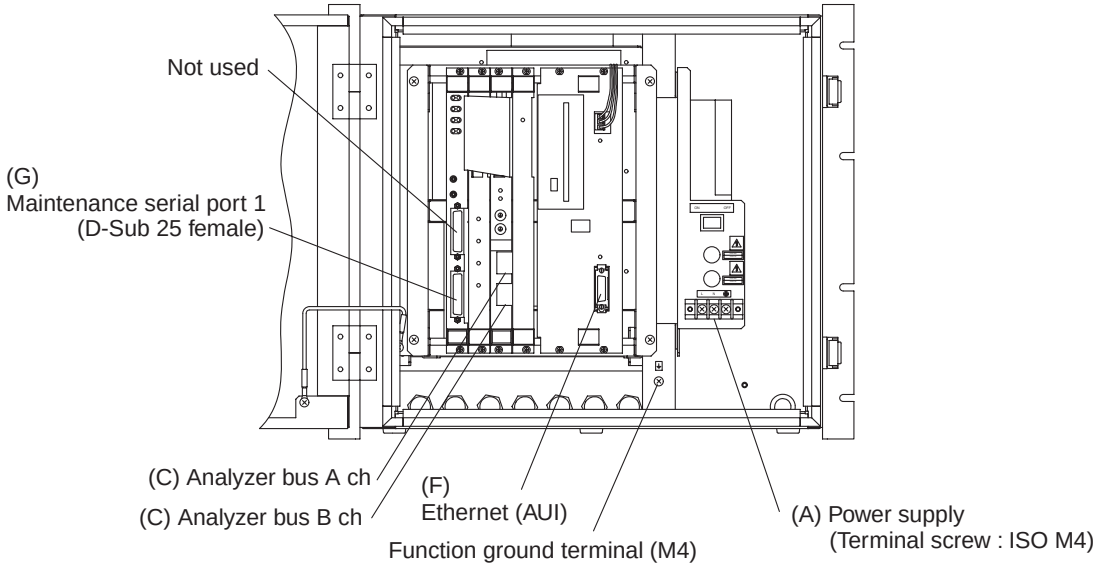
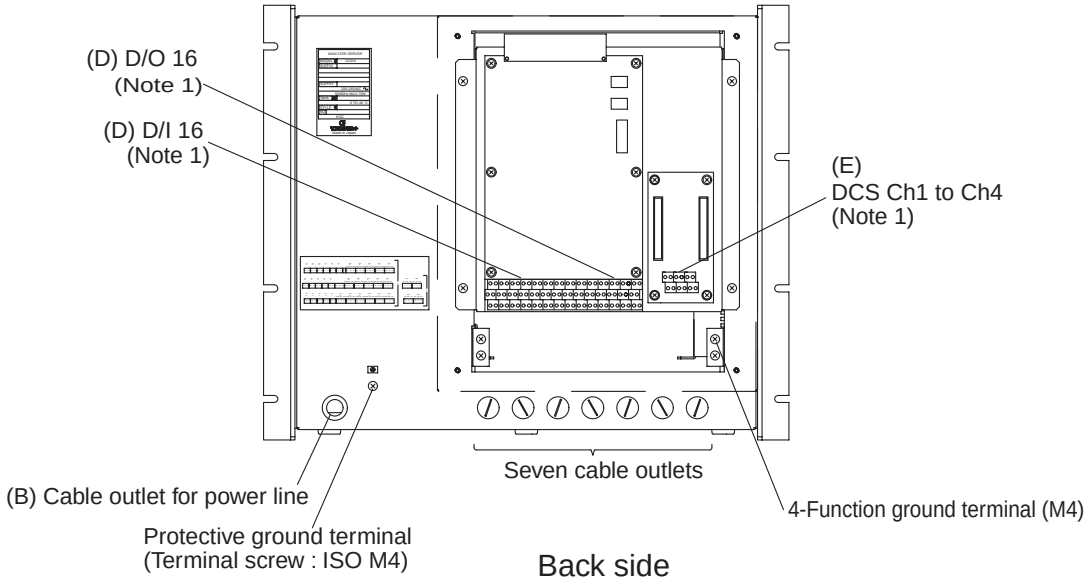
Figure 2.1 Solderless Lug



Front side



Back side

Note 1 : PHOENIX CONTACT
MK3DSN 1.5/2-5.08 Max 1.25mm^2

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CAUTION

- For protective grounding of terminal connector-type devices, connect to the ⏚ terminal.
- For grounding of devices with function grounding terminals, connect to the ⏚ terminal.

2.2.5 Analyzer Bus

Refer to Figure 2.4.

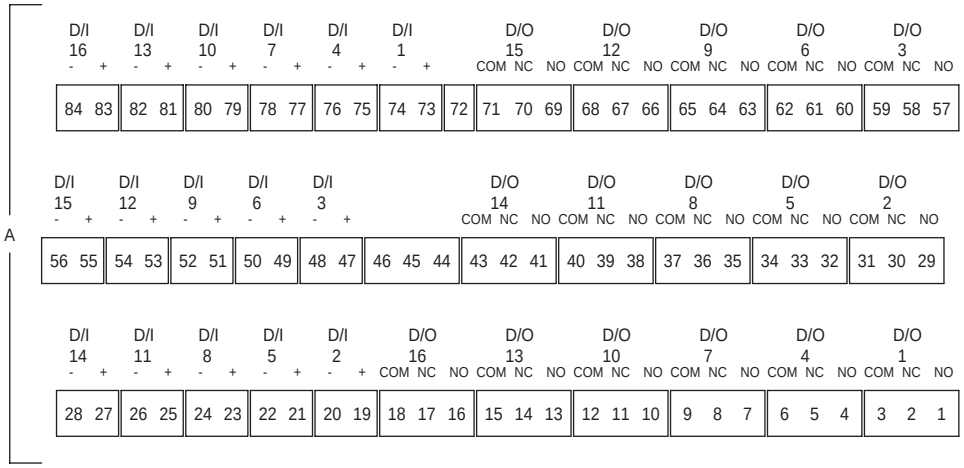
⚠ CAUTION

- Do wiring after you do protective grounding securely.

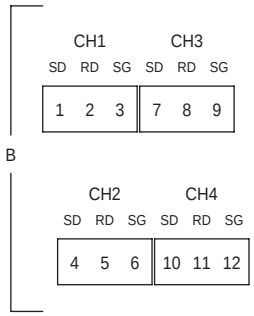
2.2.6 Signal Lines

Refer to Figure 2.4.

Contact input/output



DCS communication



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2.2.7 Terminal connection of shielded signal cables for CE marking

The shield of a signal line (shielded cable) to be connected to the GCAS should be connected to the grounding terminal inside the GCAS.

The signal lines listed below should be mounted with ferrite cores. In mounting, the signal line should be turned the specified number of turns at the joint with the ferrite core.

Cable Name	Ferrite Core Part Number	Number of Turns
Analyzer Bus	K9635MB	2
Ethernet	K9635MB	1
DCS	K9635MB	2
D/O	A1179MN	1
D/I	A1179MN	1

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The ferrite core should be mounted close to the cable inlet.

Take the shortest route for connecting the shield to the grounding terminal.

2.2.8 Turning On the Power

Turn on the power after checking that the wiring is secured.

◆ Revision Record

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Section 1.5: Safety regulation is updated accordingly.

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