

# NTB-100/200 Series

## Network Terminal Box



### Digitization of field measurements

- Network output is compliant to CAN, enables a single wire to connection
- The wide area, decentralized arrangement will be useful for the infrastructure of building and civil engineering.
- Digitizing data adjacent to the sensor, enables to transmit digital data strong against noise.
- Compact, lightweight and affordable, allowing a small-sized system to be built on site easily.
- Various ways of docking and connection are provided, broadening system applications.
- Measurement is started immediately when the instrument is connected to a computer.

NTB-100/200 Series is a measuring instrument that extends with one cable, and decentralized arrangement. A single unit measures 4 channels, and allows up to 99 units to be connected, so measurement up to 396 channels is possible.

By placing an NTB near a sensor, only a single communication cable is required to build a total distance of 1 km wide area network

The digital transmission is hardly affected by noise, thus useful for building a wide area network.

Directly connects various sensors including strain gages, facilitates digital measurement in the field such as construction or building site, or for indoor experiments and researches.

Voltage as well as thermocouples are measured by NTB-201A.

Allows SME-100A/101A to be carried to anywhere, enhancing field measurements.

### NTB-100 Series Specifications

Network data collector models			
Models*	Bridge excitation	Sensor input terminal	Quarter Bridge
NTB-100B-120	Constant-voltage	One-touch terminal	120 Ω
NTB-101A-120	Constant-voltage	Screw soldering terminal	120 Ω
NTB-100B-350	Constant-voltage	One-touch terminal	350 Ω
NTB-101A-350	Constant-voltage	Screw soldering terminal	350 Ω
NTB-110B-350	Constant-current	One-touch terminal	For Full bridge only
NTB-111A-350	Constant-current	Screw soldering terminal	For Full bridge only

\*Control Software NTB-10A Standard accessory.  
No control software for Models with suffix "-0".

### Measuring network data collector object

Bridge excitation	Measuring Targets	NTB Models				
		General-purpose strain measurement		Civil engineering measurement		
		NTB-100B-120 NTB-101A-120	NTB-100B-350 NTB-101A-350	NTB-110B-350	NTB-111A-350	
NTB models and applicable sensors	Strain gages	Quarter bridge	120 Ω 350 Ω	Yes	Yes	
		Half-bridge	Active-active system	Yes	Yes	
	Strain-gage transducers	Full-bridge	Full bridge	Yes	Yes	
Constant current	Civil engineering transducers	Full bridge	350 Ω	Civil engineering transducer with thermal sensors		Yes

### Channels 4

<b>Scanning Speed</b>	Approx. 0.5 s/channel for 0 to ± 30 k μm/m Approx. 1 s/channel for ± 30 k μm/m or more With civil engineering transducers with a thermal sensor
<b>Bridge Excitation</b>	Approx. 2 VDC for constant-voltage bridge excitation Approx. 5.6 mA for constant-current bridge excitation (At bridge resistance 350 Ω)
<b>Measuring Range</b>	Strain measurement 0 to ± 300 k μm/m (Constant-voltage bridge excitation) 0 to ± 30 k μm/m (Constant-current bridge excitation) Temperature measurement with civil engineering transducers with a thermal sensor -30.0 to 70.0°C
<b>Resolution</b>	Strain measurement 0 to ± 30 k μm/m: 1 μm/m ± 30 k to ± 300 k μm/m: 10 μm/m Temperature measurement with civil engineering transducers with a thermal sensor 0.1°C
<b>Accuracy</b>	Strain measurement 0 to ± 30 k μm/m: ± (0.05% of reading + 2) μm/m ± 30 k to ± 300 k μm/m: ± (0.1% of reading + 20) μm/m Temperature measurement with civil engineering transducers with a thermal sensor ± 0.5°C
<b>TEDS</b>	Reads information from TEDS-installed sensors Channel name writing (Kyowa ID only)



<b>Power save mode</b>	Provided ON/OFF using "OPT.3" DIP switch.
<b>Interfaces</b>	Dedicated interface conforming to CAN, cable extension up to 1 km
<b>Operating Temperature</b>	-10 to 50°C
<b>Operating Humidity</b>	20 to 85%RH (Non-condensing)
<b>Power Supply</b>	11 to 16 VDC
<b>Current Consumption</b>	(At 12 VDC) Constant-voltage bridge excitation Operation: 100 mA or less Standby: 60 mA or less Standby (In power save mode): 40 mA or less
<b>Constant-current bridge excitation Operation</b>	70 mA or less Standby: 60 mA or less Standby (In power save mode): 40 mA or less
<b>Dimensions</b>	One-touch type: 150 W × 28 H × 55 D mm (Excluding protrusions) Screw soldering type: 150 W × 28 H × 110 D mm (Excluding protrusions)
<b>Weight</b>	One-touch type: Approx. 310 g Screw soldering type: Approx. 650 g

<b>Standard Accessories</b>	DC power cable P-76, Ground wire P-72, Wire connection seals, Rubber feet, Screwdriver (For one-touch type only), Terminal block (For screw soldering type only), Control software NTB-10A, Instruction manual (CD-R)
<b>Optional Accessories</b>	Y cable N-103 Communication cable N-102 (1 m) Communication cable H-11681 (3 m) Communication cable H-11682 (5 m) Communication cable H-11683 (10 m) Note: Please contact us for communication cables other than those listed above. AC adapter SA-10A-EDS Connection board/clip CN-1A DIN rail mounting plate Terminal resistor CANTERM120 USB/CAN converter LEAF LIGHT HS V2

**NTB-201A Specifications**

<b>Channels</b>	4			
<b>Scanning Speed</b>	Approx. 0.5 s/channel			
<b>Measuring Targets</b>	DC voltage-output, thermocouples			
<b>Voltage-output Measurement</b>				
<b>Range</b>	<b>Measuring range</b>	<b>Resolution</b>	<b>Accuracy</b>	<b>Input resistance</b>
10 V	0 to ±10.0000 V	100 µV	±(0.1% of reading+0.0003 V)	Approx. 1 MΩ
50 V	0 to ±50.000 V	1 mV	±(0.1% of reading+0.003 V)	Approx. 1 MΩ

<b>Thermocouples</b>				
<b>Types</b>	<b>Range</b>	<b>Accuracy (Resolution: 0.1 °C)</b>		
K	-200.0 to 1230.0°C	-200.0 to below -100 °C -100.0 to 1230.0°C	±(0.2% of reading +0. 3°C) ±(0.1% of reading +0. 2°C)	
T	-200.0 to 400.0°C	-200.0 to below -100 °C -100.0 to 400.0°C	±(0.2% of reading +0. 3°C) ±(0.1% of reading +0. 2°C)	
E	-200.0 to 660.0°C	-200.0 to below -100 °C -100.0 to 660.0°C	±(0.2% of reading +0. 3°C) ±(0.1% of reading +0. 2°C)	
J	-200.0 to 870.0°C	-200.0 to below -100 °C -100.0 to 870.0°C	±(0.2% of reading +0. 3°C) ±(0.1% of reading +0. 2°C)	
R	-200.0 to 1760.0°C	0.0 to below 100 °C +100.0 to 1760.0°C	±(0.2% of reading +0. 8°C) ±(0.125% of reading +0. 6°C)	
N	-200.0 to 1300.0°C	-200.0 to below -100 °C -100.0 to 1300.0°C	±(0.2% of reading +0. 3°C) ±(0.1% of reading +0. 2°C)	

\* Accuracy of Internal Reference-junction Compensator Within ±0.5 °C, when temperature balanced at input terminals, and the ambient temperature is 0 to 50 °C.  
Within ±1.0 °C, when temperature balanced at input terminals, and the ambient temperature is -10 to 0 °C.

Notes:  
1. Accuracies do not include the internal reference junction compensator accuracy  
2. The reference junction compensator is switchable between internal and external  
3. The thermocouple resistance should be 1 kΩ or less

<b>Check Functions</b>	Burnout check.
<b>Power Save Mode</b>	Provided ON/OFF using "OPT.3" DIP switch.
<b>Interfaces</b>	Dedicated interface conforming to CAN,
<b>Operating Temperature</b>	-10 to 50°C
<b>Operating Humidity</b>	20 to 85% RH (Non-condensing)
<b>Power Supply</b>	11 to 16 VDC
<b>Current Consumption</b>	(At 12 VDC) Operation: 100 mA or less Standby (In power save mode): 40 mA or less
<b>Dimensions</b>	150 W × 28 H × 55 D mm (Excluding protrusions)
<b>Weight</b>	Approx. 320 g

Note: TEDS function is unusable.

<b>Standard Accessories</b>	DC power cable P-76 (2 m) Ground wire P-72 (5 m)
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**NTB power supply box NTB-20A**

**NTB relay box NTB-21A**

The power supply line and CAN communications line are integrated into one wire, enabling dispersed usage outdoors or in other locations where securing a power supply is difficult.

**NTB power supply box NTB-20A**

- **Power save function (AUTO mode)**  
When the PC power supply is OFF, then the power supply of the NTB-20 connected by a USB cable is off.
- **Power supply output limitation function**  
When a power supply exceeding the power supply range for operating the NTB-20A is input, for safety, the power supply output from the serial connector and the OUT connector is turned OFF.

<b>NTB series connected units and cable length</b>	
<b>With USB port</b>	
<b>NTB series connected units</b>	<b>Cable length</b>
1	200 m or less
2	100 m or less
<b>When AC adapter or DC power supply used</b>	
<b>NTB series connected units</b>	<b>Cable length</b>
1	1000 m or less
2	840 m or less
3	560 m or less
4	470 m or less
5	330 m or less
6	280 m or less
7	240 m or less
8	200 m or less
9	180 m or less
10	160 m or less
11	150 m or less
12	130 m or less
13	120 m or less
14	120 m or less
15	110 m or less
16	100 m or less
<b>Power Save Functions</b> With function In POWER switch "AUTO" mode, with built-in power save function (*1)	
<b>Operating Temperature</b> -10 to 50°C	
<b>Operating Humidity</b> 20 to 85%RH (Non-condensing)	
<b>Power Supply Input</b> USB port: 5 VDC External power supply: 11 to 16 VDC (AC adapter, DC power supply)	
<b>Current consumption</b> When using 12 VDC (Using AC adapter) OFF mode: 7.0 mA or less AUTO mode: 7.0 mA ON mode: 30.0 mA or less When using 5 VDC (Using USB port) OFF mode: 5.0 mA or less AUTO mode: 30.0 mA or less ON mode: 30.0 mA or less	
<b>Dimensions</b> 150 W × 28 H × 55 D mm (Excluding protrusions)	
<b>Weight</b> Approx. 260 g	

(\*1) In "AUTO" mode, turning off the PC power supply automatically turns OFF the power supply to the NTB-20A (NTB power supply box).  
When using "AUTO" mode, ensure that the PC and NTB-20A (NTB power supply box) are connected using a USB cable.

<b>Optional Accessories</b>	Connection cable N-38 (1 m), N-39 (2 m) Communication cable N-102 (1 m) Communication cable H-11681 (3 m) Communication cable H-11682 (5 m) Communication cable H-11683 (10 m)
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●NTB relay box NTB-21A

■Power supply output limitation function

When power supply exceeding the range is input into NTB, the power supply output from the serial connector is turned to OFF.

<b>Input Voltage Range</b>	11 to 16 VDC
<b>Operating Temperature</b>	-10 to 50°C
<b>Operating Humidity</b>	20 to 85%RH (Non-condensing)
<b>Dimensions</b>	150 W × 28 H × 29 D mm (Excluding protrusions)
<b>Weight</b>	Approx. 160 g

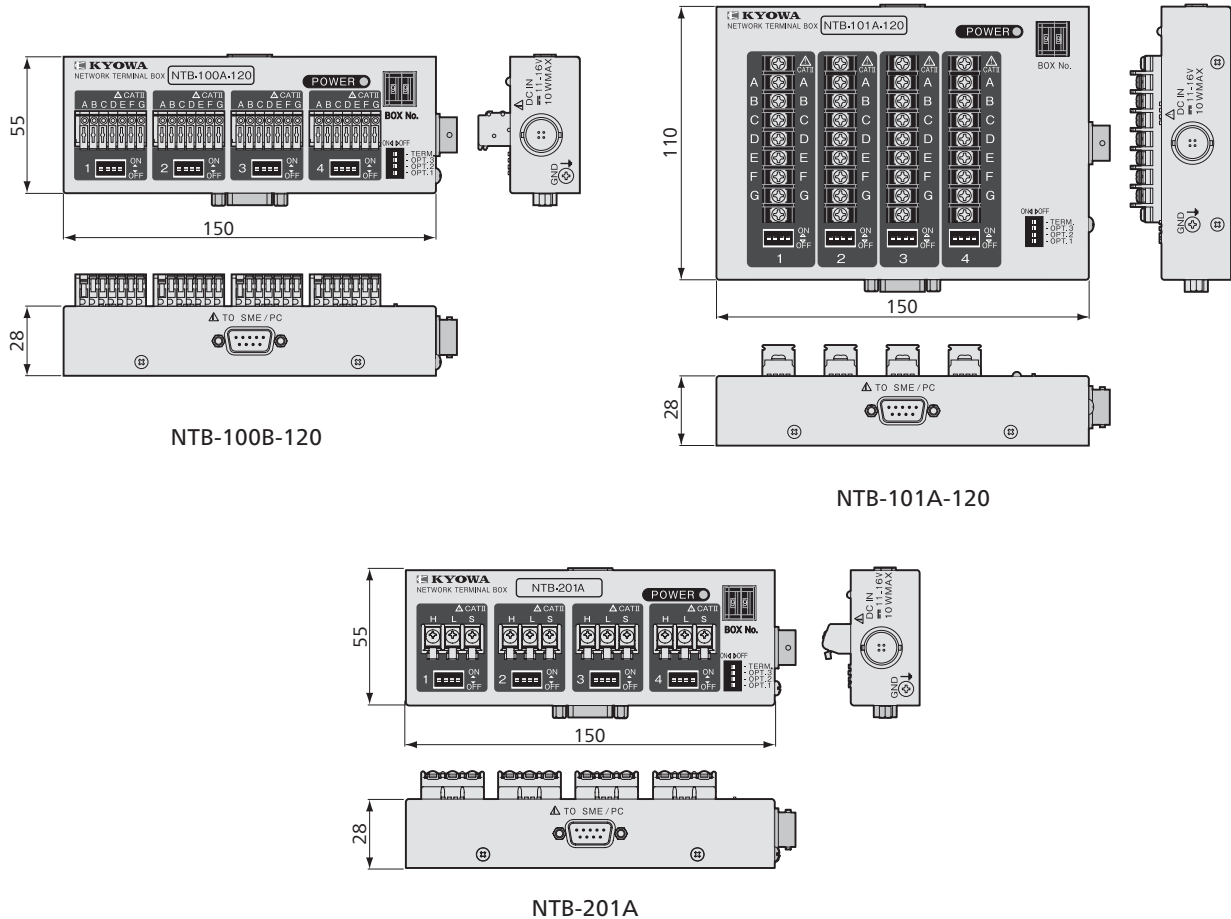
●Network Terminal Box Control Software NTB-10A

For remote control of network terminal boxes from a PC, and displaying measurement data in graphs or a numeric format on the PC screen.	
<b>Measuring Units</b>	NTB-100 series: 1 to 99 (Max. 396 channels)
<b>Measuring Functions</b>	Relative (Relative value) measure data with an initial unbalance value subtracted. ZERO measurement: Measure initial unbalance value.
<b>Channels Conditions</b>	Meas* channel ON/OFF, CAL coefficient calculation ON/OFF, Relative measurement ON/OFF, CAL coefficient, Offset, Unit, Dec, digits, Ref resist, CH Name (20 characters)
<b>Measuring Condition File</b>	Load and save
<b>Measuring Operations</b>	MONITOR Meas: Measure ZERO value during MONITOR measurement INTERVAL Meas, File dividing function of the measured data: Not divide, every hour, every day.
<b>Interval Measurement</b>	Interval start time, interval time, repeat 0 to 9999 (0 to infinite) Interval measuring steps: 5
<b>Numeric Display</b>	Available windows: 1 Window switch: List only
<b>Graph Display</b>	Y-time: Max 8 channels/graph BAR graph: Max 32 channels/graph

<b>Measured data saving function</b>	
The measured data is saved with the CSV format.	
<b>TEDS</b>	Reads sensor's information and sets to channel condition automatically Channel name writing (Kyowa sensor only, within 28 characters)
<b>Data file destination</b>	PC hard disk
<b>File Split</b>	No split Split every hour Split every day
<b>System Environment</b>	
<b>OS</b>	Windows® Vista, 7, 8, or 8.1, English/Japanese 32, 64 bits support
<b>CPU</b>	Core2Duo, 2 GHz or advanced
<b>Memory</b>	If 32-bit OS, 2 GB or more If 64-bit OS, 4 GB or more
<b>Display</b>	1024×768 pixels or more
<b>USB/CAN Converter</b>	Model: LEAFLIGHT HS

\*: Here "Meas" stands for measuring.

■Dimensions



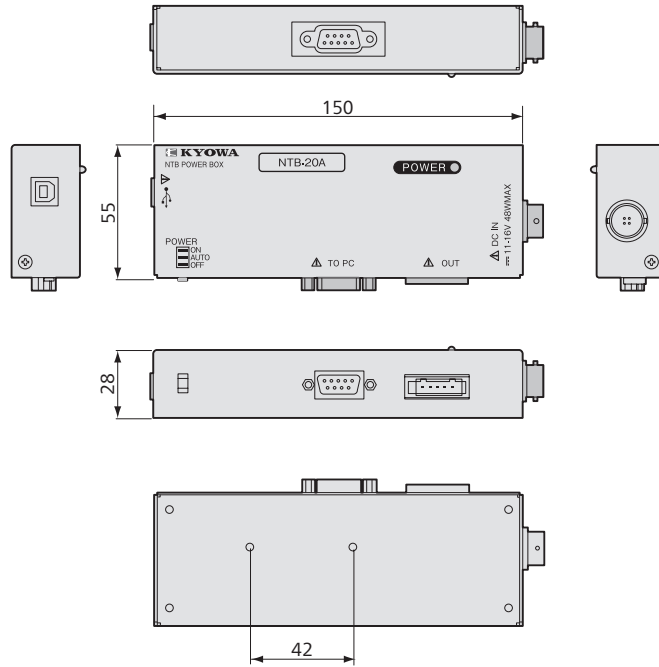
NTB-100B-120

NTB-101A-120

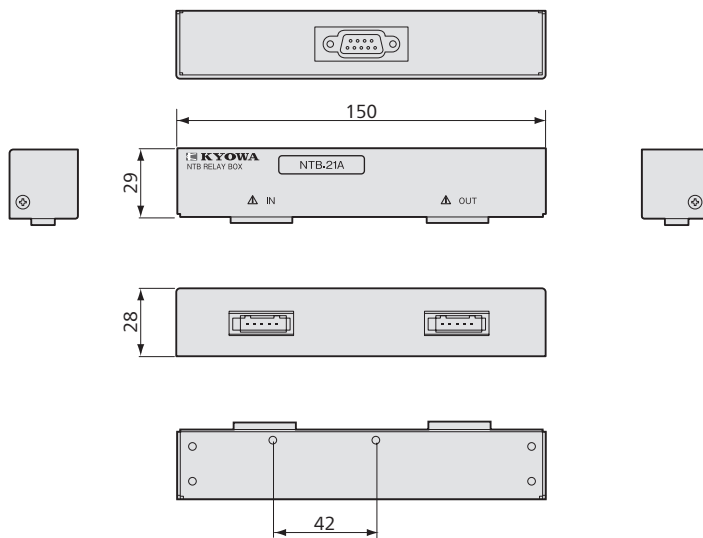
NTB-201A



■ Dimensions



NTB-20A



NTB-21A



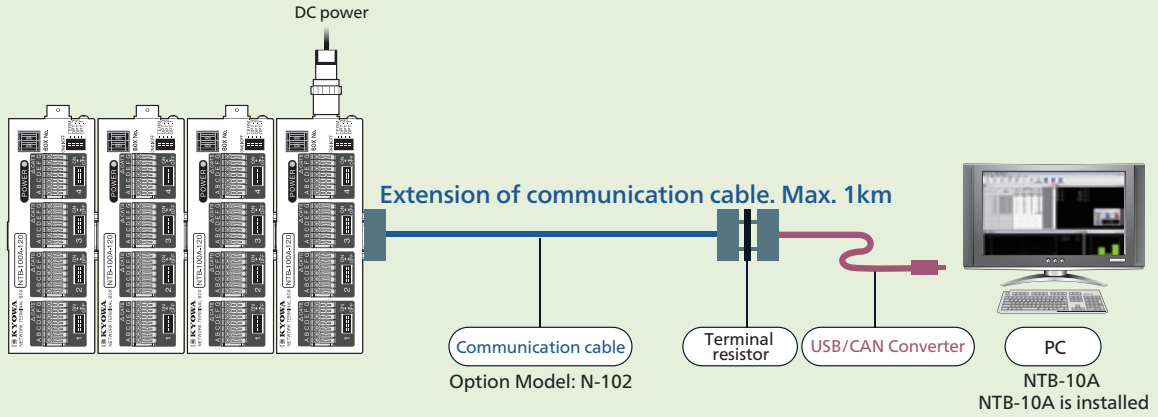
NTB Series  
Recommended  
products for  
combination



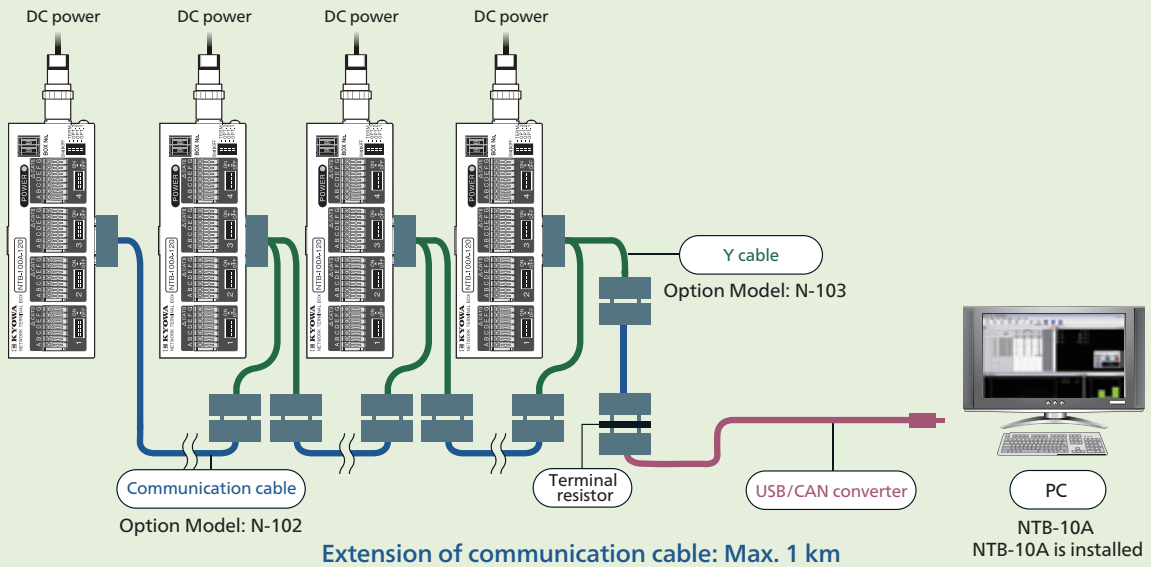


●The figures below are charts of connecting wires where the Network Terminal Box is connected with the PC.

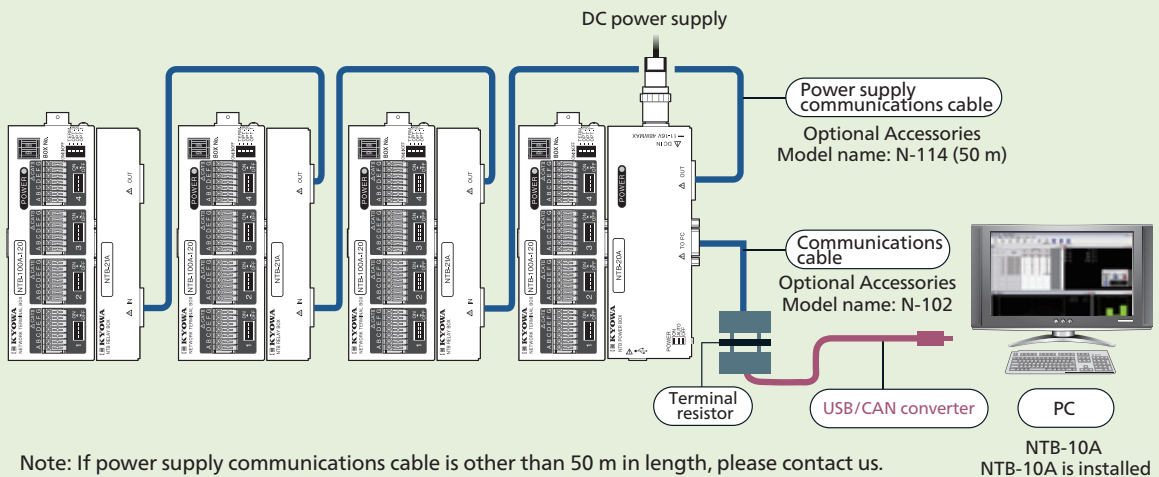
**Case A 4-NTB docked connection (UP to 8 units are possible)**



**Case B 4-NTB distributed connection (Up to 99 units are possible)**



**Case C If using an NTB power supply (NTB-20A) and NTB relay boxes (NTB-21A) for dispersed usage**  
(The diagram below uses 4 units, and the cable length will differ depending on the connected units. See table on P. 3-38)



Note: If power supply communications cable is other than 50 m in length, please contact us.

# Handy Data Logger SME-100A/101A

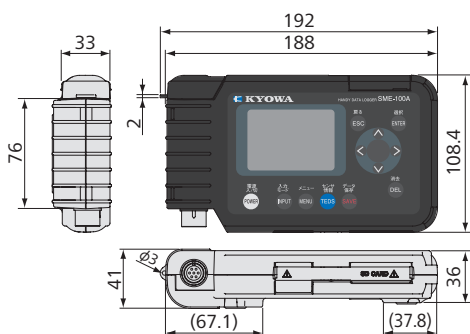


## Compact & lightweight Palm size, therefore easily to carry

- Built-in bridge circuit for direct connection of a strain gage
- Wide measuring range:  $\pm 300 \text{ k } \mu\text{m/m}$
- Data saved in SD card is read and controlled by a PC
- Driven by AA batteries (Easy to get)
- TEDS compatible (Not only reading, but also writing possible)

Combination with NTB series, total 33 channels measurement is possible.  
The strap is useful for field inspection and for confirming proper sensor installation.  
The SD card (Option) simplifies data transmission to PC.  
Using the attached input cable, a strain gage is easily connected.

### ■ Dimensions



### Specifications

<b>Channels</b>	1 (In independent use of the logger) Max. 33 channels with NTBs connected						
<b>Sampling Frequencies</b>	(In independent use, or NTB-dependent when connected to NTBs) Approx. 0.5 s: 0 to $\pm 30 \text{ k } \mu\text{m/m}$ Approx. 1 s: $\pm 30 \text{ k } \mu\text{m/m}$ or more Temperature measurement with civil engineering transducers with a thermal sensor						
<b>Measuring Modes</b>	RELATIVE mode (The zero value is subtracted from measurements) *“Zero” denotes the initial unbalance during strain measurement, and is acquired at any time.						
<b>Arithmetic Operations</b>	Calculation using a coefficient						
<b>Measuring Targets</b>	Strain gages, strain-gage transducers, civil engineering transducers with a thermal sensor						
	<table border="1"> <thead> <tr> <th>Bridge system</th> <th>Applicable gage resistance</th> </tr> </thead> <tbody> <tr> <td>Quarter bridge</td> <td>120, 240, 350 <math>\Omega</math></td> </tr> <tr> <td>Half/full bridge</td> <td>120 to 1000 <math>\Omega</math></td> </tr> </tbody> </table>	Bridge system	Applicable gage resistance	Quarter bridge	120, 240, 350 $\Omega$	Half/full bridge	120 to 1000 $\Omega$
Bridge system	Applicable gage resistance						
Quarter bridge	120, 240, 350 $\Omega$						
Half/full bridge	120 to 1000 $\Omega$						
<b>Bridge Excitation</b>	Constant-voltage bridge excitation: Approx. 2 VDC Constant-current bridge excitation: Approx. 5.6 mA (Bridge resistance 350 $\Omega$ )						
<b>Measuring Range</b>	At strain measurement 0 to $\pm 300 \text{ k } \mu\text{m/m}$ (Constant-voltage bridge excitation) 0 to $\pm 20 \text{ k } \mu\text{m/m}$ (Constant-current bridge excitation) When measuring temperature using engineering transducers with a thermal sensor -30.0°C to 70.0°C						
<b>Resolution</b>	At strain measurement 0 to $\pm 30 \text{ k } \mu\text{m/m}$ : 1 $\mu\text{m/m}$ $\pm 30 \text{ k}$ to $\pm 300 \text{ k } \mu\text{m/m}$ : 10 $\mu\text{m/m}$ When measuring temperature using engineering transducers with a thermal sensor 0.1°C						
<b>Accuracy</b>	(NDIS one-touch connector, 4-gage connection) At strain measurement 0 to $\pm 30 \text{ k } \mu\text{m/m}$ : $\pm (0.05\% \text{ of reading} + 2) \mu\text{m/m}$ $\pm 30 \text{ k}$ to $\pm 300 \text{ k } \mu\text{m/m}$ : $\pm (0.1\% \text{ of reading} + 20) \mu\text{m/m}$ When measuring temperature using engineering transducers with a thermal sensor $\pm 0.5^\circ\text{C}$						
<b>Check Functions</b>	Insulation resistance measurement: 2 to 100 M $\Omega$ Resistance measurement: 0 to 20 k $\Omega$						
<b>Interval Measurement</b>	1 minute to 99 hours 59 minutes in 1-minute steps Starting time: year/month/day/hour/minute						
<b>Storage</b>	SD card (Optional)						
<b>SD Cards</b>	256 MB, 512 MB, 1 GB, 2 GB (FAT16) (SDXC not supported)						
<b>Display</b>	Monochrome LCD, 128 x 64 dots						
<b>TEDS</b>	Reads information from TEDS-installed sensors Channel name writing (Kyowa ID only within 10 characters)						
<b>Operating Temperature</b>	-10 to 50°C						
<b>Operating Humidity</b>	20 to 85% RH (Non-condensing)						
<b>Power Supply</b>	AA battery x 2 Consecutive operation time: Approx. 10 hours (With alkaline batteries, NTB not connected) Nickel hydride batteries is also used. An AC adapter (Optional, SW-0522E) is provided for SME-101A						
<b>Auto Power Off</b>	Power is automatically turned off if no key operation is detected for 5 minutes. In interval measuring mode with an interval of 3 minutes or longer, power is automatically turned off during standby period and turned on again 1 minute before the next measurement is started (ON/OFF of Auto Power Off is specified)						
<b>Dimensions</b>	108.4x188x41 mm (Excluding protrusions)						
<b>Weight</b>	Approx. 450 g (Excluding batteries)						
<b>Standard Accessories</b>	Input cable U-119 (60 cm) Communication cable N-102 (1 m) AA alkali battery x 2 Shoulder belt Hand strap Instruction manual (CD-R)						
<b>Optional Accessories</b>	AC adapter SW-0522E, for SME-101A						

SME-100A/101A  
Recommended  
products for  
combination

