

GAT10-CC RS-485/CC-Link Converter Instruction Manual Basic Part

Thank you for purchasing our product. Please check that the delivered product is the item exactly as ordered by you. Please read this manual thoroughly to understand the contents before you start operating the product.

GAT10-CCT-1BE
May, 2016

This is the "Basic" Part of the instruction manual. Please also read the "Design" Part, which you can download from our website. (URL <http://www.shimaden.co.jp>)

Please ensure that this instruction manual is given to the end user. For details of the operation and parameters of Shimaden instruments to be connected to the GAT10-CC, please refer to the instruction manual and interface instruction manual of the instrument.

This instruction manual is meant for persons involved in wiring, installation, operation and routine maintenance for the GAT10-CC. It describes matters to be attended to in handling it, how to install it, wiring for it, its functions and operating procedure. It is requested that for ready reference, this manual is kept at the work site where the GAT10-CC is used. In operating it, please follow the instructions contained herein.

1. Safety Rules

This instruction manual describes matters to be attended to concerning safety, potential damage to equipment and/or facilities, additional explanations and notes under the following headings:

- "△ Warning" ○ This heading indicates that failure to follow instructions could cause injury or even death.
- "△ Caution" ○ This heading indicates that failure to follow instructions could cause damage to equipment and/or facilities.
- "Note" ○ This heading indicates additional explanations or notes.

The safety rules apply only to this product. For those as a PLC system, please refer to the User's Manual of Mitsubishi Electric Corporation's CPU Unit.

△ Warning

The GAT10-CC is control instruments designed for industrial use to control temperature, humidity and other physical values. Therefore, it should not be used in any way that might result in injury or fatality, or must be used only after adequate safety measures are taken. No responsibility will be taken for any accident resulting from the usage of this product without appropriate safety measures being in place.

△ Warning

- The GAT10-CC must be housed in a control box or the like to prevent the terminal board from coming into accidental physical contact with personnel.
- The GAT10-CC should not be taken out of the case. If your hand or an electric conductor is put inside it, an electric shock may result in serious injury or even death.
- Make sure that the protective conductor terminal is grounded.

△ Caution

If there is any possibility of doing harm or damage to peripheral devices, equipment or products you must take appropriate safety measures such as installing the proper fuse or an overheating prevention device before you start using the GAT10-CC. No responsibility will be taken for any accident resulting from the usage of this product without appropriate safety measures being in place.

△ Caution

- As means to turn the power off, a switch or a breaker should be installed in the external power circuit to be connected to the power supply terminal of the GAT10-CC. The switch or the breaker should be installed adjacently to the GAT10-CC and in a position which allows it to be operated easily, with an indication that it is a means of disconnecting the GAT10-CC from its power source. The switch or the breaker should meet the requirements of IEC60947.
- Fuse: The instrument has no built-in fuse. Ensure to install a fuse in the power circuit to be connected to the power supply terminal. The fuse should be placed between the apparatus and the switch or the breaker.
Fuse Rating/Characteristic: 250VAC 0.5A/ Medium time-lagged or time-lagged type.
- Make sure that a draft hole should not be blocked and that it should be protected from dust and dirt. Failure to do so might cause fire or faulty operation.
- Do not repeat endurance tests for voltage, noise, surging and the like. Doing so might cause fire or faulty operation.
- Do not attempt to disassemble, repair, or modify the GAT10-CC. Doing so might cause fire or faulty operation.

[Notes on Matters concerning Design]

△ Warning

- If the data link goes out of communication on the CC-Link, data of the master unit is retained. In a ladder program, an interlocking circuit should be formed by the use of communication status data so that the system works on the safe side.

△ Caution

- Control lines and communication cables should not be bundled with the main power circuit or the power line, or installed adjacently. They should be spaced apart by more than 100 mm as a guideline. Failure to do so might cause faulty operation.

2. Preliminary Steps

■ Confirmation of Specification Codes

Please confirm that the delivered product is exactly as you specified by comparing the model codes pasted on the case of the GAT10-CC with the following codes.

Example of model code: GAT10-CC-90-0

| ① ② | Item | Code and Description | |
|-----|--------------|----------------------|---------------|
| ① | Power supply | 90: 100-240V AC | 08: 24V AC/DC |
| ② | Special note | 0: Without | 9: With |

■ Checking Attached Items

This instruction manual: 1
Mounting base: 1
Terminating resistor 110 Ω: 1
(Color codes: Brown, brown, black, black. Brown for CC-Link)

Note: If you find a problem with the product or some of the attached items missing, please contact our sales agent.

■ Installation Site

△ Caution

Avoid installing the GAT10-CC in the following locations. Failure to do so might cause fire or faulty operation.

- Where flaming gas, corrosive gas, soot, or particles that can deteriorate electrical insulation is generated or is abundant.
- Where ambient temperature lowers below -10°C or exceeds 50°C.
- Where relative humidity exceeds 90%RH or falls below dew point.
- Where highly intense vibration or impact is generated.
- Near high voltage power lines or where inductive interference can affect the operation of the product.
- Where the product is exposed to direct sunlight, wind or rain.
- Where the elevation exceeds 2,000 m.
- Where the product is exposed to the flow of emitted air.

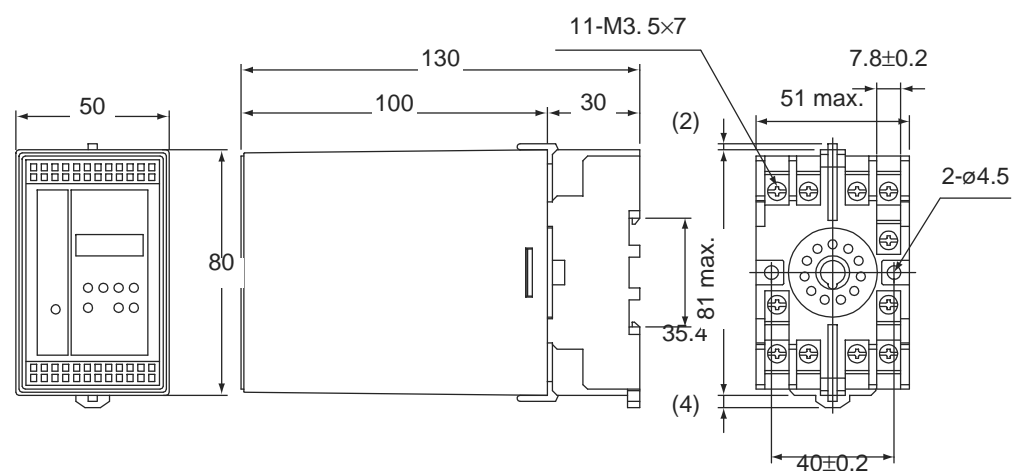
■ Wiring

△ Caution

In wiring, close attention should be paid to the following.

- Always disconnect the GAT10-CC from any power source during wiring operation to prevent an electric shock.
- Make sure that the protective conductor terminal ⊕ is grounded properly. Failure to do so might cause electric shock.
- Don't touch the wired terminals and charged devices while the GAT10-CC is energized. Doing so might cause electric shock.

■ External Dimensions



3. Specifications

- The GAT10-CC enables writing and reading, from the CC-Link, of Measured values, Target set values and parameters for up to 8 Shimaden instruments with RS-485 communication.
- The GAT10-CC is connectable to the following Shimaden products:
Digital controllers: SR80 series, SR90 series, SR253 and FP93
Digital indicator : SD16
Servo controller : EM70
- CC-Link is an abbreviation for "Control and Communication Link."
The CC-Link is a system to connect an input/output unit, an intelligent function unit, a special unit and the like, which are installed dispersedly and allows them to be controlled from a Master PLC.
- When various units of a system are installed in a dispersed configuration, wiring for entire system can be accomplished economically.
- ON/OFF information of input/output units and numerical data can be received/transmitted easily and quickly.
- As it is possible to connect various devices produced by associated manufacturers, customers' systems can be extended or modified to meet a number of requirements.

Note: For details of the CC-link, please refer to the Specifications of CC-Link published by the CC-Link Association.

■ General specifications

| Item | Specifications |
|----------------------------------|---|
| Ambient conditions for operation | Temperature -10~50°C |
| | Humidity 90%RH or less (no dew condensation) |
| | Altitude 2000m from the sea level or lower |
| Storage temperature | -20~65°C |
| Supply voltage | 100~240V AC±10% 50/60Hz 24V AC±10% 50/60Hz 24V DC±10% |
| Power consumption | 10VA (100~240V AC) 5VA (24V AC) 4W (24V DC) |
| Insulation resistance | Between input/output terminals and power terminal 500V DC 20 MΩ min. Between input/output terminals and protective conductor terminal 500V DC 20 MΩ min. |
| Dielectric strength | Between input/output terminals and power terminal 2300V AC 1 minute (induction current: 3mA) Between power terminal and protective conductor terminal 1500V AC 1 minute (induction current: 3mA) |
| Material of case | PPO resin molding |
| Color of case | Black |
| External dimensions | H80×W50×D130mm (including base) |
| Mounting | DIN rail or screw |
| Mass | Approx. 260g (including base) |

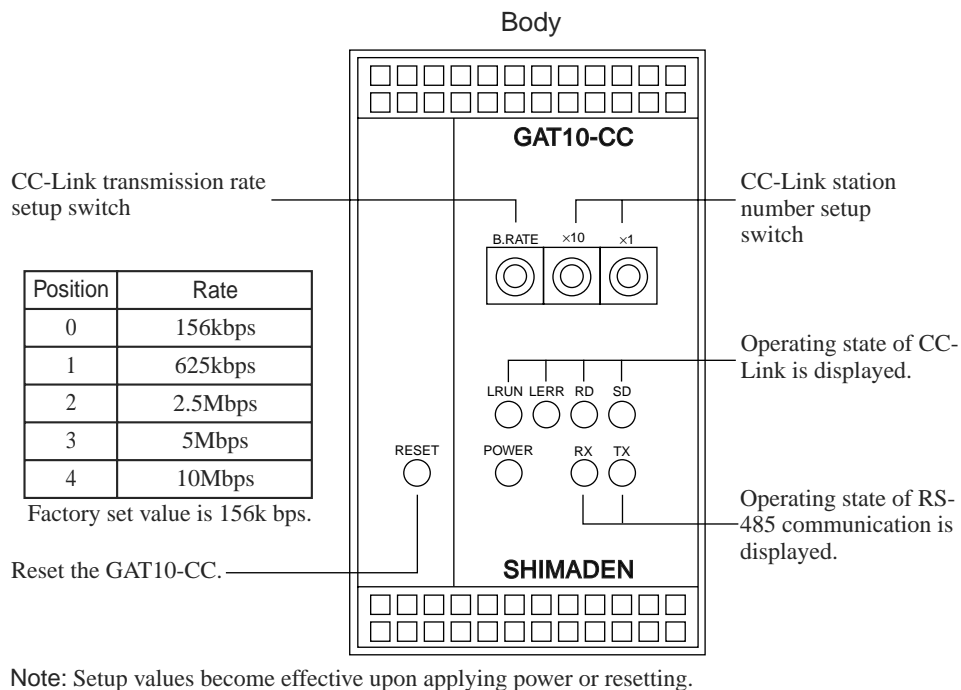
■ CC-Link Specifications

| Item | Specifications |
|-----------------------------|---------------------------------|
| Version | 1.10 |
| Communications method | Broadcast polling |
| Synchronization method | Frame synchronization |
| Transmission path format | Bus type (EIA RS-485 compliant) |
| Transmission rate | 156k/625k/2.5M/5M/10M bps |
| Station type | Remote device station |
| Number of occupied stations | 4 |
| Device type | Gateway |
| Station number | 1~61 |
| Connectable cable | CC-Link dedicated cable |
| Terminal resistor | 110Ω |

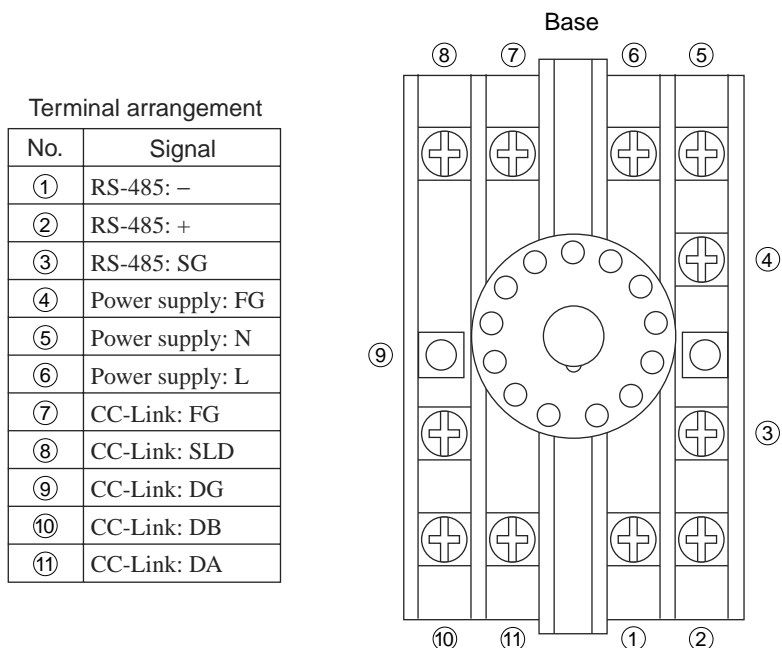
■ RS-485 (Shimaden standard protocol) Specifications

| Item | Specifications |
|---|--|
| Signal level | EIA RS-485 compliant |
| Communication method | 2-line half duplex multidrop |
| Synchronization method | Start-stop synchronization |
| Communication distance | Max. 500 m |
| Communication rate | 19200 bps |
| Data format | 7 bit/even parity/1 stop bit |
| Number of connectable Shimaden instrument | Max. 8 |
| Local address | 1 to 8 |
| Connectable products | SR80 series, SR90 series, SR253, SD16, EM70, FP93 |
| Scan time | Approx. 1.5 sec (when 8 Shimaden units are connected and without SV value updating or extended display/setting) |

■ Names & Functions of Parts



Note: Setup values become effective upon applying power or resetting.



4. Wiring

■ CC-Link dedicated cable

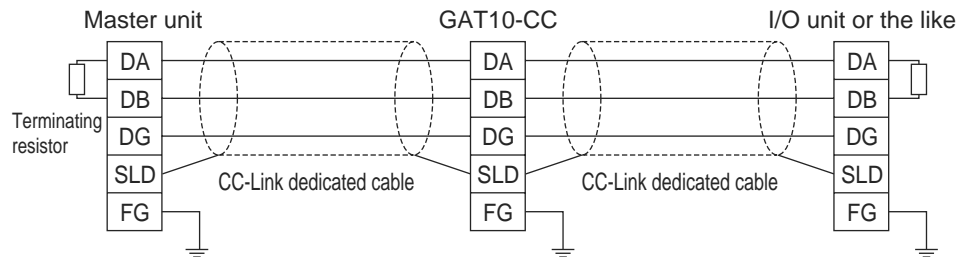
- Use the CC-Link dedicated cable for CC-Link connection.
- If any other cable than the CC-Link dedicated cable is used, the performance of the CC-Link system will not be guaranteed.

■ Total Length

| Transmission rate | Cable length between stations | Total Length |
|-------------------|-------------------------------|--------------|
| 156kbps | 20cm | 1200m |
| 625kbps | 20cm | 900m |
| 2.5Mbps | 20cm | 400m |
| 5Mbps | 20cm | 160m |
| 10Mbps | 20cm | 100m |

■ Connecting CC-Link communications

- The order of cable connection has nothing to do with the station numbers.
- For the units on both ends of the CC-Link, the "Terminating resistor" supplied as accessories to those units should be connected. Connect each terminating resistor across DA and DB.
- Terminating resistor to be connected in the CC-Link system should be 110Ω 1/2W.
- The master unit can be connected other than on both ends.
- Avoid star connection.
- How to connect the GAT10-CC to the master unit via CC-Link dedicated cable is illustrated below.



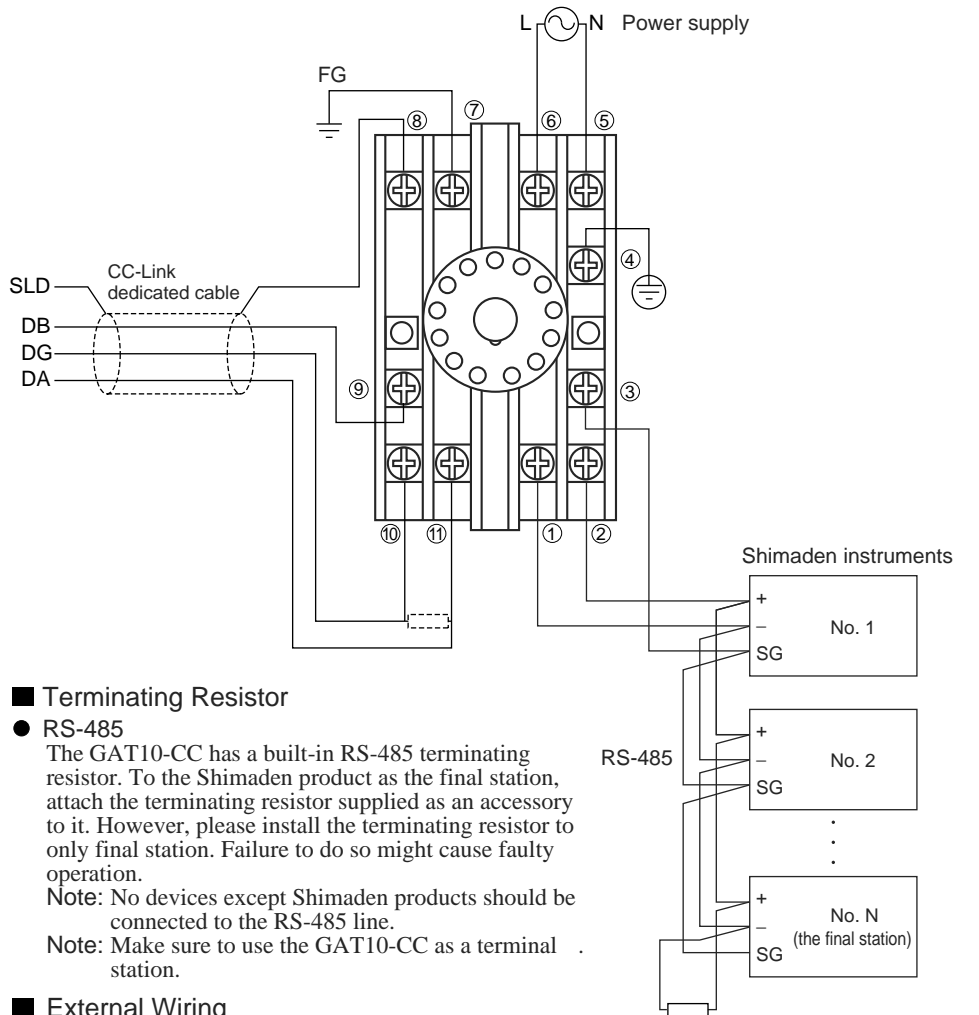
■ Notes on Wiring

The Version 1.10 of the CC-Link dedicated cable should not be used together with its 1.00 version. If Version 1.10 cable is mixed with a Version 1.00 cable, all cables are taken for Version 1.00 and normal data transmission cannot be guaranteed.

Connect the shielding wire of the cable to the "SLD" of each unit, pass it through "FG" and carry out the D type (the 3rd grade) or higher type grounding on both ends.

Ensure that the D type (3rd grade) or higher type grounding for each "FG" terminal is carried out. Failure to do so might cause faulty operation.

"SLD" and "FG" are connected inside the body of the GAT10-CC.



■ Terminating Resistor

- **RS-485**
The GAT10-CC has a built-in RS-485 terminating resistor. To the Shimaden product as the final station, attach the terminating resistor supplied as an accessory to it. However, please install the terminating resistor to only final station. Failure to do so might cause faulty operation.
Note: No devices except Shimaden products should be connected to the RS-485 line.
Note: Make sure to use the GAT10-CC as a terminal station.

■ External Wiring

As one of the requirements for enabling the GAT10-CC to function thoroughly and to establish a highly reliable system, external wiring that is not easily affected by noise is necessary. The following are matters to be attended to for external wiring.

- The external line should not be bundled with or installed adjacently to a load line except those from the main power circuit line, a high voltage line and the PLC.
- For a shielding wire or a shielded cable, one-point grounding on the PLC side is required. Depending on the condition of external noise, however, it may be better to ground on the external side.

■ Maintenance

No particular maintenance is required for the GAT10-CC. Check the inspection items listed in the master PLC's User's Manual so that your system can always be used in optimal conditions.

The contents of this manual are subject to change without notice.

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