

# ROTRY TYPE PEAK TORQUE METER MODEL ST2

## OPERATING INSTRUCTION

### ST2 ST2 Model



To use this product properly and safely, please read this manual carefully before use. If you have any question about the product and its operations, please contact your nearest distributor or TOHNICHI MFG. CO., LTD.

## Cautions on Safety

- (1) Before operation, please use correctly after often reading "cautions on safety".
- (2) Since the serious contents related safely are indicated, please follow notes shown here.  
The display and the meaning are as follows.

**Safety Symbol**

 This symbol is used for drawing attention to "safety precautions". If you see this symbol in this operating instruction, attention should be paid to safety. Take preventative actions according to the description and conduct "safe operations and proper control".

**Signal Words**

The signal words are the headers which indicate the level of hazard that should be known for human safety and in handling devices. The signal words for safety are "Danger", "Warning" and "Caution" depending on the level of hazard to human. The signal words are used with the safety symbol to indicate the following situations.

" Danger": Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

" Warning": Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

" Caution": Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. The matter which is consulted is described as "Notes".

 **Warning**

- **Do not use it in atmosphere with inflammable gas and steam.**

It may become the cause of a fire.

- **Use the charger and storage battery of exclusive use.**

Please do not use except by any means.

- **Charge correctly.**

Please do not use this charger except the power supply which has indicated by rated. It generates heat unusually and there is fear of a fire. Do not charge a storage battery in the case where temperature is less than 0 degree C, and temperature is 40 degrees C or more. There is fear of a burst or a fire. Please charge a storage battery in a well ventilated place. There is a possibility of a storage battery exploding or generating heat by fault charge. Please cover neither a charger nor a storage battery with cloth etc. There is fear of a burst or a fire. When you do not use it, please pull out a plug from a power supply. Fear of an electric shock or a fire.

- **Do not put a storage battery into fire.**

It explodes or there is a possibility that a toxic substance may come out.

- **Disassembly of apparatus, prohibition of reconstruction.**

Safety is spoiled or it becomes the cause of a function, a life fall, and failure.

- **Take the circumference situation of a work place into consideration.**

Please do not use a main part, a charger, and a storage battery in rain, or do not use them in the place which became wet or got wet. There is a cause of an electric shock, emitting smoke or failure. Please make a work place bright enough. Work in a dark place causes an accident. Please do not carry out use or charge in the place which an inflammable liquid and gas generate. There is fear of explosion or a fire.

- **Do not use it for bolting work at a height.**

If a main part and a socket are dropped, it will become the cause of the accident, an injury, or failure.

- **Be sure to use appointed accessories and an appointed option article.**

Please do not use it except the accessories of the specification indicated by this handling description, or an option article. It becomes an accident and the cause of an injury.

## Cautions

- **Stop the use and storage in high temperature, a humid place, a dusty place, the place where a possibility of entering into apparatus has water, the intense place of vibration, an unstable place, etc.**

It becomes the cause of causing failure of the main part of apparatus.

- **Don't insert in the inside of apparatus metal and the thing which is easy to bump. Moreover, don't push in.**

It becomes the cause of causing failure of apparatus.

- **Do not ride on apparatus or do not put a thing on a top.**

It becomes the cause of causing failure of apparatus.

- **Do not bring a child close.**

Please do not approach a work place other than a worker. It becomes an injury and the cause of the accident.

- **When you do not use it, please keep it exactly.**

Please keep it to the place where a child's hand does not reach, or the place which a key requires in the dry place. It becomes an injury and the cause of the accident. Please keep neither a main part nor storage battery in the place where may be gone up to the temperature of 50 degrees C or more. It becomes the cause of storage battery degradation and there is fear of emitting smoke and ignition.

- **Keep a work place always clean.**

The untidy place and a work stand become the cause of causing the accident.

- **Do not use it, carrying out unreasonableness.**

In order to work efficiently safely, please work with the torque value which suited the capability of a main part. The work beyond capability causes an accident.

- **Use the main part of a tool which suited work.**

Please do not use it in addition to the specified use. It becomes the cause of an injury.

- **Do not work with an Impossible posture.**

Please always brace a step and maintain balance. It falls and becomes the cause of an injury.

- **Do not treat the code of a charger violently.**

Conveyance with a code is not carried out. Moreover, do not pull a code to extract from a wall socket. There is a possibility of damaging. Do not bring a code close to the place where heat, oil, and the angle sharpened. Please charge in the place which is not damaged in response to power, such as a code not being stepped on and not being hooked. There are an electric shock and a possibility of short-circuiting and igniting.

- **Please maintain carefully.**

Exchange of accessories should follow a handling description. It becomes the cause of failure. The code of a charger should request repair from the store of a purchase or Tohnichi, when you check periodically and it is damaged. There are an electric shock and a possibility of short-circuiting and igniting. Please always dry a grip part, maintain a clear state, and neither oil nor grease should reach.

- **Check whether there are any damaged parts.**

Please check before use whether there is no damage in a case or other parts, or it operates normally, or a predetermined function is demonstrated. Please check whether it is normal in all the parts that affect breakage of parts, an attachment state, and other work. Please use neither the charger which the power supply plug and the code damaged, nor the charger which received certain damage. There are an electric shock and a possibility of short-circuiting and igniting. The damaged case, other part exchange, and repair should request repair from the store of a purchase or TOHNICHI MFG. CO., LTD.

## Precautions for Use

### In order to use it safely and correctly

Please do not use a product making successive impacts. (e.g. impact wrench)

Please do not use it by any means other than an attached charger.

Please use the power supply of a charger on the surely indicated voltage.

Please do not open a display part by any means.

Be sure to use within the limits of a ST.

Please equip ST main part with a socket and square drive properly.

Please use it after checking that there is no crack in a socket or a square drive.

Please fit a socket or an exchange head on a socket certainly.

Keep in mind that there is fear of failure or damage by fire if it gets wet to water or oil.

Please be sure to proofread at dairy check or in the period decided by your company.

Keep in mind that it will become the cause of breakage and failure if ST main part is dropped or it throws.

While in use, an nasty smell and when it ignites, use should be stopped immediately, and a main part should be moved in a safe place. Please contact TOHNICHI MFG. CO., LTD.

### \* For handling of used battery

Nickel metal hydrogen battery is used on this product.

Do not dispose unnecessary battery and recycle it to protect resources.

Ask the distributors or Tohnichi Japan or overseas facility.

# Contents

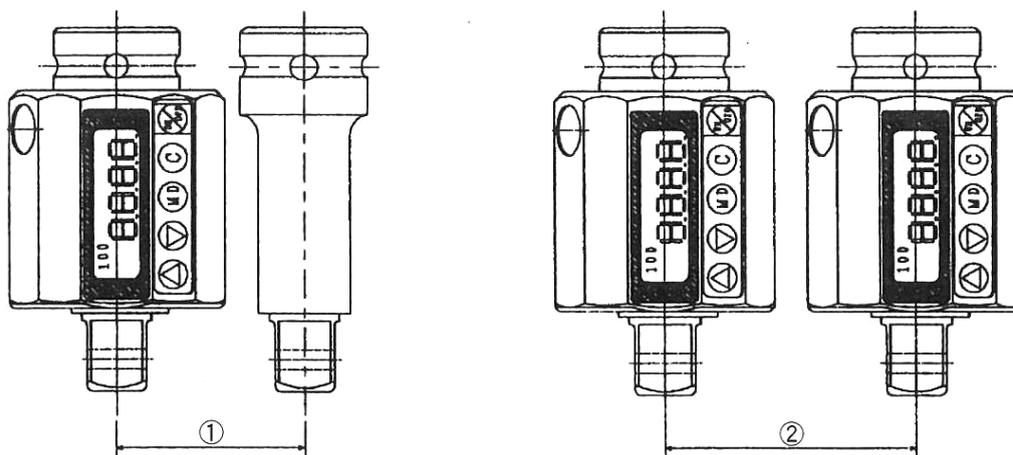
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# 1 Features

- (1) World's smallest rechargeable rotary torque meter
- (2) The ST is a cordless torque, and it can be installed into the body of rotation.
- (3) By attaching the ST to a nut runner, torque can be easily checked.
- (4) By the automatic memory function, up to 999 measurement data can be automatically counted up and stored.
- (5) The number of samples, maximum value, minimum value and average value can be displayed as measurement data.
- (6) Data can be transferred directly to PC through a USB interface. Also, infrared output of data to the infrared receiver (Option: R-DT999) is possible.
- (7) Nickel-metal hydride battery is used. 10 hours of continuous use is possible. Equipped with a battery indicator.
- (8) The combined use of the extension bar (option) and ST which have the same length allows calibration of a multiple-spindle nut runner at a low cost.
- (9) As indicated in the table below, torque measurement for small pitches of spindles is possible.

Minimum center distance Model	①	②
ST10N2 - ST200N	40mm	50mm
ST500N2	55mm	70mm
ST1000N2	60mm	

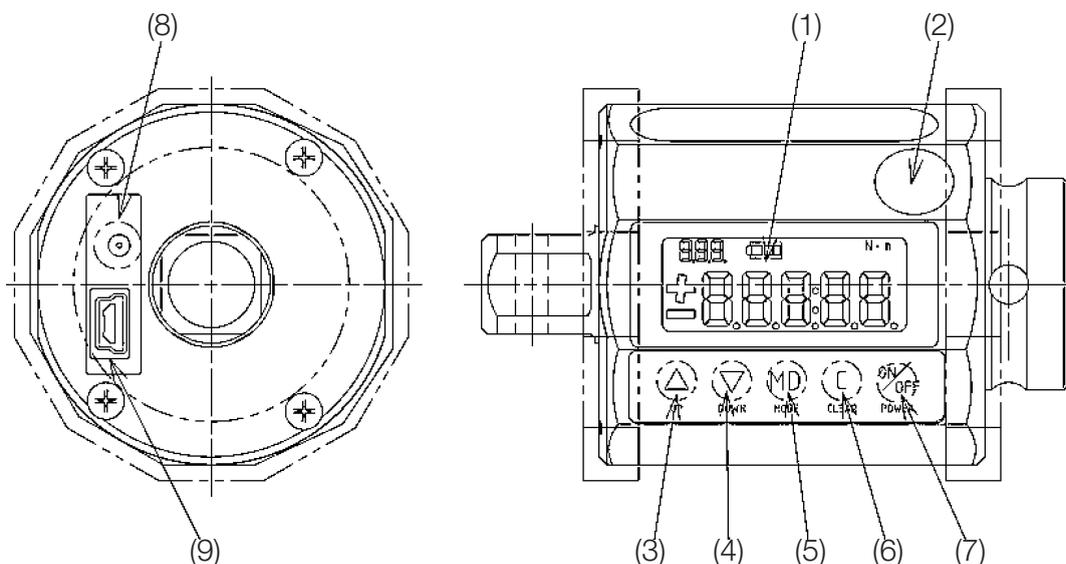




## Components

- 1) Main unit.....1 set
- 2) Battery pack BP-6 (incorporated in the main unit) .....1 set
- 3) Charger BC-4 .....1 set
- 4) Power conversion plug .....1 pc
- 5) Dummy plug (for the charging jack).....1 pc
- 6) CD-ROM (USB driver).....1 pc
- 7) USB connecting cable .....1 pc
- 8) Carrying case .....1 pc
- 9) Operating instruction .....1 pc

### 3 Names of Parts and Descriptions



#### (1) Liquid crystal display

Counter, automatic memory, battery indicator, unit and torque value are displayed.

#### (2) Infrared output window

This is a terminal that is used to output data to the Tohnichi infrared data receiver R-DT999.

#### (3) : Count UP key

The counter is moved forward by one or continuously to read out a measured data. After the counter is long pressed until 15 counts are moved forward, the counter is moved forward by +10.

#### (4) : Count DOWN key

The counter is moved backward by one or continuously to read out a measured data. After the counter is long pressed until 15 counts are moved backward, the counter is moved backward by -10.

#### (5) : MODE key

This key is used to select the calculation start position, number of samples, maximum value, minimum value or average value when the counter displays a figure other than "000".

If the key is long pressed for 2 seconds, various settings (Auto memory/Reset, output mode, communications baud rate) become possible.

(6) **C** : CLEAR key  
**CLEAR**

In the PEAK mode, the peak value is reset. Or, the stored measurement data is cleared.  
 In the RUN mode, the value on the display is automatically set to zero.

(7) **ON/OFF** : POWER switch  
**POWER**

This is a switch for turning the power ON/OFF. When it is turned ON, the key check is conducted.

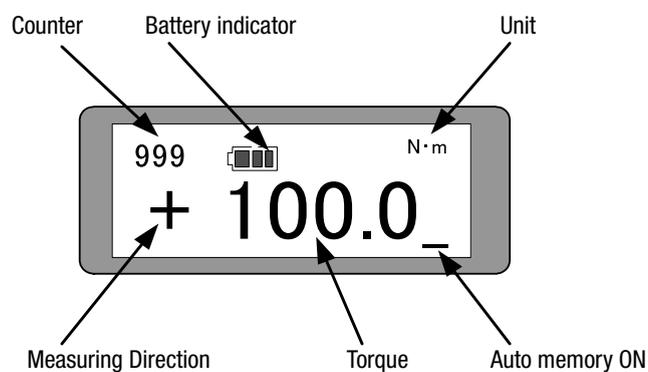
(8) Charging jack

This is a terminal for connecting the charger BC-4 for charging the battery.

(9) External output terminal (USB)

This is a terminal for connecting the supplied USB cable.

[Display]



## 4 Detailed Descriptions of Functions

### (1) RUN mode

When the counter is set at 000, the display torque increases by applying a torque load and it returns to 0 by releasing the load.

### (2) PEAK mode

When the counter displays any figure in the range of 001-999, the display torque increases by applying a torque load, and the maximum torque is held after the load is released (Peak hold).

However, if the measured torque is about 7.5% or less of the maximum torque, the RUN mode is set.

### (3) AUTO ZERO function

If **(C)** key is pressed in the RUN mode, the auto zero function is activated (in the case where the torque load is about 7.5% or less of the maximum torque.)

<<When "Err9" is displayed>>

- Under no load condition, press the power switch and **(C)** key.
  - If the "Err9" message disappears, the unit functions normally.
  - If the "Err9" does not disappear, press the Reset switch, and then press **(ON/OFF)** and **(C)** key again.
  - If the "Err9" still remains displayed, the sensor or the plated circuit may have any problem. In that case, contact TOHNICHI MFG. CO., LTD.

### (4) Error message

If **(ON/OFF)** is pressed when the power is OFF, the key check function is activated. If there is any problem, any of the error messages is displayed.

<<Err1: The Count UP key remains pressed down>>

<<Err2: The Count DOWN key remains pressed down>>

<<Err3: The Memory key remains pressed down>>

<<Err4: The Clear key remains pressed down>>

<<Err8: Internal memory is abnormal>>

When any of Err1 to 4 or 8 is displayed:

- Turn the power OFF, and without touching any key, press **(ON/OFF)** to ON.
  - If the "Err" message disappears, the unit functions normally.
- If the "Err" message does not disappear, turn the power off, and then press **(ON/OFF)** while pressing **(C)** key.
  - If the "Err" message still remains displayed, the membrane switch, plated circuit or internal memory may have any problem. In that case, contact TOHNICHI MFG. CO., LTD.

**(5) Auto Memory/Reset function**

The PEAK HOLD measurement value is automatically stored in any given set range (0.1 to 5 sec) and the counter is moved forward by one.

If the Auto Memory/Reset function is not used, set at 0.0 sec.

**(6) Auto Power OFF function**

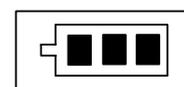
If no key is pressed or no torque load (7.5% or less of the maximum torque value) is applied for 3 minutes, the power will be automatically turned off.

If "- - - -" indicating an alarm state is displayed, the power will be automatically turned off in one minute irrespective of the above condition.

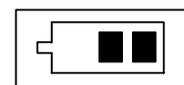
**(7) Battery remaining indicator function**

The LCD has a function of indicating the battery remaining status in 4 stages.

The full battery capacity remains.

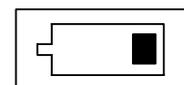


The remaining battery capacity is low. About half the battery life was consumed.

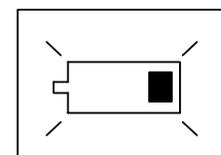


Battery alarm

There is no battery remaining. Immediately recharge the battery. "- - - -" is displayed on the LCD, and any key other than the Power switch cannot be operated. If such a state occurs, the power will be turned off in one minute.



Even if the battery is dead, stored data and settings are not cleared.



**(8) Overtorque alarm**

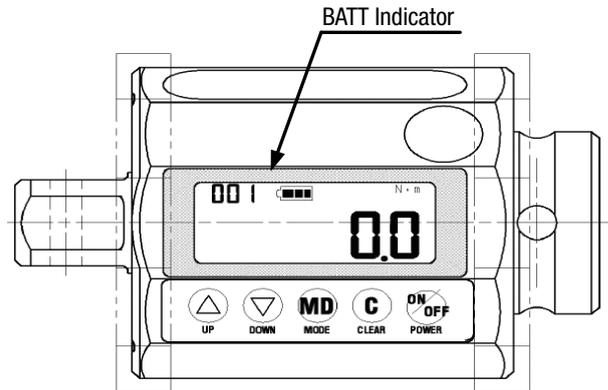
If the measured torque exceeds about 105% of the maximum torque, the torque value and "- - - -" are displayed alternately and a buzzer sounds.

**(9) Overtorque alarm and Peak Hold starting torques**

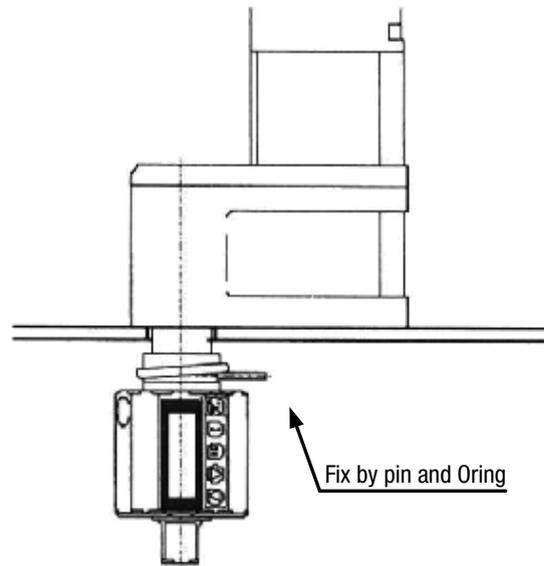
MODEL	TORQUE RANGE		1 digit	105% of max torque	7.5% of max torque	Auto zero within 75digit
	MIN	MAX		Over torque alarm	Peak hold start torque	
ST10N2	2.00	10.00	0.01	10.50	0.75	0.75
ST20N2	4.00	20.00	0.02	21.00	1.50	1.50
ST50N2	10.00	50.00	0.05	52.50	3.75	3.75
ST100N2	20.0	100.0	0.1	105.0	7.5	7.5
ST200N2	40.0	200.0	0.2	210.0	15.0	15.0
ST500N2	100.0	500.0	0.5	525.0	37.5	37.5
ST1000N2	200	1000	1	1050	75	75

## 5 Measurement Method

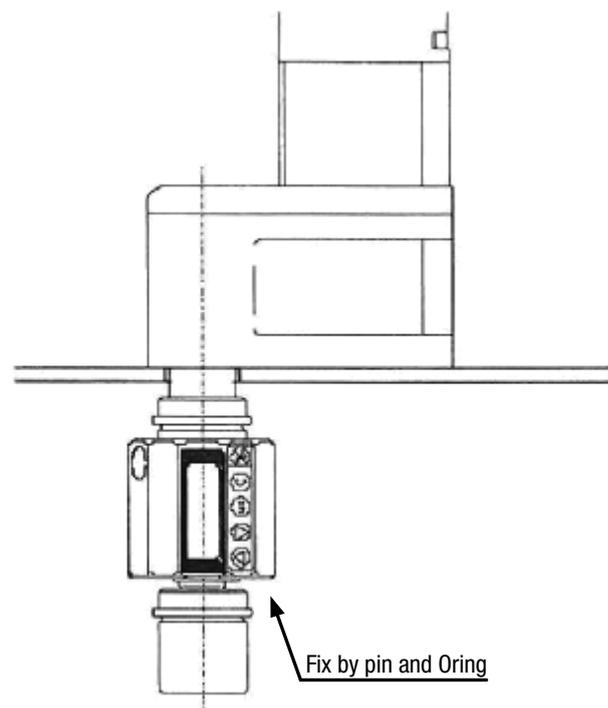
- (1) Before use, turn on the ST2 and make sure that a sufficient battery capacity remains. If the battery mark is flashing, recharge the battery.



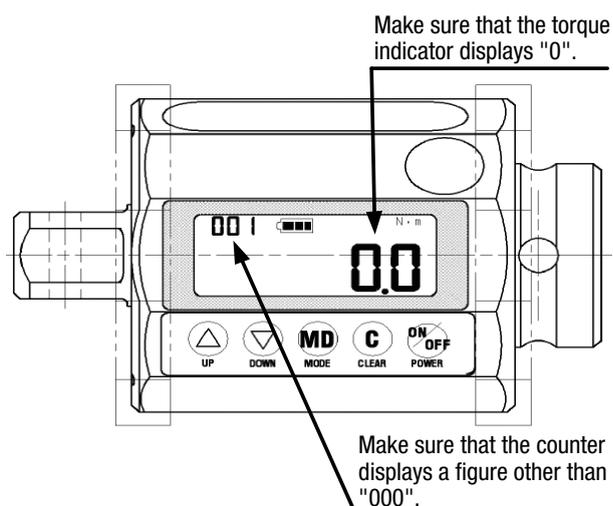
- (2) Set the ST2 to the square drive of torque equipment. To check a multiple-spindle nut runner, attach the extension bar (option) as a substitute for the ST2 to the tip of the other torque equipment and adjust the distance to the work. Use an O ring and a pin to fix the ST2 and extension bar.



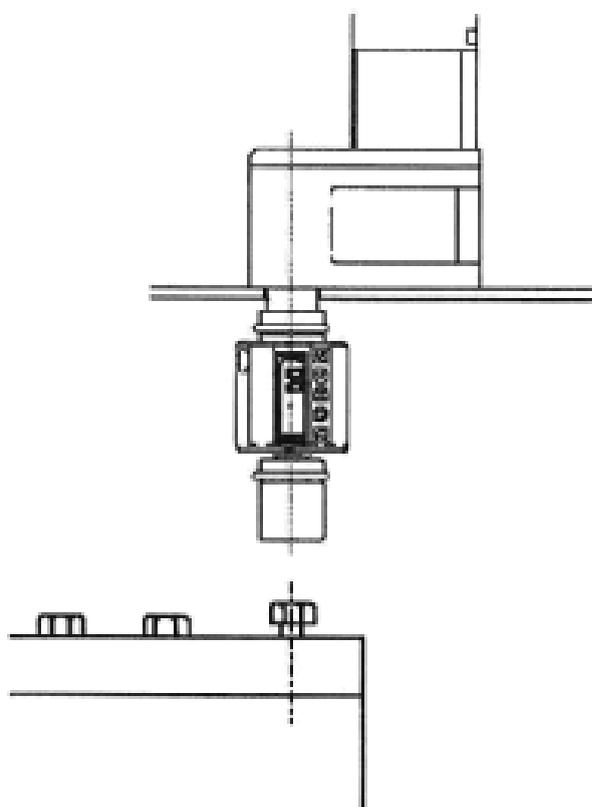
- (3) Install the socket to the square drive of ST2/extension bar. Use an O ring and a pin to fix the socket.



- (4) Press the power button  on the ST2. Make sure that the counter displays a figure other than "000". If the counter displays "000", press  key and set the counter at "001". The PEAK mode is set.

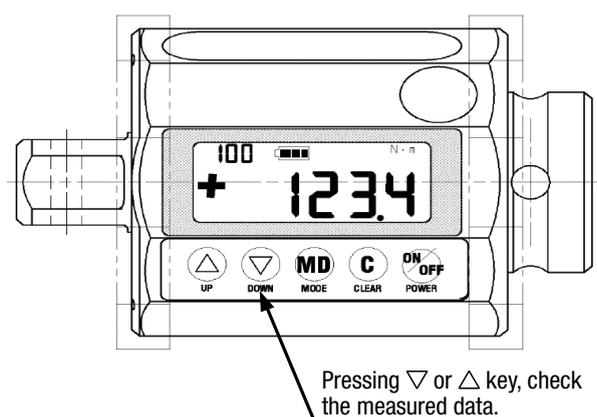


- (5) Tighten the work with the torque equipment.



- (6) Measure the necessary number of data (up to 999). The measured data are automatically counted up by the auto memory function, and continuous measurement is possible.

- (7) After completing the measurement, detach the ST2 and check the data. If you want to process the measured data on PC, etc., transfer the data to PC on the USB or using the infrared receiver (option: R-DT999).



# 6 Operating Examples

## (1) Arithmetic function

The number of data, maximum value, minimum value and average value among a specified range of measured data are calculated.

Using " $\Delta$ " or " $\nabla$ " key, set the counter at the upper limit of the range of data to be calculated.

Press "MD" key.

Ex. 1) To calculate data in the range of 001-200:

Set the counter at 200, press "MD" key and set "Stt" at 001.

Ex. 2) To calculate data in the range of 101-200:

Set the counter at 200, press "MD" key and set "Stt" at 101.

Using " $\Delta$ " or " $\nabla$ " key, set the counter at the lower limit of the range of data to be calculated.

Press "MD" key.

If "C" key is pressed, the setting is canceled.

Note) Calculation is performed among the PEAK HOLD measurement data.

Note) The maximum, minimum and average values are indicated in absolute values.

Press "MD" key.

If "C" key is pressed, the setting is canceled.

Press "MD" key.

By pressing "C" key, the setting is canceled.

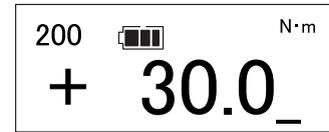
Press "MD" key.

By pressing "C" key, the setting is canceled.

Press "MD" key.

By pressing "C" key, the setting is canceled.

Memory display



Output starting range display



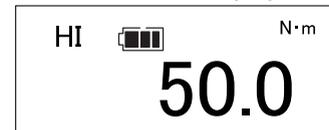
Flashing



Number of data, "n", display



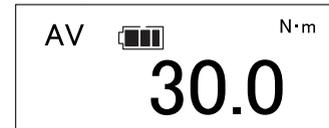
Maximum value display



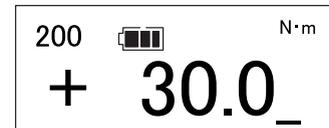
Minimum value display



Average value display



Memory display



## (2) Output of all measurement data at one time (USB output)

All measurement data in a specified range are output to an external device at one time.

Set the external output at "USB". In addition, set the output baud rate.

Using " $\Delta$ " or " $\nabla$ " key, set the counter at the upper limit of the range of data to be output.

Press "MD" key.

Ex. 1) To output data in the range of 001-200:

Set the counter at 200, press "MD" key and set "Stt" at 001.

Ex. 2) To output data in the range of 101-200:

Set the counter at 200, press "MD" key and set "Stt" at 101.

Ex. 3) To output all measurement data:

Set the counter at 999, press "MD" key and set "Stt" at 001.

Using " $\Delta$ " or " $\nabla$ " key, set the counter at the lower limit of the range of data to be output.

Press "MD" key.

If "C" key is pressed, the setting is canceled.

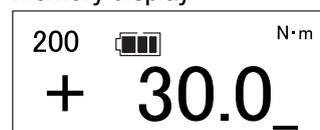
Press " $\Delta$ " key to output all the measurement data.

To cancel, press "C" key.

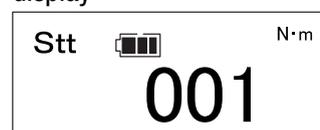
Note) To stop the data output operation, press "C" key.

While data is being output, the other keys cannot be operated.

Memory display



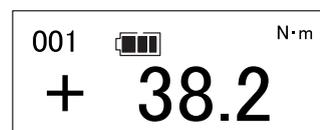
Output starting data number display



Number of data, "n", display



Data output start



Data output complete

Number of data, "n", display



### (3) Output of all measurement data at one time (Infrared output)

The measurement data in a specified range is transferred to the data tank (R-DT999).

Set the external output at "IFr".

Using " $\Delta$ " or " $\nabla$ " key, set the counter at the upper limit of the range of data to be output.

Press "MD" key.

Ex. 1) To output data in the range of 001-200:

Set the counter at 200, press "MD" key and set "Stt" at 001.

Ex. 2) To output data in the range of 101-200:

Set the counter at 200, press "MD" key and set "Stt" at 101.

Ex. 3) To output all measurement data:

Set the counter at 999, press "MD" key and set "Stt" at 001.

Using " $\Delta$ " or " $\nabla$ " key, set the counter at the lower limit of the range of data to be output.

Press "MD" key.

If "C" key is pressed, the setting is canceled.

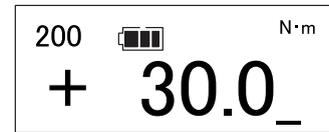
Press " $\Delta$ " key to output all the measurement data.

To cancel, press "C" key.

Note) To stop data output operation, press "C" key.

While data is being output, the other keys cannot be operated.

Memory display



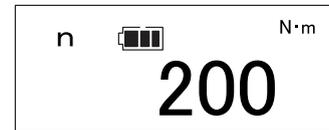
Output starting data number display



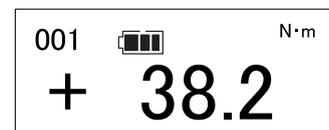
Point the infrared output window at the receiver of the data tank.  
Set the data tank ready for receiving.



Number of data, "n", display

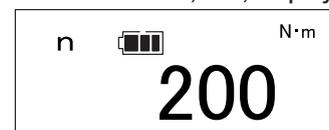


Infrared data output start



Data transfer complete

Number of data, "n", display



#### (4) Clearing stored measurement data

Stored measurement data are cleared.

##### 1): Clearing 1 data

Display the counter number of data to be cleared.

Press "C" key to clear the data.

The measurement data is cleared.

##### 2): Clearing data in a specified range

Using " $\Delta$ " or " $\nabla$ " key, set the counter at the upper limit of the range of data to be cleared.

Press "MD" key.

##### Ex. 1) To clear stored data in the range of 001-200:

Set the counter at 200, press "MD" key and set "Stt" at 001.

##### Ex. 2) To clear stored data in the range of 101-200:

Set the counter at 200, press "MD" key and set "Stt" at 101.

##### Ex. 3) To clear all stored measurement data:

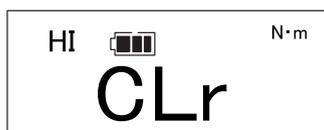
Set the counter at 999, press "MD" key and set "Stt" at 001.

Using " $\Delta$ " or " $\nabla$ " key, set the counter at the lower limit of the range of data to be cleared.

Press "MD" key to move to the next step.

If "C" key is pressed, the setting is canceled.

While any of displays shown in the right figure is being displayed, holding down "MD" key, press down "C" key. Then, release the two keys.

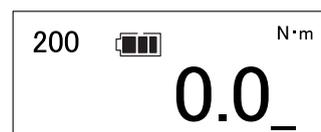
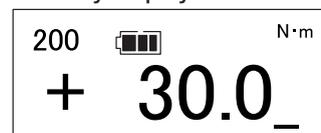


The stored measurement data is cleared.

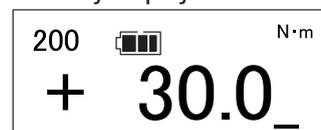


After that, the display returns to the counter number of clear starting data and then to the measurement display.

Memory display



Memory display

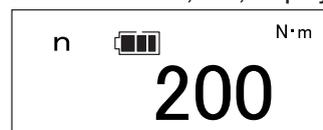


Clear starting data number display

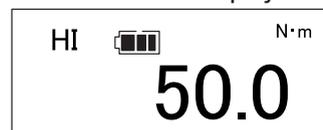


Flashing

Number of data, "n", display



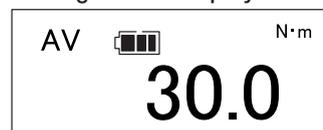
Maximum value display



Minimum value display



Average value display



# 7 External Output Specifications

USB Interface		USB1.1 compliant (using USB-serial conversion chip)
Connector		USB mini B
Serial Interface	Baud rate	2400, 4800, 9600 or 19200 bps is selected.
	Data length	8 bits
	Stop bit	1 bit
	Parity	None
	Flow control	None

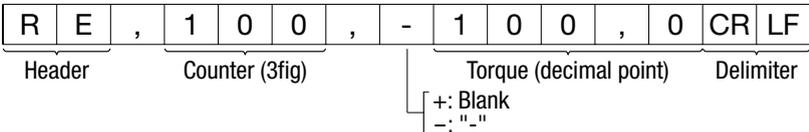
• **USB output**

- Preparation (PC)
  - (1) Install the communications driver into the PC that supports USB.  
(The communications driver is included in the supplied CD-ROM.)
  - (2) Set the port and communications format on the PC.  
(For the installation procedure and communications settings, see the instruction manual for the CD-ROM.)
- Preparation (ST2)
  - (3) Turn the power of ST2 to ON.
  - (4) Set the communications setting to USB and select a baud rate.
- Communications
  - (5) Connect the (supplied) cable to PC and ST2.
  - (6) Start up the communications software.
- Data output
  - (7) Follow the data output procedure. (See the "Output of all measurement data at one time".)

Note)

- Use the supplied USB cable to connect the ST2 to PC.
- After connecting the cable, startup of the software may be required for communications.
- If the ST2 and several Tohnichi USB serial output devices (CEM3, R-DT999) are connected to PC at the same time, communications cannot be established.

• **Output format**



## 8 Procedures for Various Settings

Various settings are explained as follows:

Note) Perform settings in the RUN mode while "000" is being displayed on the counter.

Hold down "MD" key for 2 seconds or more till the mode setting display appears. Then, release the key.

Using " $\Delta$ " or " $\nabla$ " key, change the setting of Auto Memory/Reset Timer.

(0.0 $\leftrightarrow$ 0.1 $\leftrightarrow$ 0.2 $\leftrightarrow$ 0.3 $\leftrightarrow$ 0.4 $\leftrightarrow$ 0.5 $\leftrightarrow$ 1.0 $\leftrightarrow$ 2.0 $\leftrightarrow$ 3.0 $\leftrightarrow$ 4.0 $\leftrightarrow$ 5.0 $\leftrightarrow$ 0.0 sec.)

If the Auto Memory/Reset function is not used, set at 0.0.

Press "MD" key. The setting is stored and the display moves to the next setting.

If "C" key is pressed, the setting is canceled. The display returns to the measurement display.

Using " $\Delta$ " or " $\nabla$ " key, select the output equipment.

USb: USB output

IFr: Infrared output

Press "MD" key. The setting is stored and the display moves to the next setting.

If "C" key is pressed, the setting is canceled. The display returns to the measurement display.

Note) When "IFr" is selected, the communication baud rate setting will be skipped.

Using " $\Delta$ " or " $\nabla$ " key, change the communication baud rate.

Press "MD" key. The setting is stored and the display moves to the next setting.

If "C" key is pressed, the setting is canceled. The display returns to the measurement display.

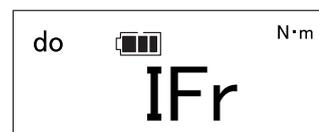
Measurement display



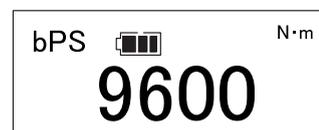
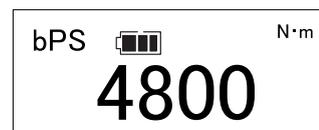
(1) Auto Memory/Reset setting



(2) Communication mode setting



(3) Communication baud rate setting



Measurement display



## 9 Charging

- Charging procedure

- (1) Connect the DC plug of the Tohnichi charger (BC-4) to the charging jack of ST2.
- (2) Insert the power plug of the charger into an outlet.
- (3) Charging starts. Check that the red light on the charger is on.
- (4) After the completion of charging, disconnect the charger from the outlet and remove the DC plug from the charging jack of ST2.

- Charging status

State of the red light	Status of the charger
Slow flashing — — —	In the process of charging
Lighted on ————	Charging is completed. An empty battery is fully recharged in about 2 hours.
Fast flashing -----	Abnormal charging

Note)

- If the DC plug is disconnected during charging and then put in to restart charging, the red light on the charger may flash on and off fast. In this case, disconnect the charger from the outlet and insert it into the outlet again. Charging will start normally.
- The battery life varies on the working condition. The average battery life is about 500 operating cycles.
- At the time of delivery, the battery is discharged. Before operation, recharge the battery using the supplied charger (BC-4).

Warning)

- Use the charger at the voltage specified on the rating plate.
- Overcharge results in shortening of battery life. If charging is completed and the red light on the charger turns on, immediately stop recharging
- The ST2 cannot be used with the charger being connected.
- If something abnormal occurs during charging, the red light of the charger starts flashing fast. In that case, disconnect the charger from the outlet, and insert it again. If the red light is still flashing fast, contact your nearest distributor or TOHNICHI MFG. CO., LTD.
- Charge the battery at the temperature of 10 to 40°C.
- If an abnormal odor or overheating occurs during charging, immediately stop the use of the charger, move the main unit to a safe place and contact TOHNICHI MFG. CO., LTD.
- If the ST2 is not used for a long period of time, the unit should be kept with the supplied dummy plug being inserted into the charging jack. In that case, be sure to charge the battery once a half year.

# 10 Optional Accessories

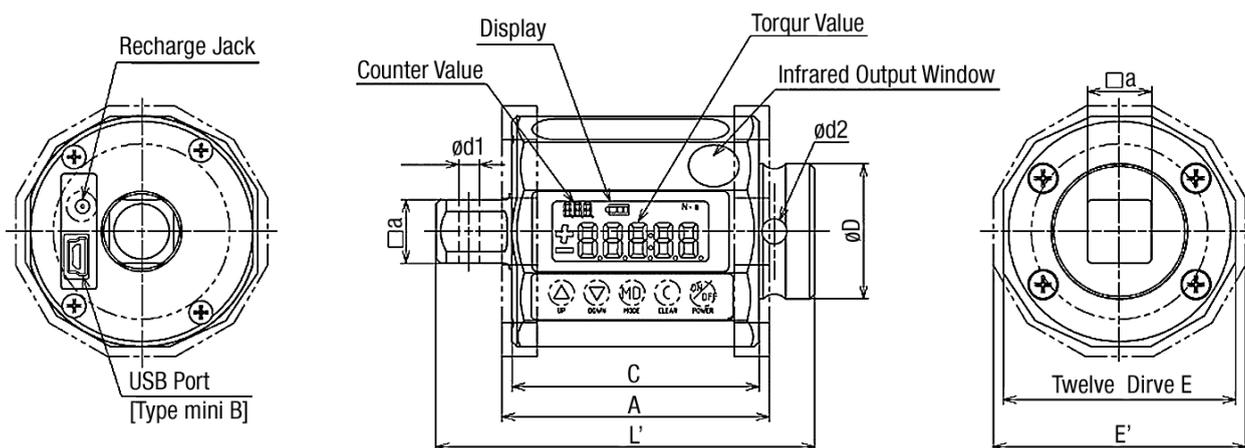
## Extension bar

Catalog No.	Applicable model
No.283	ST10N2
No.281	ST20N2
No.247	ST50N2, ST100N2, ST200N2
No.248	ST500N2
No.249	ST1000N2

Calibration instrument	Applicable model
TCL50N	ST10N2, ST20N2, ST50N2
TCL200N	ST100N2, ST200N2
TCL800N	ST500N2
TCL2000N	ST1000N2

Infrared receiver	R-DT999
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# 11 Specifications



Model		ST10N2	ST20N2	ST50N2	ST100N2	ST200N2	ST500N2	ST1000N2		
Newton	Measuring range	Min ~ Max	2 ~ 10	4 ~ 20	10. ~ 50	20 ~ 100	40 ~ 200	100 ~ 500		
		1digit	0.01	0.02	0.05	0.1	0.2	0.5	1	
Metric	Measuring range	Min ~ Max	[kgf-cm]	20 ~ 100	40 ~ 200	100 ~ 500	200 ~ 1000	400 ~ 2000	1000 ~ 5000	
			[kgf-m]							200 ~ 1000
			1digit	0.1	0.2	0.5	1	2	5	
			[kgf-m]							1
English	Measuring range	Min ~ Max	[lbf-in]	20 ~ 90	36 ~ 180	100 ~ 450	200 ~ 900			
			[lbf-ft]					30 ~ 150	72 ~ 360	144 ~ 720
			1digit	0.1	0.2	0.5	1			
			[lbf-ft]					2	5	1
Dimension	L', E, C, D, A, L, E', a	[mm]	L'	75			120		135	
			E	46					64	
			C	49					69	
			øD	13	18	27		38	51	
			Sq. drive	6.35	9.525	12.7		19.05	25.4	
			ød1	2.1	3.1	4.1		6	6.5	
			ød2	2.1	5			6	6.5	
			Protection Cover	A	53			69		
E'		50			ø73					
Weight		0.25					1.3			

## Common specifications

Accuracy	±1% + 1digit
Direction	Right and left
Display	7 segment LCD Counter value: 3 digits (character height: 3 mm) Torque value: 4 digits (character height: 7 mm) Unit, Battery life, Direction
Measurement Mode	PEAK/RUN
Data Memory	999 data
Arithmetic Function	Number of samples, maximum, minimum and average values
Data Output	Infrared output, USB output (Communications mode can be switched by key operation.)
Power	Nickel hydrogen battery pack
Continuous Operating Hours	Approx. 10 hours
Charger	Input: AC100V to 240V ± 10% (in accordance with PSE, CE-compliant)
Charging Time	Approx. 2 hours
Other Functions	Auto Power OFF: 3 minutes Auto Memory Reset: 0.5 to 5 seconds variable Auto Zero, Battery indicator (in 4 steps)
Operating Temperature Range	0 to 40°C

Designs and specifications are subject to change without notice.



■ **TOHNICHI MFG. CO., LTD.**

TEL: 81 3 3762 2455 FAX: 81 3 3761 3852  
2-12, Omori-kita, 2-Chome Ota-ku, Tokyo 143-0016, JAPAN  
E-mail: [overseas@tohnichi.co.jp](mailto:overseas@tohnichi.co.jp)  
Website: <http://tohnichi.jp>

■ **N. V. TOHNICHI EUROPE S. A.**

TEL: 32 16 60 66 61 FAX: 32 16 60 66 75  
Industrieweg 27 Boortmeerbeek, B-3190 Belgium  
E-mail: [tohnichi-europe@online.be](mailto:tohnichi-europe@online.be)  
Website: <http://www.tohnichi.be>

■ **TOHNICHI AMERICA CORP.**

TEL: 1 847 272 8480 FAX: 1 847 272 8714  
677 Academy Drive, Northbrook, Illinois 60062, U. S. A.  
E-mail: [inquiry@tohnichi.com](mailto:inquiry@tohnichi.com)  
Website: <http://www.tohnichi.com>