
Communication Unit TA8433

Instruction Manual

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Motortronics®



**Communication Unit for Conversion between
SV-NET & RS-232C/RS-485/RS-422**

TA8433

Instruction Manual

RoHS Directive Compliant

 **TAMAGAWA SEIKI CO.,LTD**

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Safety Precautions

To use the product correctly, please read this document and all supplied documents carefully before installing, operating, maintaining, and inspecting the product. Incorrect usage may lead to improper operation, and, at worst, can lead to damage to the product or the equipment connected to it. Store this manual with the supplied documents in a safe place so that you can refer to it when you have a question.

We exercise the greatest caution to ensure the product quality. However, please give due consideration to safety because unanticipated operation may occur due to unexpected noises, static electricity, accidental part failure, wiring failure, or other problems.

■ Items to Check after Unpacking

After you receive and unpack the product, please check it to see if it is the model you have ordered and for any damage that may have occurred during transportation. Should your product have any problems, please contact the dealer from whom you purchased the product.

■ Precautions for Transportation and Handling

- Do not subject the product to excessive impact, such as by dropping it.
- During transportation, handle the product carefully to avoid breakage.
- Do not handle the product in a way that may allow excessive force to be applied to its parts.
- Do not allow conductive foreign materials such as screws and metal pieces or flammable foreign materials such as paper to get onto the circuit boards or enter the inside of the product.

■ Precautions for Wiring and Installation

- Store and use the product under the following environmental conditions unless otherwise specified:

Environmental condition	Communication Unit TA8433
Operating temperature range	0°C to +40°C
Operating humidity	90% RH or less (no condensation)
Storage temperature	-10°C to +70°C (no freezing)
Storage humidity	90% RH or less (no condensation)
Environment	Indoor (no direct sunlight) Avoid dirt, dust, and corrosive and flammable gasses 1,000 m or less above sea level
Vibration/shock	4.9 m/s ² or less / 19.6 m/s ² or less

- Do not apply a voltage to the terminals other than that specified in the specifications. Doing so could result in product breakdown or damage.
- Recheck the wiring and the polarity of the connections before turning on the product.
- The vibration/shock values are short-time ratings.

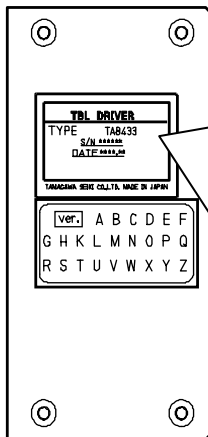


Safety Precautions


■ Model check

When you receive the product, check the model of the unit.

The model is given on the nameplate located on the rear of the product.



Model designation

TA8433 N 
(1) (2)

(1) Model base

TA8433 Series

(2) Communication specifications

- 1: Between RS232C/RS422 communication and SV-NET communication
- 2: Between RS232C/RS485 communication and SV-NET communication

1. Before You Begin

Overview of the Product

Communication unit TA8433 converts RS232C, RS422, or RS485 communication into SV-NET communication, allowing each interface to control the SV-NET driver.

In RS232C communication, the unit can be connected to a PC. Doing so enables it to control SV-NET drivers in an abbreviated manner by using the SV-NET communication software “Master of SV-NET”, making operation tests and parameter control easy to perform.

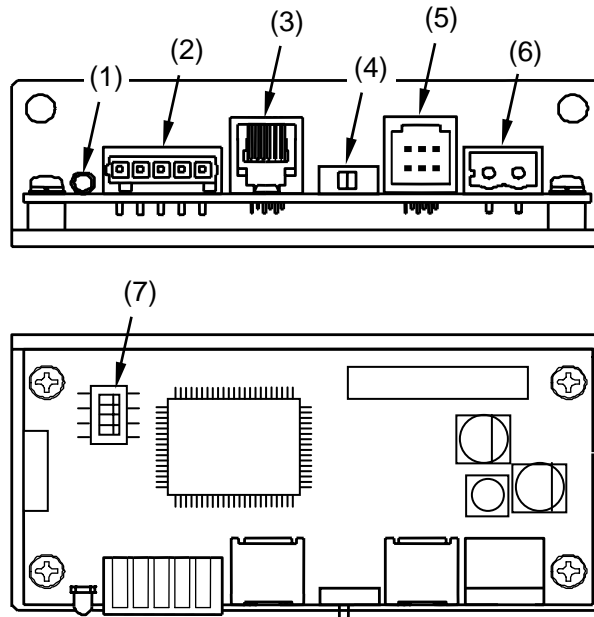
Product Specifications


Specifications	TA8433N1	TA8433N2
Communication conversion mode	RS232C ↔ SV-NET RS422 ↔ SV-NET (RS422: Four-line full-duplex communication)	RS232C ↔ SV-NET RS485 ↔ SV-NET (RS485: Two-line half-duplex communication)
Control side communication switching	Communication switching can be performed by switch.	
RS232 side (control side) Communication specifications	Communication speed: 115200 bps 56000 bps 34800 bps 19200 bps 9600 bps Communication protocol: For SV-NET conversion ➤ For detailed communication specifications and protocols, refer to the accompanying “SV-NET Conversion Serial Communication Specifications” document.	
RS422/485 side (control side) Communication specifications		
SV-NET side (driver side) Communication specifications	Communication speeds: 1 MHz, 500 kHz, 250 kHz, 125 kHz Communication protocol: SV-NET Physical layer: CAN	
Power supply input	24 V DC ± 10%	
SV-NET control power supply output	24 V DC ± 10%	
Current consumption	0.1 A + (Number of connected drivers x 0.1 A)	
Operating temperature range	0 to +40°C	
Operating humidity	90% or less	
Outer dimensions	100 x 50 x 30 (width x depth x height)	
Mass	Approximately 0.2 kg	
RoHS Directive compliance	This product complies with the RoHS Directive.	

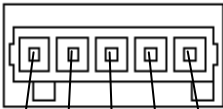
Product Configuration

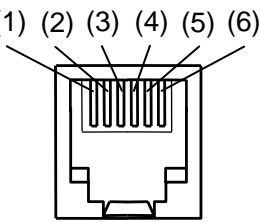
Component	Quantity	Remarks
Communication unit	1	
Power supply connector	1	Model: 231-102/026-000 (WAGO)
SV-NET connector	1	Model: 734-105 (WAGO)

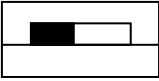
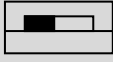
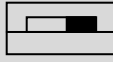
2. Names and Functions of Parts

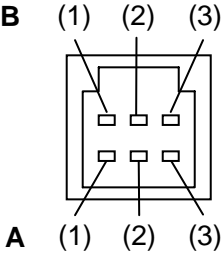


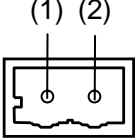
(1) LED 	Function	Status	Meaning
	The communication status is indicated by three colors.	Red light ON	Power on, communication closed
		Orange light ON	RS232, RS422, RS485 communication in progress
		Green light ON	SV-NET communication in progress

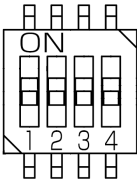
(2) SV-NET connector 	Use	PIN No.	Function
	Used to output control power supply to the driver and to connect the SV-NET communication lines.	1	GND (control power supply)
		2	CAN L (-)
		3	GND (shield)
		4	CAN H (+)
		5	24 V DC (control power supply)
■ Connector: 734-165 (WAGO) ■ Opposite connector: 734-105 (WAGO) AWG28-14 ■ Recommended cable: Shielded twist pair cable NADNR24 (MISUMI)			

(3) RS232C connector 	Use	PIN No.	Function
	RS232C connector. Used to connect control side devices and a PC.	1	Vcc (5 V DC output)
		2	TXD
		3	RXD
		4	NC
		5	GND
		6	GND
■ Connector: TMR5RU1-66 (HIROSE) ■ Recommended cable: Communication cable EU6517N1 (1 m), EU6517N2 (2 m), EU6517N5 (5 m) (Tamagawa Seiki)			

(4) Control side communication switching switch 	Use	Status	Function	
	Used to switch communication types and connectors for the control side.		TA8433N1	TA8433N2
				RS232
		RS422	RS485	

(5) RS422/RS485 connector 	Use	PIN NO.	Function	
	RS422/RS485 connector. Used to connect control side devices.		TA8433N1	TA8433N2
		A1	TX+(RS422)	TR+(RS485)
		B1	TX-(RS422)	TR-(RS485)
		A2	RX+(RS422)	NC
		B2	RX-(RS422)	NC
		A3	GND	GND
		B3	GND	GND
■ Connector: 1-1827876-3 (Tyco) ■ Opposite connector: Housing 1-1827864-3; Contact 1871744-1 (Tyco) AWG28-22				

(6) Power supply connector 	Use	PIN NO.	Function
	Power supply input connector		1
		2	24 V DC
■ Connector: 231-432/001-000 (WAGO) ■ Opposite connector: 231-102/026-000 (WAGO) AWG28-12			

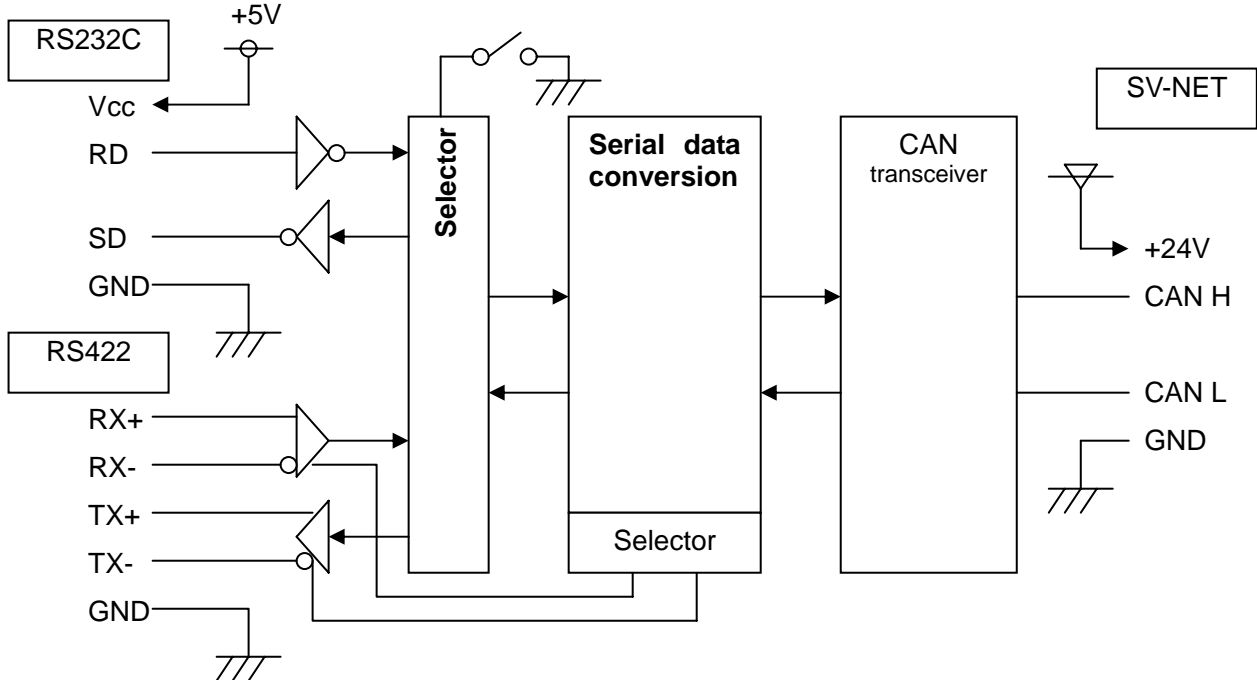
(7) DIP switch 	Use	Switch No.	Function	
	Used to change the communication speed of RS232C, RS422, and RS485.		1	Communication speed is set by varying the ON/OFF setting combinations on the switch. ⇒ P. 12 "Communication Settings"
			2	
			3	
			4	

3. Internal Block Diagrams

TA8433N1 (between RS232/RS422 and SV-NET)

Control side

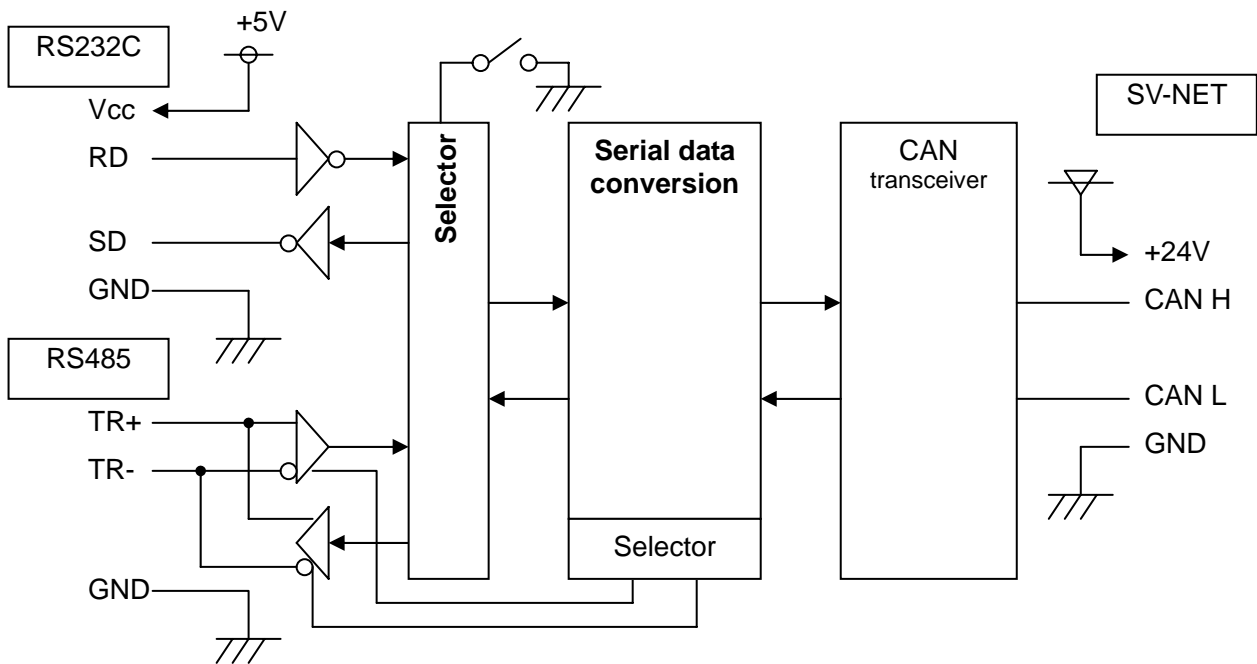
Driver side



TA8433N2 (between RS232/RS485 and SV-NET)

Control side

Driver side



4. How to Connect



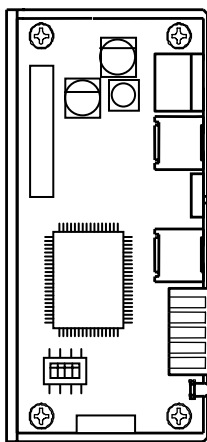
Caution!

Turn off the power before performing a connection operation. Before supplying power, check that the voltage is set to the specified voltage value. Then, turn on the power supply.

Connecting the Power Supply

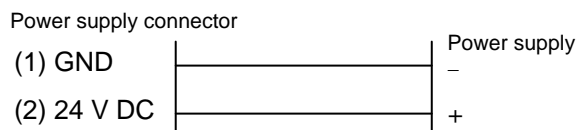
Connect the power supply to the power supply connector.

Input power supply specs: 24 V DC \pm 10%



Power supply connector

■ Connection example

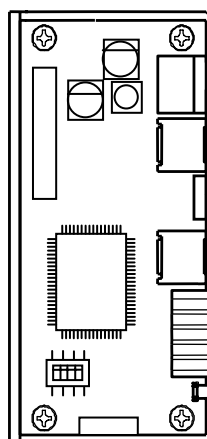


Caution!

The 24VDC/GND pins of this connector are internally connected to the 24VDC (Pin5)/GND (Pin1) pins of the SV-NET connector. Do not connect this connector if supplying power from the SV-NET connector side.

SV-NET Connection

Before connecting to the SV-NET connector, check the SV-NET pin configurations of the unit and connected device.



SV-NET connector

■ Connection example

Communication unit SV-NET connector	Connected driver SV-NET connector
(1) GND	(1) GND
(2) CAN L	(2) CAN L
(3) GND	(3) GND
(4) CAN H	(4) CAN H
(5) 24 V DC	(5) 24 V DC

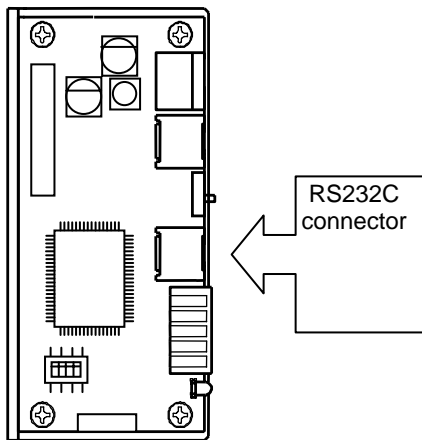
Wiring using the recommended cable NADNR24 (MISUMI) is shown in parentheses.

SV-NET can be connected using the daisy chain connection method.

□ Option parts ⇒ "SV-NET Cable" P. 15

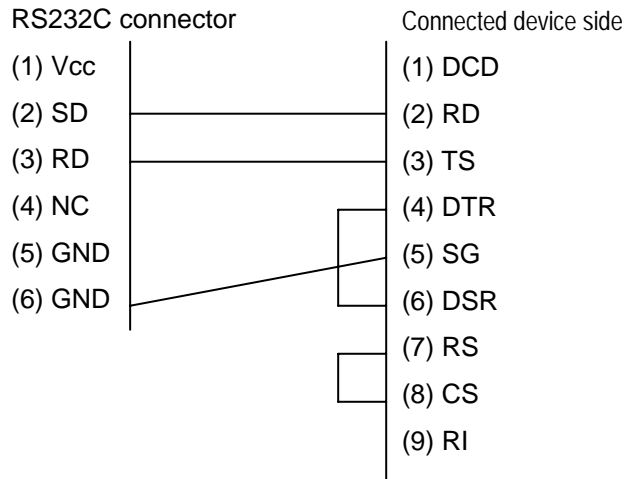
RS232C Connection

Before connecting to the RS232C connector, check the RS232C pin configurations of the unit and the connected device.



■ Connection example

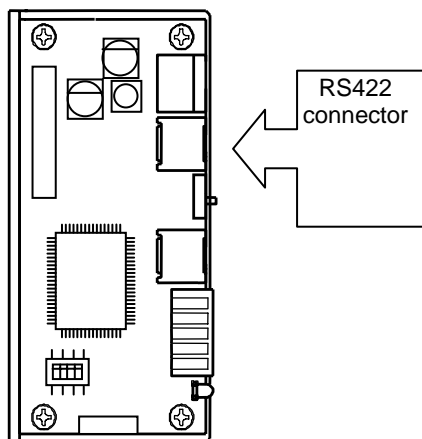
Connected device: PC-AT personal computer, D-sub 9-pin connector



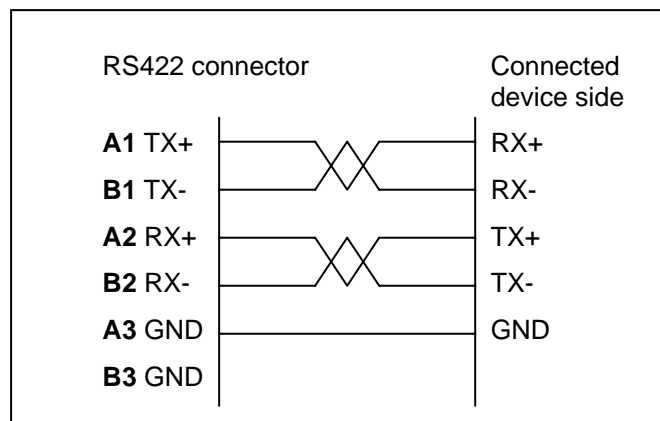
□ Option parts “Communication Cable” ⇒ P. 15

RS422 Connection (TA8433N1)

Before connecting to the RS422 connector, check the RS422 pin configurations of the unit and the connected device. Use a shielded twist pair cable to connect the cable to be used.



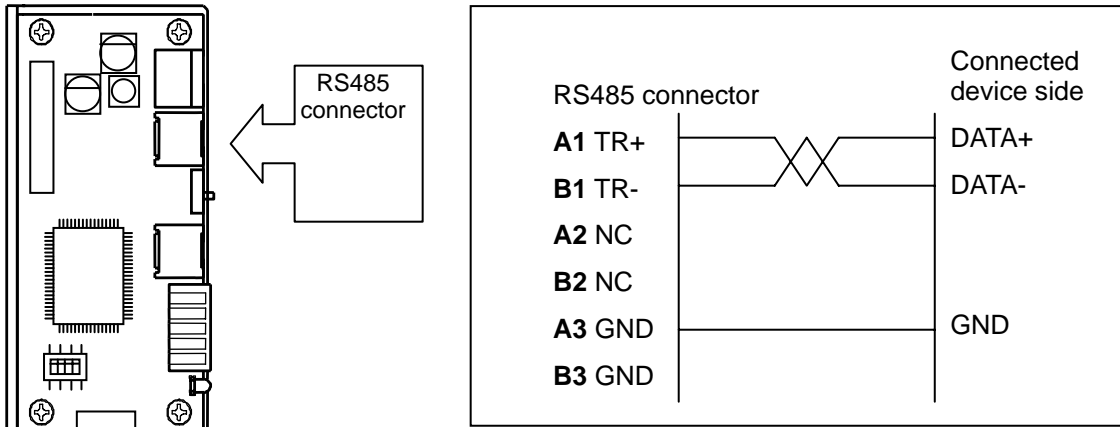
■ Connection example



RS485 Connection (TA8433N2)

Before connecting to the RS485 connector, check the RS485 pin configurations of the unit and the connected device. Use a shielded twist pair cable to connect the cable to be used.

■ Connection example

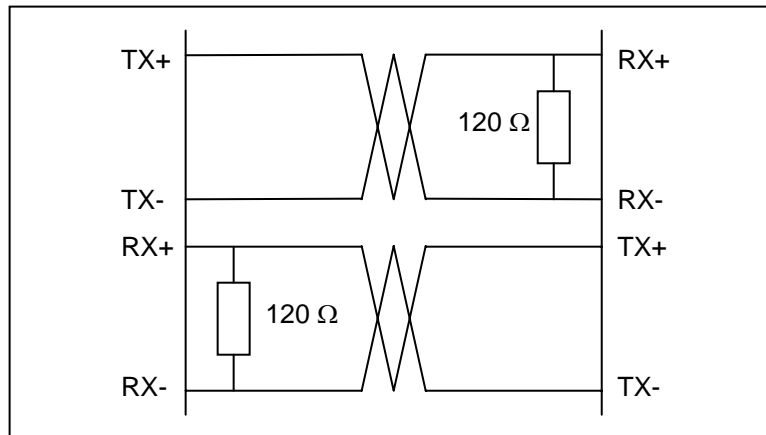


Multi-point serial connection not supported.

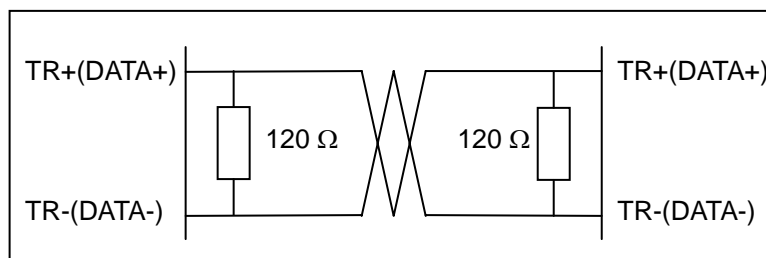
Terminator Resistor

The terminator resistor is used for impedance matching in the both send and receive node sides. If the impedance on the send side is equal to that of the load side, no reflection occurs and communication is conducted with little loss. With unmatched impedance, a send signal is returned to the send side as a reflection without being absorbed on the load side, resulting in a loss. A resistor of 120 ohms is usually used for a terminator resistor used for impedance matching, but the actual resistor used is determined by the impedance of the cable. Connect it according to the situation requirements.

■ Example RS422 terminator resistor connection



■ Example RS485 terminator resistor connection

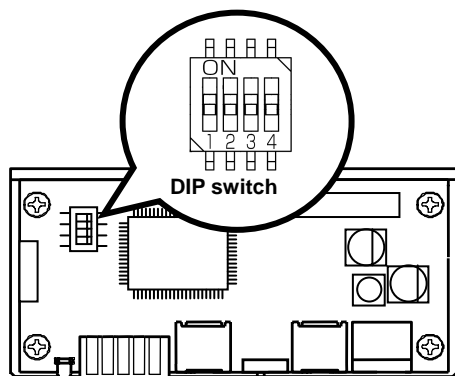


5. Communication Settings

RS232C/RS422/RS485 Control Side Communication Speed Setting

Use the DIP switch to set the communication speed of RS232C/RS422/RS485.

The communication speed can be changed with the power turned on.



Communication speed	DIP switch number			
	1	2	3	4
(*) 56000 bps	OFF	OFF	OFF	OFF
9600 bps	<input checked="" type="checkbox"/>	OFF	OFF	OFF
19200 bps	OFF	<input checked="" type="checkbox"/>	OFF	OFF
38400 bps	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	OFF	OFF
115200 bps	OFF	OFF	<input checked="" type="checkbox"/>	OFF

(*) The factory setting is 56000 bps.



Caution!

Do not change the communication speed during communication or motor operation.

SV-NET Side Communication Speed Setting

Before operating, check the SV-NET communication speed of the communication unit and the driver to be connected and then align their communication speeds. After the power is turned on, the SV-NET communication speed of the communication unit is set to 1 MHz.

■ SV-NET communication speed setting for the communication unit

The communication unit setting is established by an SV-NET communication speed setting message sent from the control side. For details, refer to “SV-NET Conversion Serial Communication Specifications.”

Using “Master of SV-NET ” allows you to change the SV-NET communication speed easily through the application.

■ SV-NET communication speed setting for the driver

The driver setting is established by changing the baud rate parameter value setting. The communication speed setting is enabled by restarting the driver. For details, refer to the instruction manual for the driver.

■ SV-NET communication change flow

- (1) Connect with the communication speed set to the driver.
- (2) Set and save the baud rate parameter of the driver.
- (3) Restarting the control power supply of the driver enables the change to the communication speed.
- (4) The control side sends an SV-NET communication speed setting message to set it to the same communication speed as the driver.
- (5) Communication starts.

6. How to Install

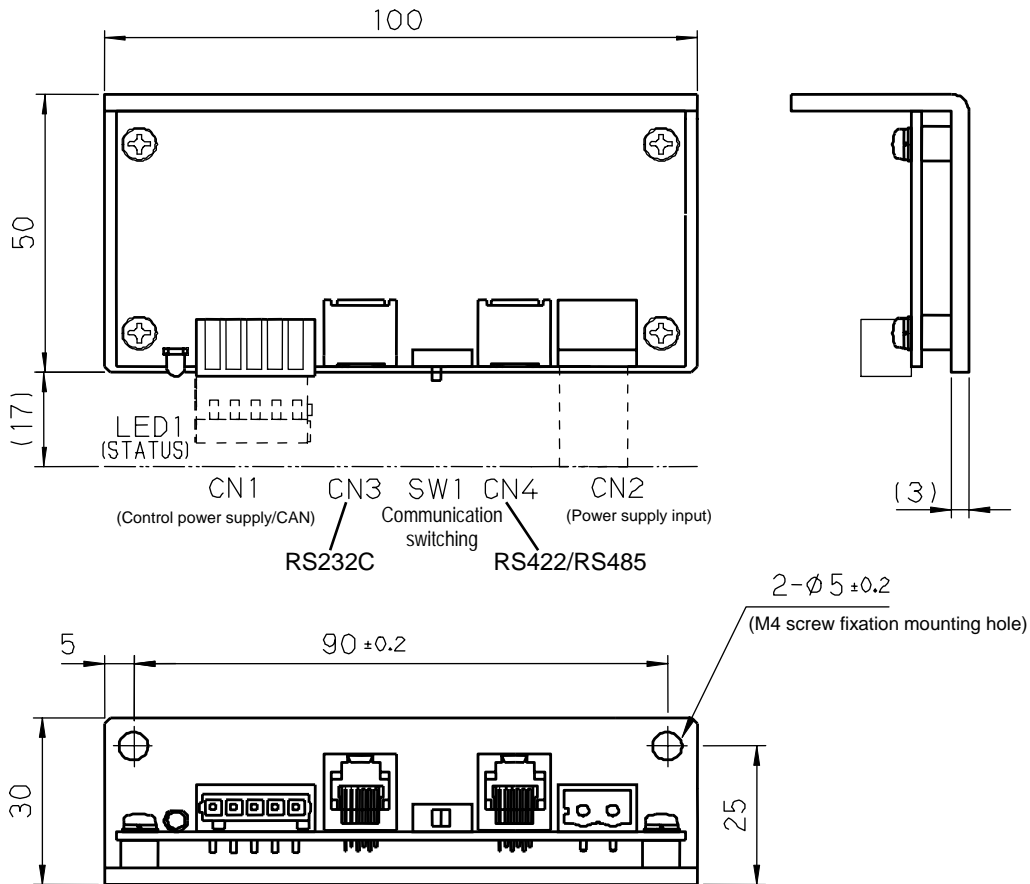
To install the communication unit, mount it with M4 screws using the two 5-mm holes located on the frame.



Caution!

All cables must be removed from the communication unit during installation. In addition, before installation, turn off the power supply for the communication unit and for any equipment to which the communication unit is installed.

Outline

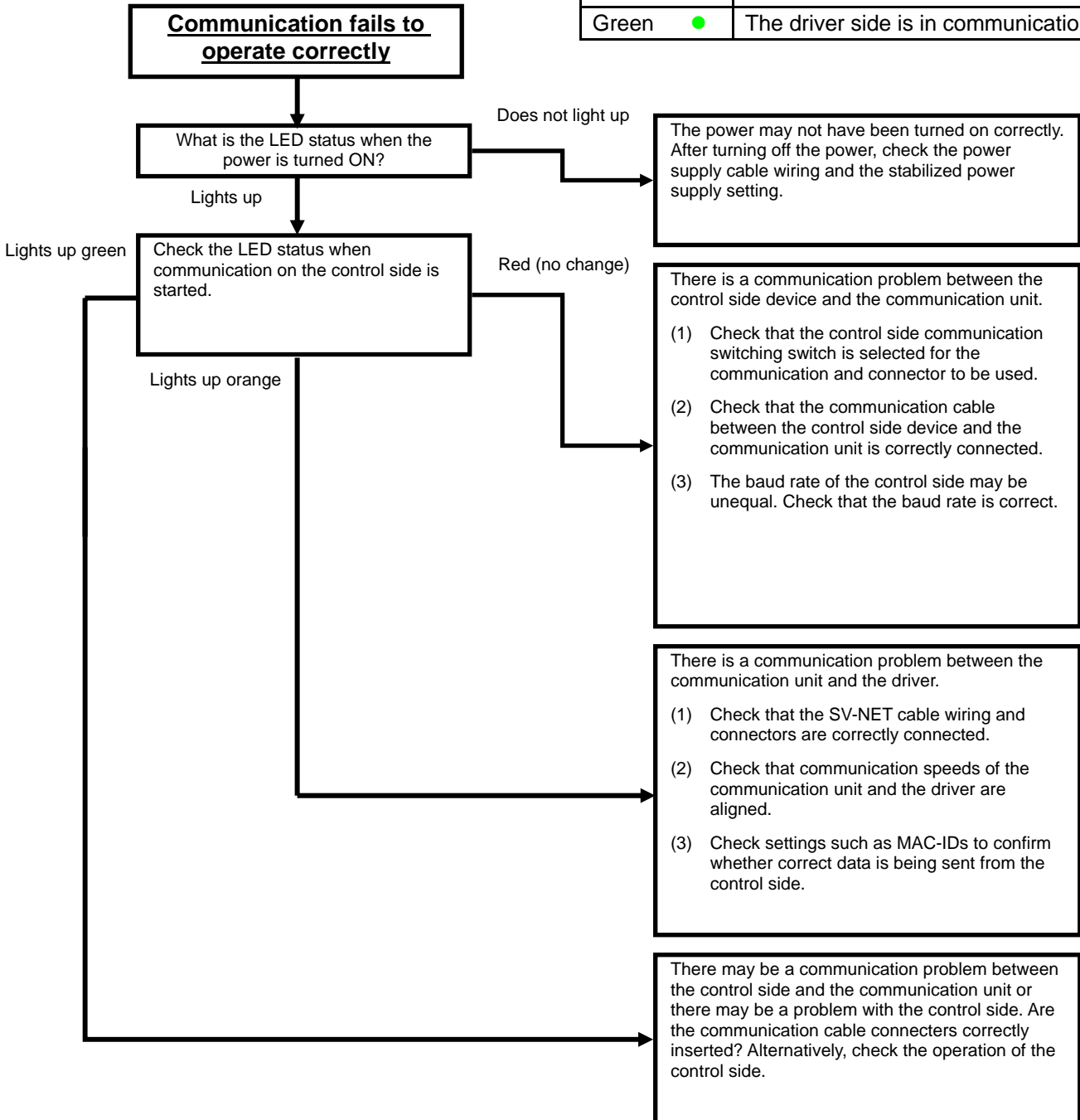


7. Troubleshooting

What should I do if communication fails to operate correctly?

If communication fails to operate correctly, follow the following procedure to check LED indications.

LED color	Meaning
Red ●	Power on, communication closed
Orange ●	This indicates that the control side is in communication and driver side communication is closed.
Green ●	The driver side is in communication.

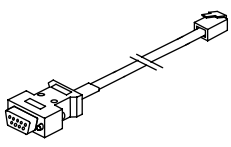


8. Option Parts

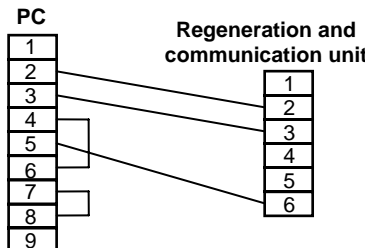
■ Communication Cable

The communication cable is for connecting the control device side, which is mainly the RS232C D-sub 9-pin connector of a PC/AT personal computer, to the communication unit.

■ Communication cable



■ Connection diagram for communication cables



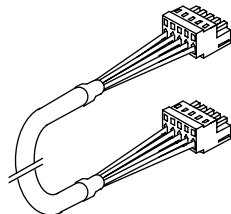
■ Communication Cable Product number
Product name: Communication cable (dedicated cable)

Product number	N code	Length	Remarks
EU6517	N2	2 m	
	N3	3 m	
	N5	5 m	

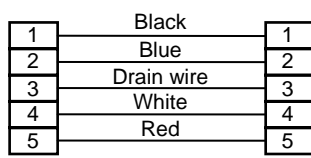
■ SV-NET Cable

The SV-NET cable is for connecting the communication unit to an SV-NET driver.

■ SV-NET Cable



■ Connection diagram for SV-NET cables



■ SV-NET cable part number

Product number	N code	Length	Remarks
EU9610	N*010	1 m	Specifiable up to 20 m, in 10-cm increment.
	N*030	3 m	
	N*050	5 m	
	N*100	10 m	

*=0: Without both-side connector
*=1: With one-side connector
*=2: With both-side connector

For multi-axis daisy chain connection, can be used together with EU9610 N1*** (one-side connector cable).

You can also order the assembled finished product. Please contact us if you wish to request this.

9. After-Sales Service

Repair and Inquiry

- For repair or inquiry, please contact the dealer from whom you purchased the product.
- We offer a service that enables you to upgrade your software version. Please consult us about this (chargeable).

Guarantee

■ Free Guarantee Period

The free guarantee period is valid for the shorter of the following: within one year of the product being installed at your site or your customer's site or within 18 months (from the manufacture date) of the product being delivered from our plant.

■ Failure Range

Failure diagnosis

We kindly request that, as a rule, you perform the first diagnose of the failure.

However, this diagnosis can be performed instead by us or our service network if you so request. In such a case, following discussions with you, repair is free if the failure is attributed to us.

Failure repair

Repair, substitute replacement, and on-site visits for the occurrence of a failure is chargeable in cases 1 to 4 that follow, and free in other cases.

1. If the failure is due to improper storage or handling, negligence on the part of you or your customer, the nature of your software or hardware design, or any other such reason.
2. If the failure is attributed to modifications and changes you have made to our products without our approval.
3. If the failure is attributed to use of our products out of the operating range.
4. Other failures that you acknowledge as being out of our responsibility.

Exemption from Responsibility for Compensation for Equipment Loss and the like

Whether within the free guarantee period or not, our guarantee does not provide compensation for the following items attributable to the failure of our products: any loss of equipment you or your customers may suffer, any damage to a product other than our own as well as damage attributable to another's responsibility.

Period of Repair after Production Discontinuation

We repair discontinued products for seven years following the date on which their production was discontinued. For some products, substitutes may be recommended.

Delivery Condition

For standard products which do not include application setting and adjustment, delivery of the product to you is deemed as acceptance of the product, and we assume no responsibility for operations such as on-site adjustment and trial runs.

Appropriate Use of This Product

- This product is not designed or manufactured for use with equipment and systems used in situations where there is a risk to life.
- If you are considering using this product with medical, aerospace, nuclear power, electric power, marine, manned transportation, or other special systems, please consult us at our sales office.
- This product is manufactured under strict quality control. However, if the application is such that failure of the product may result in serious accident or loss, safety devices must be installed on the equipment and systems on which our product is installed.

Revision History

Date of revision	Rev. No.	Reason for revision	Description of revision	Stamp
09/19/2007	0000	First version		