

# GAT10-DN RS-485/DeviceNet 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-DNT-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-DN, please refer to the instruction manual and communication interface instruction manual of the instrument.

This instruction manual is meant for persons involved in wiring, installation, operation and routine maintenance for the GAT10-DN. 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-DN 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 PLC Unit.

### ⚠ Warning

The GAT10-DN is designed for general industrial use. 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-DN 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-DN 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-DN. 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-DN. The switch or the breaker should be installed adjacently to the GAT10-DN and in a position which allows it to be operated easily, with an indication that it is a means of disconnecting the GAT10-DN from its power source. The switch or the breaker should meet the GAT10-DN 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 GAT10-DN and the switch or the breaker.  
Fuse Rating/Characteristic: 250VAC 0.5A/ In the case of a medium time-lagged or time-lagged type switch, one which meets the requirements of IEC60127 should be used.

- 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 operations.

- 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-DN. Doing so might cause fire or faulty operation.

### ⚠ 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-DN with the following codes.

Example of model code: GAT10-DN-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 Connector : 1  
Mounting base : 1

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-DN in the following locations. Failure to do so might cause fire or faulty operations.

- 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 directly exposed to the flow of emitted air.

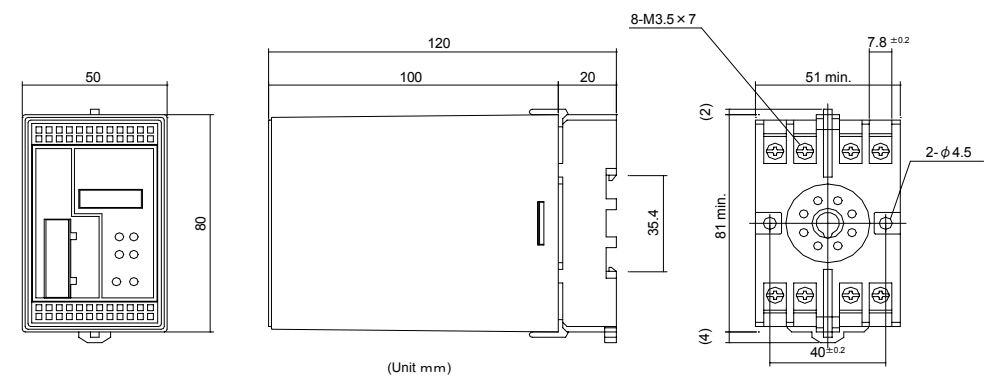
### ■ Wiring

#### ⚠ Caution

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

- Always disconnect the GAT10-DN 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 instrument is energized. Doing so might cause electric shock.

### ■ External Dimensions



## 3. Specifications

- The GAT10-DN enables writing and reading, from the DeviceNet, of Measured values, Target set values and parameters for up to 8 Shimaden instruments with RS-485 communication.
- The GAT10-DN is connectable to the following Shimaden products:  
Digital controllers : SR80 series, SR90 series, SR253  
Program controller: FP93  
Digital indicator : SD16  
Servo controller : EM70

### ■ General Specifications

Item	Specifications
Ambient conditions for operation	Temperature -10~50°C
	Humidity 90%RH or less (no dew condensation)
	Altitude 2000 m 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	5VA (100~240V AC) 4VA (24V AC) 3W (24V DC)
Insulation resistance	Between input/output terminals and power terminal 500V DC 20MΩ min. Between input/output terminals and protective conductor terminal 500V DC 20MΩ 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	H80xW50xD120 mm (Including base, but excluding front connector)
Mounting	DIN rail or screw
Mass	Approx. 250g (Including base)

## DeviceNet Specifications

Item	Specifications			
Communication system	Master/slave system			
Protocol	CAN Protocol			
Type of transmission line	Trunk line, Drop line			
Transmission rate	125k/250k/500k bps			
Type of device	Communication adaptor			
Occupied word count	Fixed to 24 words each for input and output			
Node address	0~63			
Maximum transmission distance	Transmission rate	125k bps	250k bps	500k bps
	Total length	500 m	250 m	100 m
Connecting cable	Special cable for DeviceNet			
Connector	Accessories			
Network current consumption	40mA max.			

## RS-485 (Shimaden standard protocol) Specifications

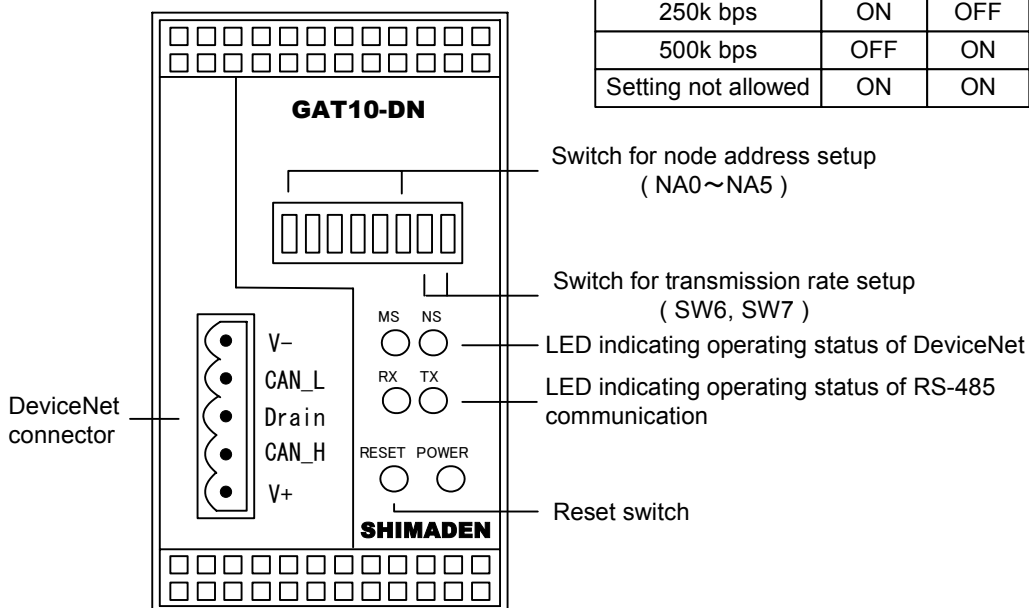
Item	Specifications
Signal level	EIA RS-485 compliant
Communication method	2-line half duplex multidrop
Synchronization method	Start-stop synchronization
Communication distance	Max. 500 m
Communication rate	19200 bps
Data format	7 bit/even parity/1 stop bit
Number of connectable Shimaden instrument	Max. 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, and parameter reading/writing)

## DeviceNet Node Address Setup

Address	NA0	NA1	NA2	NA3	NA4	NA5
0	OFF	OFF	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF	OFF	OFF
2	ON	ON	OFF	OFF	OFF	OFF
...	..	..	..	..	..	..
62	OFF	ON	ON	ON	ON	ON
63	ON	ON	ON	ON	ON	ON

## DeviceNet transmission rate setup

Transmission rate	SW6	SW7
125k bps	OFF	OFF
250k bps	ON	OFF
500k bps	OFF	ON
Setting not allowed	ON	ON



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

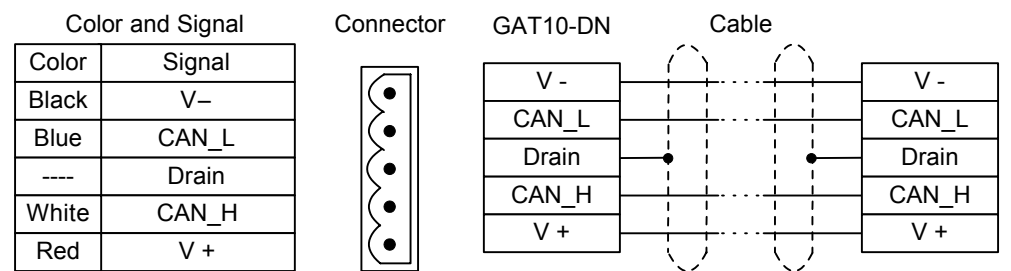
## LED indicating operating status

Name	Color	Function	Remarks
MS	Green/Red	Lights "green" when GAT10-DN operates normally. In other displays, setting error/device error has occurred.	Module status (DeviceNet)
NS	Green/Red	Lights "green" when GAT10-DN is on-line. In other displays, communication failure/connection error has occurred.	Network status (Device Net)
R X	Green	Lights during transmission of data	RS-485 Data receipt
T X	Green	Lights during reception of data	RS-485 Data transmission

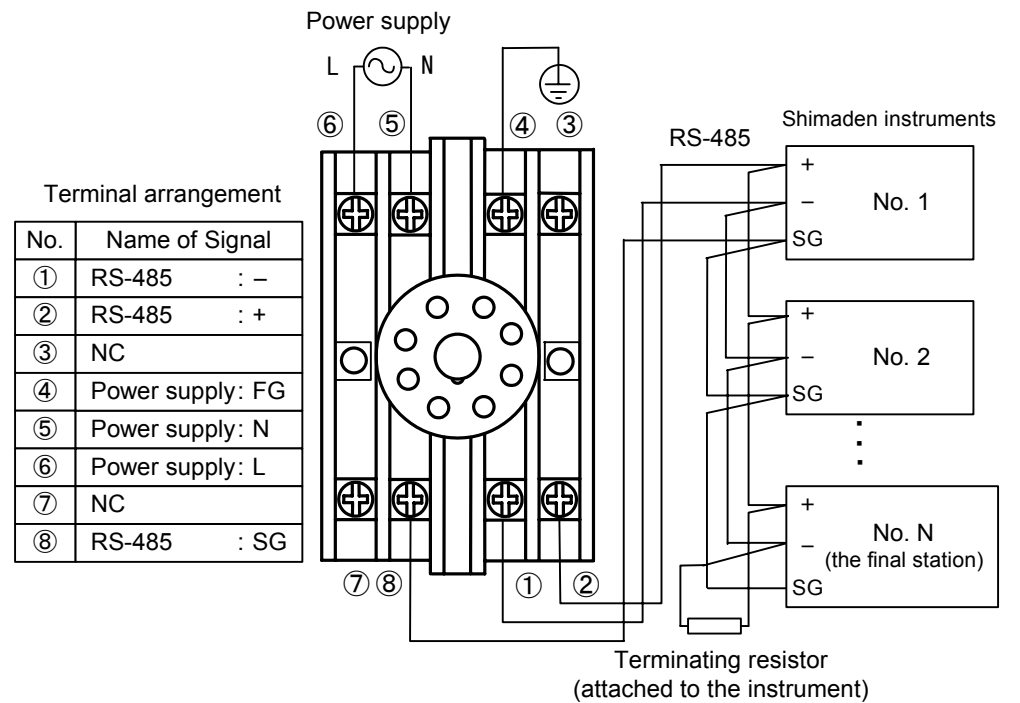
## 4. Wiring

### Connecting DeviceNet communications

- Use the special cable for DeviceNet.
- Use the attached connector.
- The connector is equivalent to the MTB2, 5/5-ST-5. 08 ABGYAU made by PHOENIX CONTACT.
- For grounding and terminating resistor for DeviceNet, refer to the DeviceNet Specifications published by ODVA.



### Connecting RS-485 communications



### Terminating resistor

- DeviceNet  
Install the DeviceNet terminating resistor according to the Master PLC Instruction Manual and the DeviceNet Specifications issued by ODVA.
- RS-485  
The GAT10-DN has a built-in RS-485 terminating resistor. To the Shimaden instrument as the final station, attach the terminating resistor supplied as an accessory to it. However, please attach the terminating resistor to only one instrument (final station). If attached to two or more instruments, correct operation cannot be guaranteed.

Note: No devices except Shimaden instruments should be connected to the RS-485 line. Otherwise, correct operation cannot be guaranteed.  
Note: Make sure to use GAT10-DN as a terminal station of RS-485 communications.

### External Wiring

- As one of the requirements for enabling the GAT10-DN 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. Otherwise it will easily be affected by noise, surge or induction.
- 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-DN. Check the inspection items listed in Master PLC 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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