

NETWORK TERMINAL BOX

NTB-201A

INSTRUCTION MANUAL

(FOR HARDWARE)

Thank you for purchasing KYOWA's product NTB-201A Network Terminal Box.
Read this Instruction Manual carefully in order to make full use of the high performance capabilities of the product.
Do not use the product in methods other than described in this Manual.
This Manual only describes Hardware operation of the NTB-201A.
For Software operation, refer to the NTB-10A Network Terminal Box Control Software Instruction Manual.

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The contents of the Instruction Manual are subjected to change without prior notice.

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STANDARD ACCESSORIES

The NTB-201A Network Terminal Box (hereinafter referred to as the NTB-201A) comes with the following accessories. After unpacking, check to be sure that they are included.

- | | | |
|--|---|--|
| <ul style="list-style-type: none">● Instruction Manual● Simplified Software (*1)● Control Software for the NTB series (*1)
(NTB-10A) | } | 1 (CD-R) |
| | | NTB-10A is included in NTB-201A.
NTB-10A is not included in NTB-201A-0. |

(*1) An USB-CAN converter driver is also included.

- | | |
|--------------------------------|--------|
| ● Diagram sticker | 1 |
| ● DC power cable (P-57) | 1 |
| ● Warranty and Test Data Sheet | 1 each |
| ● Ground wire (P-72) | 1 |
| ● Rubber foot | 4 |

OPTIONS

- Network Terminal Box NTB-100A series
- Handy data logger SME-100A/101A
- Control software for the NTB series (*1) (NTB-10A) Standard accessory for the following.
NTB-201A
(*1) The USB-CAN converter driver is also included.
- Communication cable N-102 (1 m)
H-11681 (3 m)
H-11682 (5 m)
H-11683 (10 m)
*Note: When requiring the cable other than the above,
contact KYOWA or our representatives.
- Y cable N-103
- AC adapter SA-10A-EDS (100 to 240 VAC)
- Coupling plate CN-1A

Others

- USB-CAN converter Kvaser Leaf Light HS (Kverser Inc.)
- Terminating resistance CANterm120 (Vector Japan Co., Ltd.)
- DIN rail (suggested) TAKACHI ELECTRONIC INDUSTRIAL Co., Ltd.
(35 mm)
- DIN rail mounting plate (suggested) DRA-1
(TAKACHI ELECTRONIC INDUSTRIAL Co., Ltd.)

SAFETY PRECAUTIONS

The NTB-201A is designed in accordance with “8. SPECIFICATION.”

Do not use the NTB-201A in an environment exceeding the specifications. Or, failure of the NTB-201A may result.

PRIOR TO USE

For safe use of the NTB-201A, do not forget to read the “Safety Precautions” prior to use.

Kyowa Electronic Instruments Co., Ltd. assumes no liability for any damages resulting from user’s failure to comply with the safety precautions.

SAFETY SYMBOLS

- For safety operation of the NTB-201A, the following symbol mark is attached to the NTB-201A.

	Indicates “PROTECTIVE GROUND TERMINAL.” Be sure to connect the GND terminal to the ground.
---	---

- For safety operation of the NTB-201A, the following symbol marks are used in the Instruction Manual.

 WARNING	Improper operation of the system may result in death or severe injury of the operator.
 CAUTION	Improper operation of the system may result in injury of the operator and physical damage of the system.

 WARNING

- **Power Supply**
To prevent a fire hazard, before connecting the power cable, be sure to check the local line voltage is matched with the operating voltage (11 to 16 VDC) specified for the NTB-201A.
- **AC adapter**
To prevent an electric shock or fire hazard, always use the optional AC adapter.
- **Avoid Using in Environment with Inflammable Gas, etc.**
To prevent the risk of fire hazard or explosion, do not use the NTB-201A in environment with inflammable gas, vapor or dust.
- **If Any Trouble Occurs**
To prevent a fire hazard, if smoke is emitted from the NTB-201A, immediately disconnect the AC adaptor from the receptacle and stop using the NTB-201A.
- **Avoid Measuring Object Applied With High Voltage**
Although the NTB-201A is insulated, if it is used for measuring objects with excessive high voltage, it may deteriorate its performance and cause trouble.
- **If the NTB-201A faulty, emitting smoke or offensive odor, or producing abnormal sound, immediately turn OFF the power.**
- **In case if any foreign matters or water are entered or the NTB-201A is dropped, immediately turn OFF the power.**
- **Do not put liquid near the NTB-201A.**
If the liquid is spilled into the NTB-201A, it may cause trouble, fire hazard or explosion.
- **When it started thundering, do not touch the NTB-201A or cables.**
Or, electric shock hazard may result.
- **When placing the NTB-201A, do not place the NTB-201A on an unstable place.**
Or, the NTB-201A may drop and surroundings will be damaged.
- **Ground terminal (E)**
For input lightning surge protection such as JB-100C, be sure to earth (ground) the ground terminal (E).
- **Do not operate the NTB-201A at a location with excessive vibration.**
- **Protective Ground**
Do not forget to connect the protective ground terminal. Or. electric shock hazard, deteriorated performance, and damage of the product may result.

To prevent troubles and accidents caused by erroneous handling and installation, fully understand the operating instructions and operating environment and properly use the NTB-201A with special care to have the NTB-201A safely fulfill its performance.



CAUTION

- Before wiring, always confirm a terminal arrangement of the target NTB-201A.
- Before moving the NTB-201A, disconnect all cables.
- Use the NTB-201A in the specified operating temperature range -10 to 50°C.
Use at temperatures exceeding the specified range may lower the performance and cause trouble.
If use under direct sunlight or in a cold place is inevitable, prepare a sunscreen or take proper measures to keep it warm.
- Use the NTB-201A in the specified operating humidity range 20 to 85% RH.
Use in a humid place exceeding the specified range or where it is exposed to splashing water may lower the performance and cause trouble.
- Immediately stop the NTB-201A if operating environment changes abruptly.
Leave the NTB-201A as it is until it becomes adaptable to the environment.
Abrupt change in ambient temperature due to transportation, etc. may cause dew condensation result to deteriorate its performance and cause trouble.
- Do not use the NTB-201A under dusty environment.
Use the NTB-201A under environment where the PC may be used.
- To prevent short-circuit trouble, fasten screws on a terminal board.
- Do not use or storage the NTB-201A under environment with excessive vibration or high impact.
Use the NTB-201A under environment without excessive vibration or high impact.
Do not apply excessive vibration or high impact to the NTB-201A. It may lower the performance and cause trouble.
- Do not use the NTB-201A in strong electromagnetic field.
Use the NTB-201A in a magnetic field environment where the PC may be used.
If the NTB-201A is used near devices generating strong magnetic field such as a telemetry system, microwave oven, electric furnace, etc., its performance may be lowered and erroneous operation and trouble may result.
- Use the NTB-201A within an operating power voltage range.
Use the NTB-201A with 11 to 16 VDC and in an environment with no instantaneous power failure and little interfering noise.
- Do not pull cords and cables.
Lay cords and cables with a certain allowance so that unreasonable force is applied to the connections.
Pulling or applying unreasonable force may cause trouble or interrupt the measurement.
- Do not disassemble or remodel the NTB-201A.
Or, it may cause electrical shock or trouble.
- Do not insert foreign matters to connector.
Or, it may cause trouble.
- Handle the CD-R with care.
Do not expose the CD-R to direct sun light, high temperature, or high humidity.
Do not apply pressure to the CD-R by laying object or bending.
Handle with care to avoid any fingerprint, dirt, scratch on both sides.
- Preheat the NTB-201A before use.
Preheat the NTB-201A for about 30 to 60 minutes after the power ON.

NOTATIONS USED IN THE INSTRUCTION MANUAL

Certain notations are used in this Instruction Manual.

- **Quotations**

Names described on the panel surface are expressed in double quotation mark (“ ”).

- **Informational Notes**

Certain notations are used as necessary to attract your attention to information that requires special care when handling the NTB-201A, and to information provided for reference purposes.

Examples of Notations

NOTE

Essential precautions required when handling the NTB-201A.

MEMO

Reference items required when handling the NTB-201A.

1. OUTLINE OF NTB-201A

1-1 OUTLINE OF NTB-201A

The NTB-201A is a measurement instruments that is capable of measuring signal only by connecting the USB-CAN converter to the PC. Capable of measuring signal easily with the voltage output transducer and thermocouple connected when using the Control Software for the NTB series (hereinafter referred to as the NTB-10A).

Capable of measuring signal at the site without circumstance by using an optional Handy Data Logger (SME-100A/101A). CAN card of the KYOWA EDX series can also be used.

1-2 FEATURES

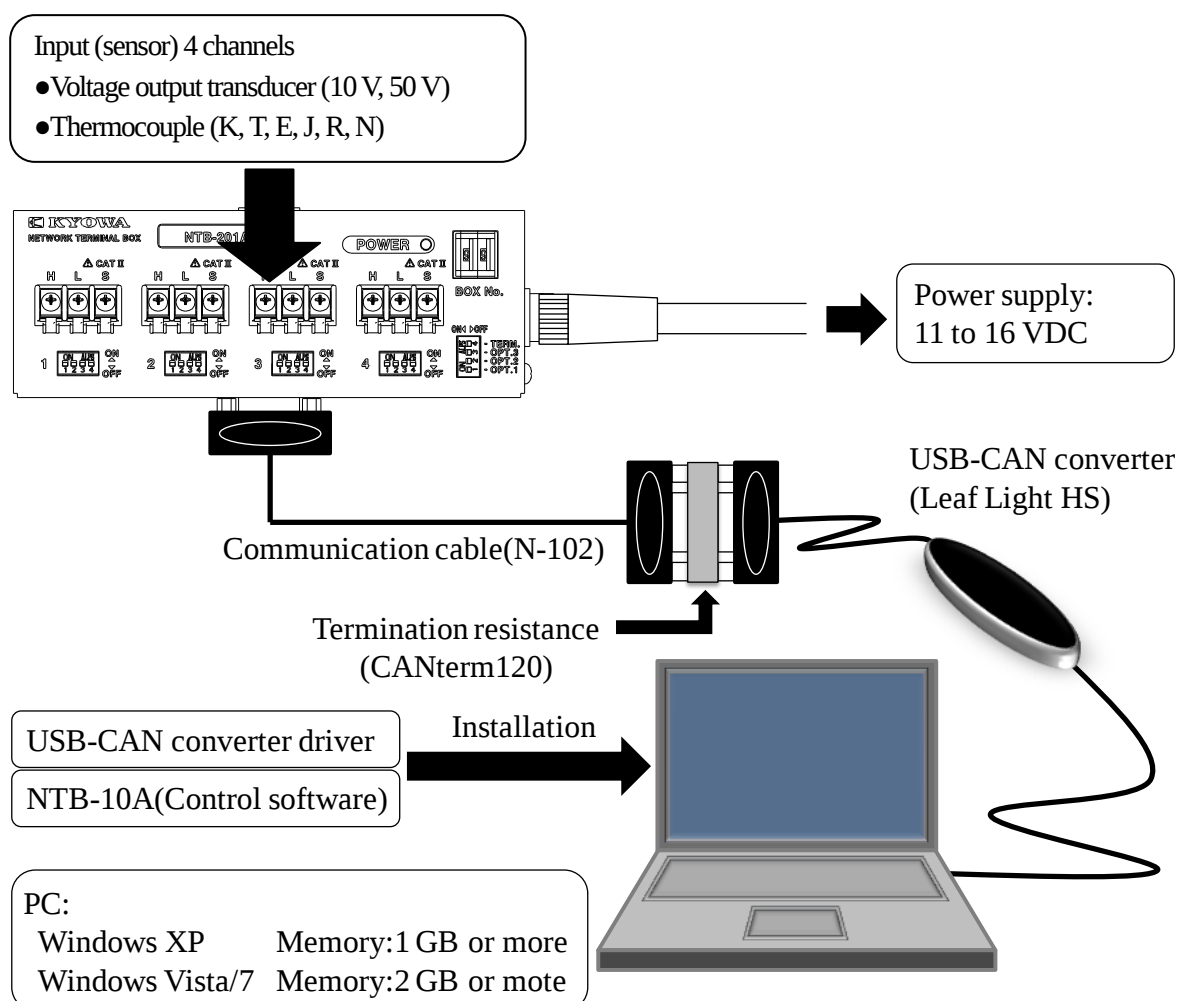
- One communication cable and one DC power are enough for the multiple NTB-201A units since the units can be coupled with each other.
- Capable of distributing the NTB-201A units over a wide range since the units can be placed maximum 1km from the PC or SME-100A/101A.
- The NTB-201A units are connected with the PC by using USB-CAN converter.
- When measuring 4-CH/unit with the NTB-10A, maximum 99 units (396-CH) can be measured.
The NTB-201A can widely be used from small to medium scale measurement.

1-3 SYSTEM CONFIGURATION

1-3-1 For Using NTB-10A

PC:

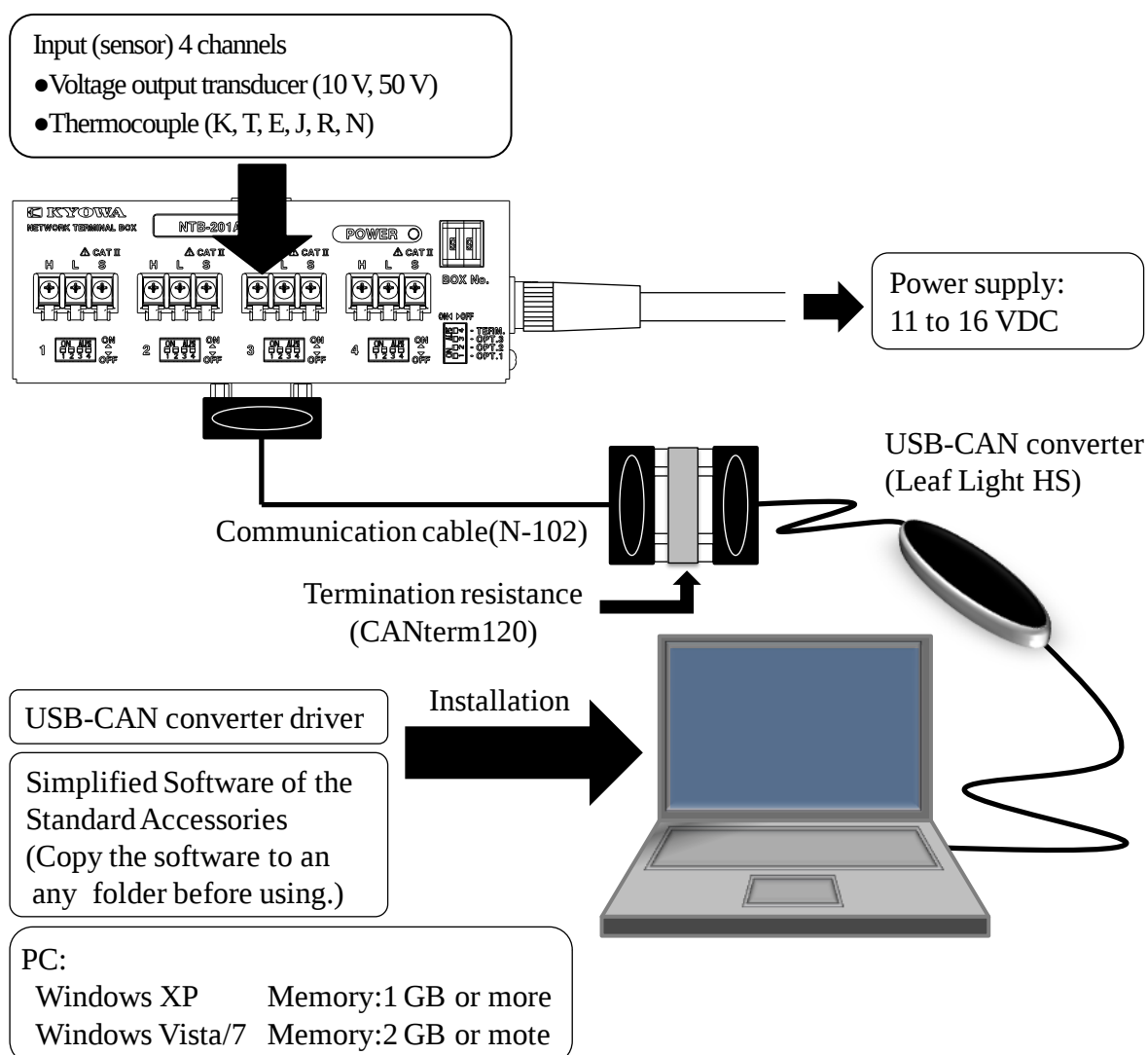
CPU	Pentium 4 2 GHz or more	
OS	Microsoft Windows XP (SP3 or later) (32-bit version) Japanese and English versions	
	Microsoft Windows Vista (SP2 or later) (32-bit version) Japanese and English versions	
	Microsoft Windows 7 (32-bit version) Japanese and English versions	
Memory	For Microsoft Windows XP:	1 G bytes or more
	For Microsoft Windows Vista and 7:	2 G bytes or more
Hard disk	Residual capacity:	30 Mbyte or more
		(not including the recording data file size)
Display	Resolution:	1024 × 768 dots or more
	Colors:	Full color or more
Y cable	N-103 (for distributed arrangement)	
Communication cable	N-102 (1 m), H-11681 (3 m), H-11682 (5 m), H-11683 (10 m)	
	Note: When requiring the cable other than the above, contact KYOWA or our representatives.	
Termination resistance	CANterm120 (Vector Japan Co., Ltd.)	
USB-CAN converter	Leaf Light HS (Kvaser Inc.)	



1-3-2 For Using Simplified Software of Standard Accessories

PC:

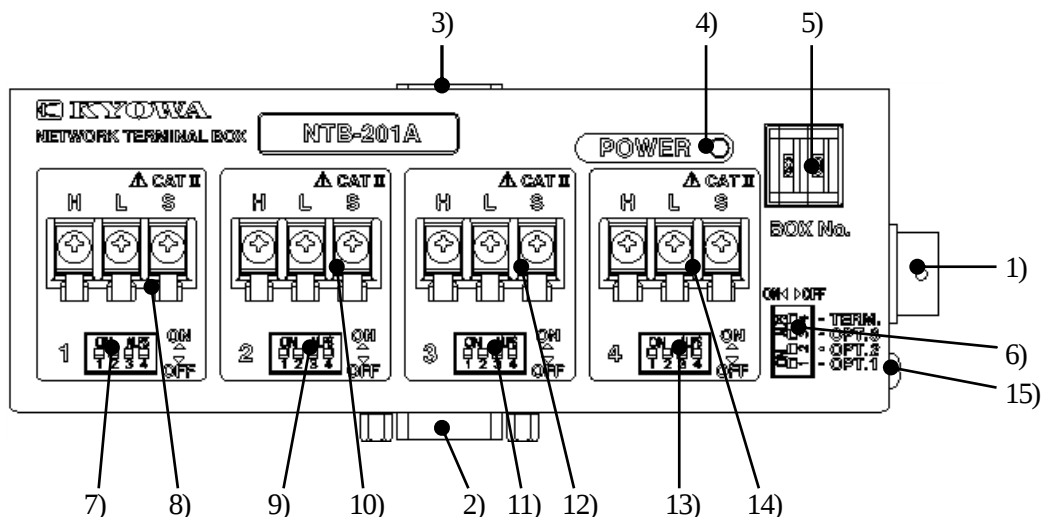
CPU	Pentium 4 2 GHz or more	
OS	Microsoft Windows XP (SP3 or later) (32-bit version) Japanese and English versions	
	Microsoft Windows Vista (SP2 or later) (32-bit version) Japanese and English versions	
	Microsoft Windows 7 (32-bit version) Japanese and English version	
Microsoft Office Excel	2003, 2007, 2010	
Memory	For Microsoft Windows XP:	1 G bytes or more
	For Microsoft Windows Vista and 7:	2 G bytes or more
Hard disk	Residual capacity:	10 Mbyte or more
		(not including the recording data file size)
Display	Resolution:	1024 × 768 dots or more
	Colors:	Full color or more
Y cable	N-103 (For distributed arrangement)	
Communication cable	N-102 (1 m) , H-11681 (3 m), H-11682 (5 m), H-11683 (10 m)	
	Note: When requiring the cable other than the above, contact KYOWA or our representatives.	
Terminator	CANterm120 (Vector Japan Co., Ltd.)	
USB-CAN converter	Leaf Light HS (Kvaser Inc.)	



2. PARTS AND FUNCTIONS

2-1 TOP PANEL

“NTB-201A”

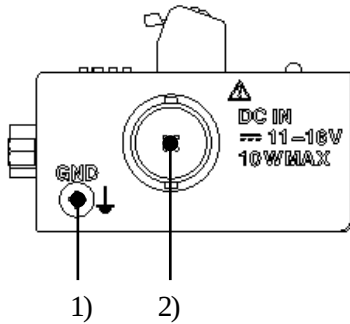


- | | |
|--------------------------------------|---|
| 1) Power connector | Power connector
Power voltage range is 11 to 16 VDC. |
| 2) Communication connector | For connecting the PC or SME-100A/101A. |
| 3) Coupling connector | For coupling the other NTB series. |
| 4) “Power” LED | Lights up while turning ON the NTB-201A. |
| 5) “BOX No.” | Digital switch for setting the “BOX No.” |
| 6) DIP switch for option | For function settings. |
| 7) DIP switch for changing CH1 mode | For setting a CH mode of the CH1. |
| 8) CH1 input terminal | Input terminal for voltage and thermocouple measurement of CH1. |
| 9) DIP switch for changing CH2 mode | For setting a CH mode of the CH2. |
| 10) CH2 input terminal | Input terminal for voltage and thermocouple measurement of CH2. |
| 11) DIP switch for changing CH3 mode | For setting a CH mode of the CH3. |

- | | |
|--------------------------------------|---|
| 12) CH3 input terminal | Input terminal for voltage and thermocouple measurement of CH3. |
| 13) DIP switch for changing CH4 mode | For setting a CH mode of the CH4. |
| 14) CH4 input terminal | Input terminal for voltage and thermocouple measurement of CH4. |
| 15) “GND” terminal | GND terminal (protective grounding)
Connect the earth. |

2-2 SIDE PANEL (POWER CONNECTOR SIDE)

“NTB-201A”



- | | |
|--------------------|---|
| 1) Power connector | Power connector
Power voltage range is 11 to 16 VDC. |
| 2) “GND” terminal | GND terminal (protective grounding)
Connect the earth. |

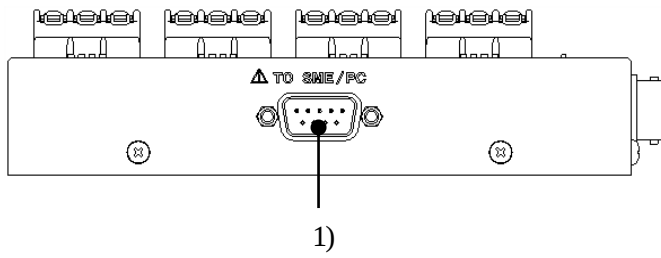
NOTE

- Before connecting the DC power, check the power voltage.
The operating power voltage is from 11 to 16 VDC.
If the power voltage exceeds the above specified voltage range, no connection is made and it may cause trouble or damage to the NTB-201A.
In addition, use the P-57 cable (accessory) for connecting the DC power.

MEMO

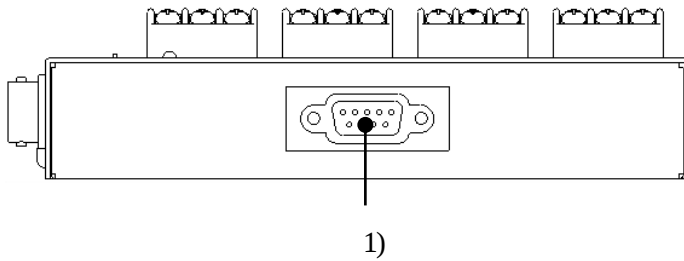
- For using the AC adapter, use the following recommended AC adapter.
Recommended AC adapter: SA-10A-EDS (100 to 240 VAC)

2-3 SIDE PANEL (SME-100A/101A, PC CONNECTION SIDE)



- 1) Communication connector For connecting the PC or SME-100A/101A.

2-4 SIDE PANEL (NTB SERIES COUPLING SIDE)

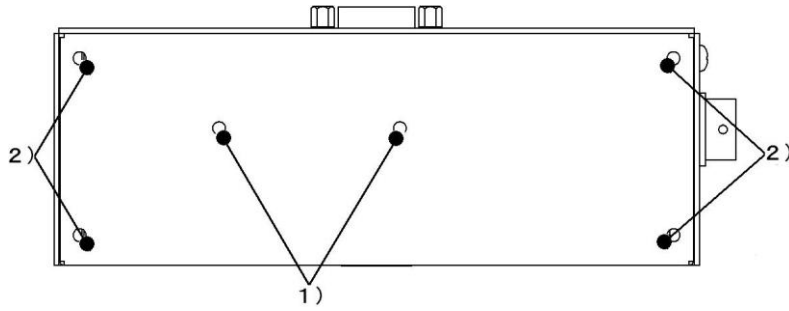


- 1) Coupling connector For coupling the other NTB series.

NOTE

Do not connect the PC and SME-100A/101A to the “Coupling connector.”
--

2-5 BOTTOM PANEL



- | | |
|--|---|
| 1) Fixing hole for DIN rail mounting plate | Used for fixing the NTB-201A to the DIN rail.
(Width between the holes: 42 mm) |
| 2) Fixing hole for coupling the NTB series units | Used for coupling the NTB series units.
(When not using the DIN rail) |

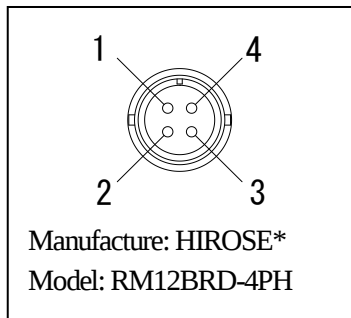
NOTE

- When mounting the optional DIN rail mounting plate or coupling plate, use the option's accessory screws. Pay attention to the screw lengths.
- For the coupling plate, use flat head machine screws (M3 × 6).
- For the DIN rail mounting plate, use binding head machine screws (M3 × 6).

2-6 POWER CONNECTOR

Model and pin No. of the power connector are described in the following.

Pin No.	Name
1	+DC IN
2	+DC IN
3	−DC IN
4	−DC IN



* HIROSE ELECTRIC CO., LTD

NOTE

- Before connecting the DC power, check the power voltage.
The operating voltage range is 11 to 16 VDC.
When the power voltage range exceeds the above range, never connect the NTB-201A.
Or, it may cause trouble or accident.
In addition, use the P-57 cable (accessory) for connecting the DC power.

MEMO

- When using the AC adapter, use the following recommended AC adapter.
Recommended AC adapter: SA-10A-EDS (100 to 240 VAC)

2-7 STATUS OF POWER LED

Statuses of the “POWER” LED are described in the following.

Status of the “POWER LED”	Operation of the NTB-201A
Light out	Power OFF / Power saving
Light up (Orange color)	Initialization / Burn-out checking
Light up (Green)	Power ON (standby)
Blinking (Green : low speed)	Measuring
Blinking (Green : high speed)	“BOX No.” Error The “BOX No.” is set to 00. The “BOX No.” is overlapping.

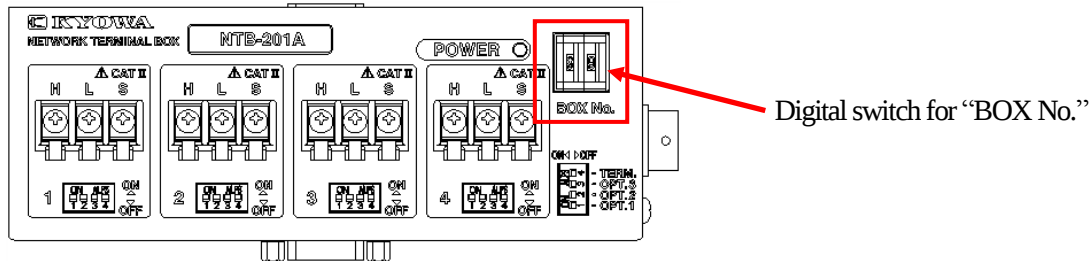
2-8 DIGITAL SWITCH FOR “BOX No.”

Digital switches are for specifying the measuring CH No.

For increasing the CH No., dial numbers to the downward, for decreasing, dial to the upward.

Be sure not to overlap the digital switches in the same network.

The settable range of the digital switch for the “BOX No.” is 01 to 99.

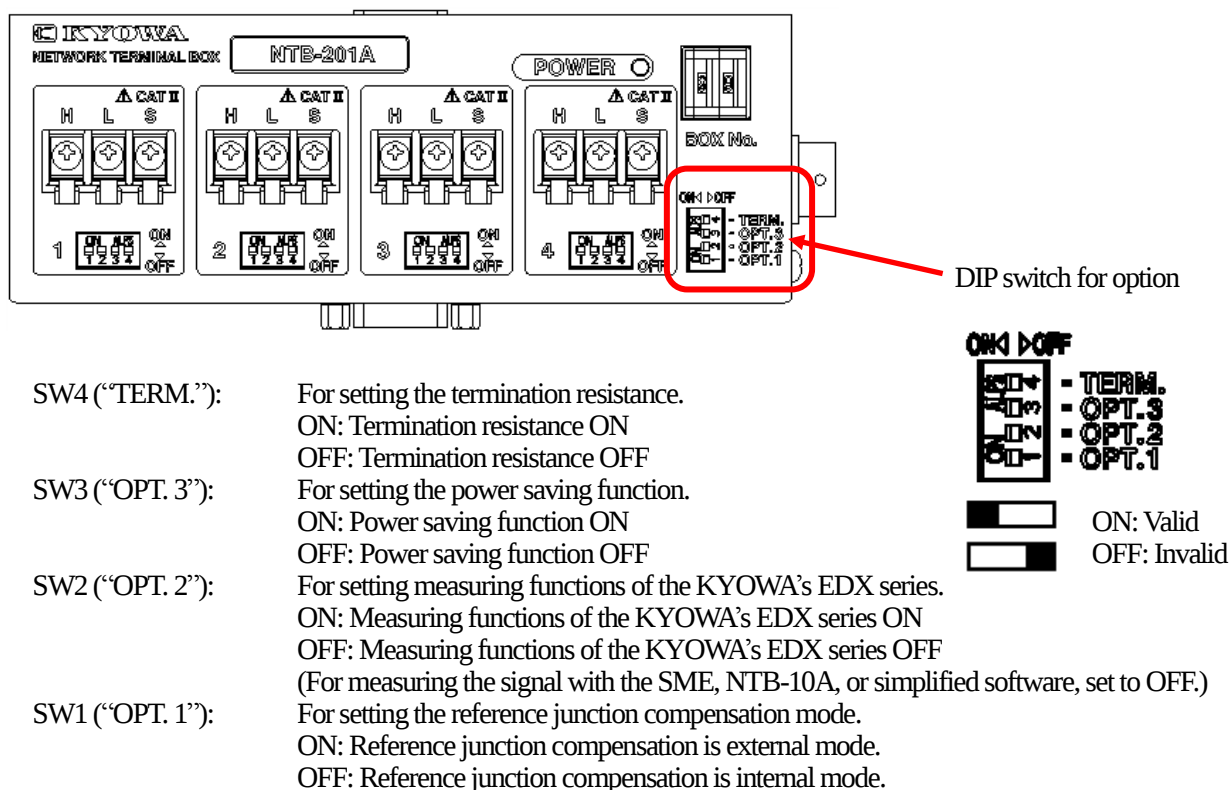


NOTE

- Do not set 00 to the “BOX No.”. Neither communication nor measurement can be conducted.

2-9 DIP SWITCH FOR OPTION

Functions of the DIP switch for option are described in the following.



NOTE

- When coupling or distributing the multiple NTB series units, turn ON the termination resistance ("TERM") of the endmost NTB series.
For termination resistance, see "3-3."
- When connecting the multiple NTB series units, SW2 ("OPT.2") and SW3 ("OPT.3") should be same.
Or, the measuring system does not operate properly.
If each setting does not match, does not operate properly.
- The setting of the DIP switch for option becomes valid after the NTB-201A is turned ON or after clicking the **File** - **Environment Setting** - **NTB comm. check** button of the NTB-10A.

MEMO

- If the power save function SW3 ("OPT. 3") is set to ON, the NTB-201A becomes power saving status after turning ON. (The POWER LED lights out.)
- For communication and measurement, the power saving status is released temporarily. (The POWER LED lights up and flickers.)
- After the communication or measurement is not conducted for 3 minutes or more, the NTB-201A becomes power saving status again. (The POWER LED lights out.)
- The NTB-201A automatically repeats the operations in 2) and 3) in accordance with the status.

2-10 FOR COUPLING AND DISTRIBUTED ARRANGEMENT WITH OTHER NTB SERIES

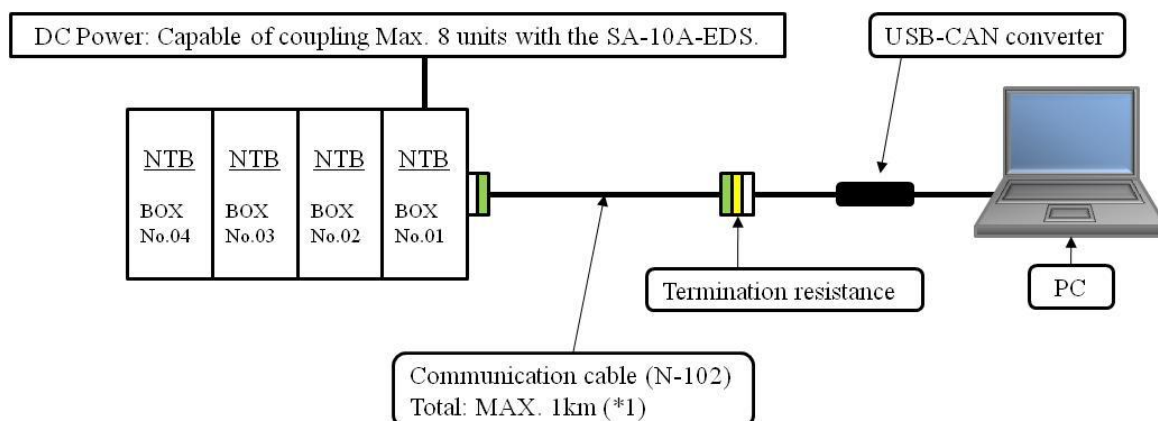
Capable of coupling the NTB-201A with the other NTB series unit by using the “Coupling connector.”
If coupled, wire-saving layout can be obtained since the coupled units require DC power, USB-CAN converter, termination resistance, and communication cable each.

Use the DIN rail (option) or coupling plate (option, model: CN-1A) for coupling.

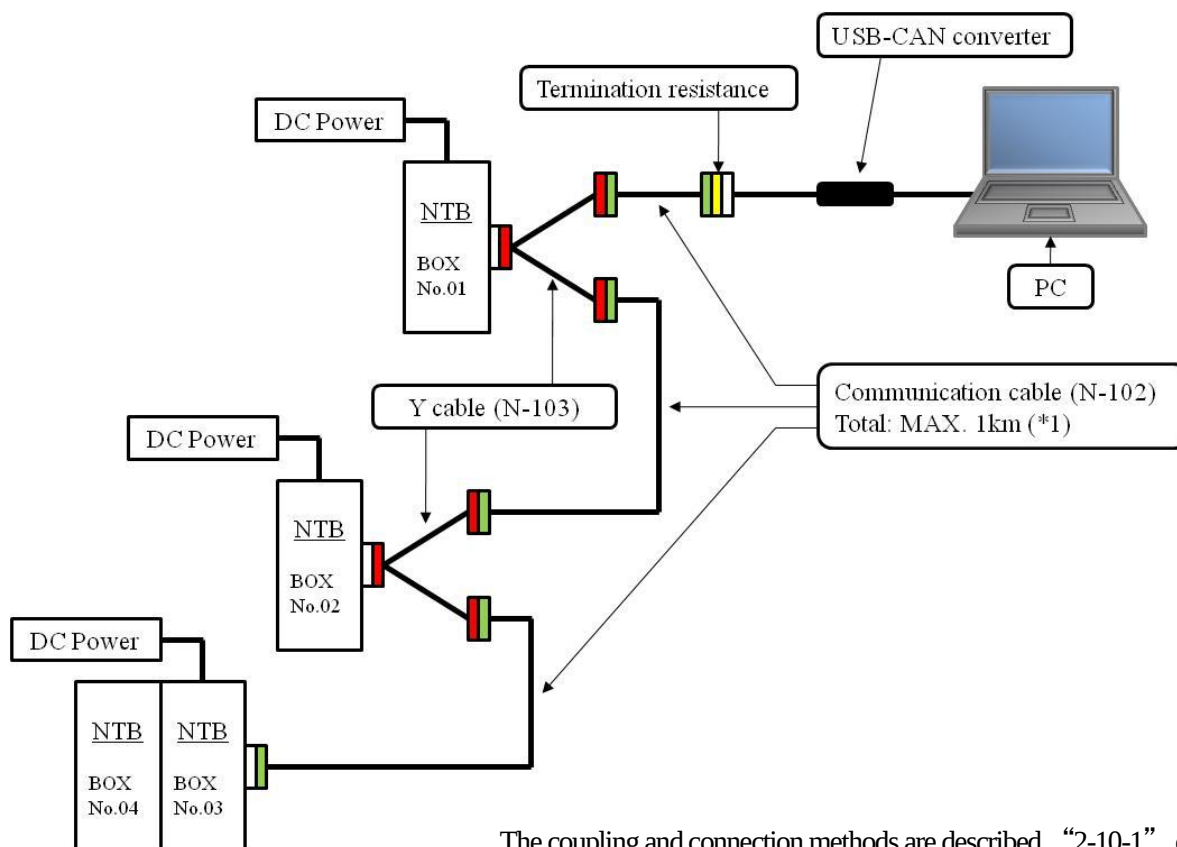
For distributed arrangement, use the Y cable and communication cable for connecting the other NTB series.

At that time, every units requires DC power.

■ For coupling (when using the PC)



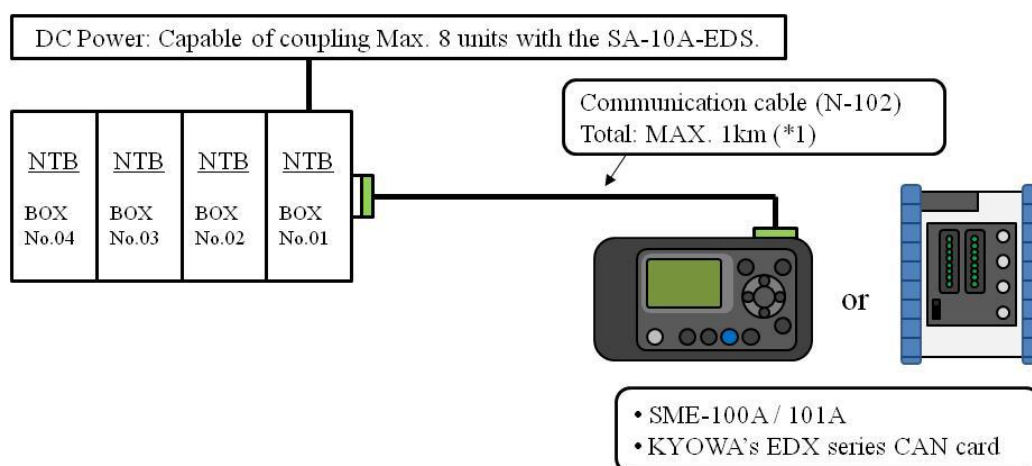
■ For distributed arrangement (when using the PC)



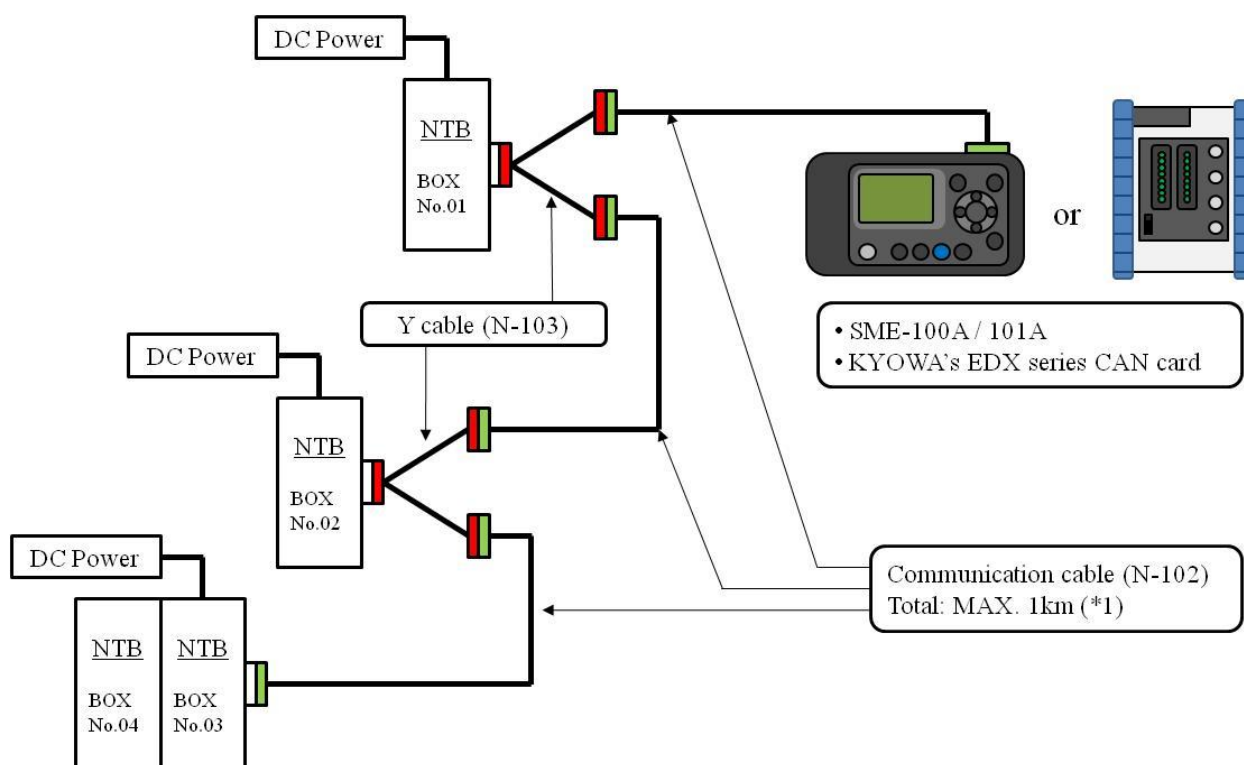
The coupling and connection methods are described “2-10-1” or later.

*Note: When requiring a cable the other than optional cable, contact KYOWA or our representatives.

- For coupling (when using the SME-100A/101A or KYOWA's EDX series CAN card)



- For distributed arrangement (when using the SME-100A/101A or KYOWA's EDX series CAN card)



The coupling and connection methods are described “2-10-1” or later.

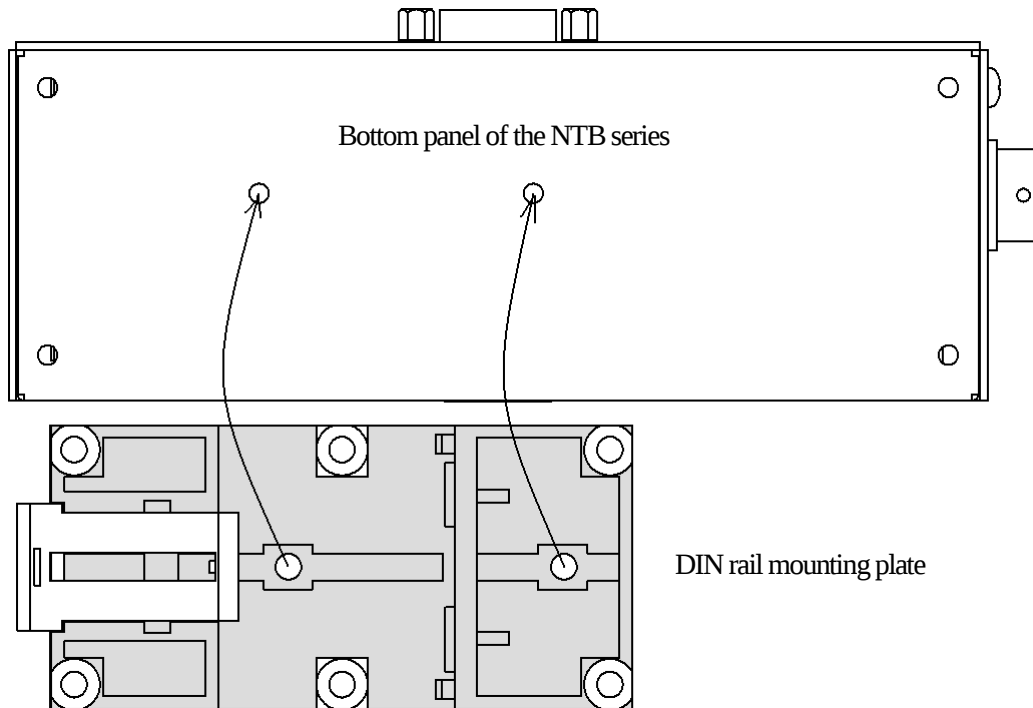
*Note: When requiring a cable the other than optional cable, contact KYOWA or our representatives.

2-10-1 For mounting NTB series units (2) to DIN rail

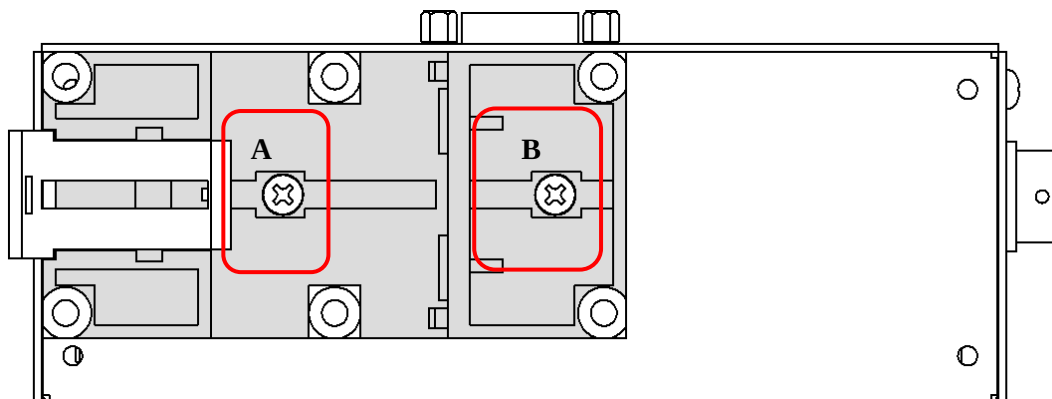
This section describes how to mount any 2 units of the NTB series to the DIN rail.

The following is an example of mounting DIN rail when using any two units of NTB-100A series and NTB-201A.

- 1) Set the DIN rail mounting plate (option) to the bottom panel of the NTB series.

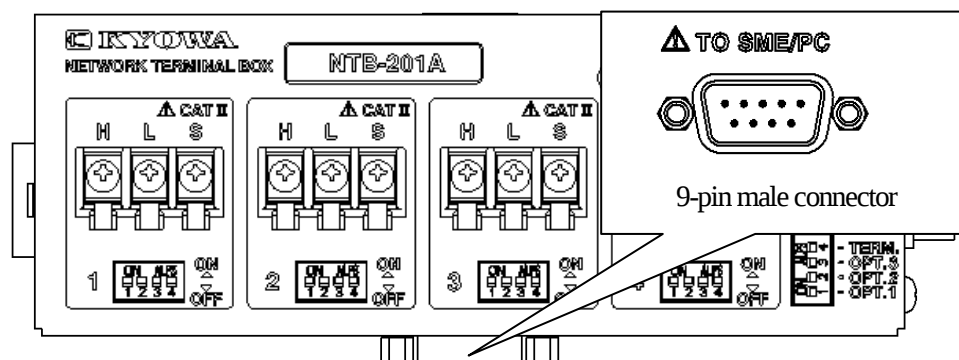


- 2) Fasten the screws of the DIN rail mounting plate to the NTB series.
(Fasten the A and B screws in the following.)



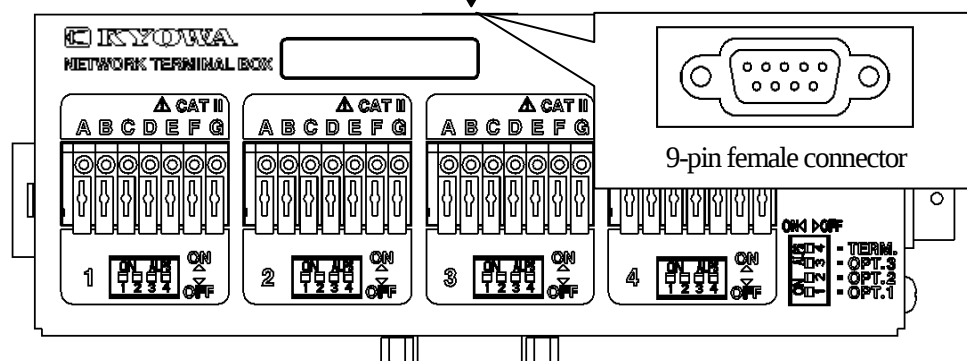
3) Connect the “Coupling connector” of the 1st unit and “Communication connector” of the 2nd unit.

- NTB-201A (2nd unit)

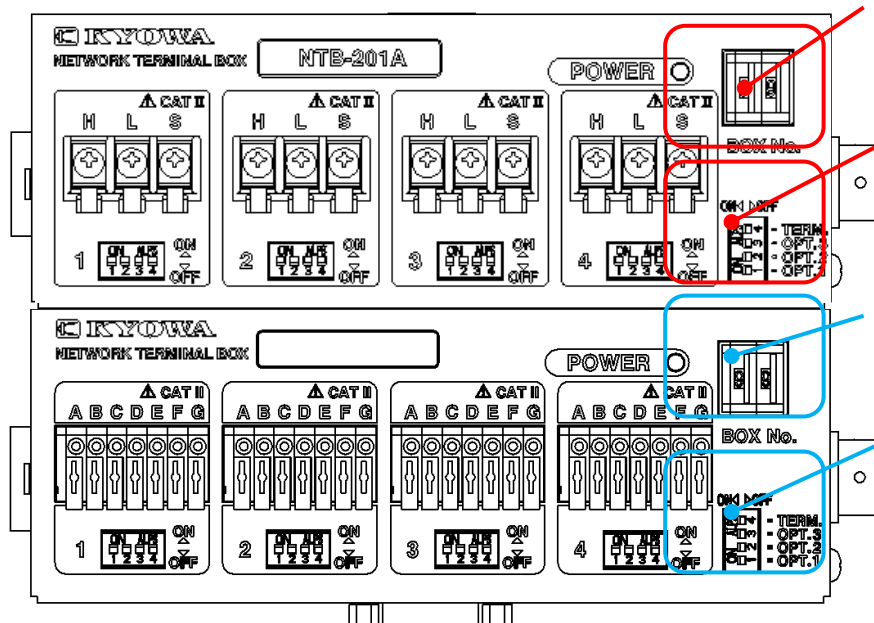


Connect the “Coupling connector” of the 1st unit and “Communication connector” of the 2nd unit.

- NTB-100A series (1st unit)



■ When coupling 2 units



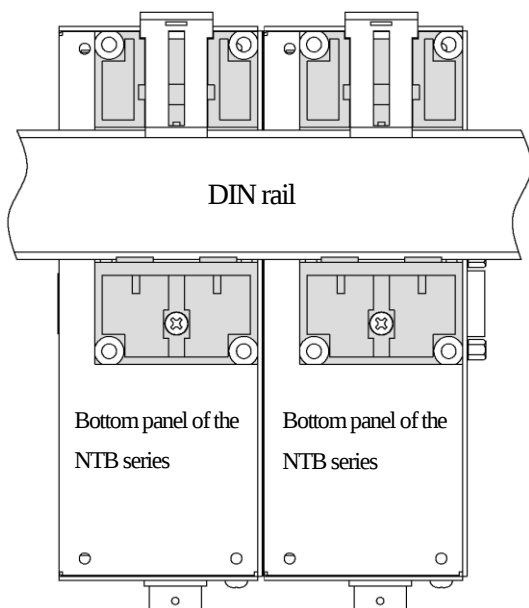
Set the BOX No. of the 2nd unit to 02.

Set the SW4 (“TERM.”: termination resistance) of the DIP switch for option to ON.

Set the BOX No. of the 1st unit to 01.

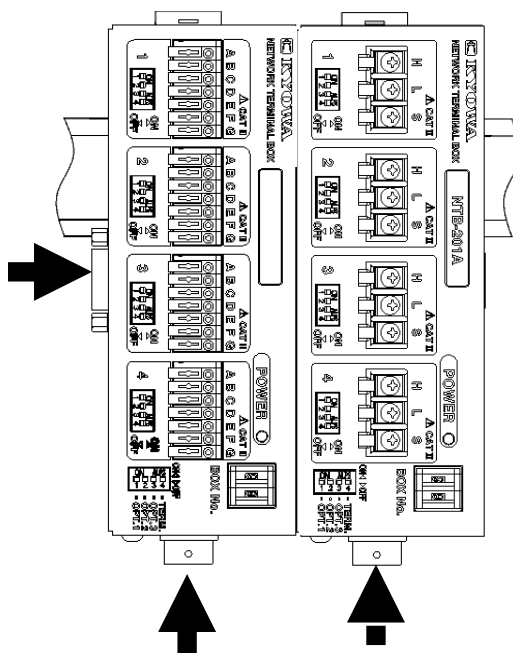
Set the SW4 (“TERM.”: termination resistance) of the DIP switch for option to OFF.

- 4) Mount the coupled NTB series units to the DIN rail.



- 5) Connect the DC power and connect the termination resistance and USB-CAN converter with the communication cable (N-102 *Note) to the 1st unit.

Connect the termination resistance and USB-CAN converter with the communication cable (N-102 *Note).



Connect the DC power.

The DC power is not required for the 2nd unit (and after).

*Note: When requiring a cable the other than optional cable, contact KYOWA or our representatives.

NOTE

- When using the multiple NTB series units by coupling or in a same network, set the termination resistances ("TERM.") of the NTB series units of both sides in the network to ON. For termination resistance, see "3-3."
- When coupling the multiple NTB series units, set the "BOX No." so as not to overlap.
- After changing the "BOX No.", turn OFF and ON the power.
Or click the **File** → **Environment Setting** → **NTB comm check** in the NTB-10A.
- For mounting the optional DIN rail mounting plate to the NTB-201A, use the accessory screws. Pay attention to the screw lengths. Use binding head machine screws (M3 × 6).

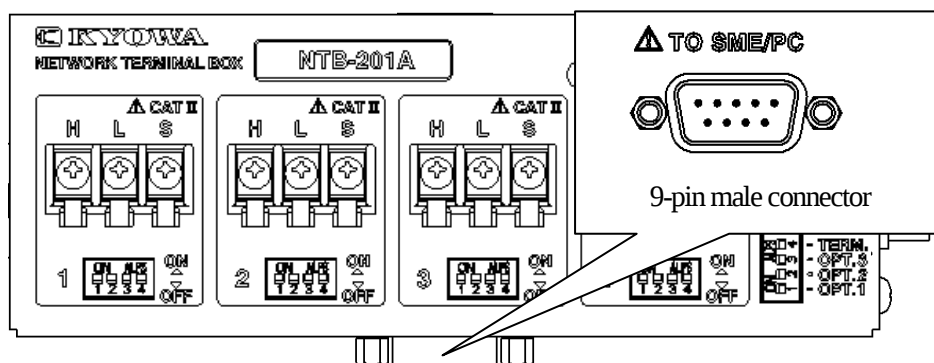
2-10-2 For Using NTB Series Units by Coupling

This section describes how to couple the 2 units of the NTB series.

The following is an example of mounting coupling plate when using any two units of NTB-100A series and NTB-201A.

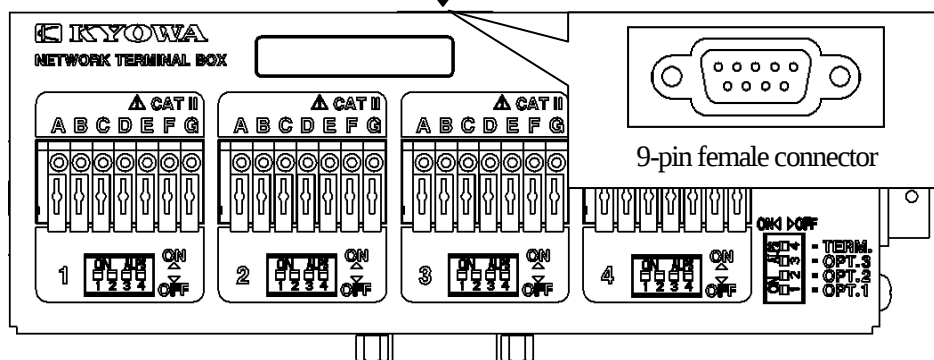
- 1) Connect the Coupling connector of the 1st unit NTB series and Communication connector of the 2nd unit NTB series.

- NTB-201A (2nd unit)

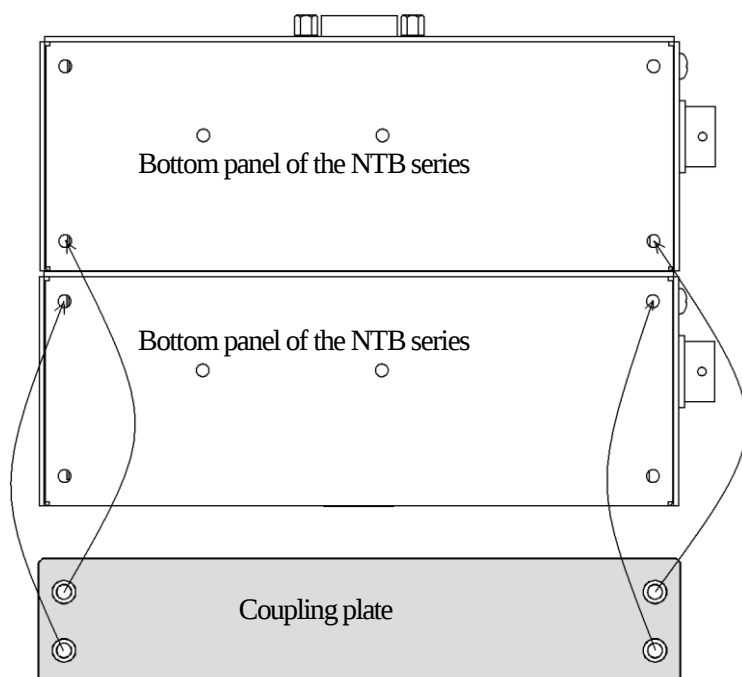


Connect the Coupling connector of the 1st unit and Communication connector of the 2nd unit.

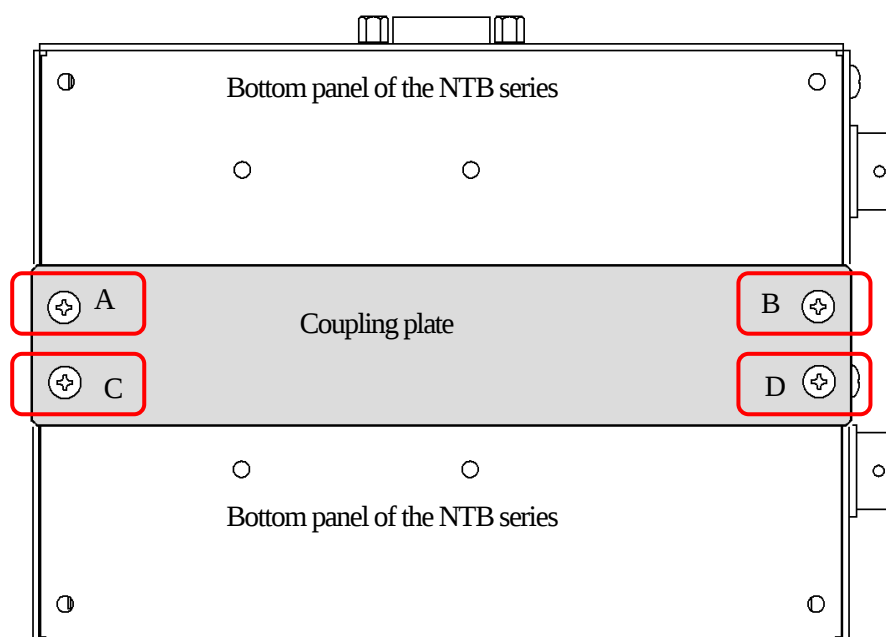
- NTB-100A series (1st unit)



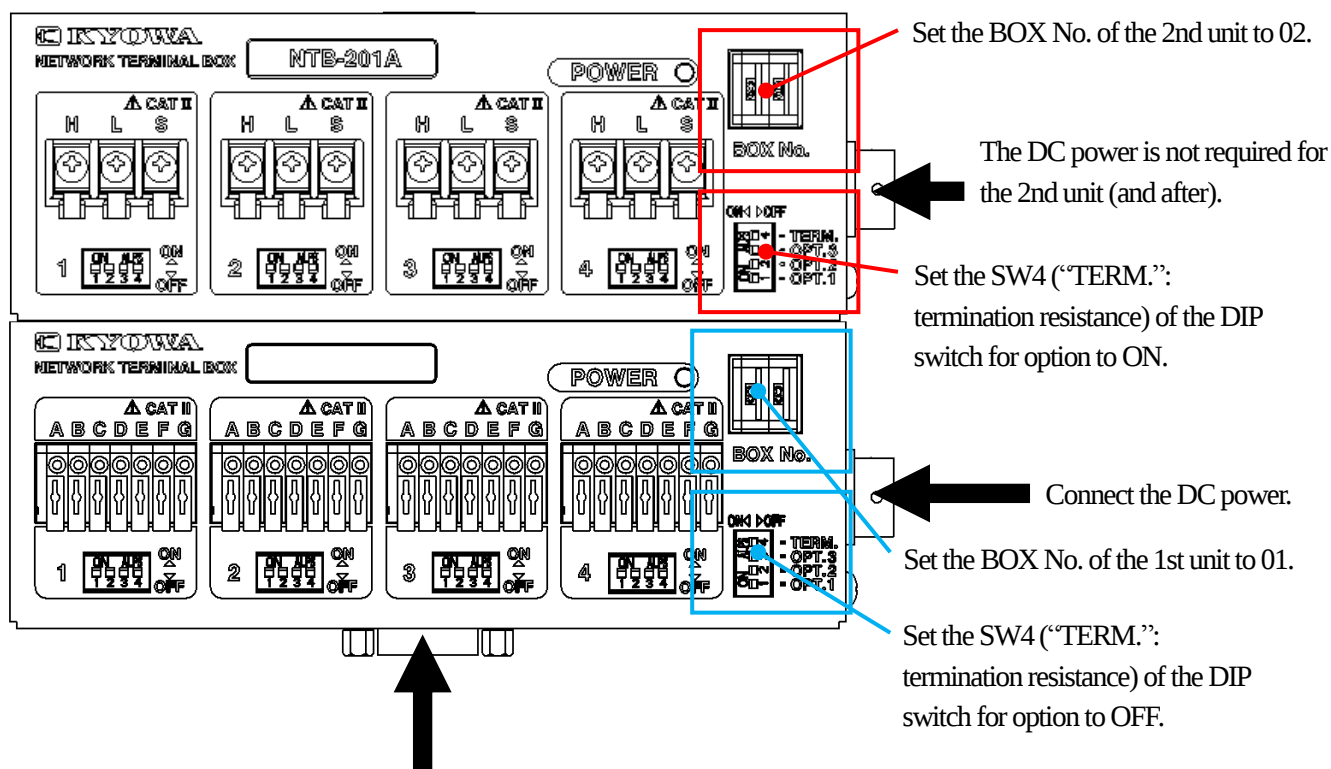
- 2) Set the optional coupling plate (CN-1A) to the bottom panel of the NTB series units.



- 3) Fasten screws on the coupled plate to couple the NTB series units.
(Fasten the A, B, C, and D screws in the following.)



- 4) Connect the DC power and connect the termination resistance and USB-CAN converter with the communication cable (N-102 *Note) to the 1st unit.



Connect the termination resistance and USB-CAN converter with the communication cable (N-102 *Note).

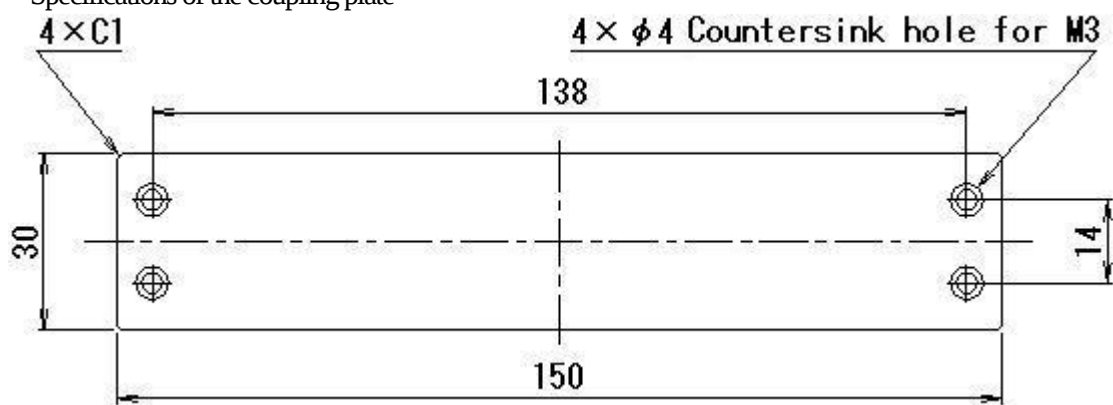
*Note: When requiring a cable the other than optional cable, contact KYOWA or our representatives.

NOTE

- When using the multiple NTB series units by coupling or in a same network, set the termination resistances (“TERM.”) of the NTB series units of both sides in the network to ON.
For terminator, see “3-3.”
- When coupling the multiple NTB series units, set the “BOX No.” so as not to overlap.
- After changing the “BOX No.”, turn OFF and ON the power.
Or click the **File** → **Environment Setting** → **NTB comm check** in the NTB-10A.
- For mounting the optional DIN rail mounting plate to the NTB-201A, use the accessory screws.
Pay attention to the screw lengths. Use binding head machine screws (M3 × 6).

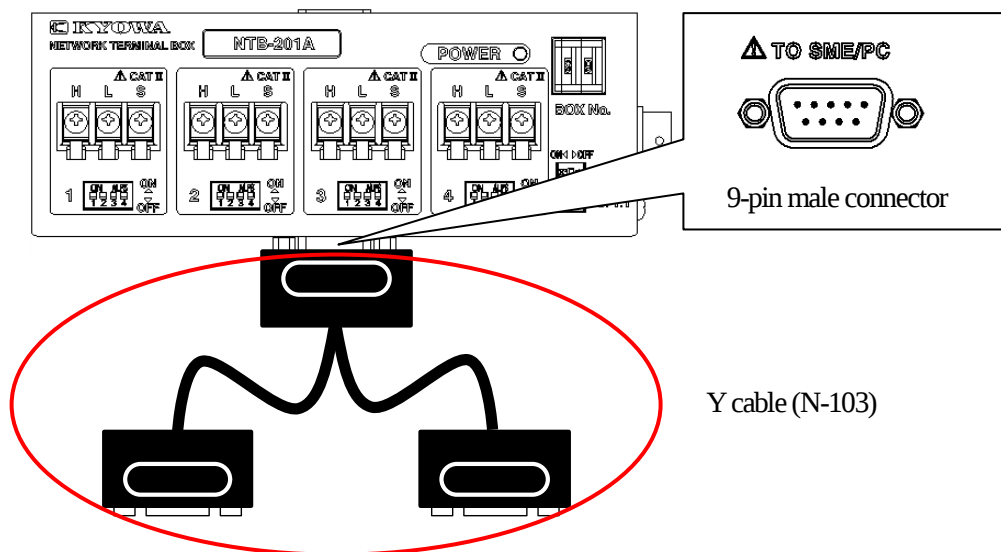
MEMO

- Specifications of the coupling plate

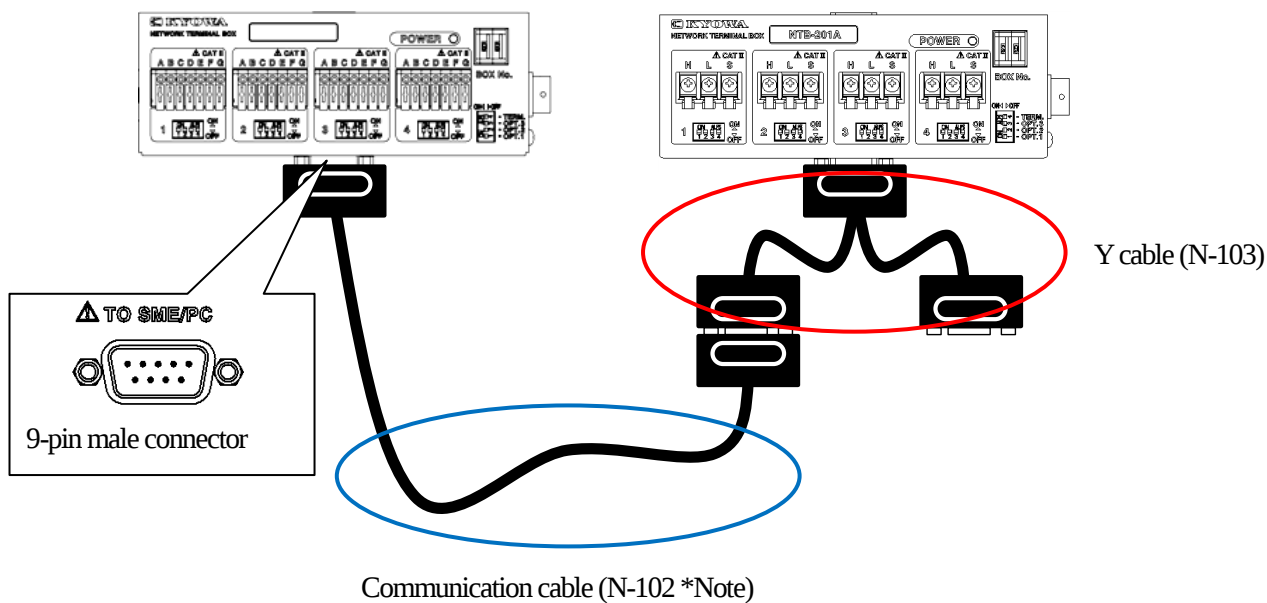


2-10-3 For Using NTB Series Units in Distributed Arrangement

- 1) For the 1st NTB series, connect the Y cable (N-103) to the “TO SME/PC” communication connector.

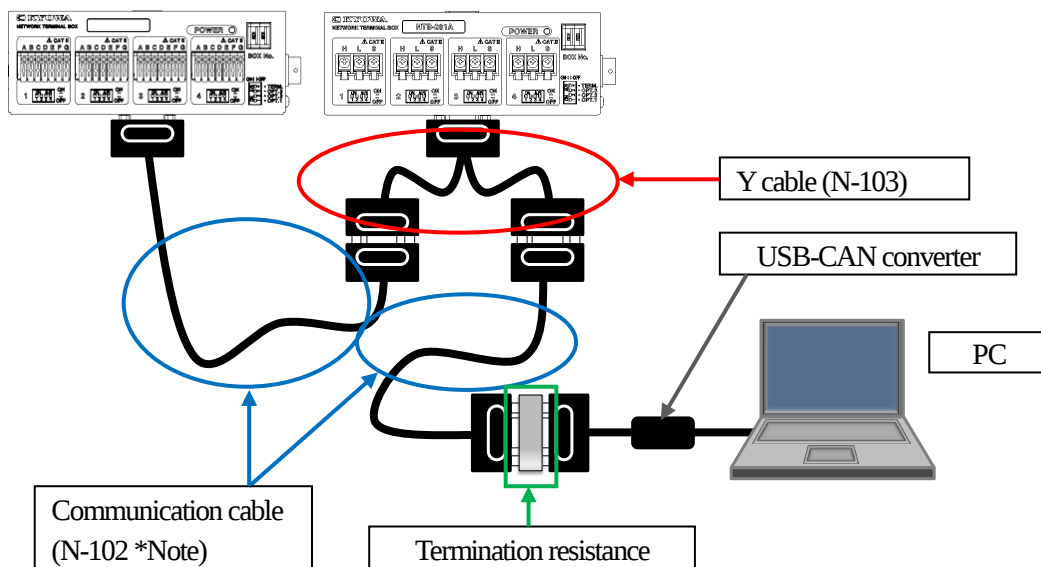


- 2) Connect the “TO SME/PC” communication connector of the 2nd NTB series and an one end of the Y cable of the 1st NTB series with the communication cable (N-102 *Note).

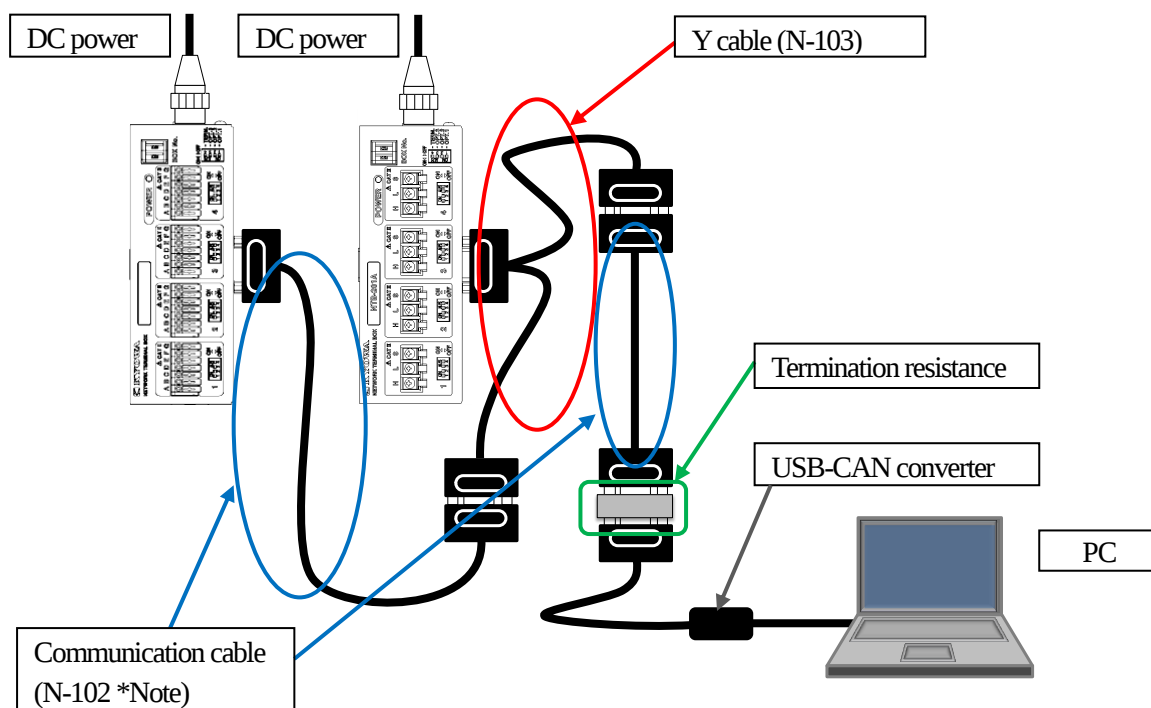


*Note: When requiring a cable the other than optional cable, contact KYOWA or our representatives.

- 3) Connect the communication cable (N-102 *Note) to another end of the Y cable (N-103). And connect the termination resistance to another end of the communication cable and USB-CAN converter. Then connect the PC to the USB-CAN converter.



- 4) Supply power to the every NTB series.



*Note: When requiring a cable the other than optional cable, contact KYOWA or our representatives.

NOTE

- When using the multiple NTB series units by coupling or in a same network, set the termination resistance ("TERM.") of the NTB series units of both sides in the network to ON. For termination resistance, see "3-3."
- When coupling the multiple NTB series units, set the "BOX No." so as not to overlap.
- After changing the "BOX No.", turn OFF and ON the power.
Or click the **File** → **Environment Setting** → **NTB comm check** of the NTB-10A.

3. HOW TO INSTALL

3-1 INSTALLATION PROCEDURES

This section describes necessary preparations from installation to measurement.

Follow the following procedures as far as possible.

Section 3-2 Set the “BOX No.”
↓

... Set the “BOX No.” of the NTB series.

Section 3-3 Set the termination resistor
↓

... Set the termination resistance.

Section 3-4 Connect the sensor and set the CH mode
↓

... Connect various sensors and set the CH mode.

Section 3-5 Grounding
↓

... Ground the earth (Ground).

Section 3-6 Connect the power
↓

... Connect the DC power or AC adapter.

Chapter 4 Measure with the simplified software

... Prepare for the measurement and measure signals with the simplified software.
See “4. FOR MEASURING WITH SIMPLIFIED SOFTWARE.”

Chapter 5 Measure with the KYOWA’s EDX series

... Prepare for the measurement and measure signals with the KYOWA EDX series.
See “5. FOR MEASURING WITH KYOWA’s EDX SERIES.”

For measuring signals with the NTB-10A (NTB series control software), refer to the NTB-10A Network Terminal Box Control Software Instruction Manual.

For signals with the KYOWA’s Handy Data Logger (SME-100A/101A), refer to the SME series Handy Data Logger Instruction Manual.

3-2 SET “BOX No.”

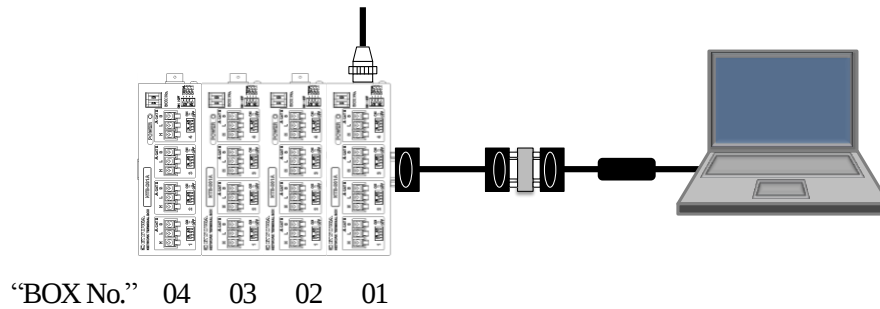
Before setting the “BOX No.”, disconnect the power.

Set the “BOX No.” on the top panel of the NTB series.

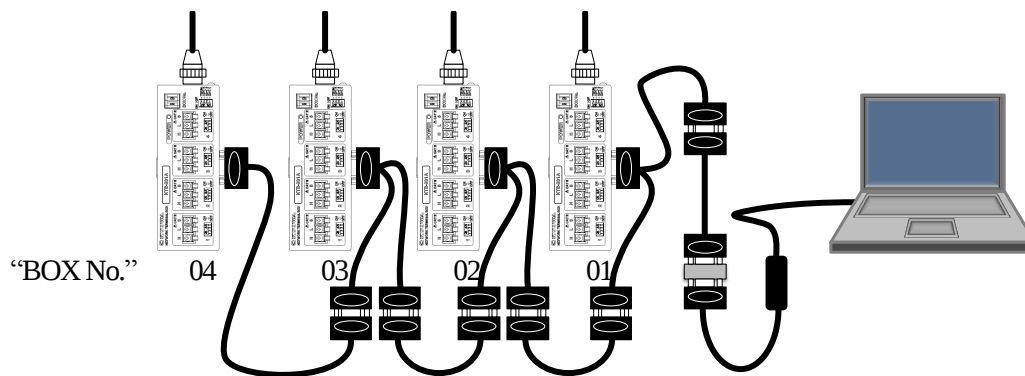
The measuring CH number is specified by the “BOX No.” and CH No.

From “1” to “4” on the top panel of the NTB series units are corresponding to the actual CHs in the following table.

- 1) For coupling (with the PC)



- 2) For distributed arrangement (with the PC)



“BOX No.”	CH No.	Actual CH No	“BOX No.”	CH No.	Actual CH No.
01	1	CH1 of the “BOX No.” 01	03	1	CH1 of the “BOX No.” 03
	2	CH2 of the “BOX No.” 01		2	CH2 of the “BOX No.” 03
	3	CH3 of the “BOX No.” 01		3	CH3 of the “BOX No.” 03
	4	CH4 of the “BOX No.” 01		4	CH4 of the “BOX No.” 03
02	1	CH1 of the “BOX No.” 02	04	1	CH1 of the “BOX No.” 04
	2	CH2 of the “BOX No.” 02		2	CH2 of the “BOX No.” 04
	3	CH3 of the “BOX No.” 02		3	CH3 of the “BOX No.” 04
	4	CH4 of the “BOX No.” 02		4	CH4 of the “BOX No.” 04

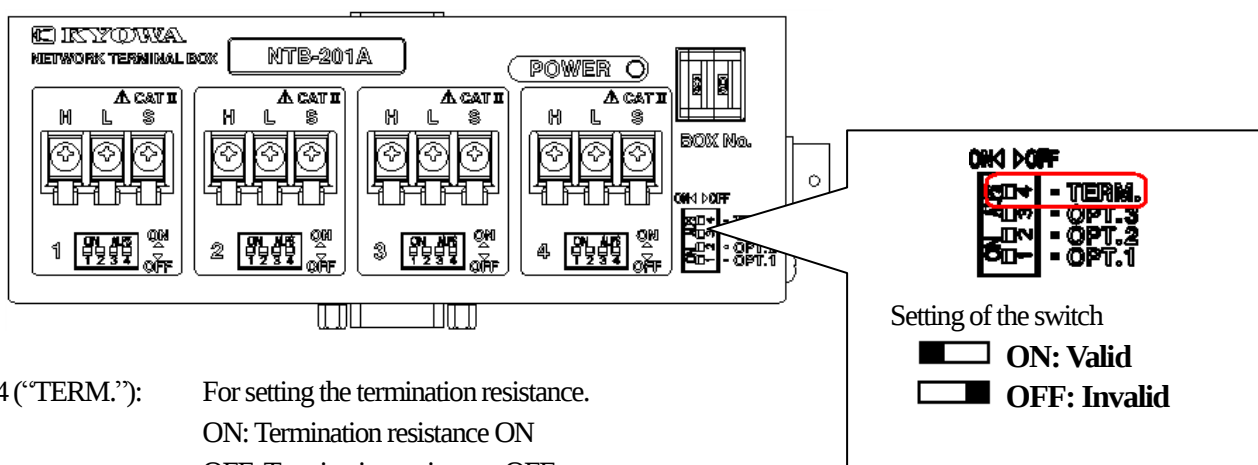
NOTE

- When turning ON the NTB series, the “BOX No.” is read. Therefore, set the “BOX No.” before turning ON the NTB series. After that, turn ON the power.
- Setting range of the “BOX No.” is 01 to 99. Do not set 00.
- Set the “BOX No.” so as not to overlap.

3-3 SET TERMINATION RESISTANCE

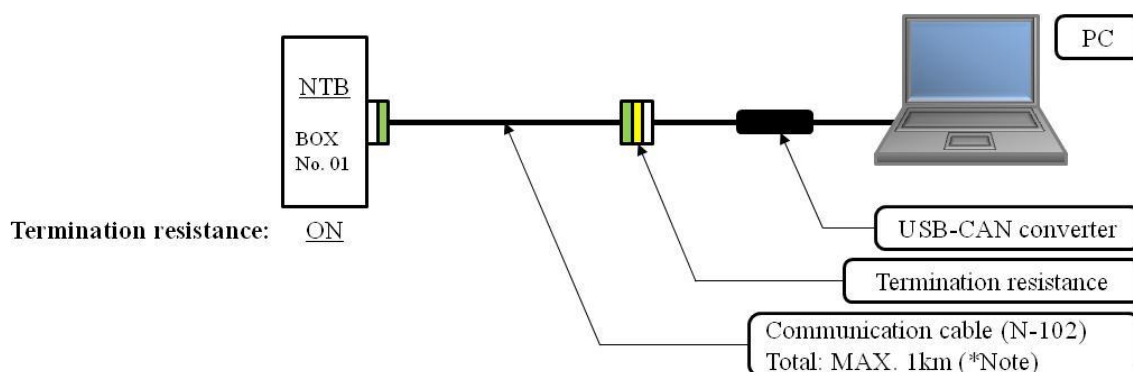
Before setting the termination resistance, disconnect the power.

- When using one NTB series: Set the termination resistance (“TERM.”) switch of the “DIP switch for option” to ON.
- When using 2 or more NTB series units: Turn ON the terminal resistance (“TERM.”) switch of the furthest NTB from the PC.(SME-100A/101A)

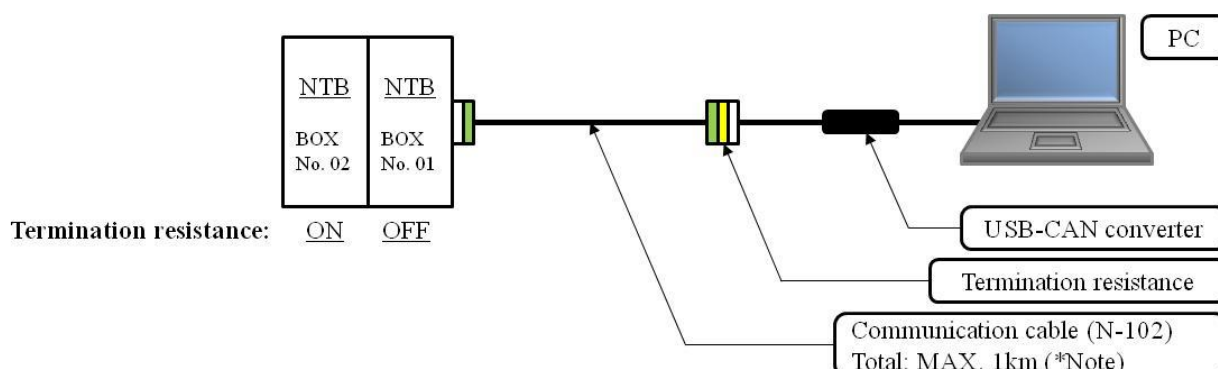


- SW4 (“TERM.”): For setting the termination resistance.
ON: Termination resistance ON
OFF: Termination resistance OFF
- SW3 (“OPT. 3”): For setting the power saving function.
- SW2 (“OPT. 2”): For setting the measuring function of the KYOWA’s EDX series.
- SW1 (“OPT. 1”): For setting the reference junction compensation mode.

- For connecting one NTB series (When using the PC)

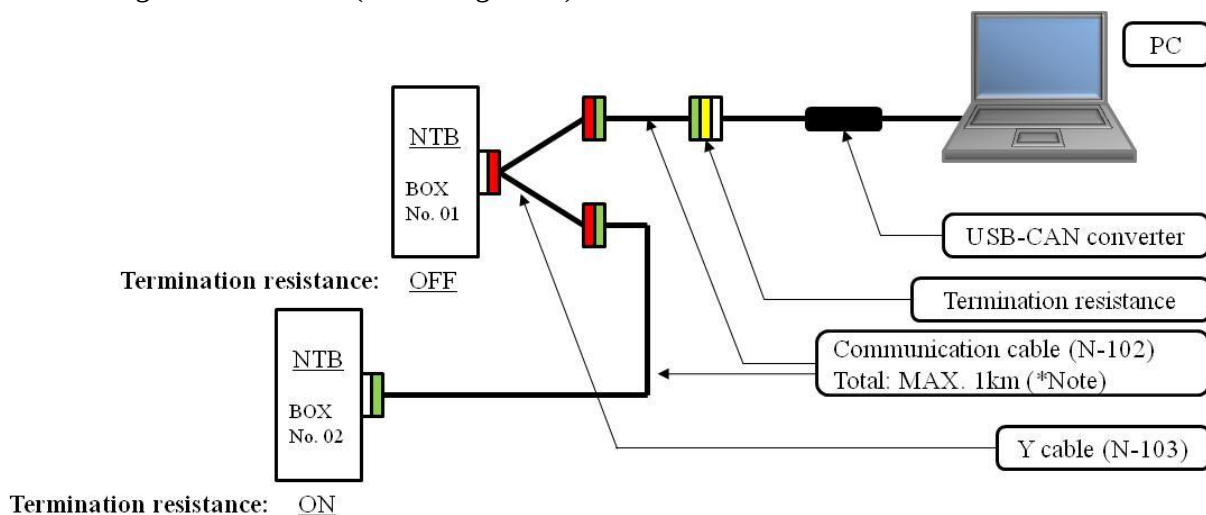


- For coupling 2 NTB series units (When using the PC)

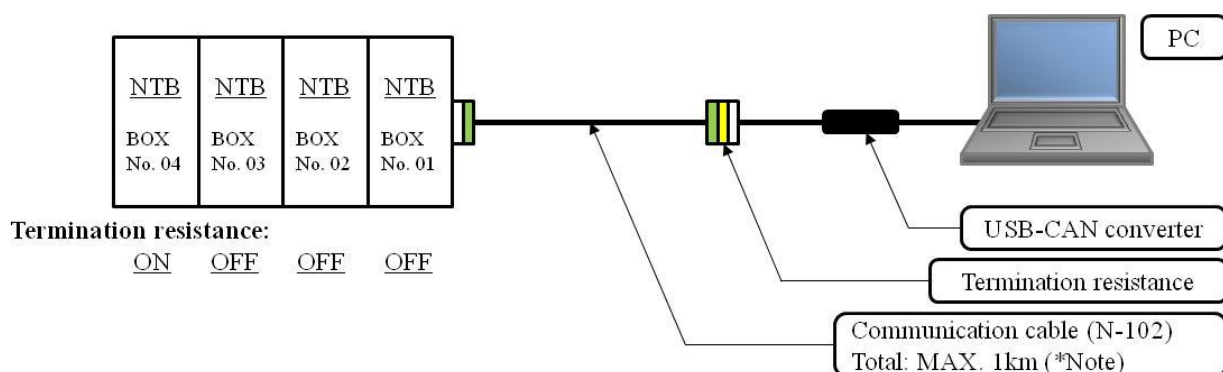


*Note: When requiring a cable the other than optional cable, contact KYOWA or our representatives.

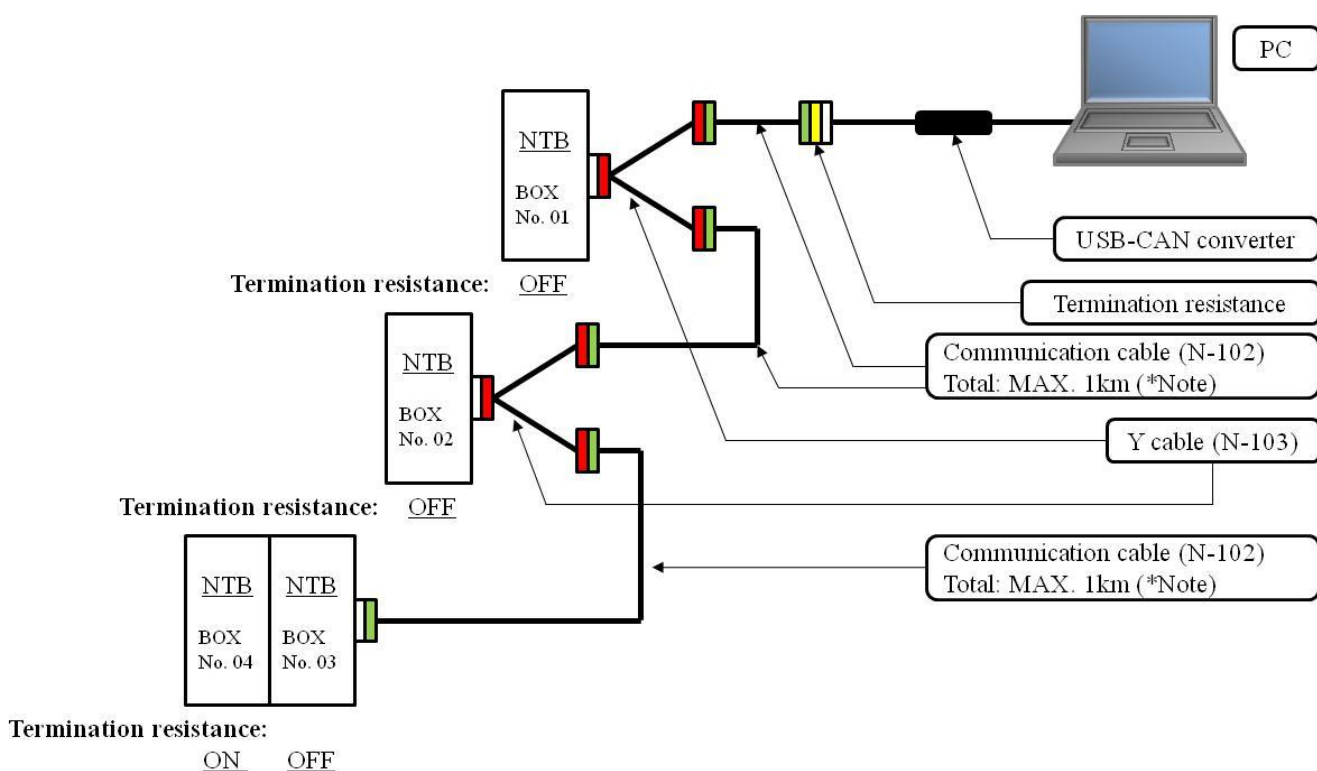
- For distributing 2 NTB series units (When using the PC)



- For coupling 4 NTB series units (When using the PC)

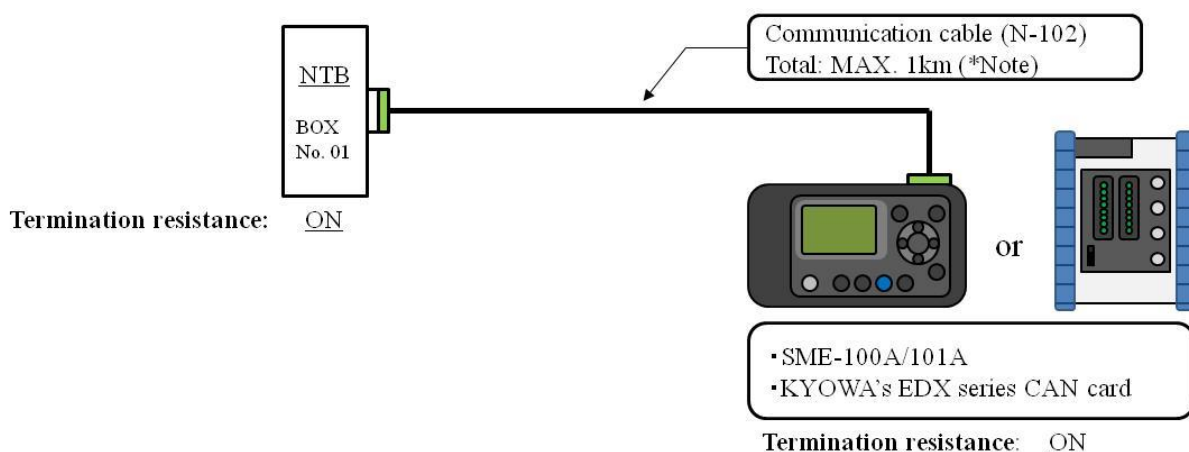


- For distributing 4 NTB series units (When using the PC)

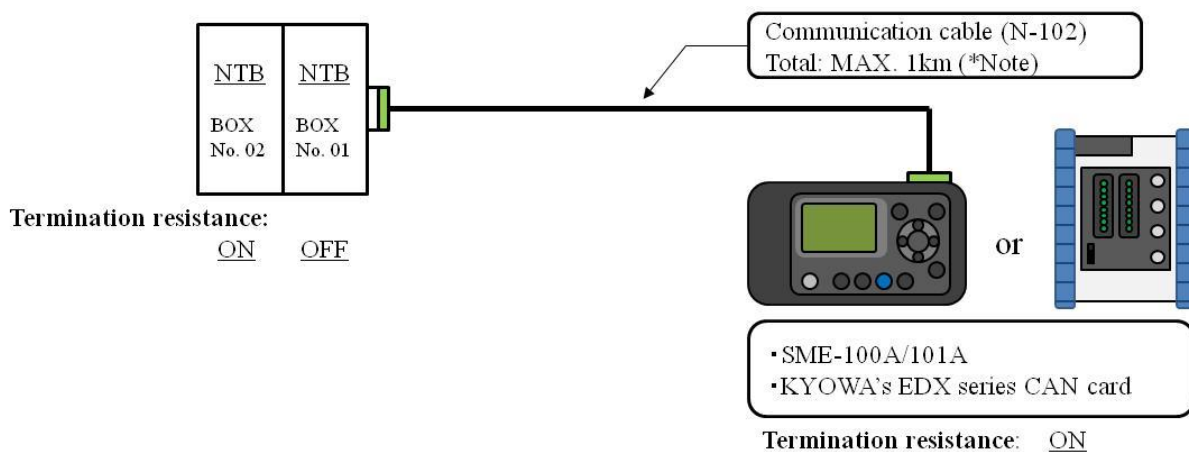


*Note: When requiring a cable the other than optional cable, contact KYOWA or our representatives.

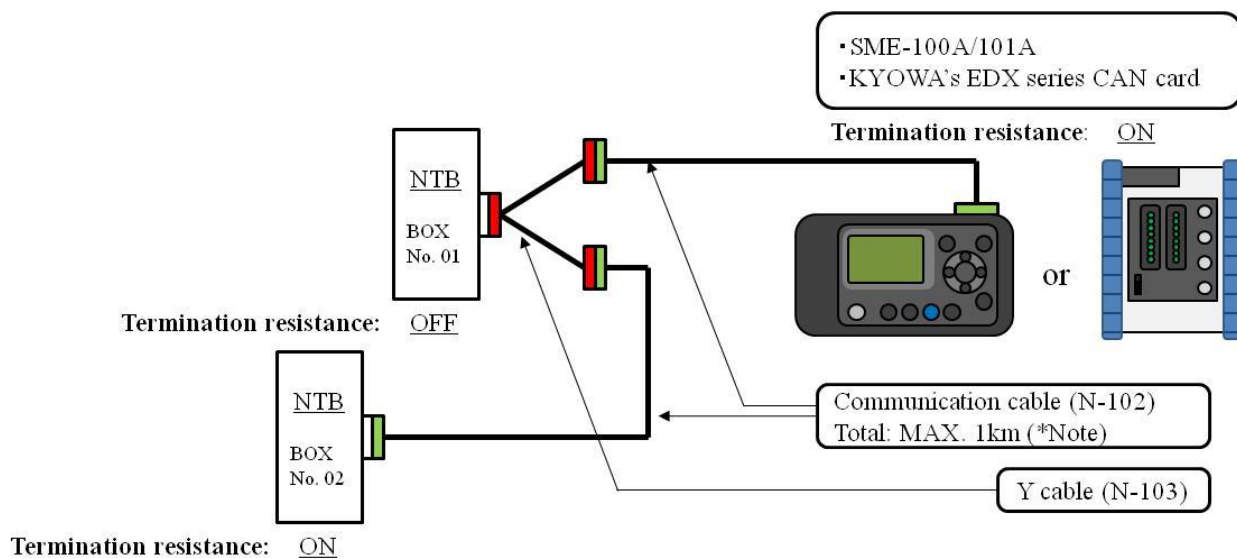
- For connecting one NTB series (When using SME-100A/101A or KYOWA's EDX series CAN card)



- For coupling 2 NTB-100A series units (When using SME-100A/101A or KYOWA's EDX series CAN card)

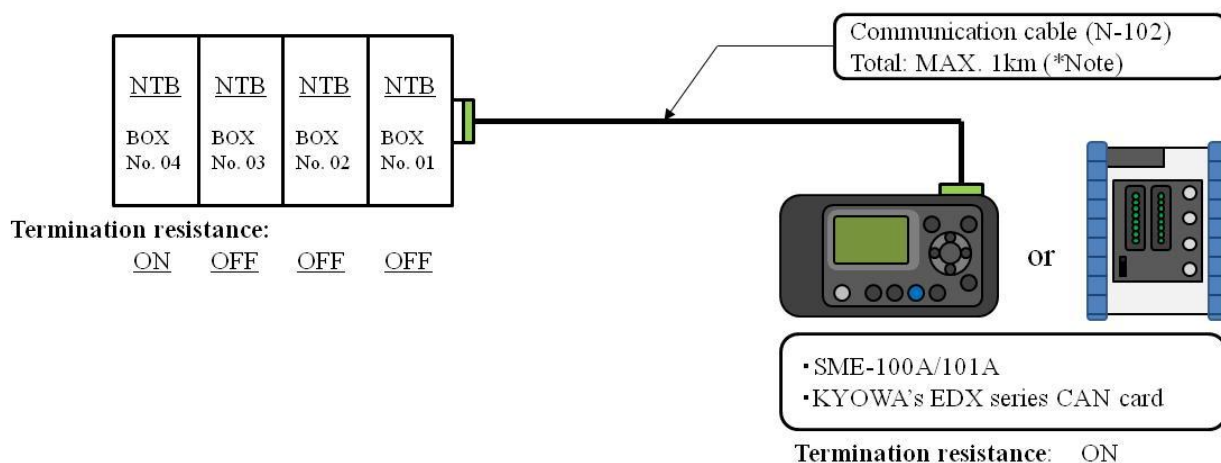


- For distributing 2 NTB series units (When using SME-100A/101A or KYOWA's EDX series CAN card)

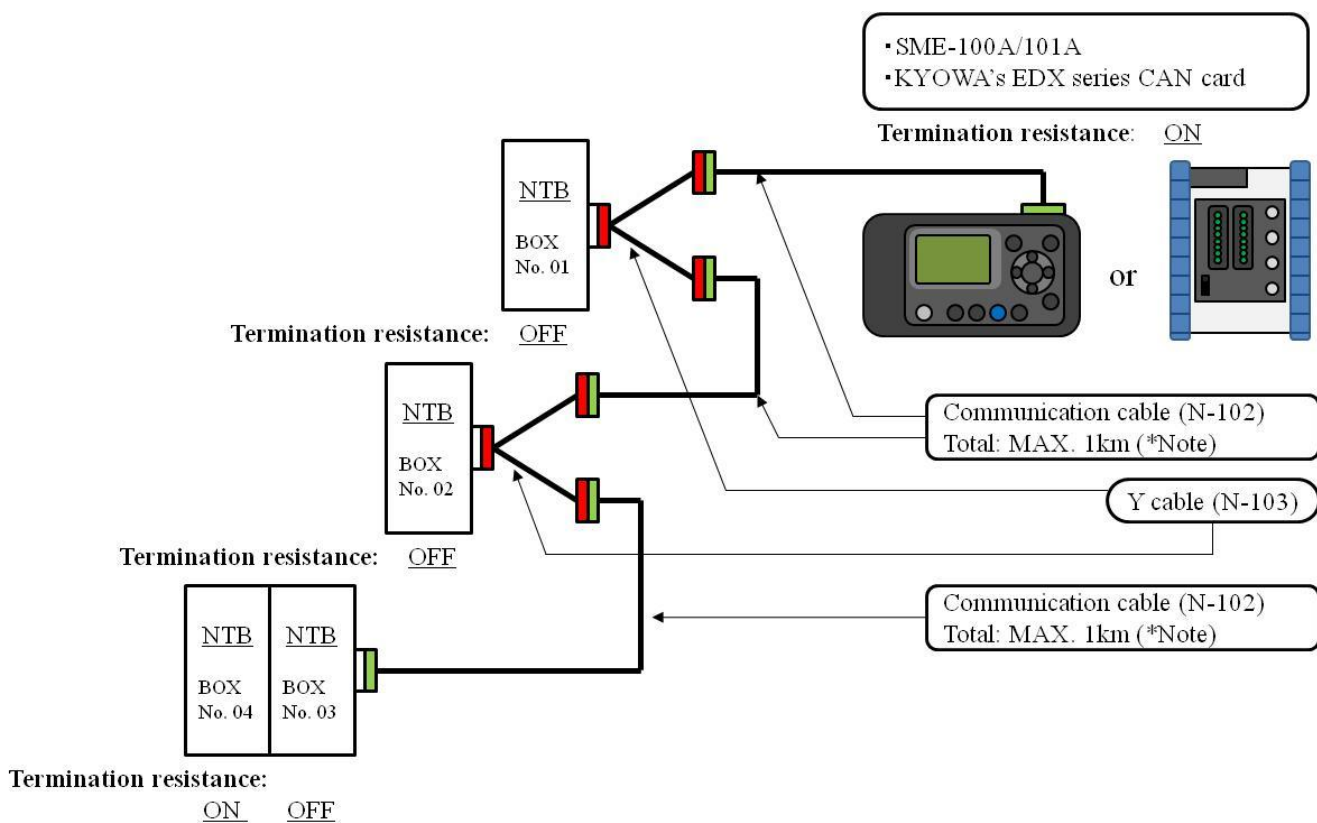


*Note: When requiring a cable the other than optional cable, contact KYOWA or our representatives.

- For coupling 4 NTB series units (When using SME-100A/101A or KYOWA's EDX series CAN card)



- For distributing 4 NTB series units (When using SME-100A/101A or KYOWA's EDX series CAN card)



*Note: When requiring a cable the other than optional cable, contact KYOWA or our representatives.

■ What is termination resistance?

It is required to terminate at both ends of the pair signal lines (CAN_H and CAN_L).

That is because the CAN bus allows two-way communication.

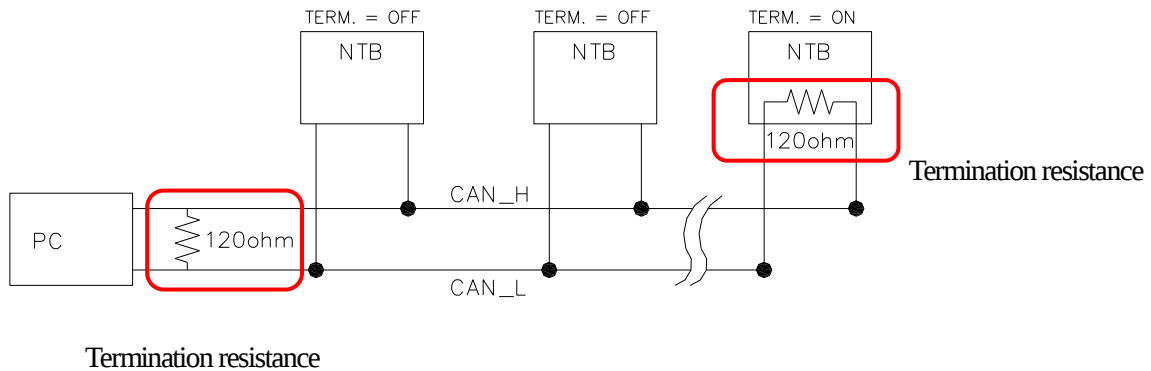
In a standard 9-pin D-sub connector, a CAN_L: pin2 and CAN_H: pin7.

The terminator on the cable should be match with the nominal impedance of the cable.

Since the ISO 11898 requires a cable with nominal impedance 120 ohm, the resistor of the 120 ohm should be used for the terminal.

When installing multiple devices on the cable, the devices on the both end of the cable require terminator.

Example of the termination method is described in the following.



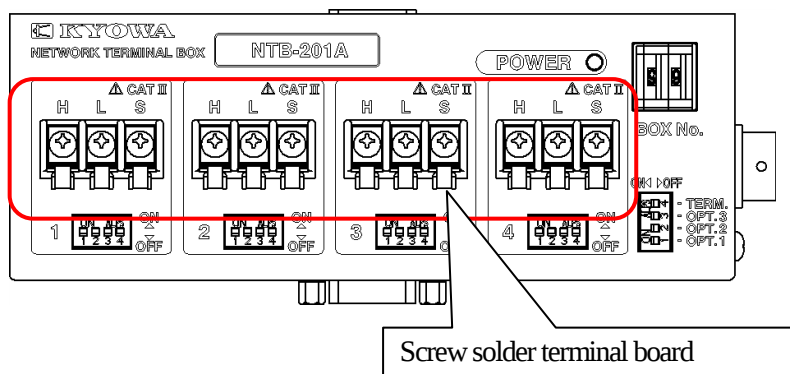
3-4 CONNECT SENSOR AND SET CH MODE

3-4-1 Connect Sensor

Before connecting the sensor, disconnect the power.

Before connecting lead wires, peel off the lead wire about 9 to 10 mm in advance.

■ Types and features of the terminal board for input



- Screw solder terminal board: After loose a screw with a phillips-head screwdriver, connect the sensor. Then, fasten the screw. For the connection method, see “3-4-3” and “3-4-4.”

3-4-2 Set CH mode

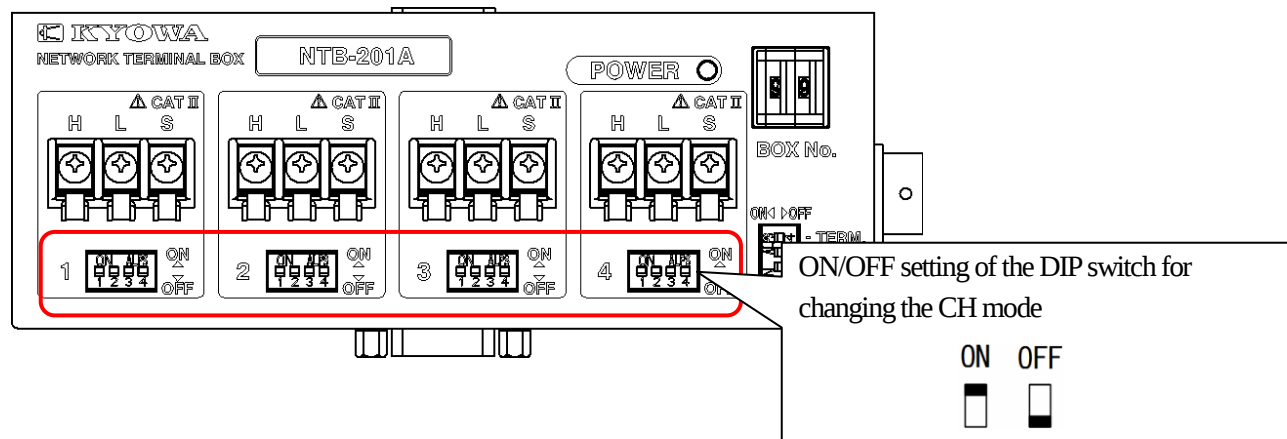
Before setting the CH mode, disconnect the power.

This section describes a relation between a target CH mode and DIP switch for changing the CH mode.

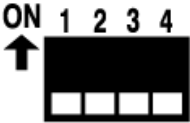
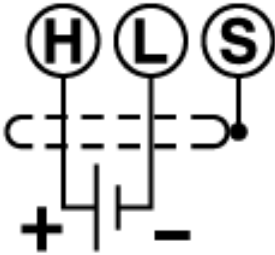
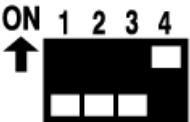
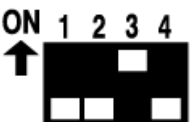
Set the CH mode to every CH.

For the settings other than described, the CH modes become SKIP and the measurements are not conducted.

(For the CH mode, see “3-4-3” and “3-4-4.”)



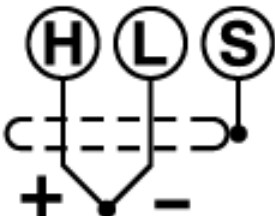
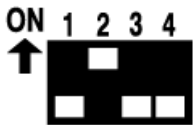
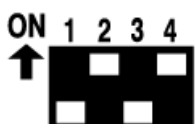
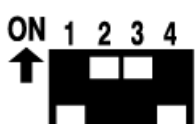
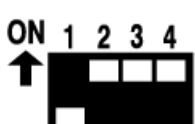
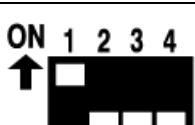
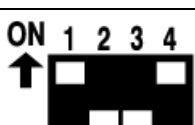
3-4-3 CH modes and connection methods (Connecting to a voltage output transducer)

Measuring Method	Connection Method	Setting of the DIP switch	CH mode
No measurement.			SKIP
Voltage measurement			10V range
			50V range

MEMO

- For the instability of the measurement value, connect (ground) the GND of the NTB-201A to the earth.

3-4-4 CH modes and connection methods of (Connecting to a thermocouple)

Measuring Method	Connection Method	Setting of the DIP switch	CH mode
No measurement.			SKIP
Temperature measurement using thermocouples			TC/K
			TC/T
			TC/E
			TC/J
			TC/N
			TC/R

MEMO

- For the temperature measurement, adapt the NTB-201A to the using environment and make terminal temperatures stable.
Do not expose the NTB-201A to direct sunlight or wind from air conditioners.
If temperature gradient occurs, it may cause temperature error.
- Install the NTB-201A as horizontally as possible.
If the NTB-201A is installed vertically or is propped against wall etc., temperature gradient occurs and it may cause measurement error.
- Use shielded and twisted pair thermocouples.
If parallel or unshielded thermocouples are used, measurement errors caused by the effect of external noise are generated.
- Never connect thermocouples directly to the target with larger potential than the earth.
Or, it may cause trouble or measurement errors.
- For the instability of the measurement value, connect (ground) the GND of the NTB-201A to the earth.

3-5 GROUNDING

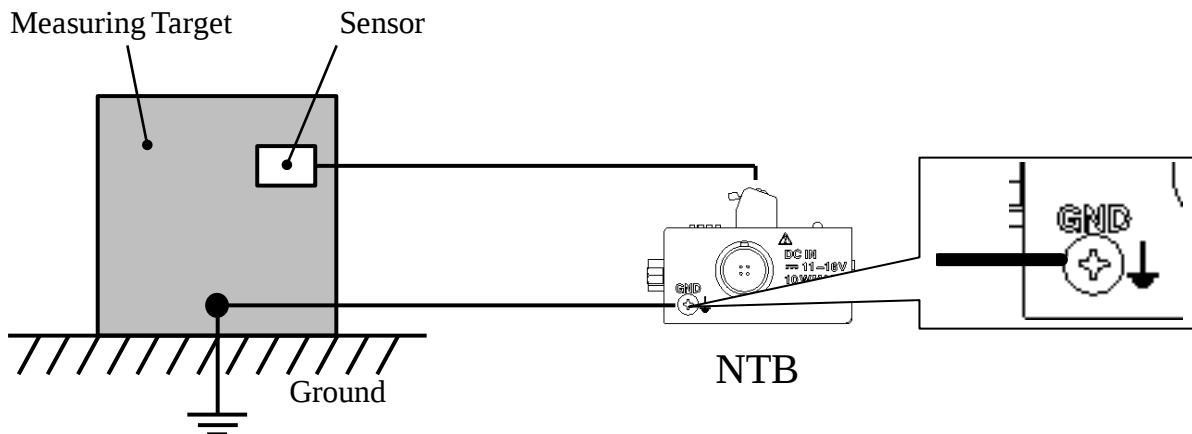
Before grounding, disconnect the power.

Ground the “GND” terminal (protective grounding terminal) on the side panel (power connector side).

1) Example 1: When measuring target is grounded

Check that the measuring target (specimen) is surely grounded and connect as follows.

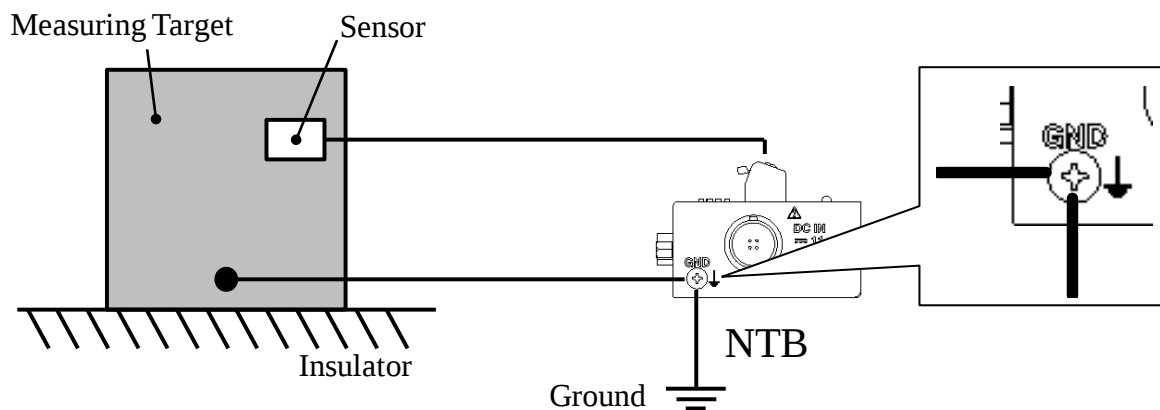
- (1) Connect the measuring target (specimen) and “GND” terminal (ground) of the NTB series with the accessory ground wire.



2) Example 2: When measuring target is insulated from ground

Check that the measuring target (specimen) is surely insulated and connect as follows.

- (1) Connect the “GND” terminal of the NTB series and earth (ground) with the accessory ground wire.
- (2) Connect the measuring target (specimen) and “GND” terminal (ground) of the NTB series with the green color heat-resistance vinyl coated wire.



- Ground the “GND” terminal to prevent the NTB series from being affected by noise as well as receiving electric shock due to leaks in the electric current. Be sure to ground the GND terminal.
- Use the accessory ground wire for wire rod.
- When a length or the number of the ground wire is short, use green heat-resistance vinyl coated wire having a nominal diameter of 0.75 mm² or more.
- Basis of the grounding is one-point grounding. If the grounding is made at more than 2 points, it should be noted that a loop may be formed resulting to cause the NTB series easily affected by noise.
- Grounding should be independently made from the power system 300 V or more.

3-6 CONNECT POWER

1) Connect DC power

Before connecting the DC power cable, check the power voltage.

The operating power voltage of the NTB-201A is from 11 to 16 VDC. Be sure to keep this operating power voltage.

Use the DC power 10W or more. (Capable of coupling the 8 NTB series units with 10W.)

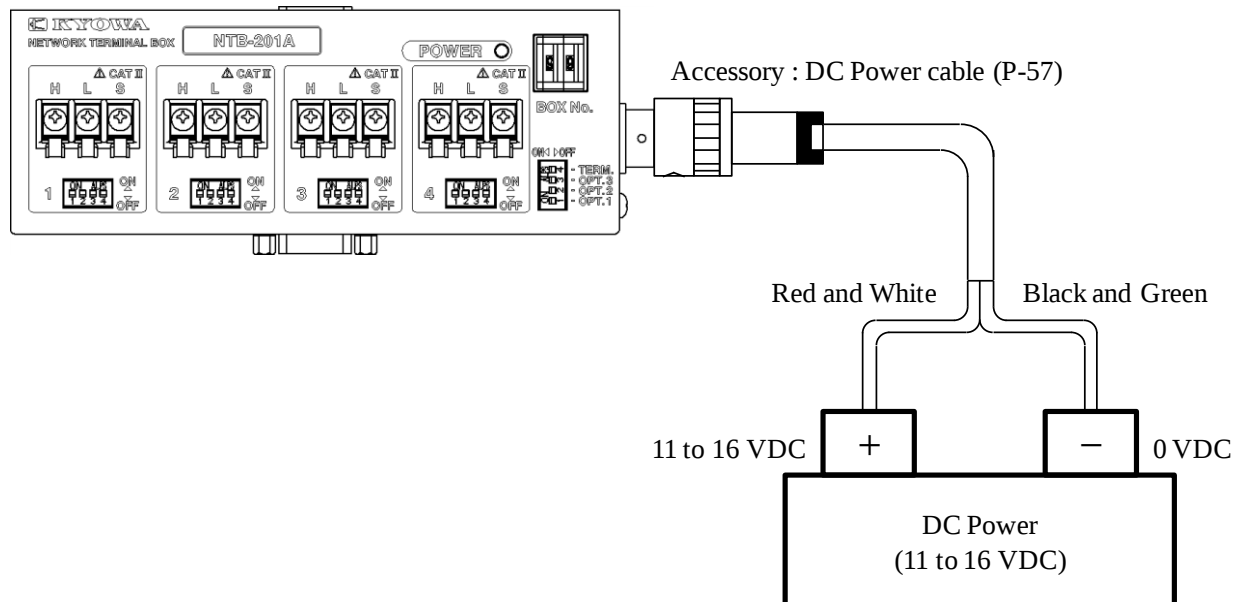
Supply power with the accessory DC power cable (P-57).

Connect a connector side of the power cable to the NTB-201A.

Connect black and green wires at the end of the power cable to the – side of the DC power.

Connect red and white wires at the end of the power cable to the + side of the DC power.

Connection diagram of the DC power is described in the following.



NOTE

When the power voltage exceeds the above operating voltage range or when the + and – sides are connected adversely, it may cause trouble and accident.

2) Connect AC adapter

Connect the optional AC adapter (SA-10A-EDS) to the power connector on the side panel to supply power.

Before connecting the power cable of the AC adapter to the AC outlet, check the power voltage.

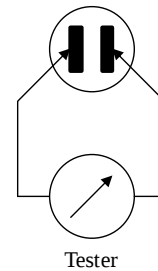
The operating power voltage of the AC adapter is from 100 to 240 VAC. Be sure to keep this operating power voltage.

If the power voltage exceeds the above specified voltage range or if the power voltage terminal has potential with excessive power voltage against the ground, no connection is made and it may cause trouble or damage to the NTB-201A.

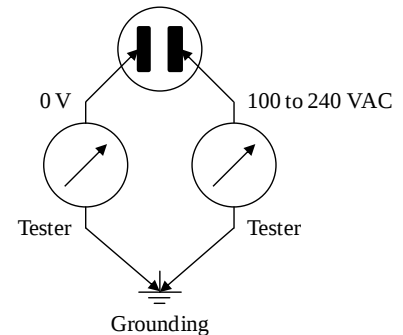
Method of confirming the power voltage is described in the following.

- (1) Measure voltage between AC receptacle terminals with a tester and confirm it is between 100 to 240 VAC.

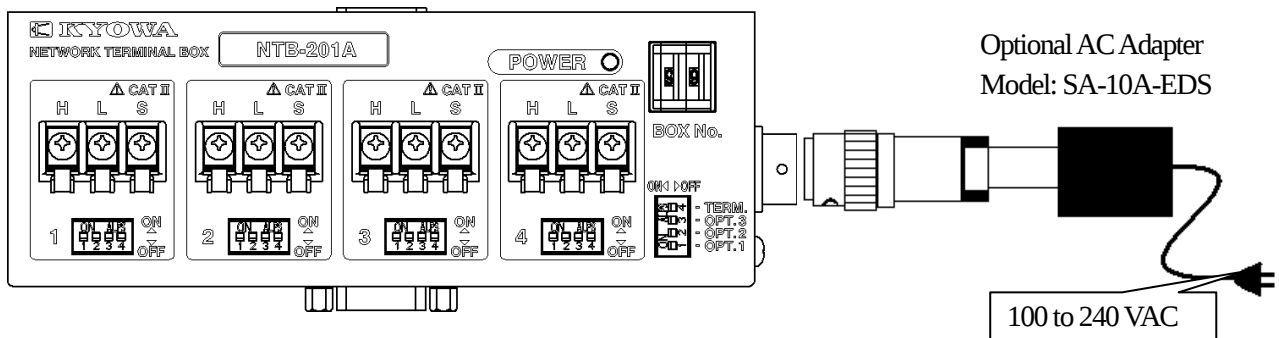
100 to 240 VAC



- (2) Measure the voltage between the ground and each end of the AC power receptacle with a tester. Confirm one end has 0 V and the other, 100 to 240 VAC.



- (3) If the NTB-201A is used at site using apparatuses generating interfering noise, for example, induction motor, electric welding machine, etc., power supply condition may be deteriorated due to excessive noise. Take appropriate measures against the noise by using an insulation transformer or commercially available noise-cut transformer.



- (4) If the power voltage excessively varies, it is recommended to use a stabilized power supply unit.

4. FOR MEASURING WITH SIMPLIFIED SOFTWARE

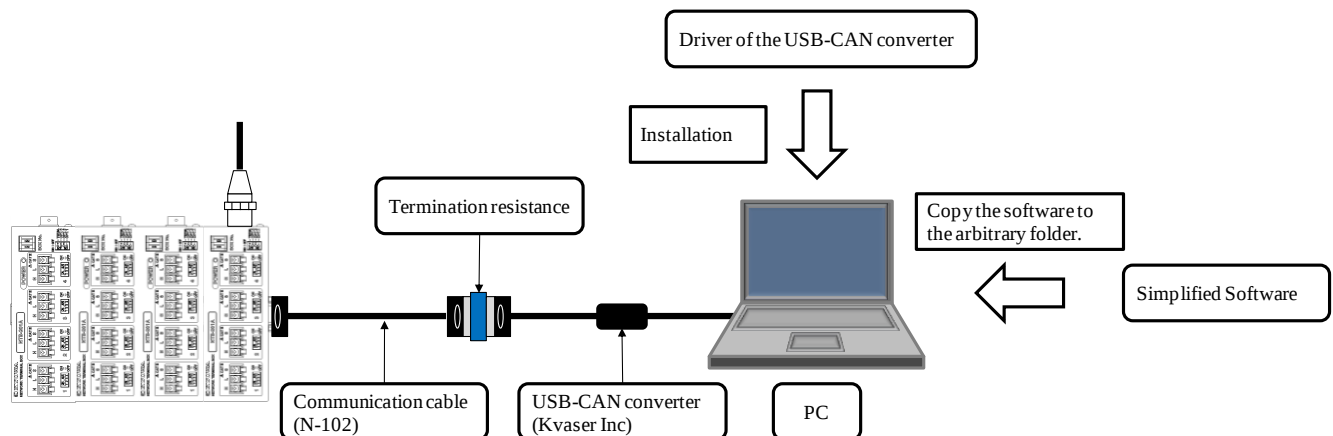
The Simplified Software is the software to control the NTB-201A and NTB-100A series from the PC and numerically display the measured data on the EXCEL sheet.

For activating this Simplified Software, it is required to install a driver of the USB-CAN converter.

Capable of creating your original software by referring this Simplified Software.

4-1 SYSTEM CONFIGURATION AND SPECIFICATIONS OF SOFTWARE WHEN USING SIMPLIFIED SOFTWARE

■ System Configuration	
CPU	Pentium 4 2 GHz or more
OS	Microsoft Windows XP (SP3 or later) (32-bit version) Japanese and English versions Microsoft Windows Vista (SP2 or later) (32-bit version) Japanese and English versions Microsoft Windows 7 (32-bit version) Japanese and English versions
Microsoft Office Excel	2003, 2007, 2010
Memory	For Microsoft Windows XP: 1 G bytes or more For Microsoft Windows Vista and 7: 2 G bytes or more
Hard disk	Residual capacity: 10 Mbyte or more (not including the recording data file size)
Display	Resolution: 1024 × 768 dots or more Colors: Full color or more
Y cable	N-103 (For distributed arrangement)
Communication cable	N-102 (1 m), H-11681 (3 m), H-11682 (5 m), H-11683 (10 m) Note: When requiring the cable other than the above, contact KYOWA or our representatives.
Termination resistance	CANterm120 (Vector Japan Co., Ltd.)
USB-CAN converter	Leaf Light HS (Kvaser Inc.)



- Specifications of the Software
 - The number of connecting units: 1 to 8 (the number of MAX. channels: 32)
 - Measuring function: Measure initial unbalance value (zero value) of the voltage and thermocouple with no compensation.
 - Measuring times: MAX. 65000 times.
- CAN communication condition
 - CAN communication standard: High speed CAN
 - Communication speed: 50 kbps

4-2 INSTALLING AND UNINSTALLING USB-CAN CONVERTER DRIVER

4-2-1 Installing USB-CAN Converter Driver

NOTE

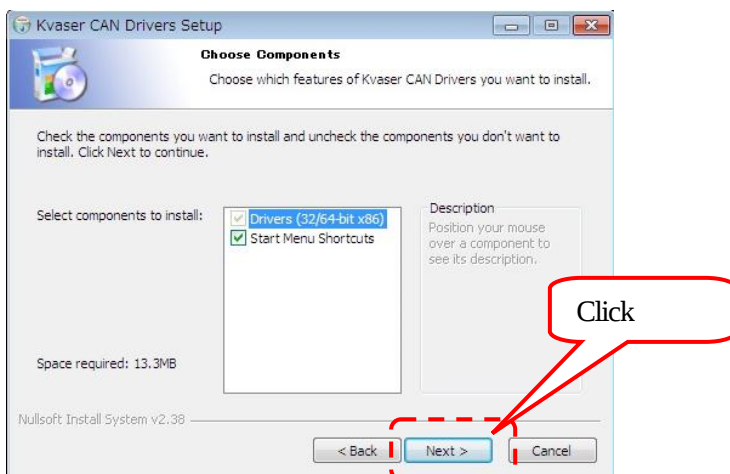
Do not connect the USB-CAN converter to the PC yet.

* Be sure to install the driver of the USB-CAN converter.

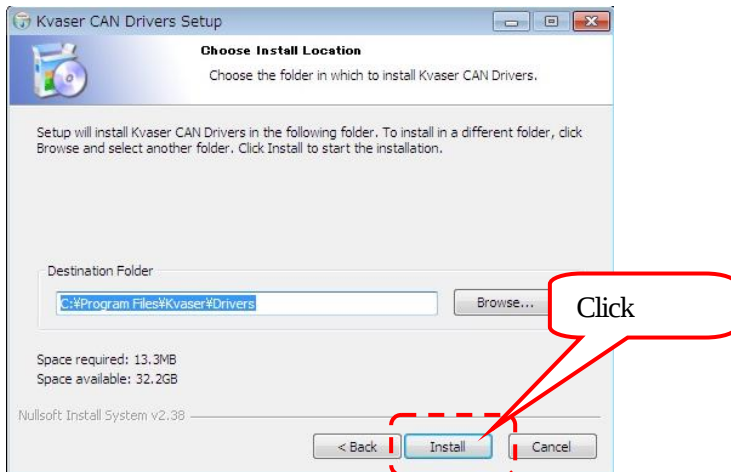
- 1) Set the accessory CD-R of the NTB-201A to the CD drive.
- 2) Please run the following program within the CD-R.
[\DRIVERS\KVASER\kvaser_drivers_w2k_xp.exe]



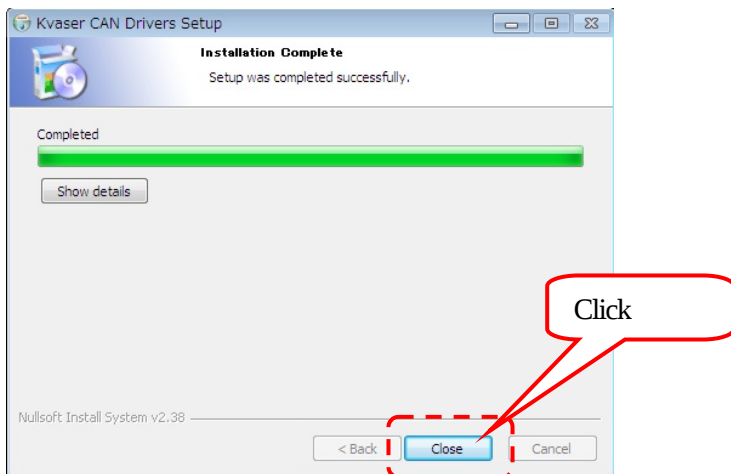
- 3) Click **next>**.



8) Click **Install** button.



9) Click **Close** button for completing the driver installation.



4-2-2 Connect USB-CAN Converter to the PC

Connect the USB-CAN converter to the USB port to automatically start the installation.

4-2-3 Checking After Connection

This section describes how to check that the USB-CAN converter is correctly recognized.

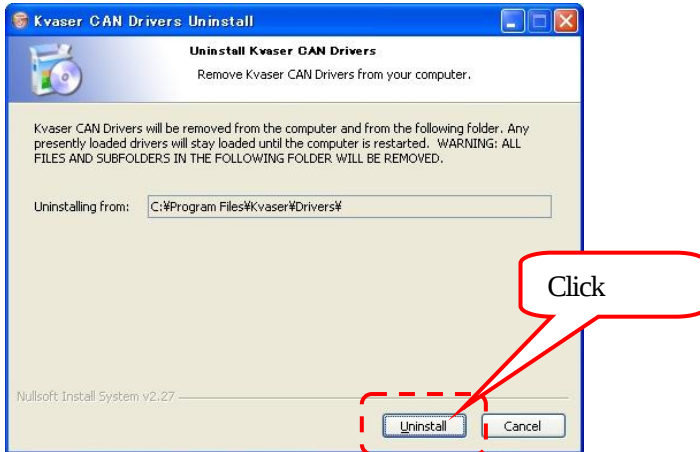
1) Open the device manager.

- For the Windows 7:
Click **Start** and click **Control Panel**.
Click the **Device Manager**.
When the **User Account Control** window appears, click **Continue** button.
- For the Windows Vista:
Click **Start** and right click **Computer** to display **Property**.
Click the **Property**.
Click the **Device Manager**.
When the **User Account Control** window appears, click **Continue** button.
- For the Windows XP:
Click **Start** and right click **My Computer**.
Click **Hardware** tab.
Click the **Device Manager**.

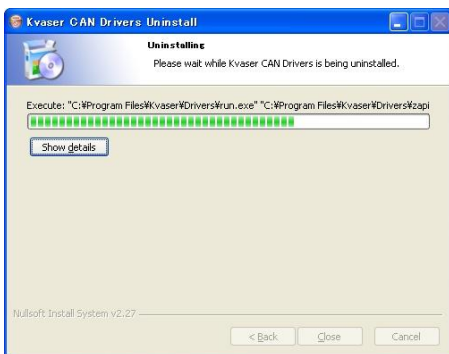
2) After checking, close the **Device Manager** window.

4-2-4 Uninstalling the USB-CAN Converter Driver

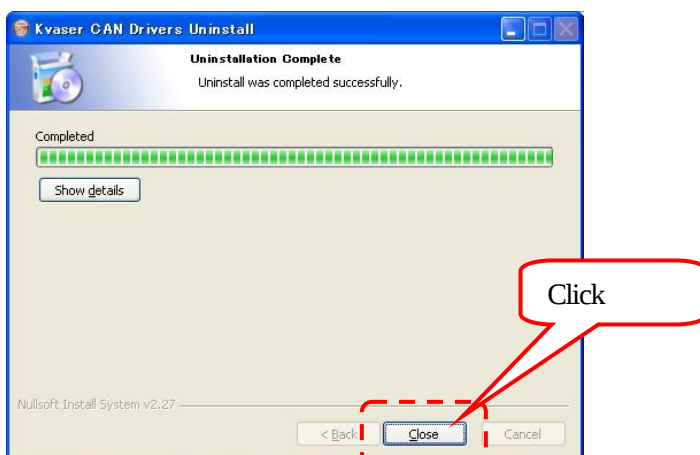
- 1) Click the **Start** button and **Control Panel**.
- 2) Click **Add or Remove programs**.
Add or Remove programs window appears. Click **Kvaser CAN Drivers** and **Delete** button.
- 3) Click **Uninstall** button.



- 4) Uninstalling window.



- 5) After completing the uninstallation, **Close** button becomes valid. Click the **Close** button to finish the uninstallation.



4-3 STARTING UP SIMPLIFIED SOFTWARE

Click “NTB-201A” – “AttachedSoftware” – “US” in the accessory CD-R and copy SimpleSoftUS. xls to the arbitrary folder in your PC.

1) Start up the “SimplSoftUS. xls”.

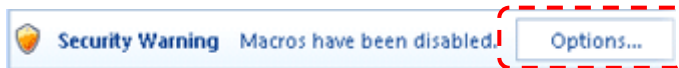
----- For the EXCEL 2010 -----

When the **Security Warning** is displayed on the message bar, click **Enable Content** button.



----- For the EXCEL 2007 -----

When the **Security Warning** is displayed on the message bar, click **Options...** button.

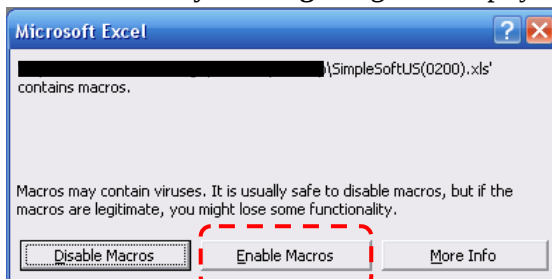


When the Security Options dialog appears, click **OK** button after selecting “Enable this content”.



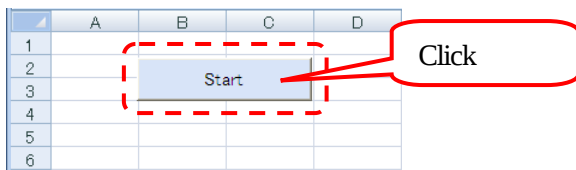
----- For the EXCEL 2003 -----

When the **Security Warning** dialog box is displayed, click **Enable Macros** button.

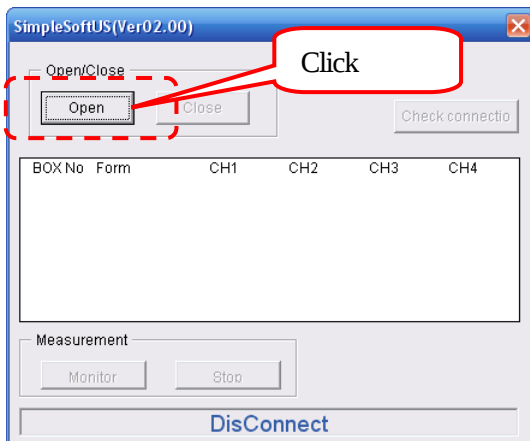


—— EXCEL2003, EXCEL2007, and EXCEL2010 have the following common operations. ——

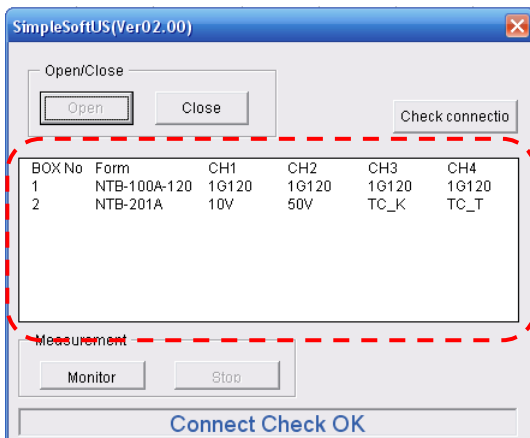
- 2) Click the **Start** button on the Menu sheet.



- 3) Click the **Open** button.



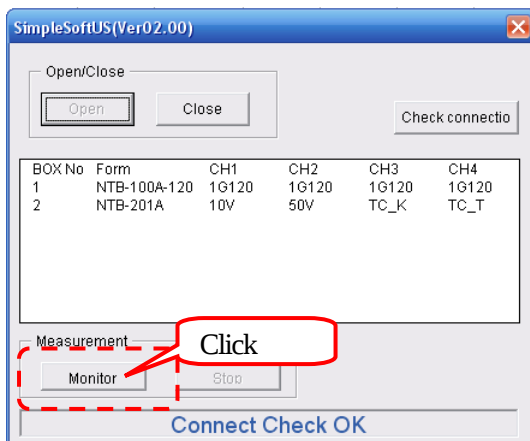
- 4) Information of the connecting NTB series appears.



Information of the connecting NTB series appears here.

- BOX No., model, and CH mode appear for the number of connecting units.

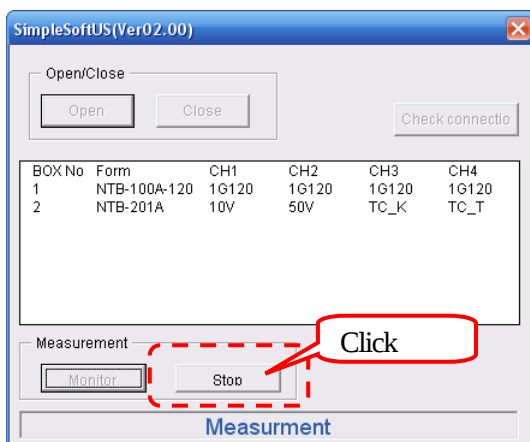
5) Click **Monitor** button to start the measurement.



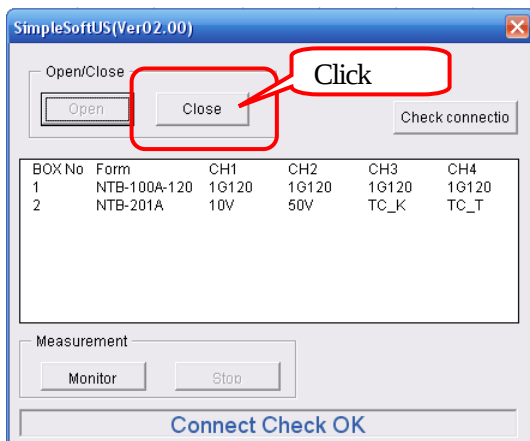
The measured data is pasted to cells

	A	B	C	D	E	F	G	H	I	J	K
1	BOX No.			1				2			
2	Type			NTB-100A-120				NTB-201A			
3	CH No			CH1	CH2	CH3	CH4	CH1	CH2	CH3	CH4
4	CH Mode			1G120	1G120	1G120	1G120	10V	50V	TC_K	TC_T
5	Unit			um/m	um/m	um/m	um/m	V	V	degC	degC
6	Data No	Day	Time	Data							
7	1	2011/2/8	13:18:28	262	100	315	349	1.3672	1.367	26.4	27
8	2	2011/2/8	13:18:30	263	100	315	350	1.3673	1.367	26.4	27
9	3	2011/2/8	13:18:32	263	100	315	350	1.3671	1.368	26.4	27
10	4	2011/2/8	13:18:33	262	100	315	350	1.3672	1.367	26.4	27
11	5	2011/2/8	13:18:35	263	100	315	350	1.3673	1.368	26.4	27
12	6	2011/2/8	13:18:37	263	100	315	350	1.3673	1.368	26.5	27
13	7	2011/2/8	13:18:40	264	100	315	351	1.3672	1.367	26.4	27
14	8	2011/2/8	13:18:42	263	100	315	350	1.3672	1.367	26.5	27
15	9	2011/2/8	13:18:44	263	100	315	349	1.3673	1.367	26.5	27
16	10	2011/2/8	13:18:46	263	100	315	350	1.3672	1.367	26.5	27
17	11	2011/2/8	13:18:48	263	100	315	350	1.3673	1.367	26.5	27
18	12	2011/2/8	13:18:50	264	100	315	349	1.3673	1.367	26.4	27
19	13	2011/2/8	13:18:52	263	100	315	350	1.3673	1.367	26.4	27
20	14	2011/2/8	13:18:54	263	100	315	350	1.3674	1.367	26.4	27
21	15	2011/2/8	13:18:56	263	100	315	350	1.3673	1.368	26.5	27

6) Click the **Stop** button to stop the measurement.



7) Be sure to click the **Close** button for finishing this Simplified Software.



8) For requiring the measured data, save the file and close the EXCEL.

4-4 COMMANDS USED IN SIMPLIFIED SOFTWARE

4-4-1 Communication Protocol

This section describes communication protocol.

For controlling the NTB-201A, send and receive the data of MAX. 8 bytes (variable 0 to 8).

Attached IDs are used for identifying the commands.

Hereinafter, the communication data is described as follows in this Instruction Manual.

Example)

ID	Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7
0x0111	0x01	0x02	0x03	0x04	0x05	0x06	0x07	0x08

For the communication data more than 1 byte, the data is described as byte 0 to 1 and byte 4 to 7.

Example)

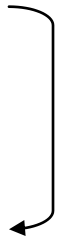
ID	Byte0 to 1	Byte2	Byte3	Byte4 to 7
0x0123	0x0123	0x02	0x03	0x0456789A

In addition, the data assignment is little endian in this protocol.

Therefore, the actual data of the above example is as follows.

Example)

ID	Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7
0x0123	0x23	0x01	0x02	0x03	0x9A	0x78	0x56	0x04



- Frame

The NTB-201A send and receive data using a data frame.

Do not use a remote frame absolute. It may cause trouble.

- “BOX No.”

The “BOX No.” is used for identifying the NTB-201A.

Set the “BOX No.” so as not to overlap.

Arbitrary set the “BOX No.” from 01 to 99. (00 cannot be set.)

4-4-2 Description of Command

(1) NTB information reading command

<Description>

For reading the information (model No.) of the connecting NTB-201A.

- ◆ Request (PC → NTB-201A: The number of bytes = 2 bytes)

ID	Command No. (byte0)	“BOX No.” (byte1)
0x0000	0x81	Sending “BOX No.”

- Capable of sending a command to all connecting NTB series units by specifying 0x00 to the “BOX No.” of the byte1.

- ◆ Response (NTB-201A → PC: The number of bytes = 2 bytes)

ID	Byte0	Byte1 to 6	Byte7
0x0700 + “BOX No.”	0x00	Serial No.	Model No.

*The Serial No. is as follows.

byte1-2	byte3	byte4-6
YEAR_No.	LOT_No.	TYPE_No. × 4096 + SER_No.

*The model No. and model names are as follows.

Model No. (byte7)	Model Name
0x12	NTB-201A

(2) Measurement start command

<Description>

For sending the measured data from the connecting NTB-201A.

When the CH mode is set to Skip, the measuring data is not sent.

- ◆ Request (PC → NTB-201A: The number of bytes = 2 bytes)

ID	Command No. (byte0)	“BOX No.” (byte1)
0x0000	0x01	Sending “BOX No.”

- Specify 0x00 to the “BOX No.” of the byte1 to start the measurement of the all connecting NTB series units.

- ◆ Response (NTB-201A → PC: The number of bytes = 8 bytes)

ID	Byte0 to 3	Byte4 to 7
0x0180 + “BOX No.”	Voltage or temperature data of the CH1	Terminal temperature data

ID	Byte0 to 3	Byte4 to 7
0x0280 + “BOX No.”	Voltage or temperature data of the CH2	Terminal temperature data

ID	Byte0 to 3	Byte4 to 7
0x0380 + “BOX No.”	Voltage or temperature data of the CH3	Terminal temperature data

ID	Byte0 to 3	Byte4 to 7
0x0480 + “BOX No.”	Voltage or temperature data of the CH4	Terminal temperature data

(3) Measurement stop command

<Description>

For stopping the measurement of the connecting NTB series.

- ◆ Request (PC → NTB-201A: The number of sending bytes: 2 bytes)

ID	Command No. (byte0)	“BOX No.” (byte1)
0x0000	0x02	Sending “BOX No.”

- Specify 0x00 to the “BOX No.” in the byte1 to stop the measurement of the all connecting NTB series units.

(4) CH mode reading command

<Description>

For reading a CH mode that is set to every CH of the NTB-201A.

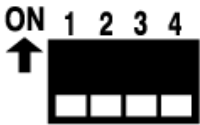
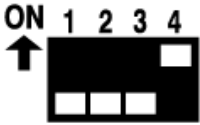
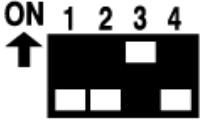
◆ Request (PC → NTB-201A: The number of bytes = 8 bytes)

ID	Byte0	Byte1 to 2	Byte3	Byte4	Byte5	Byte6	Byte7
0x0600 + “BOX No.”	0x40	0x3100	0x01	0x00	0x00	0x00	0x00

◆ Response (NTB-201A → PC: The number of bytes = 8 bytes)

ID	Byte0	Byte1 to 2	Byte3	Byte4	Byte5	Byte6	Byte7
0x0580 + “BOX No.”	0x43	0x3100	0x01	CH mode of the CH1	CH mode of the CH2	CH mode of the CH3	CH mode of the CH4

● CH mode data that is sent from the NTB-201A

CH mode name	Setting of the DIP switch	CH mode data that is sent from the NTB-201A
SKIP (1) (2) (3) (4) OFF OFF OFF OFF 0 0 0 0		D7 D6 D5 D4 D3 D2 D1 D0 0 0 0 0 0 0 0 0 : 0x00
10V (1) (2) (3) (4) OFF OFF OFF ON 0 0 0 1		D7 D6 D5 D4 D3 D2 D1 D0 0 0 0 1 0 0 0 0 : 0x10
50V (1) (2) (3) (4) OFF OFF ON OFF 0 0 1 0		D7 D6 D5 D4 D3 D2 D1 D0 0 0 1 0 0 0 0 0 : 0x20

(5) The DIP switch for option reading command

<Description>

For reading the DIP switch for option that is set to the NTB-201A.

- ◆ Request (PC → NTB-201A: The number of bytes = 8 bytes)

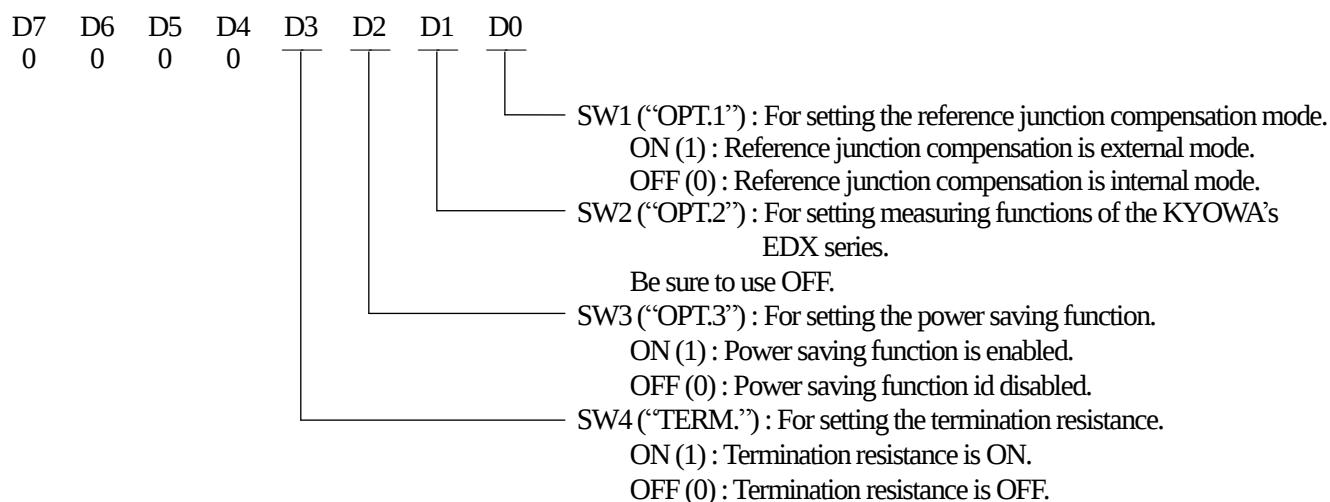
ID	Byte0	Byte1 to 2	Byte3	Byte4 to 7
0x0600 + "BOX No."	0x40	0x3400	0x01	(0x00000000) fixed

- ◆ Response (NTB-201A → PC: The number of bytes = 8 bytes)

ID	Byte0	Byte1 to 2	Byte3	Byte4	Byte5 to 7
0x0580 + "BOX No."	0x43	0x3400	0x01	(OPT SW)	(0x000000) fixed

- The detail of the DIP switch for option

1byte	Bit support
0x0y	The higher 4 bits : 0 fixed The lower 4 bits : The contents of each bit



(6) Starting Burn-out check and reading check result

<Description>

For instructing the connecting NTB-201A to start the Burn-out check, and reading the check result.

(6-1) Starting Burn-out check

- ◆ Request (PC → NTB-201A: The number of bytes = 8 bytes)

ID	Byte0	Byte1 to 2	Byte3 to 7
0x0600 + "BOX No."	0x22	0x37F0	(0x0000000000) fixed

- ◆ Response (NTB-201A → PC: The number of bytes = 8 bytes)

ID	Byte0	Byte1 to 2	Byte3 to 7
0x0580 + "BOX No."	0x60	0x37F0	(0x0000000000) fixed

(6-2) Checking for whether completed Burn-out check

- ◆ Request (PC → NTB-201A: The number of bytes = 8 bytes)

ID	Byte0	Byte1 to 2	Byte3 to 7
0x0600 + "BOX No."	0x40	0x37F0	(0x0000000000) fixed

- ◆ Response (NTB-201A → PC: The number of bytes = 8 bytes)

ID	Byte0	Byte1 to 2	Byte3	Byte4	Byte5 to 7
0x0580 + "BOX No."	0x4F	0x37F0	0x00	0x00 / 0x01	(0x000000) fixed

0x00: Checking

0x01: Check completed

(6-3) Reading Burn-out check results

- ◆ Request (PC → NTB-201A: The number of bytes = 8 bytes)

ID	Byte0	Byte1 to 2	Byte3	Byte4 to 7
0x0600 + "BOX No."	0x40	0x3700	0x01	(0x00000000) fixed

- ◆ Response (NTB-201A → PC: The number of bytes = 8 bytes)

ID	Byte0	Byte1 to 2	Byte3	Byte4	Byte5	Byte6	Byte7
0x0580 + "BOX No."	0x43	0x3700	0x01	Result of CH1	Result of CH2	Result of CH3	Result of CH4

Result:

0x01: Burn-out check is OK.

0xFF: Burn-out check is failed.

0x00: CH mode that is unable to Burn-out check.

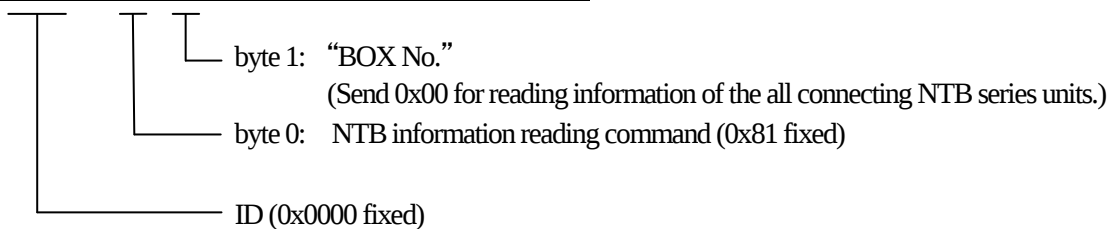
4-4-3 Reading NTB Information and CH Mode

The following example is when the NTB-201A of the “BOX No.” 12 (0x0C) is connected.

ID (HEX)	Data (HEX)	
0000	81 00	1)
070C	00 FF FF FF FF EF 00 12	2)
060C	40 00 31 01 00 00 00 00	3)
058C	43 00 31 01 10 50 40 50	4)

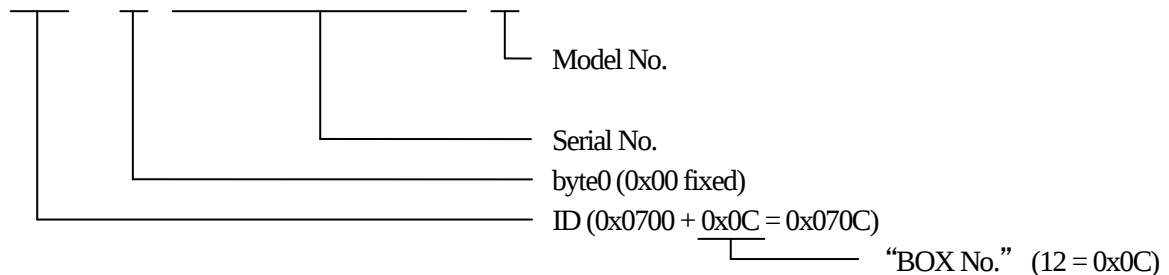
- 1) Send the NTB information reading command for reading the NTB information. (PC → NTB-201A)

ID (HEX)	Data (HEX)
0000	81 00



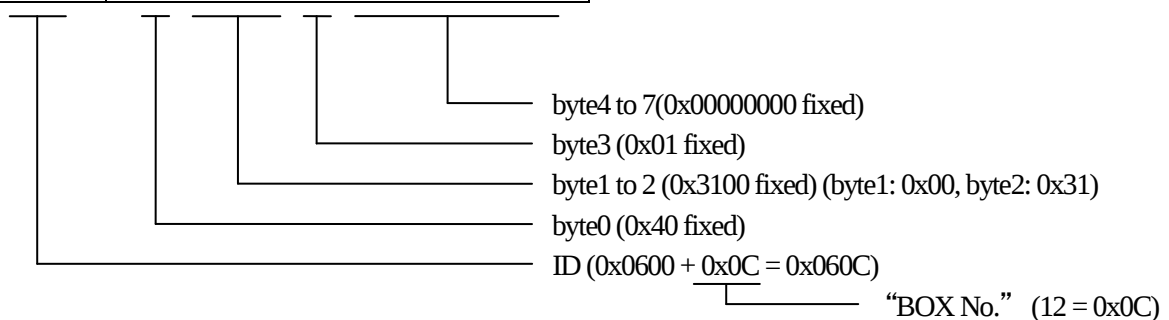
- 2) The NTB-201A received the command and send the information. (NTB-201A → PC)

ID (HEX)	Data (HEX)
070C	00 FF FF FF FF EF 00 12

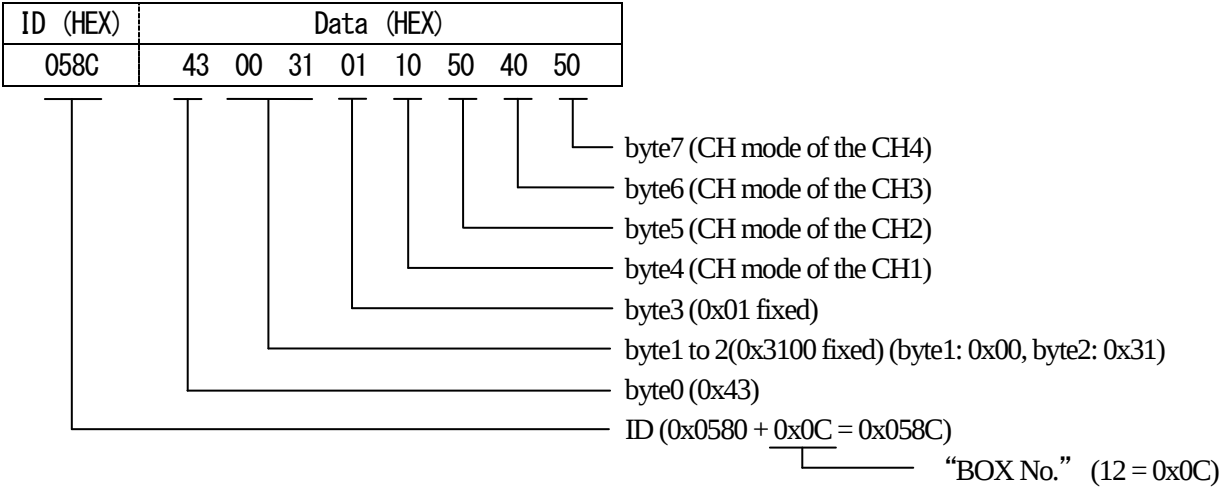


- 3) Send the reading command of the CH mode of the connecting NTB-201A. (PC → NTB-201A)

ID (HEX)	Data (HEX)
060C	40 00 31 01 00 00 00 00



4) The NTB-201A send the CH mode information. (NTB-201A → PC)

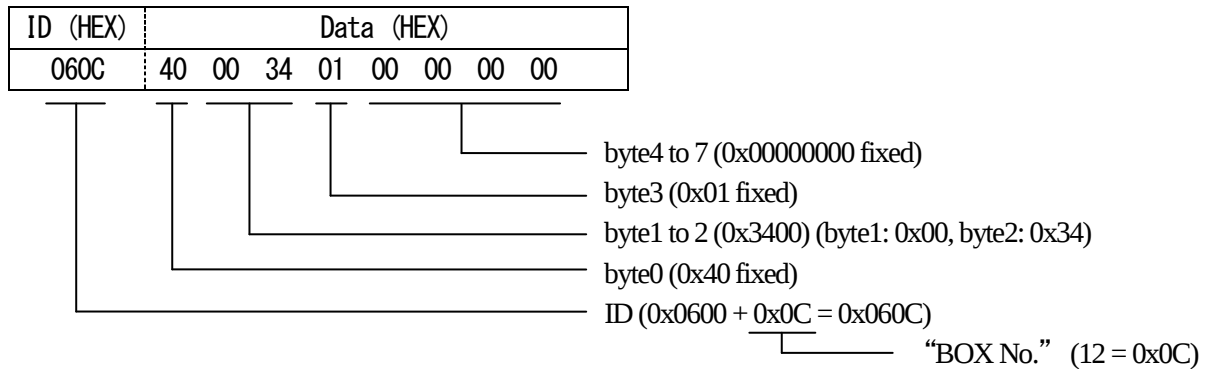


4-4-4 Reading the DIP switch for option

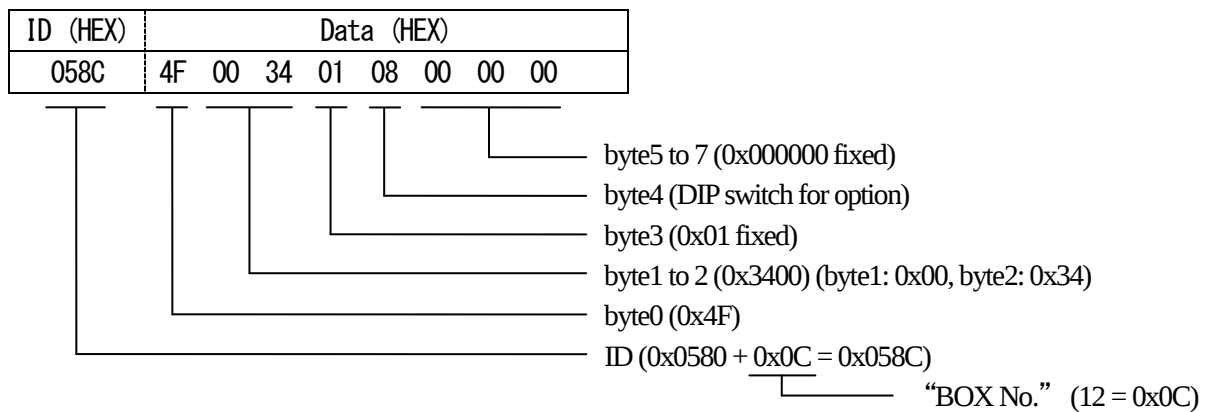
The following example is when the NTB-201A of the “BOX No.” 12 (0x0C) is connected.

ID (HEX)	Data (HEX)
060C	40 00 34 01 00 00 00 00
058C	4F 00 34 01 08 00 00 00

- 1) Send the reading command of the DIP switch for option connecting the NTB-201A. (PC → NTB-201A)



- 2) Send the reading command of the DIP switch for option connecting the NTB-201A. (PC → NTB-201A)



- The detail of the DIP switch for option

1byte	Bit support
0x0n	The higher 4 bits : 0 fixed The lower 4 bits : The contents of each bit

D7 D6 D5 D4 D3 D2 D1 D0
0 0 0 0

SW1 ("OPT.1") : For setting the reference junction compensation mode.
ON (1) : Reference junction compensation is external mode.
OFF (0) : Reference junction compensation is internal mode.

SW2 ("OPT.2") : For setting measuring functions of the KYOWA's EDX series.
Be sure to use OFF.

SW3 ("OPT.3") : For setting the power saving function.
ON (1) : Power saving function is enabled.
OFF (0) : Power saving function id disabled.

SW4 ("TERM.") : For setting the termination resistance.
ON (1) : Termination resistance is ON.
OFF (0) : Termination resistance is OFF.

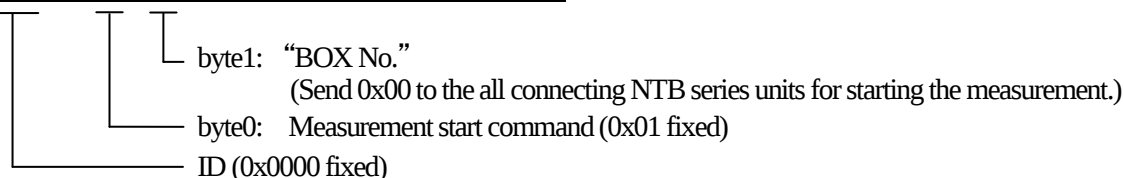
4-4-5 Measurement Start and Stop

The following example is when the NTB-201A of the “BOX No.” 12 (0x0C) is connected.

ID (HEX)	Data (HEX)
0000	01 00
018C	17 B7 D1 B8 00 00 EC 41
028C	CD CC 0C C1 00 80 EC 41
038C	33 33 DB 41 00 00 EC 41
048C	66 66 DE 41 00 80 EC 41
0000	02 00

- 1) Send the measurement start command. (PC → NTB-201A)

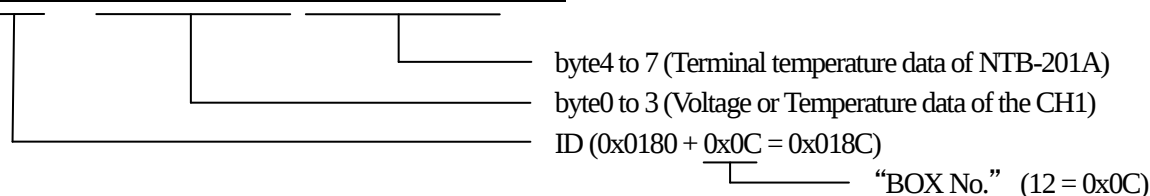
ID (HEX)	Data (HEX)
0000	01 00



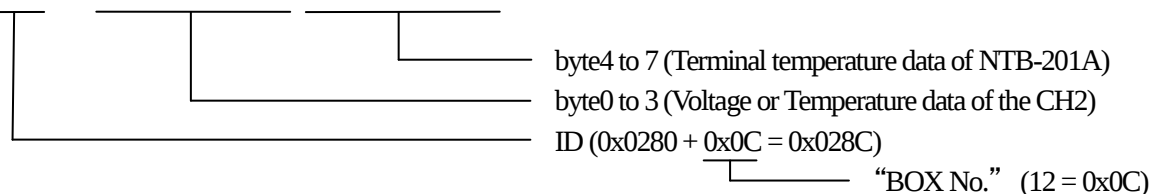
(The NTB-201A becomes measuring state.)

- 2) The measured data is sent from the NTB-201A. (NTB-201A → PC)

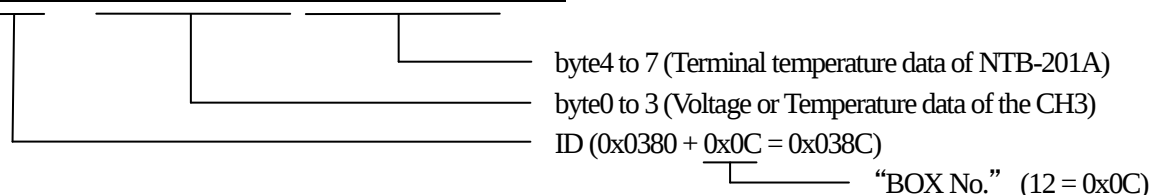
ID (HEX)	Data (HEX)
018C	17 B7 D1 B8 00 00 EC 41



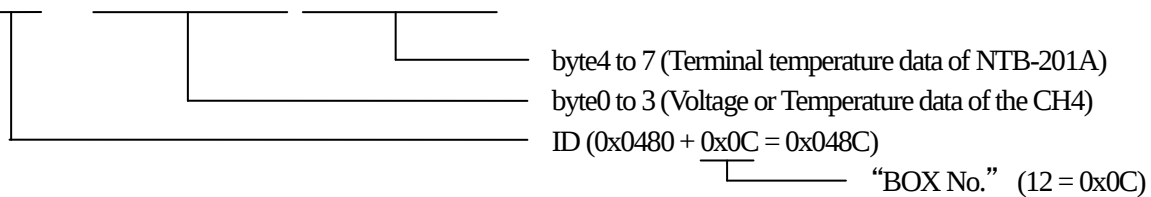
ID (HEX)	Data (HEX)
028C	CD CC 0C C1 00 80 EC 41



ID (HEX)	Data (HEX)
038C	33 33 DB 41 00 00 EC 41



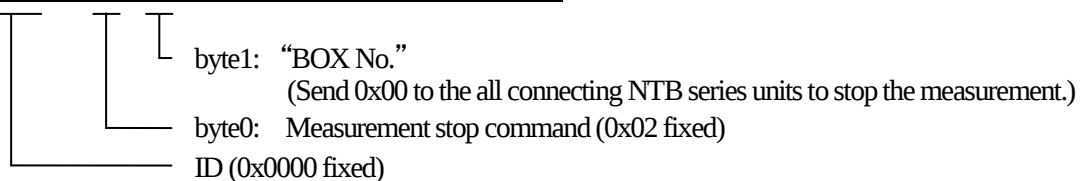
ID (HEX)	Data (HEX)							
048C	66	66	DE	41	00	80	EC	41



(The measured data is sent from the NTB-201A until the measurement stop command is sent.)

3) Send the measurement stop command. (PC → NTB-201A)

ID (HEX)	Data (HEX)	
0000	02	00



(The NTB-201A becomes measuring stop state.)

4-4-6 Burn-out check Start and reading check result

The following example is when the NTB-201A of the “BOX No.” 12 (0x0C) is connected.

ID (HEX)	Data (HEX)								
060C	22	F0	37	00	00	00	00	00	1)
058C	60	F0	37	00	00	00	00	00	2)
060C	40	F0	37	00	00	00	00	00	3)
058C	4F	F0	37	00	00	00	00	00	4)
060C	40	F0	37	00	00	00	00	00	3)
058C	4F	F0	37	00	00	00	00	00	4)
.	.	.	.	.	.	.	.	.	
.	.	.	.	.	.	.	.	.	
.	.	.	.	.	.	.	.	.	
.	.	.	.	.	.	.	.	.	
060C	40	F0	37	00	00	00	00	00	3)
058C	4F	F0	37	00	01	00	00	00	4)
060C	40	00	37	01	00	00	00	00	5)
058C	4F	00	37	01	01	FF	01	01	6)

- 1) Send the Burn-out check start command to the connecting NTB-201A. (PC → NTB-201A)

ID (HEX)	Data (HEX)							
060C	22	F0	37	00	00	00	00	00

Byte 4 to 7 (0x00000000 fixed)

Byte 3 (0x00 fixed)

Byte 1 to 2 (0x37F0) (byte 1: 0xF0, byte 2: 0x37)

Byte 0 (0x22 fixed)

ID (0x0600 + 0x0C = 0x060C)

“BOX No.” (12 = 0x0C)

- 2) The reply for start command is sent from the NTB-201A. (NTB-201A → PC)

ID (HEX)	Data (HEX)							
058C	60	F0	37	00	00	00	00	00

Byte 5 to 7 (0x000000 fixed)

Byte 4 (0x00 fixed)

Byte 3 (0x00 fixed)

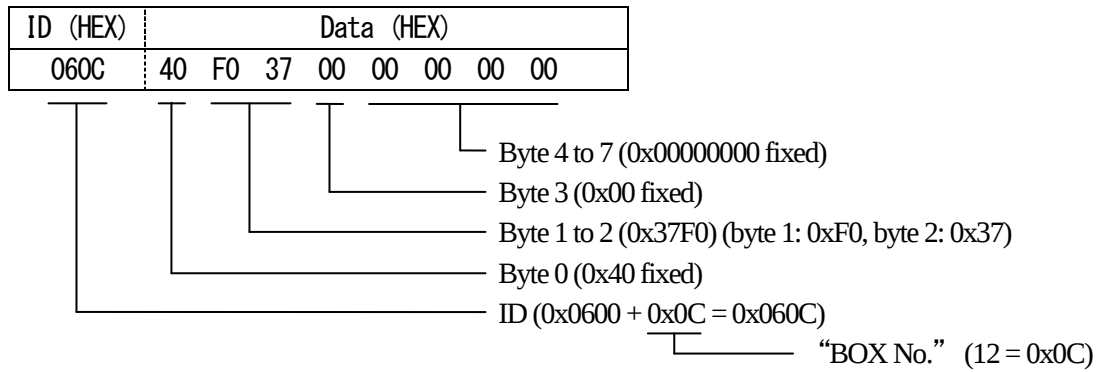
Byte 1 to 2 (0x 37 F0) (byte 1: 0xF0, byte 2: 0x37)

Byte 0 (0x60)

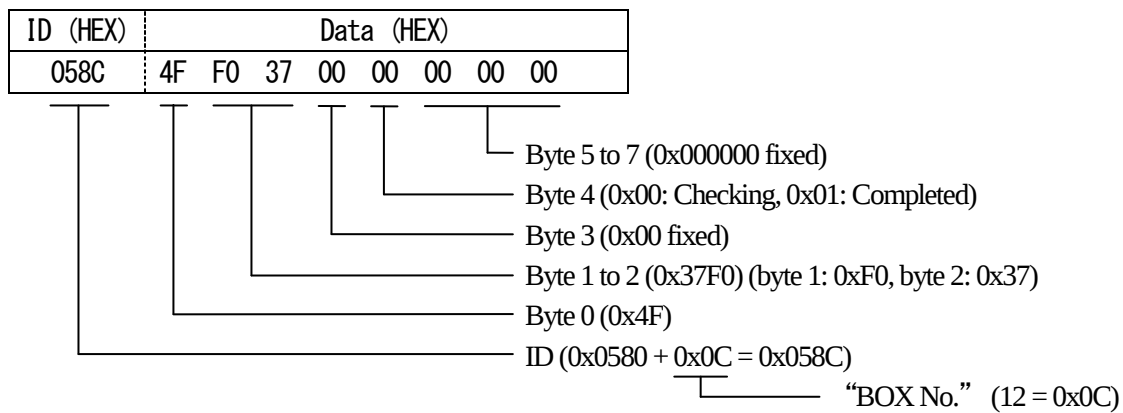
ID (0x0580 + 0x0C = 0x058C)

“BOX No.” (12 = 0x0C)

- 3) Send the confirmation command to confirm whether the Burn-out check has completed. (PC → NTB-201A)



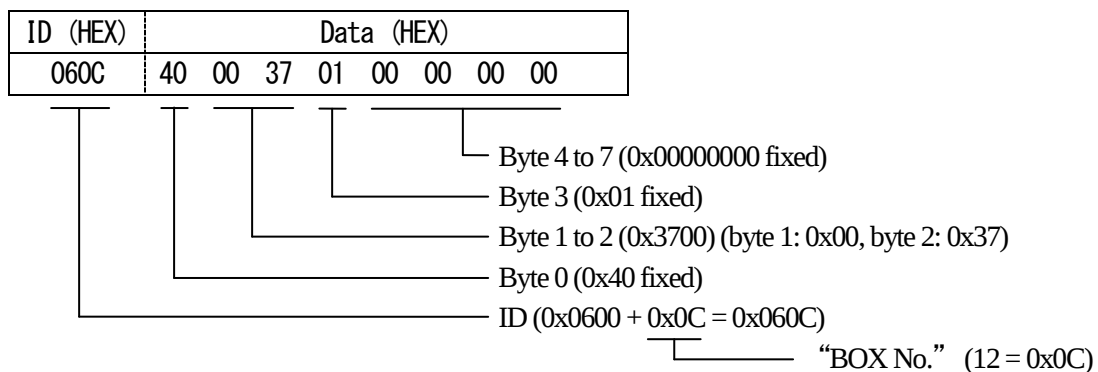
- 4) The reply whether the Burn-out check has completed is sent from the NTB-201A. (NTB-201A → PC)



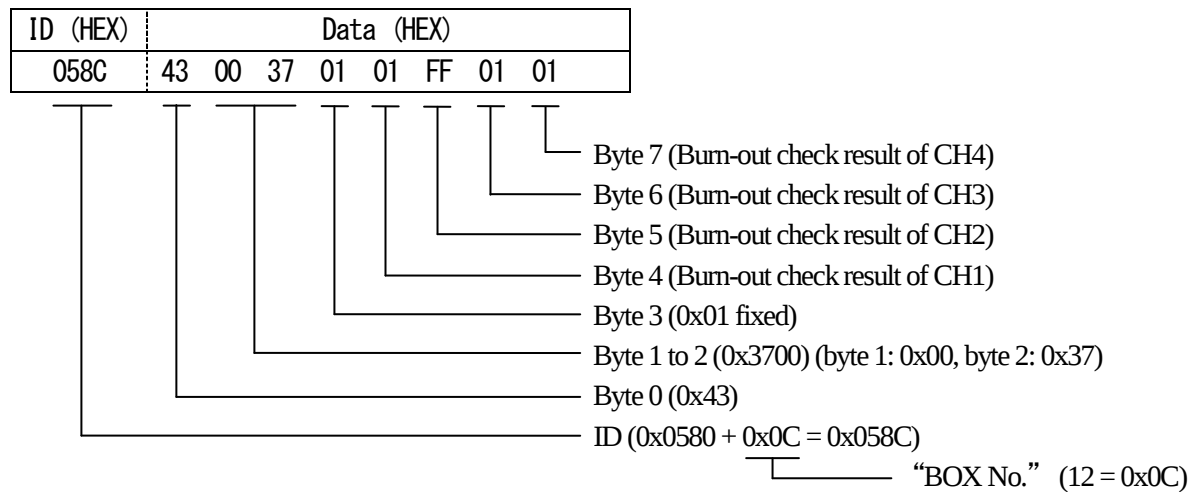
Conduct the item 3) and 4) to check whether the Burn-out check has completed.

After receiving the reply and when the byte4 in the item 4) is displaying 0x01, conduct item 5).

- 5) Send the reading command of Burn-out check result. (PC → NTB-201A)



6) Burn-out check result is sent from the NTB-201A. (NTB-201A → PC)



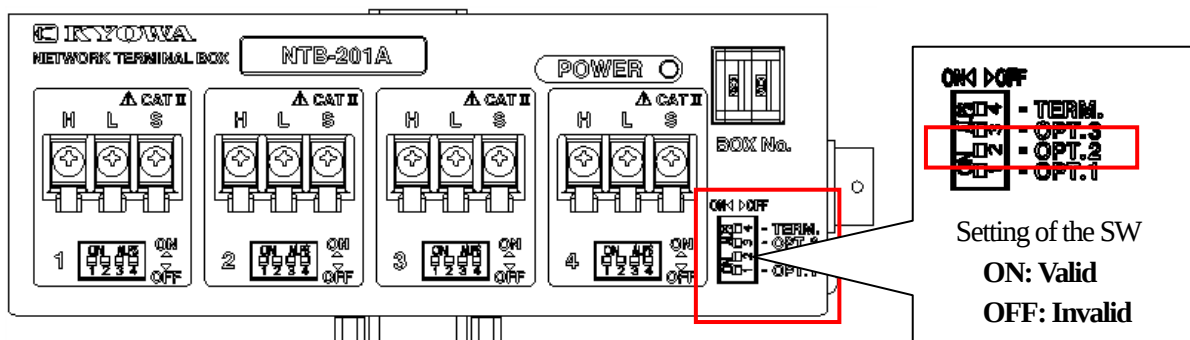
Burn-out check result:

- 0x01: Burn-out check is OK.
- 0xFF: Burn-out check is failed.
- 0x00: CH mode that is unable to Burn-out check.

5. FOR MEASURING WITH KYOWA'S EDX SERIES

The NTB-201A can also record the measured data with the CAN card of the KYOWA' s EDX series.

5-1 SET NTB-201A



Set the OPT. 2 of the DIP switch for option to ON.

After connecting the CAN card, the NTB-201A automatically and continuously output the measured data by turning ON the DIP switch.

NOTE

- For connecting the PC or SME-100A/101A, be sure to set the OPT. 2 of the DIP switch for option to OFF.
- When using the multiple NTB series units by coupling or in a same network, set the termination resistances ("TERM.") of the NTB series units of both sides in the network to ON. For termination resistance, see "3-3."
- When coupling the multiple NTB series units, set the "BOX No." so as not to overlap.

5-2 CAN CONDITION OF NTB-201A

5-2-1 CAN Communication Condition

Communication standard: High speed CAN
Communication speed: 50 kbps

5-2-2 CAN-ID Condition

Format: Standard ID
ID: CH1 = 0x0180 + "BOX No."
CH2 = 0x0280 + "BOX No."
CH3 = 0x0380 + "BOX No."
CH4 = 0x0480 + "BOX No."
Data length: 8
Endian: Little

<Example>

When the BOX No. is 17 (0x11):
CH1: 0x0180 + 0x11 = 0x0191
CH2: 0x0280 + 0x11 = 0x0291
CH3: 0x0380 + 0x11 = 0x0391
CH4: 0x0480 + 0x11 = 0x0491

5-2-3 CAN-CH Condition

Data type: Float

ID	Byte0 to 3	Byte4 to 7
0x0180 + "BOX No."	Voltage or Temperature data of the CH1	Terminal temperature data of NTB-201A

ID	Byte0 to 3	Byte4 to 7
0x0280 + "BOX No."	Voltage or Temperature data of the CH2	Terminal temperature data of NTB-201A

ID	Byte0 to 3	Byte4 to 7
0x0380 + "BOX No."	Voltage or Temperature data of the CH3	Terminal temperature data of NTB-201A

ID	Byte0 to 3	Byte4 to 7
0x0480 + "BOX No."	Voltage or Temperature data of the CH4	Terminal temperature data of NTB-201A

When the CH mode is set to Skip, the measurement data is not sent from the NTB-201A.

5-3 FOR MEASURING WITH EDX-2000A

5-3-1 Set the communication Condition

[Condition Setting] – [CAN-ID Information] – [Communication Condition]

Commun Stand: High speed CAN
Commun Speed: 50 kbps
Sample Point: Default value for general purpose. But the Sample Point varies with the system conditions.
Sample Times: Default value for general purpose.
SJW: Default value for general purpose. But the SJW varies with the system conditions.
Term Resist: ON (OFF for the terminated system)

5-3-2 CAN-ID Information

[Condition Setting] – [CAN-ID Information]

Format: Standard
Frame ID: 0x0180 + "BOX No." (The following is for the "BOX No." = 01 (0x01))
0x0280 + "BOX No."
0x0380 + "BOX No."
0x0480 + "BOX No."
Data Length: 8
Endian: Little

The screenshot shows the EDX-2000A interface. At the top, it says "EDX-2000A" and "Free space(Byte) 0". The date and time are "2009/10/07 13:56:42". The main menu is titled "< CAN-ID Information >". It lists several settings: "Commun Stand : HiSpeedCAN", "Commun Speed : 50kbps", "Sample Point : 80.0%(TSEG1:15,TSEG2:4,40MHz)", "Sample Times : 1", "SJW : 2", and "Term Resist : ON". Below these settings is a table with columns: "CAN-ID", "Meas", "Format", "Frame ID", "Length", "Endian", "LSB/MSB", "CH", and "ID Name". The table contains 16 rows of data. The first four rows (1-4) are highlighted with a red box. The first row (1) has "ON" for Meas, "Std" for Format, "181" for Frame ID, "8" for Length, "Little" for Endian, "***" for LSB/MSB, "2" for CH, and an empty ID Name. The other rows follow a similar pattern with different Frame IDs and Endian values. To the right of the table is a "MENU" list with options: "1 Condition", "2 CAN-ID Info", "1) MEAS ID", "2) Format", "3) Frame ID", "4) Data Length", "5) Endian", "6) LSB/MSB", "7) ID Name", "8) Commun Cond", and "0) End". At the bottom right, there is a button labeled "[LEFT/RIGHT]: Change Item".

CAN-ID	Meas	Format	Frame ID	Length	Endian	LSB/MSB	CH	ID Name
1	ON	Std	181	8	Little	***	2	
2	ON	Std	281	8	Little	***	2	
3	ON	Std	381	8	Little	***	2	
4	ON	Std	481	8	Little	***	2	
5	--	Std	000	8	Big	LSB	**	
6	--	Std	000	8	Big	LSB	**	
7	--	Std	000	8	Big	LSB	**	
8	--	Std	000	8	Big	LSB	**	
9	--	Std	000	8	Big	LSB	**	
10	--	Std	000	8	Big	LSB	**	
11	--	Std	000	8	Big	LSB	**	
12	--	Std	000	8	Big	LSB	**	
13	--	Std	000	8	Big	LSB	**	
14	--	Std	000	8	Big	LSB	**	
15	--	Std	000	8	Big	LSB	**	
16	--	Std	000	8	Big	LSB	**	

5-3-3 CAN-CH Condition

[Condition Setting] – [CAN-CH Condition]

(1) Mode for setting a bit position with the bit number in the data flame

- Voltage or Temperature Data

Start Bit (SB): 0
 Bit Length (LN): 32
 Data Type: Float
 Cal Coef: Set the required number.
 Offset: Set zero value if required.
 Max: Set the expecting maximum value of the input.
 Unit: Set the required unit.

- Terminal Temperature Data of NTB-201A

Start Bit: 32
 Bit Length: 32
 Data Type: Float
 Cal Coef: 1
 Unit: °C

EDX-2000A

Free space(Byte) 32,930,675,456
 2009/10/07 14:44:24

< CAN Channel Condition >

CAN-ID : 1
 ID Name :
 Frame Format : Std
 Frame ID : 181
 Data Length : 8
 Endian : Little
 LSB/MSB : ***
 CH Nos : 2

CH	Meas	SB	LN	Data Type	CAL Coef	Offset	Max	Unit
1	ON	0	32	Float	1.0000	0.0000	500000	µm/m
2	ON	32	32	Float	1.0000	0.0000	32000	°C
3	--	0	8	Unsigned	1.0000	0.0000	32000	V
4	--	0	8	Unsigned	1.0000	0.0000	32000	V
5	--	0	8	Unsigned	1.0000	0.0000	32000	V
6	--	0	8	Unsigned	1.0000	0.0000	32000	V
7	--	0	8	Unsigned	1.0000	0.0000	32000	V
8	--	0	8	Unsigned	1.0000	0.0000	32000	V
9	--	0	8	Unsigned	1.0000	0.0000	32000	V
10	--	0	8	Unsigned	1.0000	0.0000	32000	V
11	--	0	8	Unsigned	1.0000	0.0000	32000	V
12	--	0	8	Unsigned	1.0000	0.0000	32000	V
13	--	0	8	Unsigned	1.0000	0.0000	32000	V
14	--	0	8	Unsigned	1.0000	0.0000	32000	V
15	--	0	8	Unsigned	1.0000	0.0000	32000	V
16	--	0	8	Unsigned	1.0000	0.0000	32000	V

M E N U

1 Condition

2 CAN-CH Cond

1)Change CAN-ID

2)MEAS Channel

3)Start Bit(SB)

4)BitLength(LN)

5)Data Type

6)Cal Coeff

7)Offset

8)Max

9)Unit

A)Channel Name

B)Next Page

C)Prev Page

0)End

[TAB]:Change Set
 [SPACE]:Change CH
 [LEFT/RIGHT]:
 Change Item

(2) Mode for setting a bit position with the byte number and bit number in the byte.

- Voltage or Temperature Data

Sta Point (SP): 00
 End Point (EP): 37
 Bit Length (LN): 32
 Data Type: Float
 Cal Coef: Set the required number.
 Offset: Set zero value if required.
 Max: Set the expecting maximum value of the input.
 Unit: Set the required unit.

- Terminal Temperature Data of NTB-201A

Sta Point (SP): 40
 End Point (EP): 77
 Bit Length (LN): 32
 Data type: Float
 Cal Coef: 1
 Unit: °C

EDX-2000A Free space(Byte) 32,930,675,456 2009/10/07 14:45:05

< CAN Channel Condition >

CAN-ID : 1
 ID Name :
 Frame Format : Std
 Frame ID : 181
 Data Length : 8
 Endian : Little
 LSB/MSB : ***
 CH Nos : 2

CH	Meas	SP	EP	LN	Data Type	CAL Coef	Offset	Max
1	ON	00	37	32	Float	1.0000	0.0000	500000
2	ON	40	77	32	Float	1.0000	0.0000	32000
3	--	00	07	8	Unsigned	1.0000	0.0000	32000
4	--	00	07	8	Unsigned	1.0000	0.0000	32000
5	--	00	07	8	Unsigned	1.0000	0.0000	32000
6	--	00	07	8	Unsigned	1.0000	0.0000	32000
7	--	00	07	8	Unsigned	1.0000	0.0000	32000
8	--	00	07	8	Unsigned	1.0000	0.0000	32000
9	--	00	07	8	Unsigned	1.0000	0.0000	32000
10	--	00	07	8	Unsigned	1.0000	0.0000	32000
11	--	00	07	8	Unsigned	1.0000	0.0000	32000
12	--	00	07	8	Unsigned	1.0000	0.0000	32000
13	--	00	07	8	Unsigned	1.0000	0.0000	32000
14	--	00	07	8	Unsigned	1.0000	0.0000	32000
15	--	00	07	8	Unsigned	1.0000	0.0000	32000
16	--	00	07	8	Unsigned	1.0000	0.0000	32000

M E N U

1) Condition
 2) CAN-CH Cond
 1) Change CAN-ID
 2) MEAS Channel
 3) Sta Point (SP)
 4) End Point (EP)
 5) BitLength (LN)
 6) Data Type
 7) Cal Coeff
 8) Offset
 9) Max
 A) Unit
 B) Channel Name
 C) Next Page
 D) Prev Page
 0) End

[TAB]: Change Set
 [SPACE]: Change CH
 [LEFT/RIGHT]: Change Item

5-4 FOR MEASURING WITH EDX-100A (DCS-100A)

5-4-1 CAN Communication Condition

CAN Comm Std:	High speed CAN
Comm Speed (kbps):	50 kbps
Sample Point:	Default value for general purpose. But the Sample Point varies with the system conditions.
Sample Times:	Default value for general purpose.
Resync Jump Width:	Default value for general purpose. But the Resync Jump Width varies with the system conditions.
Term Resist:	ON (OFF for the terminated system)

EDX-ID No.	Device Name	Port No.	CAN Comm Std	Comm Speed (kbps)	Sample Point	Sample Times	Resync Jump Width	Term Resist
F	???	1	High Speed CAN	50	80.0%(TSEG1:15, TSEG2:4, 40MHz)	1	2	ON

5-4-2 CAN-ID Condition

Format:	Standard
Frame ID:	0x0180 + "BOX No." (The following is for the "BOX No." = 06 (0x06)) 0x0280 + "BOX No." 0x0380 + "BOX No." 0x0480 + "BOX No."
Data Length (Byte):	8
Endian:	Little

CAN-ID	Measurement ON	Port No.	Format	Frame ID	Data Length (Byte)	Endian	LSB/MSB	Number of CAN-Chs	CAN-ID Name
1	☒	1	Standard	186	8	Little	***	2	
2	☒	1	Standard	286	8	Little	***	2	
3	☒	1	Standard	386	8	Little	***	2	
4	☒	1	Standard	486	8	Little	***	2	
5	☐	1	Standard	004	8	Big	LSB	1	
6	☐	1	Standard	005	8	Big	LSB	1	

5-4-3 CAN-CH Condition

(1) To cut out the CAN-CH data with bit.

- Voltage or Temperature Data

Start Bit: 0
 Bit Length: 32
 Data Type: Float
 CAL Coefficient: Set the required number.
 Offset: Set zero value if required.
 Unit: Set the required unit.

- Terminal Temperature Data for NTB-201A

Start Bit: 32
 Bit Length: 32
 Data Type: Float
 CAL Coefficient: 1
 Unit: °C

Set CAN Condition

CAN-ID CAN-CH CAN Comm

EDX-ID No.F ???

CAN-ID1
Port No.:1 Format:Standard Frame ID:186 Data Length (Byte):8 Endian:Little LSB/MSB:***

CAN-ID2
Port No.:1 Format:Standard Frame ID:286 Data Length (Byte):8 Endian:Little LSB/MSB:***

CAN-ID3
Port No.:1 Format:Standard Frame ID:386 Data Length (Byte):8 Endian:Little LSB/MSB:***

CAN-ID4
Port No.:1 Format:Standard Frame ID:486 Data Length (Byte):8 Endian:Little LSB/MSB:***

How to cut out the CAN-CH data: **Bit** Display Bit Assignment...

CAN-CH	Measurement ON/OFF	Start Bit	Bit Length	Data Type	CAL Coefficient	Offset	Unit	CH Name	Deci Digits
1	☒	0	32	Float	1.0000	0.0000	µm/m		Auto
2	☒	32	32	Float	1.0000	0.0000	°C		Auto
3	☐	0	1	Signed	1.0000	0.0000			Auto
4	☐	0	1	Signed	1.0000	0.0000			Auto
5	☐	0	1	Signed	1.0000	0.0000			Auto
6	☐	0	1	Signed	1.0000	0.0000			Auto
7	☐	0	1	Signed	1.0000	0.0000			Auto
8	☐	0	1	Signed	1.0000	0.0000			Auto

CAN-CH1 Bit Assignment

		Bit							
		7	6	5	4	3	2	1	0
Byte	0	7	6	5	4	3	2	1	0
	1	15	14	13	12	11	10	9	8
	2	23	22	21	20	19	18	17	16
	3	31	30	29	28	27	26	25	24
	4	39	38	37	36	35	34	33	32
	5	47	46	45	44	43	42	41	40
	6	55	54	53	52	51	50	49	48
	7	63	62	61	60	59	58	57	56

Print Change Setting Items... OK Cancel

The above Bit Assignment is for voltage or temperature data.

(2) To cut out the CAN-CH data with point.

- Voltage or Temperature Data

Start Point: 00
 End Point: 37
 Bit Length: 32
 Data Type: Float
 CAL Coefficient: Set the required number.
 Offset: Set zero value if required.
 Unit: Set the required unit.

- Terminal Temperature Data for NTB-201A

Start Point: 40
 End Point: 77
 Bit Length: 32
 Data type: Float
 CAL Coefficient: 1
 Unit: °C

Set CAN Condition

CAN-ID CAN-CH CAN Comm

EDX-ID Ito.F ???

CAN-ID1
Port No.:1 Format:Standard Frame ID:186 Data Length (Byte):8 Endian:Little LSBMSB:***

CAN-ID2
Port No.:1 Format:Standard Frame ID:286 Data Length (Byte):8 Endian:Little LSBMSB:***

CAN-ID3
Port No.:1 Format:Standard Frame ID:386 Data Length (Byte):8 Endian:Little LSBMSB:***

CAN-ID4
Port No.:1 Format:Standard Frame ID:486 Data Length (Byte):8 Endian:Little LSBMSB:***

How to cut out the CAN-CH data: Point Display Bit Assignment...

CAN-CH	Measurement ON/OFF	Start Point	End Point	Bit Length	Data Type	CAL Coefficient	Offset	Unit	CH Name	Deci Digits
1	☒	00	37	32	Float	1.0000	0.0000	µm/m		Auto
2	☒	40	77	32	Float	1.0000	0.0000	°C		Auto
3	☐	00	00	1	Signed	1.0000	0.0000			Auto
4	☐	00	00	1	Signed	1.0000	0.0000			Auto
5	☐	00	00	1	Signed	1.0000	0.0000			Auto
6	☐	00	00	1	Signed	1.0000	0.0000			Auto
7	☐	00	00	1	Signed	1.0000	0.0000			Auto
8	☐	00	00	1	Signed	1.0000	0.0000			Auto

CAN-CH2 Bit Assignment

Byte	Bit							
	7	6	5	4	3	2	1	0
0	7	6	5	4	3	2	1	0
1	15	14	13	12	11	10	9	8
2	23	22	21	20	19	18	17	16
3	31	30	29	28	27	26	25	24
4	39	38	37	36	35	34	33	32
5	47	46	45	44	43	42	41	40
6	55	54	53	52	51	50	49	48
7	63	62	61	60	59	58	57	56

Print Change Setting Items... Close OK Cancel

The above Bit Assignment is for terminal temperature data for NTB-201A.

6. FURTHER INFORMATION ON OPTIONS

6-1 DESCRIPTIONS OF OPTIONS

For details of the options that are used in combination with the Network Terminal Box (NTB-201A), see the following table.

Name	Model	Function
Network Terminal Box for Strain Measurement	NTB-100A-120 NTB-100A-350 NTB-110A-350 NTB-101A-120 NTB-101A-350 NTB-111A-350	● For measuring strain gage and strain gage transducer.
Control software for the NTB series	NTB-10A	● For controlling the NTB series from the PC.
AC adapter	SA-10A-EDS	● For supplying power to the NTB series. Power voltage of the AC adapter is from 100 to 240 VAC (50/60 Hz).
Communication cable (1 m) (3 m) (5 m) (10 m)	N-102 H-11681 H-11682 H-11683	● For connecting the NTB series and USB-CAN converter, NTB series and SME-100A/SME-101A. ● For connecting the multiple NTB series units in the distributed arrangement. Note: When requiring the cable other than the left, contact KYOWA or our representatives.
Y cable	N-103	● For using multiple NTB series units in the distance.
Coupling plate	CN-1A	● For coupling multiple NTB series units without using the DIN rail.
Handy logger	SME-100A/101A	● For controlling the NTB series without using the PC.
USB-CAN converter	Kvaser Leaf Light HS (Kvaser Inc.,)	● USB-CAN converter for connecting the PC and NTB series. ● The NTB-10A (Control Software) and accessory sample software are operated by this interface.
Termination resistance	CANterm120 (Vector Japan Co., Ltd.)	● Before connecting the communication cable, be sure to connect the termination resistance to the USB-CAN converter.
DIN rail (recommended)	(TAKACHI)*	
DIN rail mounting plate (recommended)	DRA-1 (TAKACHI)*	● For fixing the NTB series to the DIN rail.

* TAKACHI ELECTRONIC INDUSTRIAL Co., Ltd.

7. TROUBLESHOOTING

7-1 TROUBLESHOOTING

If the NTB-201A does not operate as expected or in a stable manner, examine the facts that may be causing such a condition before concluding that the system has failed.

Items to be checked and countermeasures for various symptoms are described below.

If the problem still occurs even after corrective action is taken, contact KYOWA or our representative.

Symptom	Check item and/or countermeasures
1) No power is ON. (The "POWER LED" does not light up.)	- Does the DC power connector have the specified voltage? - Are the both ends of the AC power cable securely connected? - Is the "Power connector" securely connected? → Check the connection and securely connect it. - Is the "OPT. 3" switch set to ON? → The power saving function is set to ON. You may use the NTB-201A as it is. But if not requiring power saving function, set the "OPT. 3" switch to OFF.
2) After turning ON the power, the "POWER LED" flickers.	- Is the "BOX No." set to 00? → Set the "BOX No." other than 00. - Are the "BOX No." overlapping? → Set the "BOX No." so as not to overlap.
3) The NTB-201A stops operation and accepts no operation.	- The NTB-201A operation failed due to external interfering noise. → Turn OFF and ON the power once again. If the phenomenon recurred because of external interfering noise, take countermeasures against noise from operating environment, power supply, etc. - Is the "BOX No." set to 00? → Set the "BOX No." other than 00. - Is the termination resistance correctly set? → For single: Set the termination resistance ("TERM.") switch to ON. → For multiple: Set the endmost termination resistance ("TERM.") switch of the connecting NTB series to ON. *For the termination resistance, see "3-3." - Is the "OPT. 2" switch set to ON? → Set the "OPT. 2" switch to OFF.
4) Measured value varies and not stable.	- Operation of the NTB-201A failed due to external interfering noise. → Turn OFF and ON the power once again. If the phenomenon recurred because of external interfering noise, take countermeasures against noise from operating environment, power supply, etc. - Are the input lead wire and input cable correctly connected to the input terminal? → If the connections to the input terminal (soldering, screwing) are not stable, the measured value varies. Check the connection and securely connect it.
5) No mode changes even if the "DIP switch for changing mode" is changed.	The mode is updated by turning OFF and ON the NTB-201A, or clicking the File – Environment Setting - NTB comm. check button of the NTB-10A. → Turn OFF and ON the power once again or conduct the 'communication check' of the NTB-10A.

6)	No optional function changes even if the “DIP switch for option” is changed.	• The function is updated by turning OFF and ON the NTB-201A or clicking the File – Environment Setting - NTB comm. check button of the NTB-10A. → Turn OFF and ON the power once again or conduct the ‘communication check’ of the NTB-10A. - However, turn ON and OFF the NTB-201A to update the termination resistance setting (ON/OFF of the “TERM.”).
7)	Measured value is faulty.	• Are the setting of the “DIP switch for changing mode” and connecting method correct? → Correctly set the DIP switch and correctly connect wiring. • Are input lead wire and input cable correctly connected to the input terminal? → If the connections to the input terminal (soldering, screwing) are wrong, you cannot measure correctly. - Check the connection and connect it correctly.
8)	The NTB-201A does not operate.	• Is the termination resistance correctly set? → For single: Set the termination resistance (“TERM.”) switch to ON. → For multiple: Set the endmost termination resistance (“TERM.”) switch of the connecting NTB series to ON. *For the termination resistance, see “3-3.” • Is the “BOX No.” overlapping? → Set the “BOX No.” so as not to overlap. • Are the PC/SME and NTB-201A securely connected? → Check the connection and securely connect it. • Is the “OPT. 3” switch set to ON? → Set the “OPT. 3” switch to OFF.
9)	Measurement of multiple NTB series units is not available.	• Are the “BOX No.” overlapping? → Set the “BOX No.” so as not to overlap. • Are the PC/SME and NTB series securely connected? → Check the connection and securely connect it.
10)	The NTB-201A does not come back from the power saving mode.	• Are the both ends of the AC power cable securely connected? • Is the “power connector” securely connected? → Check the connection and securely connect it. • Are the PC/SME and NTB-201A securely connected? → Check the connection and securely connect it.

11) No measurement can be conducted with the CAN card of the EDX series.	● Is the “OPT. 2” switch of the DIP switch for option set to ON? → Set the “OPT. 2” switch to ON. The NTB-201A becomes automatically and continuously output the data. ● Is the terminator correctly set? → Check the setting of the termination resistance. *For the termination resistance setting, see “3-3. ● Is the communication standard High Speed CAN? (Setting of the EDX side) → Check that the standard is High Speed CAN. ● For the CAN-40A Is the NTB-201A connected to the High Speed CAN port? → Check that the NTB-201A is connected to the High Speed CAN port. ● Is communication speed 50 kbps? (Setting of the EDX side) → Check that the speed is 50 kbps or not. ● Is format of the ID Standard? (Setting of the EDX side) → Check that the format is Standard. ● Are IDs correctly set in hex? (Setting of the EDX side) → Check that the ID is correctly set. CH1: 0x0180 + “BOX No.” CH2: 0x0280 + “BOX No.” CH3: 0x0380 + “BOX No.” CH4: 0x0480 + “BOX No.” ● Is Data length 8? (Setting of the EDX side) → Check that the Data length is 8. ● Is Endian Little? (Setting of the EDX side) → Check that the Endian is Little. ● Is Data type Float? (Setting of the EDX side) → Check that the Data type is Float. ● Are the CAN conditions of the CAN correct? (Setting of the EDX side) → 0 to 3 byte: Voltage or Temperature data 4 to 7 byte: Internal temperature data
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7-2 ERROR MESSAGE (FOR SIMPLIFIED SOFTWARE)

Error Message	Check item and/or countermeasures
	● Are the PC and NTB-201A correctly connected? → Check the connection and securely connect it. ● Is the DC power correctly connected to the connecting NTB-201A? → Check the connection and securely connect it. ● Is the “BOX No.” set to 00? → Set the “BOX No.” other than 00. ● Is the termination resistance correctly set? → For single: Set the termination resistance (“TERM.”) switch to ON. → For multiple: Set the endmost termination resistance (“TERM.”) switch of the connecting NTB series to ON. *For the termination resistance, see “3-3.” ● Is the “OPT. 2” switch set to ON? → Set the “OPT. 2” switch to OFF.
	● Is the USB-CAN converter correctly connected? → Check the connection and securely connect it. ● Was the driver of the USB-CAN converter already installed? → Check the driver by opening the Device Manager.

8. SPECIFICATONS

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|-----|---|--|
| (1) | Model | NTB-201A (NTB series control software “NTB-10A” is included)
NTB-201A-0 (NTB series control software “NTB-10A” is not included) |
| (2) | Number of measuring CHs | 4 |
| (3) | Scanning speed | Approx. 0.5 sec/CH |
| (4) | Measuring Target | Voltage, Thermocouple |
| (5) | Measuring range, Resolution and Accuracy (Voltage measurements) | |

Measurement range	Measuring range	Resolution	Accuracy	Input resistance
10 V	0 to ± 10.0000 V	100 μ V	$\pm (0.1\% \text{ of reading} + 0.0003 \text{ V})$	Approx. 1 Mohm
50 V	0 to ± 50.000 V	1 mV	$\pm (0.1\% \text{ of reading} + 0.003 \text{ V})$	Approx. 1 Mohm

- (6) Measuring range, Resolution and Accuracy (Thermocouple measurements)

Type	Measuring range	Resolution	Accuracy		Accuracy of reference junction compensation
K	-200.0 to +1230.0℃	0.1℃	-200.0 to less than -100.0℃ ----- -100.0 to +1230.0℃	±(0.2 % of reading + 0.3℃) ----- ±(0.1 % of reading + 0.2℃)	±0.5℃ 〔 When the input terminal temperature is stable. 〕
T	-200.0 to + 400.0℃		-200.0 to less than -100.0℃ ----- -100.0 to + 400.0℃	±(0.2 % of reading + 0.3℃) ----- ±(0.1 % of reading + 0.2℃)	〔 Ambient temperature range 0 ~ +50℃ 〕
E	-200.0 to + 660.0℃		-200.0 to less than -100.0℃ ----- -100.0 to + 660.0℃	±(0.2 % of reading + 0.3℃) ----- ±(0.1 % of reading + 0.2℃)	
J	-200.0 to + 870.0℃		-200.0 to less than -100.0℃ ----- -100.0 to + 870.0℃	±(0.2 % of reading + 0.3℃) ----- ±(0.1 % of reading + 0.2℃)	±1.0℃ 〔 When the input terminal temperature is stable. 〕
R	0.0 to +1760.0℃		0.0 to less than +100.0℃ ----- +100.0 to +1760.0℃	±(0.2 % of reading + 0.8℃) ----- ±(0.125 % of reading + 0.6℃)	〔 Ambient temperature range -10 ~ less than 0 ℃ 〕
N	-200.0 to +1300.0℃		-200.0 to less than -100.0℃ ----- -100.0 to +1300.0℃	±(0.2 % of reading + 0.3℃) ----- ±(0.1 % of reading + 0.2℃)	

- * The above “Accuracy” does not include the “Accuracy of reference junction compensation” and the accuracy of the connected sensor.
- * The reference junction compensation is selectable between external mode and internal mode.
- * Resistance of thermocouple: 1 kohm or less

(7)	Checking function	Burn-out check
(8)	Power saving function	Valid after no measurement is conducted for 3 minutes. Capable of selecting ON/OFF of the power saving function with the “OPT. 3” DIP switch.
(9)	Interface	Dedicated interface (CAN-compliant)
(10)	Operating temperature range	-10 to 50 °C
(11)	Operating humidity range	20 to 85%RH (Non-condensing)
(12)	Power supply	11 to 16 VDC
(13)	Consumption current (when operating 12 VDC)	When measuring: 100 mA or less When waiting: 100 mA or less When standby: 40 mA or less (with the power saving function)
(14)	Dimensions	150 (W) × 28 (H) × 55 (D) mm (Protruded portion not included)
(15)	Weight	Approx. 310 g

9. OUTSIDE DRAWING

