Your Torque Partner
TOHNICHI

DIGITAL LINE CHECKER
MODEL LC3-G

OPERATING INSTRUCTION

LC200N3-G with QL100N4

LC1000N3-G with QLE750N2

CE

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.

Safety Precautions

To customers: Before using this product, please read this operationg instruction carefully to use it properly. If yo have any question, please contact your nearest distributor or Tohnichi Mfg. Co., Ltd. This operating instruction should be stored in a safe place.

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.

⚠Warning

1 Stop using the product when smoke comes out or strange smell or unusual noise occurs.
Use in an abnormal state may result in electric shock or fire. Immediately turn off the power, remove the plug from the outlet and contact your nearest distributor or Tohnichi Mfg. Co., Ltd.
2 Do not disassemble or modify this line checker. It may result in loss of safety, degradation in functions, shortening of product life, or failure.
3 Stop using the product when foreign matter or liquid such as water gets inside. If not, you may be exposed to the danger of electric shock or fire.
4 Do not connect or disconnect the power plug with wet hands. You may be exposed to the danger of electric shock.
5 Do not use this line checker with a power voltage other than that specified (AC100V to 240V). Use with any unspecified power voltage may result in electric shock or fire.
6 Do not use a damaged power cable. Use of a damaged power cable may result in electric shock or fire. When handling the power cable, follow the instructions below.
- Do not damage, extend or heat the power cable.
- Do not yank the power cable, put heavy objects on it, or pinch it.
- Do not bend the power cable by force, twist it or bind it.
- Do not use a power cable other than that supplied with the product.
- Do not use the power cable with other devices.

7 Handle the power plug carefully. Improper handling may result in fire.
- Remove any foreign matter such as dust before inserting the plug into outlet.
- Be sure to insert the power plug fully into outlet.

8 When removing the power plug from outlet, grasp the plug by hand. Do not pull on the power cable. It may damage the cable, resulting in fire or electric shock.
9 Do not place this line checker on an unstable or shaky place such as a rickety table or slope. The line checker or attachments (socket, ratchet adapter) may fall, resulting in injury.
10 Do not put this line checker in a place where inflammable liquid or combustible gas is present. It may cause electric shock or fire.
11 Be sure to use the specified accessories or options. Do not use any accessory or option other than those specified in this operating instruction.
Use of any unspecified accessory may result in accident or injury.

⚠Caution

1 Do not put this line checker in a place of much moisture or dust, in a place that is exposed to water or direct sunlight, or in a place where the humidity or temperature fluctuates largely. It may result in electric shock, fire, malfunction, degradation of performance or failure.
2 Clean the power plug periodically. Before cleaning, disconnect the plug from outlet and clean the root of the plug and the portion between the blades. Accumulation of dust at the root of the power plug may cause a short circuit, leading to fire.
3 If this line checker is not to be used for a long time, be sure to disconnect the power plug from outlet for safety's sake.
4 Before moving this line checker to another place, be sure to turn off the power, remove the power plug from outlet and disconnect all connecting cables. When moving the line checker, avoid shock or vibration to it. It may damage the power cable or connecting cables, resulting in fire, electric shock or malfunction.
5 Do not use this line checker to conduct measurements beyond its capacity. For safe and efficient operation, use this line checker to measure the torque wrenches suited to the capacity. Measurement beyond the capacity may cause accident or damage.
6 Check for any damaged parts. Before use, check the line checker, accessories and other parts for damage and make sure that it operates normally and fulfills the specified functions. Check the parts and all other portions that may affect the operation for damage, installation status, etc. For replacement or repair of damaged parts, contact your nearest distributor or Tohnichi Mfg. Co., Ltd.

Precautions for Use

1 Do not give vibrations or a shock to this line checker.
2 Do not use this line checker in an environment other than that specified in the operating instruction.
3 Before use, make a pre-operation inspection and check the settings.
4 If this line checker gets wet with water or oil, it may break down or burn out. Be careful not to drop water or oil.
5 Do not let this line checker fall or bump. It may result in damage or failure.
6 This line checker is intended for measuring only torque wrenches.
7 Be sure to conduct a periodic inspection.
8 Before make measurement, make sure that "zero" is displayed. Conduct zero adjustment by pressing C key or turning OFF/ON the power under removing a torque wrench and no loading.

Should the line checker give out abnormal smell or catch fire during use, stop using it immediately. Then, move the line checker to a safe place and contact Tohnichi Mfg. Co., Ltd.

Contents

1 Features

Model LC3-G has the following features.

- Easy to operate and suitable for daily inspections of torque wrenches near the assembly lines.
- The built-in clock keeps track of time and date when measurements were taken.
- The over-torque prevention function enables reading of the operating torque of click type torque wrench.
- Wide measurement range - one line checker can measure many types of torque wrenches.
- Adapters with hexagon heads are free to be combined, allowing a free 3-piece combination according to the size of the torque wrench to be checked. *See Fig. 1.
- Double measurement resolution compared with the conventional LC2-G series, providing finer digits.
  * 1 digit equivalent to 1 graduation.
- Up to 1,000 data can be stored. * Conventionally 99 data
- With the statistical processing function, arithmetic operations of maximum, minimum and average values on measured data can be performed.
- A measured value can be evaluated to be OK/NG based on the pre-registered upper- and lower-limit values. An OK/NG Judgment result is indicated in blue in case of OK and in red in case of HI/LO, allowing easy discrimination.
  The upper- and lower-limit values can be registered up to 10 of them, respectively, allowing easy checking of the torque wrenches of different capacities.
- Provided with RS232C-compliant and USB (B-type) connectors for serial communication, allowing easy connection to a personal computer and an exclusive printer.
- This line checker has CE marking and can be used in EU without problem.

2 Components

1	LC3-G body	1 unit
2	AC adapter BA-6	1 pc
3	Hexagon Head Adapter	1 set * Only for LC20N3-G, 200N3-G
4	Driver Adapter	1 pc * Only for LC20N3-G
5	Socket Adapter	* LC20N3-G, 200N3-G: 1pc, LC1000N3-G, 1400N3-G: 2pcs
6	Fixing Plate	1 set * Only for LC1000N3-G, 1400N3-G
7	Operating manual	1 pc

* See "3 Specification" for details.

How to Assemble Hexagon Head Adapters

Select three hexagon head adapters that are frequently used from the supplied adapters. Assemble the three adapters onto the fixed base and tighten them with the fixing screws. Then, place the assembled adapters onto the holder on the left side of the checker. * See Fig. 1

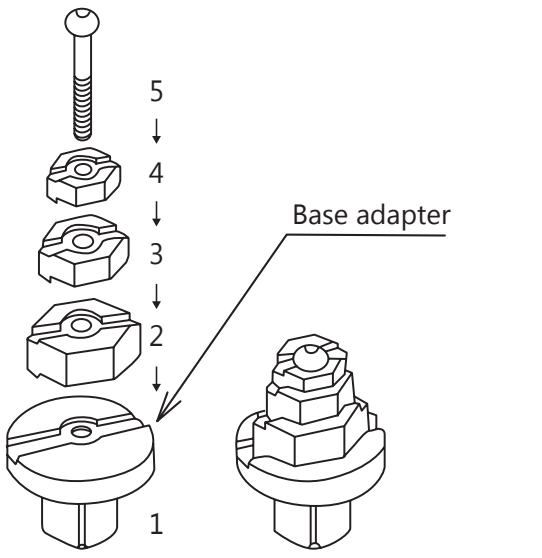


Fig. 1 Completed figure

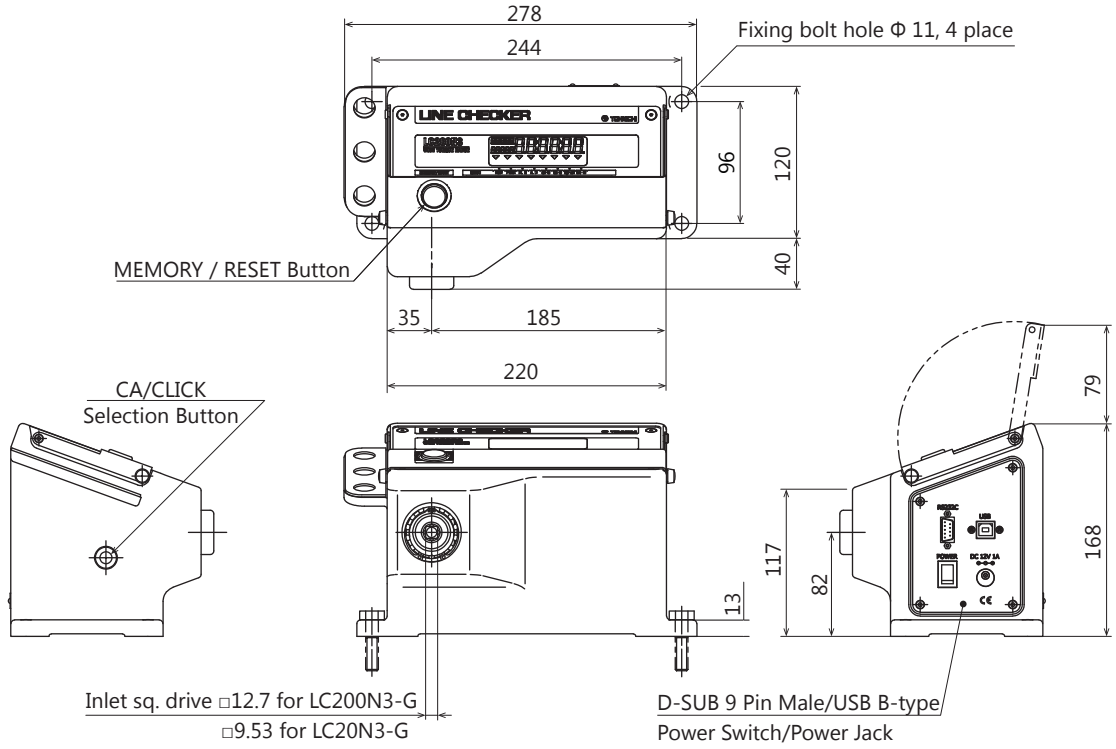
3 Specificatons

Model	Mode	Torque Range											
		cN·m		N·m		kgf·cm		kgf·m		lbf·in		lbf·ft	
		Min.Max.	1 digit	Min.Max.	1 digit	Min.Max.	1 digit	Min.Max.	1 digit	Min.Max.	1 digit	Min.Max.	1 digit
LC20N3-G	Run	50.0-2000.0	0.2	0.500-20.000	0.002	5.00-200.00	0.02	-	-	5.00-174.00	0.02	-	-
	Peak	50.0-99.8	0.2	0.500-0.998	0.002	5.00-9.98	0.02	-	-	5.00-9.98	0.02	-	-
		100-999	1	1.00-9.99	0.01	10.0-99.9	0.1	-	-	10.0-99.9	0.1	-	-
		1000-2000	10	10.0-20.0	0.1	100-200	1	-	-	100-174	1	-	-
LC200N3-G	Run	-	-	5.00-200.00	0.02	50.0-2000.0	0.2	-	-	50.0-1740.0	0.2	4.00-140.00	0.02
	Peak	-	-	5.00-9.98	0.02	50.0-99.8	0.2	-	-	50.0-99.8	0.2	4.00-9.98	0.02
		-	-	10.0-99.9	0.1	100-999	1	-	-	100-999	1	10.0-99.9	0.1
		-	-	100-200	1	1000-2000	10	-	-	1000-1740	10	100-140	1
LC1000N3-G	Run	-	-	50.0-1000.0	0.1	-	-	5.00-100.00	0.01	500-8800	1	36.8-735.0	0.1
	Peak	-	-	50.0-99.9	0.1	-	-	5.00-9.99	0.01	500-999	1	36.8-99.9	0.1
		-	-	100-1000	1	-	-	10.0-100.0	0.1	1000-8800	10	100-735	1
LC1400N3-G	Run	-	-	100.0-1400.0	0.2	-	-	10.00-140.00	0.02	900-12000	2	75.0-1000.0	0.2
	Peak	-	-	100-999	1	-	-	10.0-99.8	0.1	900-998	2	75.0-99.8	0.2
		-	-	1000-1400	10	-	-	100-140	1	1000-9990	10	100-1000	1
		-	-	-	-	-	-	-	-	10000-12000	100	-	-

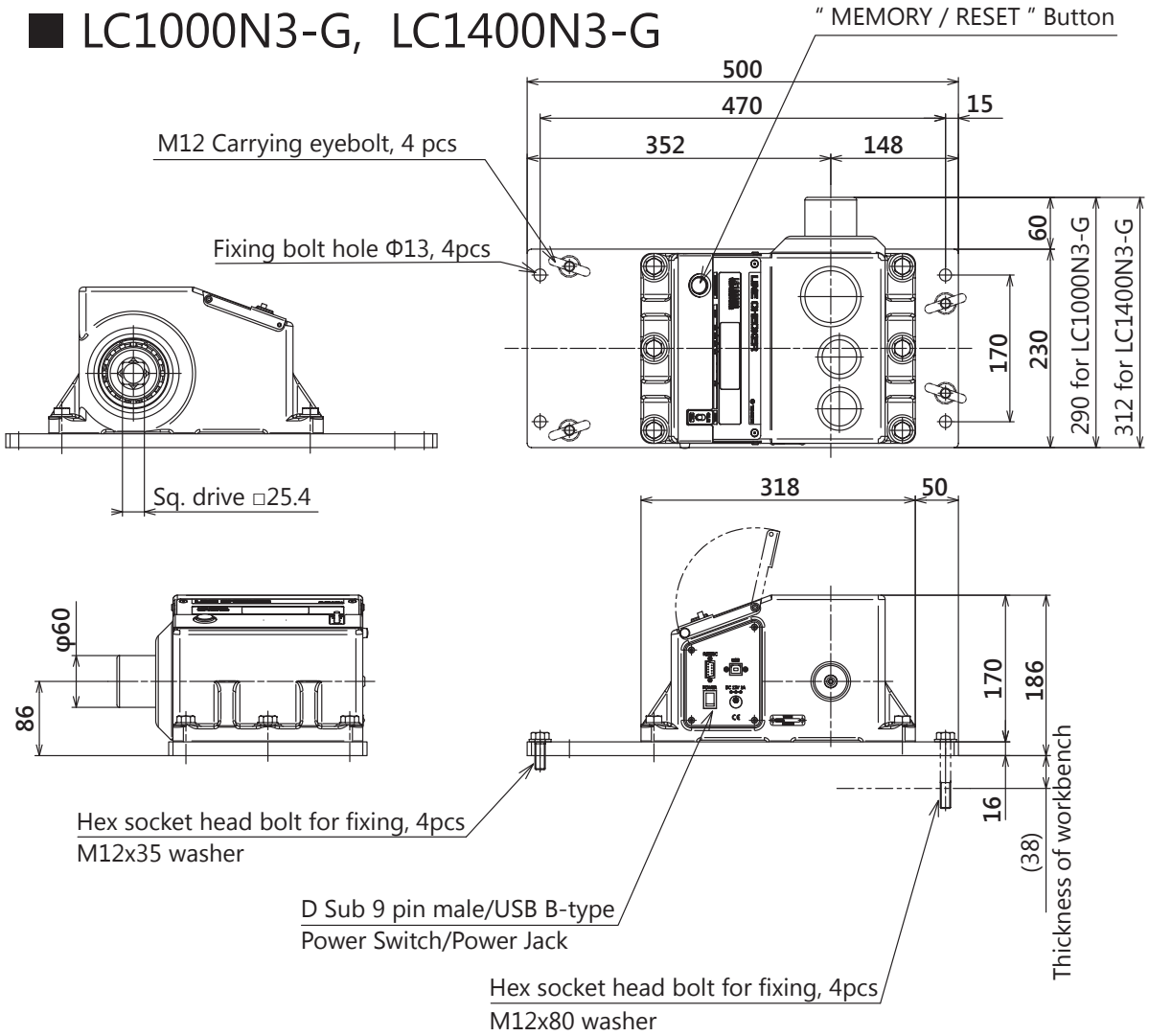
Common Specifications

Model		LC20N3-G	LC200N3-G	LC1000N3-G	LC1400N3-G
Measuring direction		Clockwise			
Accuracy		+/- 1% + 1digit			
Display		Black backlight LCD *White, red, blue			
Display digits		3 digits * PEAK mode / 5 digits * RUN mode			
Data memory		1,000 data * Counter, time, torque value			
Measurement mode		PEAK/RUN			
Zero adjustment		Auto zero by "C" key or Power ON/OFF			
OK/NG judgment		10 cases registerable			
Data output		RS232C-compliant and USB (B-type) connectors for serial communication			
Memory/reset		Manual / Auto * Changeable in the range from 0.1 to 5.0 sec.			
Inlet Socket		9.5 mm double square	12.7 mm double square	25.4 mm double square	
Dimensions		W 278 x D 160 x H 167		W 500 x D 290 x H 186	W 500 x D 313 x H 186
Bolt Pitch to fix the body		244 x 96 4-Φ11 * Hex socket head bolt M10		470 x 170 4-Φ13 * Hex socket head bolt M12	
Weight		Approx. 10.5 kg		Approx. 34 kg	Approx. 39 kg
Socket Adapter		No. 1282	No. 1280	No. 274 19.0 (Male) x 12.7 (Female)	
		9.5 (Male) x 6.35 (Female)	12.7 (Male) x 9.5 (Female)	No. 276 25.4 (Male) x 19.0 (Female)	
Standard accessories	Hexagon Head Adapter	No. 282 * 8, 10, 12, 13, 14, 17 each 1 pc, Base Adapter 1pc, Driver Adapter 1pc.	No. 280 * 8, 10, 12, 13, 14, 17 19, 22, each 1 pc, Base Adapter 2pcs	-	
	AC Adapter	BA-6			
	Fixing Plate	-		Attached (Connected), Eyebolt M12	
Optional Accessories		Battery pack model BP-100-4, Calibration kit, Printer, Supporting board for LC1000N3-G and LC1400N3-G			

■ LC20N3-G, LC200N3-G

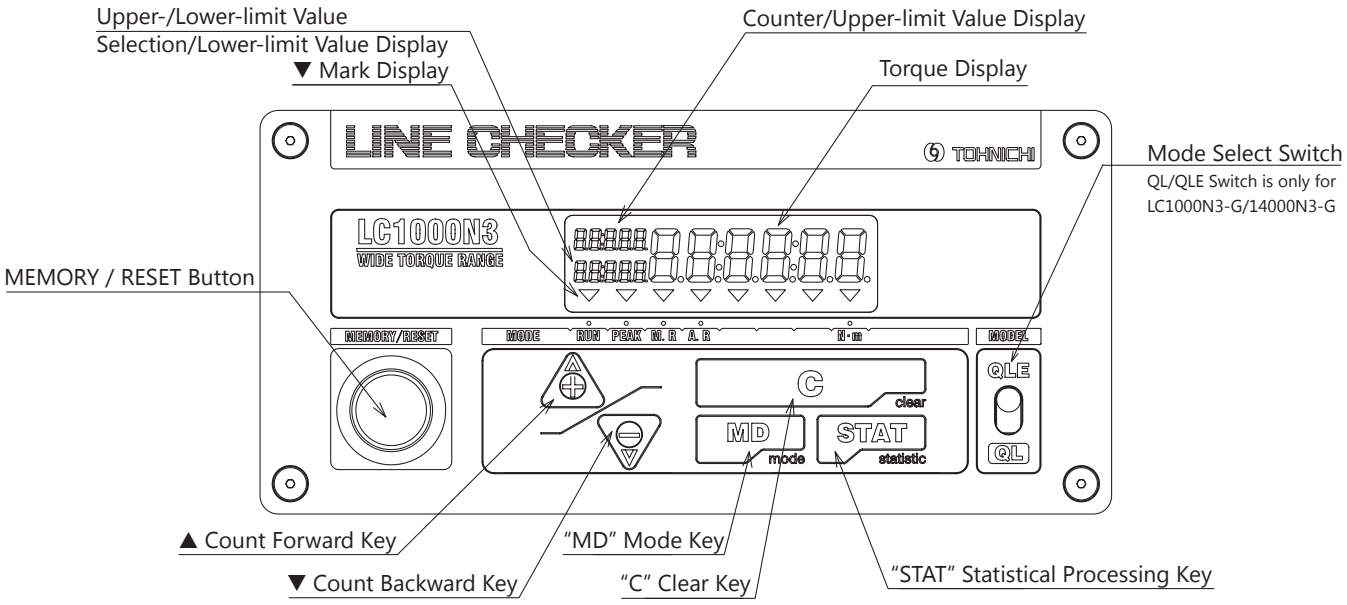


■ LC1000N3-G, LC1400N3-G



4 Name of Parts

4-1 Indicator and Operating Parts



Torque Display

Displays torque value and measurement time. They are displayed in blue when an OK/NG Judgment result is OK, in red when it is LO/HI, and in white when no OK/NG Judgment is made.

Counter/Upper-limit Value Display

Displays a memory counter or an upper-limit value.

Upper-/Lower-limit Value Selection/Lower-limit Value Display

Displays an upper-/lower-limit value selection status for OK/NG Judgment or a lower-limit value.

▼ Mark Display

· RUN: Lights up when RUN mode (Continuous display) is selected.

· PEAK: Lights up when PEAK mode (Maximum value display) is selected.

· M.R: Lights up when Auto memory/Reset is not set in the PEAK mode. Lights up in the RUN mode.

· A.R: Lights up when Auto memory/Reset is set in the PEAK mode.

· Unit: ▼ appears on the unit (cN·m, N·m, kgf·cm, kgf·m, lbf·in, lbf·ft,) selected.

Count Forward Key " ▲ Key"

Moves the counter forward by one or continuously to read out a measured data.
When a measured data exists, the measurement time is displayed for about 0.5 seconds, and then the torque is displayed.
When the counter is continuously moved forward, the measurement time is not displayed.

Count Backward Key " ▼ Key"

Moves the counter backward by one or continuously to read out a measured data.
When a measured data exists, the measurement time is displayed for about 0.5 seconds, and then the torque is displayed.
When the counter is continuously moved backward, the measurement time is not displayed.

Clear Key "C Key"

In the PEAK mode, the peak value is reset. Or, the stored data is cleared. In the RUN mode, auto zero adjustment is performed.

Statistical Processing Key "STAT Key"

This is a key for selecting the number of samples, maximum value, minimum value or average value.

Mode Key "MD Key"

This is a key for selecting the RUN mode or PEAK mode.

The upper-/lower-limit value selection screen is displayed by holding down the key for 2 seconds or longer.

Memory/Reset Button "MEMORY/RESET"

Stores the measured data (measured torque, measurement date and time) and moves the counter forward by one after OK/NG Judgment of the measured data.

Model Select Switch

<<LC1000N3-G, LC1400N3-G only>>

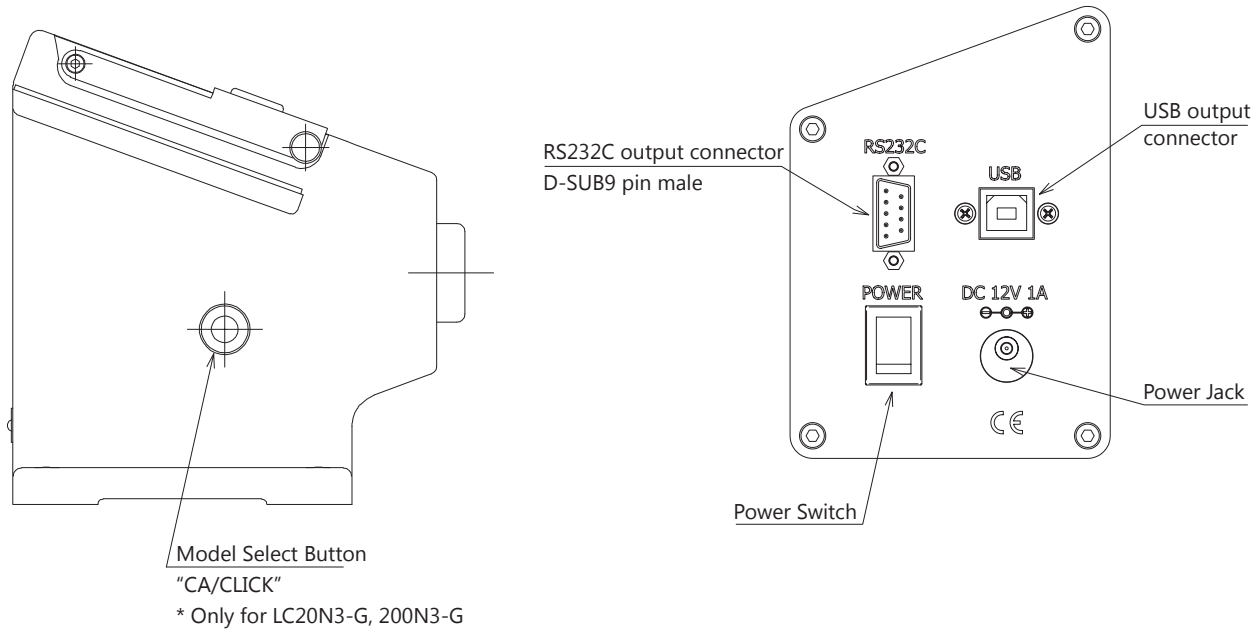
Set the switch on QL or QLE model according to the torque wrench to be measured as described in the table below.

For QL mode, select QL mode when measuring torque wrenches, such as QL and CL.

For QLE mode, select QLE when measuring torque wrenches with extension handles, such as QLE, CLE and DQLE.

Model	Model Selction	Torque Range [N • m]
LC1000N3-G	QL	50 to 600
	QLE	100 to 1000
LC1400N3-G	QL	100 to 600
	QLE	100 to 1400

4-2 Right Side of Checker



Power Jack: 12V, 1A, Center positive, connect the supplied AC adapter model BA-6.

Power Switch: Turn on/off and auto zero adjustment.

RS232C output connector: Connect RS232C cable for serial communication to external devies.

USB (B-type) output connector: For serial communication by USB cable.

* Do not connect RS232C and USB output connectors externally at the same time.

Model Select Button "CA/CLICK" <<LC20N3-G, LC200N3-G only>>

"Push Model Select Button in PEAK mode and change to "CA Mode" for QSPCA measuring mode . If no load for more than three seconds, it will return to "CLICK Mode" for click type torque wrench measuring.

5 Function and Operating Methods

5-1 Continuous Display * RUN Mode

A torque display value increases by applying a torque load and returns to 0 by removing the load. "▼" above RUN on the front panel is illuminated. This is mainly used for measuring dial direct reading type torque wrenches (DB, F, etc.) or calibration of the LC. Pressing the MD key switches to the PEAK mode.

5-2 Maximum Value Display * PEAK Mode

A torque display value increases by applying a torque load and a maximum torque display value is held even after removing the load; it is displayed in 3 effective digits. "▼" above PEAK on the front panel is illuminated. This is mainly used for measuring click type torque wrenches (QL, SP, etc.). Pressing the MD key switches to the RUN mode.

5-3 Upper-/Lower-limit Value Selection

The following describes how to select pre-registered upper-lower-limit values.

1 The upper-/lower-limit value selection screen is displayed by holding down the MD key for 2 seconds.

2 Using ▲ or ▼ key, select the upper-/lower-limit values.

3 If the STAT key is pressed, the upper- and lower-limit values are determined and thedisplay goes back to the measurement mode.

If the MD key is pressed, the display goes back to the measurement mode, keeping the previous upper- and lower-limit values. For registration of the upper- and lower-limit values, see "6. Various Settings".

5-4 OK/NG Judgment and Data Memory

When the Memory/Reset key is pressed or the auto memory/reset function is activated, OK/NG Judgment is made, storing up to 1,000 of measured values, measurement dates (month, day) and measurement times (hours, minutes). An OK/NG Judgment result is displayed in blue for about 0.5 second in case of OK and in red for about 1 second in case of LO/HI. No OK/NG Judgment is made when the upper- and lower-limit values are 0. OK/NG Judgment is made according to the following conditions.

HI : Upper-limit value < Measured torque

OK: Lower-limit value ≤ Measured torque ≤ Upper-limit value

LO : Measured torque < Lower-limit value

5-5 Auto Memory/Reset

When a measured value is peak-held and a load is removed, OK/NG Judgment is made after 0.1 to 5.0 seconds (can be freely set), the measured value is stored, and the counter is moved forward by one and reset. An OK/NG Judgment result is indicated in blue for about 0.5 second in case of OK and in red for about 1 second in case of LO/HI. No OK/NG Judgment is made when the upper- and lower-limit values are 0.

5-6 Deletion of Data

1 To delete one data: Using ▲ or ▼ key, display a data to be deleted and press "C" key. The data will be deleted.

2 To delete data between two selected count values: Using ▲ or ▼ key, display the last count value of data to be deleted and then, press STAT key. "Stt" will be displayed. Using ▲ or ▼ key, display the first count value of data to be deleted and then, press STAT key. With any of "n", "HI", "Lo" or "Av" on the display, press "C" key while pressing "STAT" key.
The data between the two selected values will be deleted.

3 To delete all stored data: If the power is turned on while pressing the Memory/Reset key, "CLEAr" is displayed at the start-up time, clearing all the data. Using ▲ or ▼ key, display a data to be deleted and press "C" key. The data will be deleted.

Note * Before deleting data, recheck whether or not the data should be deleted.
* To turn off the power, save the necessary data in other device beforehand.

5-7 Statistical Processing Function *Number of sample, maximum, minimum and average value

1 Using ▲ or ▼ key, display the last count in the data range to be subjected to statistical processing.

2 Press STAT key once, and "Stt" is displayed. Using ▲ or ▼ key, display the first count in the data range to be subjected to statistical processing.
Press STAT key, and the sampling number "n", maximum value "HI", minimum value "Lo" and average value "Av" in the specified data range are displayed.

5-8 Auto Zero Adjustment

When the torque is lower than the value indicated in the table below, press "C" key or turn the power OFF/ON. Auto Zero function will be activated. Before conducting the above operation, remove the torque wrench.
If the torque load exceeds the above value, "Err9" is displayed.

LC20N3-G	1N • m
LC200N3-G	10N • m
LC1000N3-G LC1400N3-G	50N • m

<<When "Err9" is displayed>>

- Under no load condition, press "C" key.
  - If the "Err9" message disappears, the line checker functions properly.
- If the "Err9" message does not disappear, turn OFF the power, and then turn it ON again.
  - If the "Err9" message remains displayed, the torque sensor or the plated circuit may have any problem.

5-9 Over-Torque Alarm

When the torque exceeds 110% of the maximum measurement range, a display value flashes in order to protect the line checker.

5-10 Error Display

The LC3-G has a self-diagnosis function. When a problem occurs, any of the error messages from Err1 to 9 is displayed.

<<When any of Err1 to 5 is displayed>>

- Turn OFF the power switch. Then, without touching any key, turn ON the power again.
  - If the "Err" message disappears, the line checker functions properly.
  - If the "Err" message remains displayed, the LC3-G needs repair. Contact your nearest distributor or Tonichi Mfg. Co., Ltd.

<<When "Err8" is displayed>>

- The LC3-G needs repair. Contact your nearest distributor or Tohnichi Mfg. Co., Ltd.

<<When "Err9" is displayed>>

- Under no load condition, press "C" key.
  - If the "Err9" message disappears, the line checker functions properly.
- If the "Err9" message does not disappear, turn OFF the power, and then turn it ON again.
  - If the "Err9" message remains displayed, the LC3-G needs repair. Contact your nearest distributor or Tohnichi Mfg. Co., Ltd.

Example of error message *Err9

Errors List

LC3-G Errors Messages

Error Message	Description	Remedy
Err 1 to 5	The fron panel key has been left pressed.	Turn OFF the power switch. Then, without touching any key, turn ON the power again. If the "Err" message disappears, the line checker functions properly. If the error cannot be reset, the key is defective, and the LC3-G needs repair. Contact your nearest distributor or Tohnichi Mfg. Co., Ltd.
Err 8	CPU memory error	The LC3-G needs repair. Contact your nearest distributor or Tohnichi Mfg. Co., Ltd.
Err 9	Torque over zero width * Torque sensor or internal circuit error.	Under no loading condition, press "C" key. If the "Err" message disappears, the line checker functions properly. If the "Err" message remains displayed, the torque sensor or the internal circuit may have any problem. The LC3-G needs repair. Contact your nearest distributor or Tohnichi Mfg. Co., Ltd.

6 Various Settings

The following describes various setting functions and operating methods.

To make settings, operate in the following procedures.

6-1 Setting Items

• Registration of upper- and lower-limit values

* In memory mode 99, Upper-/Lower-limit value is displayed in maximum 4 digits.

	Item	Counter/Upper -limit Value Display	Counter/Upper -limit Value Selection/Lower-limit Value Display	Main Display	
				Factory Default	Selectable range e.g. LC20N3-G
1	Setting item selection	- -		torq-S	PArA-S
2	Measurement unit setting	Unit		N·m	4 units selectable by displaying ▼ at the desired unit.
3	Upper-limit value (A) setting	Hi	SEt-A	00.000	00.000-20.000
4	Lower-limit value (A) setting	Lo	SEt-A	00.000	00.000-20.000
5	Upper-limit value (B) setting	Hi	SEt-b	00.000	00.000-20.000
6	Lower-limit value (B) setting	Lo	SEt-b	00.000	00.000-20.000
	⋮	⋮	⋮	⋮	
23	Upper-limit value (J) setting	Hi	SEt-J	00.000	00.000-20.000
24	Lower-limit value (J) setting	Lo	SEt-J	00.000	00.000-20.000

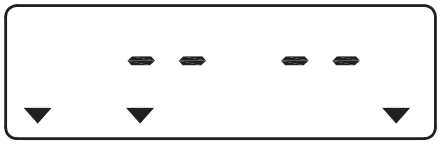
• Other parameter settings

	Item	Counter/Upper -limit Value Display	Selection item	
			Factory Default	Selection item
1	Auto memory/reset setting	Ar	0	0.1/0.2/0.3/0.4/0.5/1.0/2.0/3.0/4.0/5.0
2	Key operation sound setting	bU	on	oFF
3	External output setting	doUt	PC	Prn
4	Baud rate setting	bPS	2400	4800/9600/19200
5	Data length setting	LngtH	7 bit	8 bit
6	Parity setting	PArty	nonE	odd/EVEn
7	Memory mode setting	deCnt	1000	99
8	Default setting	dFLt	dFLt-n	dFLt-y
9	Time setting	rtc1	-	00:00:00-23:59:59
10	Data setting	rtc2	-	00.00.00-99.12.31

6-2 Registration of Upper- and Lower-limit Values

• Setting screen reading

In the measurement screen (no-load), press the C, STAT, and MD keys in that order. Bars are displayed, followed by the setting item selection screen.

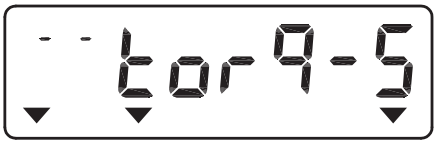


• Setting item selection

Register the upper- and lower-limit values or select other parameter setting.

With "torq-S" displayed, press the MD or STAT key to proceed to the next item.

To return to the measurement display mode without making any setting, press the C key.



• Measurement unit setting * Factory default: cN·m

Set the measurement unit.

Select the unit with the ▲ or ▼ key and press the STAT key to set it.

Press MD key to skip this setting and press C key to go back to the measurement mode.

• Upper-limit value (A) registration (Factory default: 0)

Register an upper-limit value (A) for OK/NG Judgment.

Select a digit with the ▲ key, adjust a numerical value with the ▼ key, and register it with the STAT key to proceed to lower-limit value (A) registration.

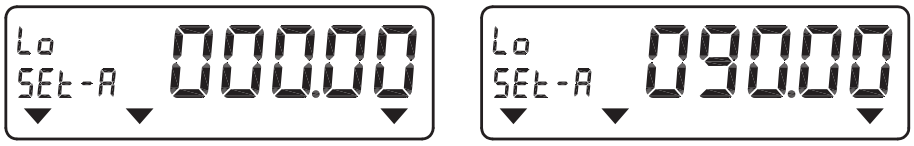
Press MD key to skip this setting and press C key to go back to the measurement mode.

If an attempt is made to register a value exceeding the measurement range, "SEtErr" is displayed, returning to upper-limit value (A) registration again.

• Lower-limit value (A) registration (Factory default: 0)

Register a lower-limit value (A) for OK/NG Judgment.

Select a digit with the ▲ key, adjust a numerical value with the ▼ key, and register it with the STAT key to proceed to upper-limit value (B) registration. Press MD key to skip this setting and press C key to go back to the measurement mode. If an attempt is made to register a value exceeding the measurement range or the upper-limit value, "SEtErr" is displayed, returning to upper-limit value (A) registration.



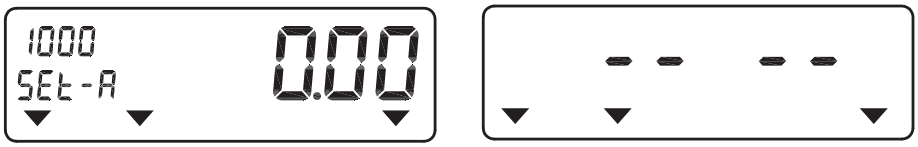
Subsequently, register the upper- and lower-limit values (B to J) in the same manner. Completion of lower-limit value (J) registration returns the display to the measurement mode. When you want to finish upper-/lower-limit value registration halfway, press the C key to return you to the measurement mode.

* To alter the upper- and lower-limit values, erase the stored measured data. If the upper- and lower-limit values are altered with the measured data stored, the displayed upper- and lower-limit values and OK/NG Judgment colors may differ when the measured data are read out.

6-3. Other Parameter Settings

• Setting screen reading

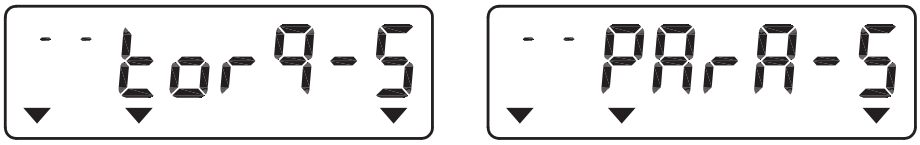
In the measurement screen (no-load), press the C, STAT, and MD keys in that order. Bars are displayed, followed by the setting item selection screen.



• Setting item selection

Register the upper- and lower-limit values or select other parameter setting.

Switch the display to "PArA-S" with the ▲ and ▼ keys, and press the MD or STAT key to proceed to the next item. To return to the measurement display mode without making any setting, press the C key.

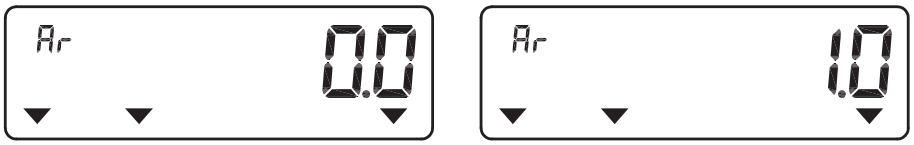


• Auto memory/reset setting (Factory default: 0.0)

Using ▲ or ▼ key, select any time between 0.1 to 5.0 seconds and press the STAT key.

For manual memory/reset, press the STAT key while "0.0" is displayed.

Press MD key to skip this setting and press C key to go back to the measurement mode.



• Key operation sound setting * Factory default: on

Set whether key operation sound should be turned on. Even if "oFF" is set, an over-torque alarm sounds.

Select "on"/"oFF" with the ▲ or ▼ key, press the STAT key to set it, and proceed to communication setting.

Press MD key to skip this setting and press C key to go back to the measurement mode.

• Communication setting

1 Output format setting * Factory default: PC output

The RS232C output format is set at Printer output or PC output.

Using ▲ or ▼ key, select "PC1", "PC2" for PC output or "Prn" for printer output and press the STAT key for setting.

Now, the display is ready for communication baud rate setting.

Press MD key to skip this setting and press C key to go back to the measurement mode.

- PC1: At memory mode "1000", transfer measured data to PC.
- PC2: At memory mode "1000", transfer measured data and measurement mode to PC.
- Prn: Use this mode to print out the measured data with Tohnichi printer model "EPP16M3".

* See 8. External Output Function for details.

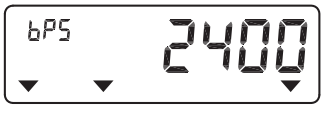
2 Communication baud rate setting *Factory default: 2400 bps

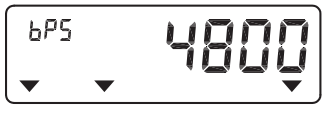
The communication baud rate is set as follows:

Using ▲ or ▼ key, select "2400", "4800", "9600" or "19200" and press the STAT key for setting.

Now, the display is ready for data length setting.

Press MD key to skip this setting and press C key to go back to the measurement mode.





3 Data length setting * Factory default: 7 bits

The communication data length is set as follows:

Uing ▲ or ▼ key, select "7bit" or "8bit", and press STAT key for setting. Now, the display is ready for parity setting.

Press MD key to skip this setting and press C key to go back to the measurement mode.

4 Parity Setting * Factory default: None

Using ▲ or ▼ key, select "nonE" for none, "EVEn" for even number or "odd" for odd number.

Then, press STAT key for setting, and the display returns to the measurement mode.

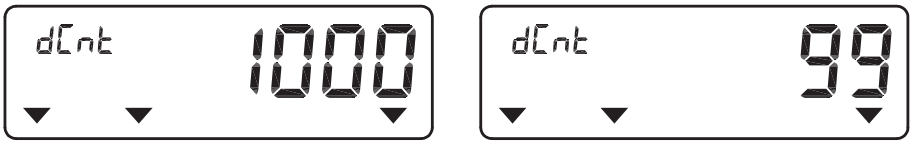
Press MD key to skip this setting and press C key to go back to the measurement mode.

• Memory mode setting * Factory default: 1000

Set a measured data memory capacity.

"1000": Memorizes 1,000 data,

"99" : Memorizes 99 data; Communication format compatible with the LC2-G



Select with the ▲ or ▼ key, and press the STAT key to display the confirmation screen.

Press MD key to skip this setting and press C key to go back to the measurement mode.

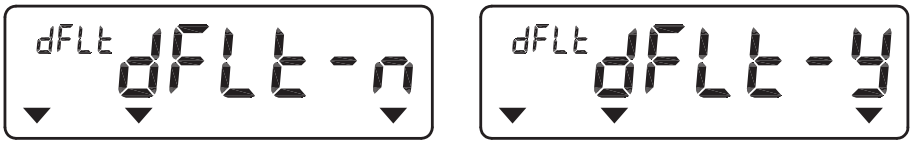
If the STAT key is pressed, the memory mode is changed, and the memory data are cleared to proceed to the next item.

* Note that if the memory mode is changed, the measured data memory is cleared.

Pressing the C key restores the pre-change display.

• Default setting

Initialize the setting values to those existing at the time of shipment.



Select "dFLt-Y" with the ▲ or ▼ key, and press the STAT key. All the setting values and the upper- and lower-limit values are initialized to those existing at the time of shipment. If the MD key is pressed, setting process proceeds to the next without saving the data, and if the C key is pressed, the display returns to the measurement mode.

• Time checking/setting

1 Time checking

Press ▲ or ▼ key and check the time (hour:minute:second) and date (year/month/day). To change the setting, press the STAT key. The display becomes in the time setting mode. To return to the measurement display mode without making any setting, press the C key.

2 Time setting *Hour:minute:second

"Hour" is flashing. Press ▲ or ▼ key and set the hour. Then, press the STAT key for setting. The display is ready for "minute" setting. To skip the setting, press the MD key. The display will be ready for the next setting.

To return to the measurement display mode without making any setting, press the C key.

In the same way, set "minute" and "second". After completion of the settings, the display becomes in the date setting mode. Note that "00" is displayed on the filed of "second".

3 Date setting * Year/month/day

"Year" is flashing. Press ▲ or ▼ key and set the year. Then, press the STAT key for setting.

The display is ready for "month" setting. To skip the setting, press the MD key. The display will move to the next setting.

To return to the measurement display mode without making any setting, press the C key.

In the same way, set "month" and "day". After completion of the settings, the display returns to the measurement display mode.

* If the C key is pressed in the course of setting, control returns to the setting enabled state without registering a setting value. Be sure to press the STAT key.
* The auto memory/reset function is activated only in the PEAK hold mode.
* When the auto memory/reset function is being used, the Memory/Reset key is not available.
* When setting the auto memory/reset function, it is not activated if the RUN mode is selected.

7 How to Use

7-1 Handling

1 Place the LC3-G on a sturdy and stable workbench in a horizontal position and fix it with screws.
2 Connect the AC adapter to the power jack on the side of the main unit. Make sure that the power switch is in the off position, and then, insert the plug into an outlet.
3 Turn on the power switch. *After the power is turned on, leave the unit as it is for 30 minutes or more.
4 Conduct the following settings: See "6. Various Settings" for the upper- and lower-limit value registration, auto memory/reset setting, key operation sound setting, communication setting, memory mode setting, and time setting methods.
5 Install the adapters suitable for the torque wrench to be measured.
6 Select the appropreate measurement mode, LC20N3-G, LC200N3-G": CLICK/CA, LC1000N3-G, LC1400N3-G: QL/QLE, with the model select switch according to the torque wrench to be measured.

7-2 Measurement

1 Using the MD key, set the measurement mode suitable for the torque wrench to be measured. Click type torque wrench (QL, SP, etc.): PEAK hold mode, Dial direct reading type torque wrench (DB, F, etc.): RUN mode
2 Make auto zero adjustment. For the adjustment procedure, see "5-8. Auto Zero Adjustment".
3 Check the measurement torque and torque unit of the torque wrench.
4 Set the torque wrench and apply force at the grooved line or dot of torque wrench handle until you hear a click when the measuring point is reached. Applying a load increments a torque display value.
5 Release the load from the torque wrench. For manual memory/reset, press the Memory/Reset key. The measured data (Torque value & time) is stored, and increments a counter and resets. For auto memory/reset, release the load. The measured data is automatically stored, and increments a counter and resets.
* Retry measurement after confirming the display has been reset.
6 Repeat the above steps "4" and "5" by the required number of times.

8 External Output Function

8-1 Printer Output

Connect the LC3-G and the Tohnichi printer (EPP16M2) using a printer cable catalog No. 382.

Set the communication output format to "Prn" and ensure that other communication settings are consistent with the printer.

* See "6 Various Settings" for the setting methods

* Do not use a printer cable and a USB communication cable at the same time.

• Communication settings for the EPP16M3

Data format	: RS232C-compliant
Transmission system	: Start-stop synchronization serial
Baud rate	: 2400 bps
Data length	: 7 bits
Stop bit	: 1 bit
Parity	: None

1 Progressive printing

Press the Memory/Reset key. In the progressive printing, the results of statistical processing are not printed.

In the Auto Memory/Reset mode, the results are automatically printed out.

2 Continuous printing

Display the last count value in the print range and press STAT key. "Stt" is displayed. Using ▲ or ▼ key, display the first count value in the print range and press STAT key. Then, press ▲ key while "n" is displayed.

The data, sampling number "n", maximum value "HI", minimum value "LO" and average value "X" in the specified range are printed out.

3 Printing of only statistical processing value

Display the last count value in the print range and press STAT key. "Stt" is displayed. Using ▲ or ▼ key, display the first count value in the print range and press STAT key. Then, press ▼ key while "n" is displayed.

The sampling number "n", maximum value "HI", minimum value "LO" and average value "X" in the specified range are printed out.

• Continuous printing example for memory mode 1000

```
  1：OK  SET-A          ← Memory counter: OK/NG judgment result, Upper-/Lower-limit value selection symbol
 30. 0N・m              ← Torque value, Torque unit
 12/31  12：00          ← Measurement date and time *month/date, hour:minute
  2：HI  SET-A
 31. 0N・m
 12/31  12：01
  3：-                  ← OK/NG judgment function was inactivated "--"  Selection symbol: Blank
 ==. ==N・m             ← Torque value  ====
 00/00  00：00          ← Measurement date and time 00/00 00:00
    ・
    ・
    ・
 20：OK  SET-A
 30. 0N・m
 12/31  12：03
————————————
n = 18                  ← Sampling number
HI：31. 0N・m           ← Maximum value
LO：29. 0N・m           ← Minimum value
X ：30. 0N・m           ← Avarage value
```

• For memory mode 99

```
 1：30. 0N・m           ← Torque value & Torque unit
 2：31. 0N・m
 3：==. = N・m
    ・
    ・
    ・
20：30. 0N・m
————————————
n = 18                  ← Sampling number
HI：31. 0 N・m          ← Maximum value
LO：29. 0 N・m          ← Minimum value
X ：30. 0 N・m          ← Avarage value
```

"====" denotes that the measured value displayed at the LC3-G is either "0" or exceeds 110%.

It is excluded from statistical processing and not printed.

8-2 PC Output

Connect the LC3-G and an external device with a communication cable (Catalog No.383 or 385). Set the communication output format to "PC" and ensure that other communication settings are consistent with the external device.

* See "6 Various Settings" for the setting methods.
* Do not use an RS232C communication cable and a USB communication cable at the same time.
* An exclusive driver is required for communications with the No. 385 cable. Install the driver from a CD-R accompanying the No. 385 cable.

• Communication settings

Data format	: RS232C-compliant
Transmission system	: Start-stop synchronization serial
Baud rate	: 2400/4800/9600/19200 bps
Data length	: 7 bits/8 bit
Stop bit	: 1 bit
Parity	: None/Even/Odd

1 Progressive output

The data are output when the Memory/Reset key is pressed or the auto memory/reset function is activated.

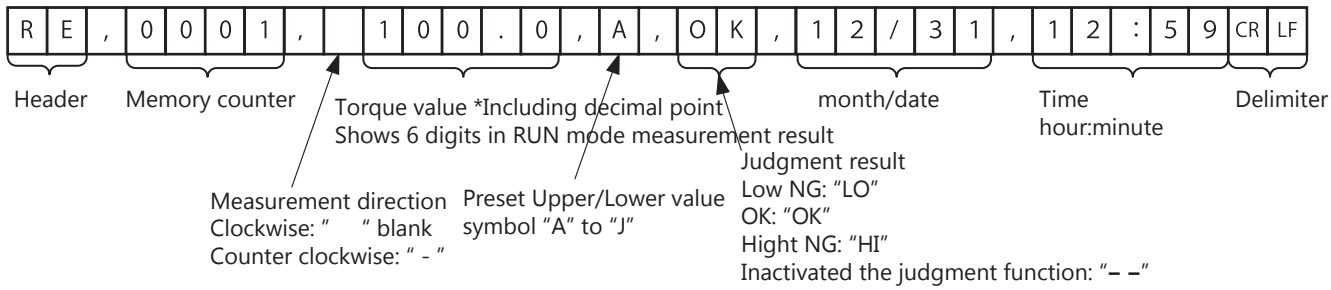
2 Batch output

Display the last memory count value in the output range and press STAT key.

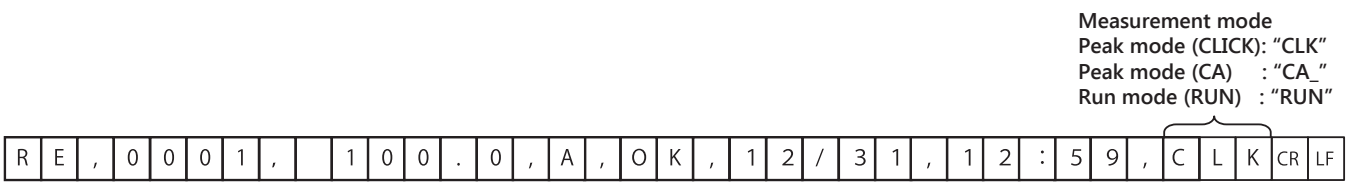
"Stt" is displayed. Using ▲ or ▼ key, display the first memory count value in the output range and press STAT key.

Then, press ▲ key while "n" is displayed. The measured data of a selected range are collectively output.

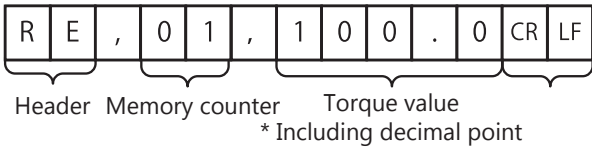
• PC output format for memory mode 1000, PC1 mode



• PC output format for memory mode 1000, PC2 mode



• For memory mode 99 * Communication format compatible with the LC2-G.



9 Appendix

Example of Use

	Part	Reference Torque	Upper-limit / Lower-limit
SEt-A	QSP25N3 000001C	10.0	10.5 / 9.5
SEt-b	QSP12N4 000002C	9.5	9.97 / 9.03
SEt-C	QSP6N4 000003C	4.5	4.73 / 4.28
SEt-d	QSP25N3 000004C	11.0	11.55 / 10.45
SEt-E	QSP12N4 000005C	7.3	7.67 / 6.94

• Appendix: List of Torque Wrenches

The following lists the reference torques, and their upper- and lower-limit values of the torque wrenches to be checked with the LC3-G. This list is convenient for organizing the upper- and lower-limit values registered with the LC3-G. Copy it to your desired size for use.

How to select registerd Torque Wrench: Press MD for 1 sec., ▲ or ▼ key to select - STAT key to decide.

	Part	Reference Torque	Upper-limit / Lower-limit
SEt-A			
SEt-b			
SEt-C			
SEt-d			
SEt-E			
SEt-F			
SEt-g			
SEt-h			
SEt-I			
SEt-J			

10 Optional Accesories

Connecting Cable

Part No.385 USB B type. LC3-G → PC

Connecting Cable

Part No.385 (USB B type. LC3-G → PC

Thermal Line Dot Printer

Model EPP16M3

Calibration Kit

Model		Available model
TCL50N	· · · · ·	LC20N3-G
TCL200N	· · · · ·	LC200N3-G
TCL1000N	· · · · ·	LC1000N3-G
TCL2000N	· · · · ·	LC1400N3-G

* Weights are sold separately.

Battery Pack

Model BP-100-4

■**Tohnichi Mfg. Co., Ltd.**
Tel.+81 3 3762 2455 Fax.+81 3 3761 3852
2-12, Omori-Kita, 2-Chome Ota-ku, Tokyo Japan
E-mail: overseas@tohnichi.co.jp
Website: http://www.global-tohnichi.com
■**N.V. Tohnichi Europe S.A.**
TEL.+32 16 60 66 61 FAX.+32 16 60 66 75
Industrieweg 27 Boormeerbeek, B-3190 Belgium
E-mail: tohnichi-europe@online.be
■**Tohnichi America Corp.**
Tel.+1 847 947 8560 Fax.+1 847 947 8572
1303 Barclay Blvd. Buffalo Grove,IL 60089 USA
E-mail: inquiry@tohnichi.com
Website: http://tohnichi.com
■**Tohnichi Shanghai Mfg. Co., Ltd.**
东仁扭矩仪器（上海）有限公司
Tel.+86 21 3407 4008 Fax.+86 21 3407 4135
RM.5 No.99 Nong1919, Du Hui Road, Minhang, Shanghai, P.R.China
E-mail: sales@tohnichi-sh.com

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