Combo Controller for Electric Pulse UEP-MC Tool

UECD-4800

Instruction Manual

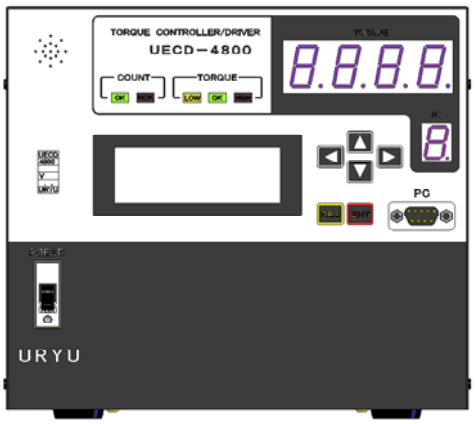

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Table of Contents

1. Safety Instructions

Do peruse this instruction manual before installation, operation, maintenance and inspection of this system, and the use this system properly. Use this system only after you master knowledge of this equipment, safety instruction and all instructions given in the safety instructions of this system. Take note that this operation manual classifies the safety instructions into two signs; “DANGER” and ”WARNING”, according to the degree of seriousness and urgency.

: A fatality and/or heavy personal injury is highly possible by improper operation. Urgent warning is essential in the event of an accident.

: A dangerous situation accompanying mid-slight personal injury and/or property damage is possible by improper operation.

sign also warns the risk of serious consequences depending on the situation. So, always follow the instructions given in this manual.

◆Installation & Surroundings

WARNING

- ●Place on a metal or other incombustible component to prevent a fire.
- ●Keep away from the combustibles to prevent a fire.
- ●Avoid foreign material intrusion to prevent a fire.
- ●Set up controller on a site that can bear its weight to avoid personal injury from accidental falling.
- ●Keep the workplace well lighted and clean to avoid personal injury.
- ●Never wear loose-fitting clothes or dangling jewelry when using this system, and always wear the proper clothes for your job. In addition, be careful not to get your hair caught in tools, and tie long hair with a rubber ribbon or the like and wear a protective helmet to prevent personal injury.
- ●Securely install and fix this system to avoid personal injury in case of an emergency like an earthquake.
- ●Never carry this combo controller with your fingers on the switch while it is being plugged in. You may get injured.

◆Wiring

DANGER

- ●Be sure to turn off the power switch prior to wiring to avoid an electric shock or a fire.
- ●Place the no fuse breaker (NFB). There may be a fire risk.
- ●Make sure that the cords and outlets are properly grounded to avoid an electric shock or a fire.
- ●Carry out wiring after you installed controller to avoid an electric shock or a fire.
- ●Never use the power code for dragging the UEP tool and pull it out roughly. There may be an electric shock or fire risk.
- ●Wiring must be carried out by an expert electrician to avoid an electric shock or a fire.
- ●Always use Y-shape crimp contact or round-shape crimp contact when wiring terminal block to avoid an electric shock or fire.

WARNING

- ●Verify that the rated voltage of the system matches with the connected AC power. There may be an electric shock or fire risk.
- ●Connect the tool to the correct size of UEPD. There may be an electric shock or fire risk.
- ●Make the correct wiring. There may be an electric shock or fire risk.

◆Handling/Operations

DANGER

- ●Assurance of work-site safety by operators themselves prior to power switching operation is essential to prevent personal injury.
- ●Never touch switching devices with wet hands to avoid an electric shock.
- ●Never touch the current-carrying controllers' terminals even if the tool is not in operation to avoid electric shock.
- ●Never damage, excessively stress, load the cords, and never tuck them between objects to avoid electric shock.
- ●Switch off the system when you do not run it.
- ●Do not run the tool when the built in switch is out of work. Inspect it and send it for repair.
- ●This system may restart abruptly when you reset the system with the tool trigger on. Never reset the system while the start signal is being triggered. There may be an injury risk.

WARNING

●The excessive operation causes the motor unit and driver unit to be overheated. Do not run the system excessively or more than necessary. Never touch the motor unit or rotating part in operation or immediately after the system is switched off. There may be an injury or burn risk.
●Never overwork the system more than it is intended. There may be an injury or burn risk.
●Run the system in a good workstation. The awkward posture in operation is dangerous.
●Be careful to run the system in operation. Never run it in a careless manner or when you are not in good health. There may be an injury risk.
●Never touch the rotating part after the power is supplied again due to the instant drop of voltage, e.g. thunder. The system may resume the operation suddenly. Inspect the system before you continue to run it.

◆Maintenance & Service

DANGER

●Wait for 5 minutes or longer to inspect and/or replace the system after it is switched off. There may be an electric shock.
●Only the personnel with expertise shall conduct the maintenance and inspection. Take off a watch or jewels before conducting. Inspect the cables periodically and get the qualified personnel to repair or replace them, if needed. Use the isolated tool only to avoid an electric shock and injury.
●Never dismantle the system locally. Send it to URYU or its designated distributor only. There may be an electric shock and injury and fire risk.

◆Disposal

Note

●Dispose of the system as industrial waste.

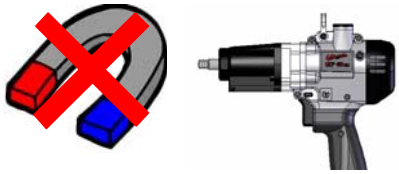
◆Miscellaneous Concern

Danger

●Never dismantle the system locally to avoid an injury and fire risk.
●Stop the operation and disconnect the system from electricity immediately in emergency.

Special Considerations

●Note that the drawings and pictures in this manual may not list all the accessories needed for safety measure to explain the details. Be sure to put the accessories back to the system as specified in this manual before operation and run it as intended.
●Never let anyone other than the operator in operation come near workstation.
●This combo controller is used with URYU Electric Transducerized Pulse (UEP-MC) Tool only.
●This is not a waterproof system. Never expose the system to water or moisture. Otherwise, there may be an electric shock or fire risk.
●The magnet-strictive sensor is built into the UEP-MC tool. Never place any magnet near the UEP-MC tool to avoid any magnetic field effect. Otherwise, the tool may malfunction.

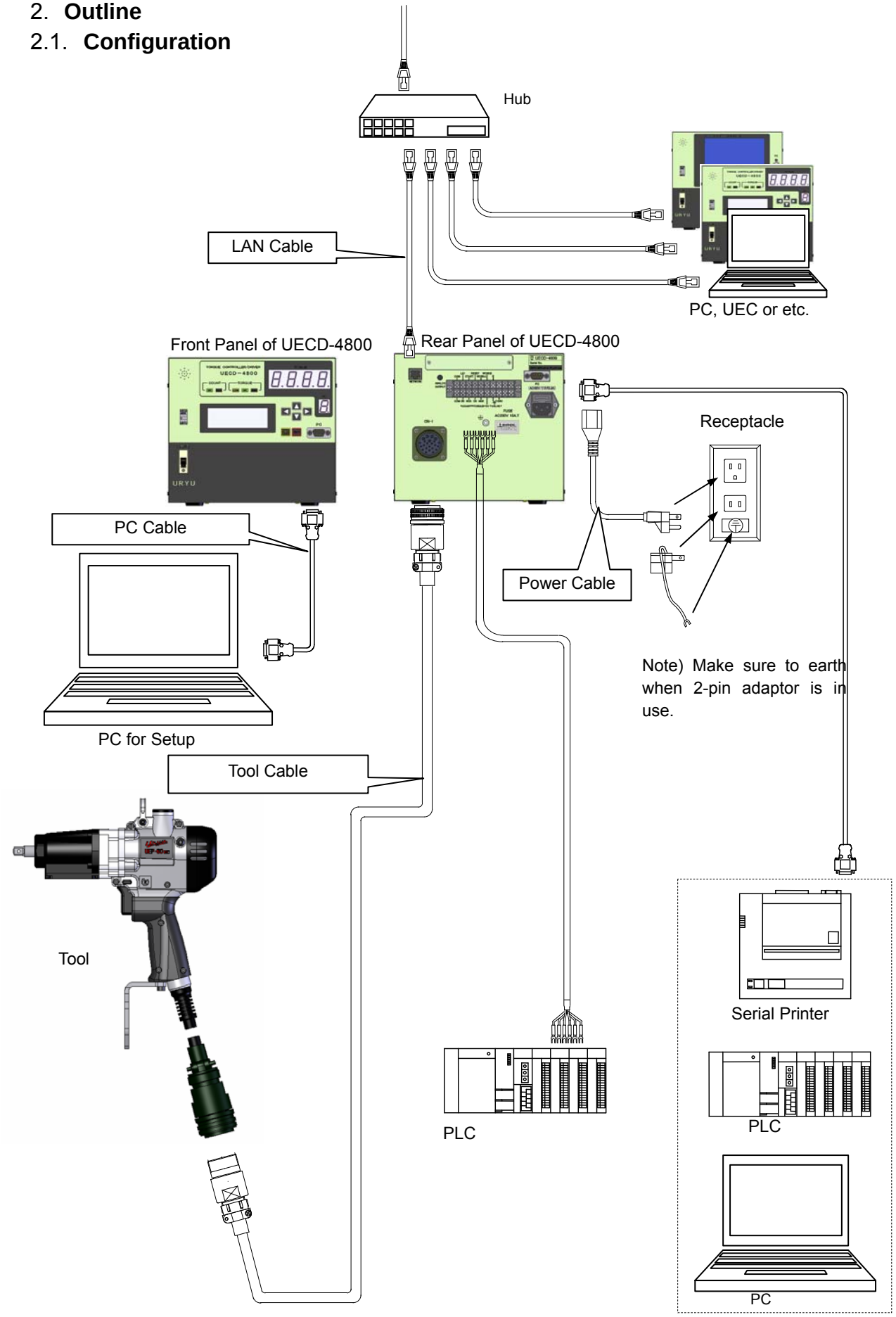


Disclaimer

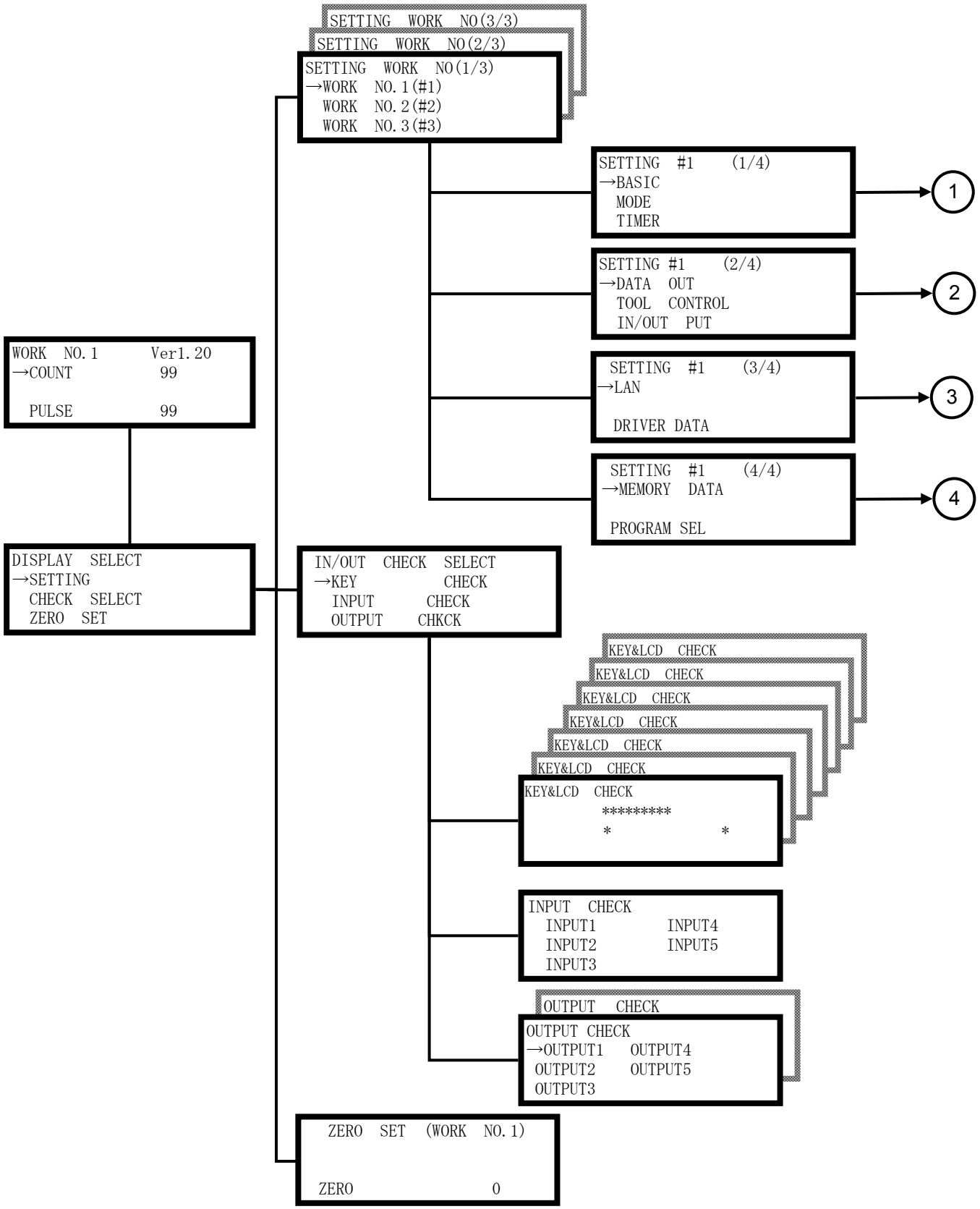
●Contents of this manual may change without notice.

2. Outline

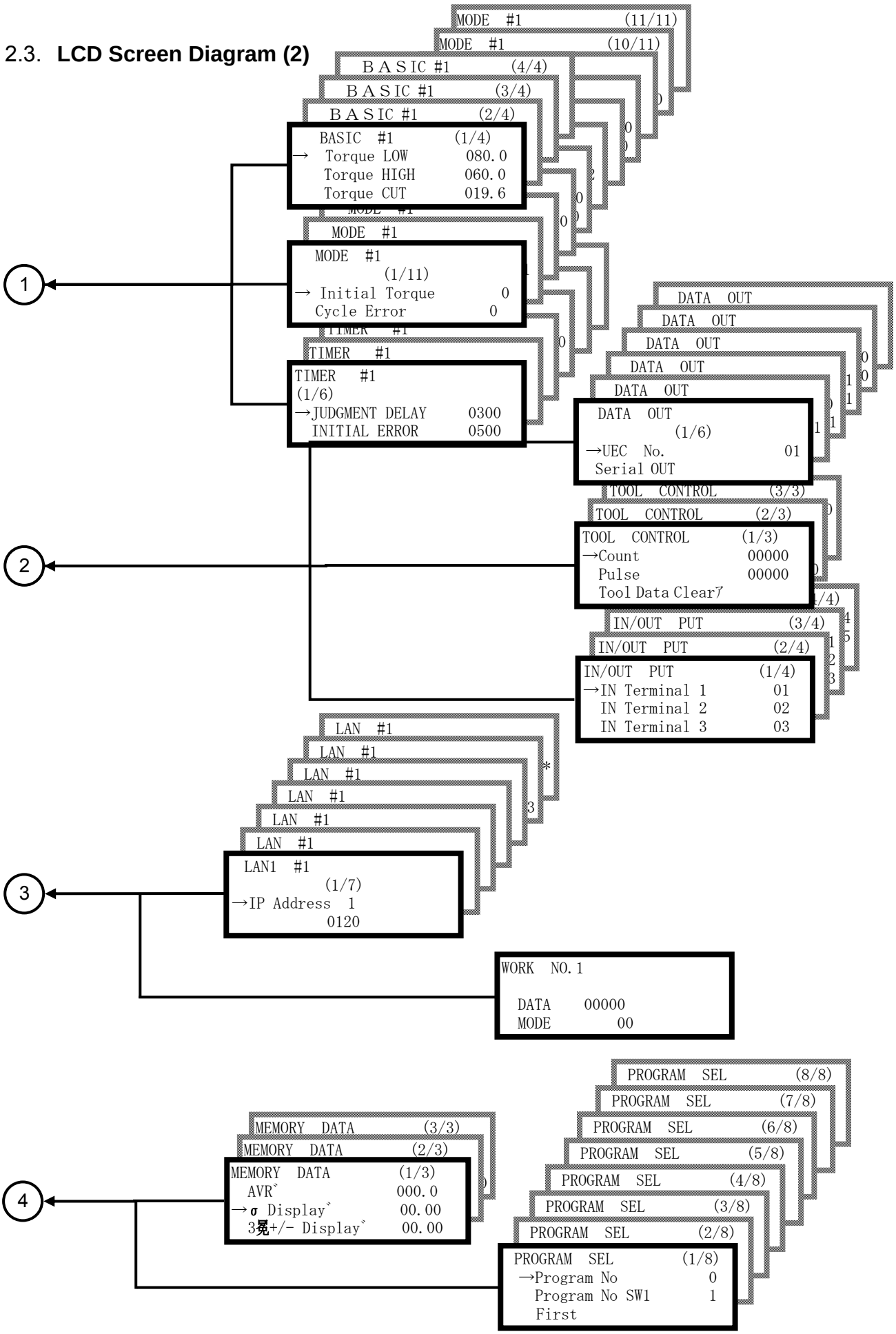
2.1. Configuration



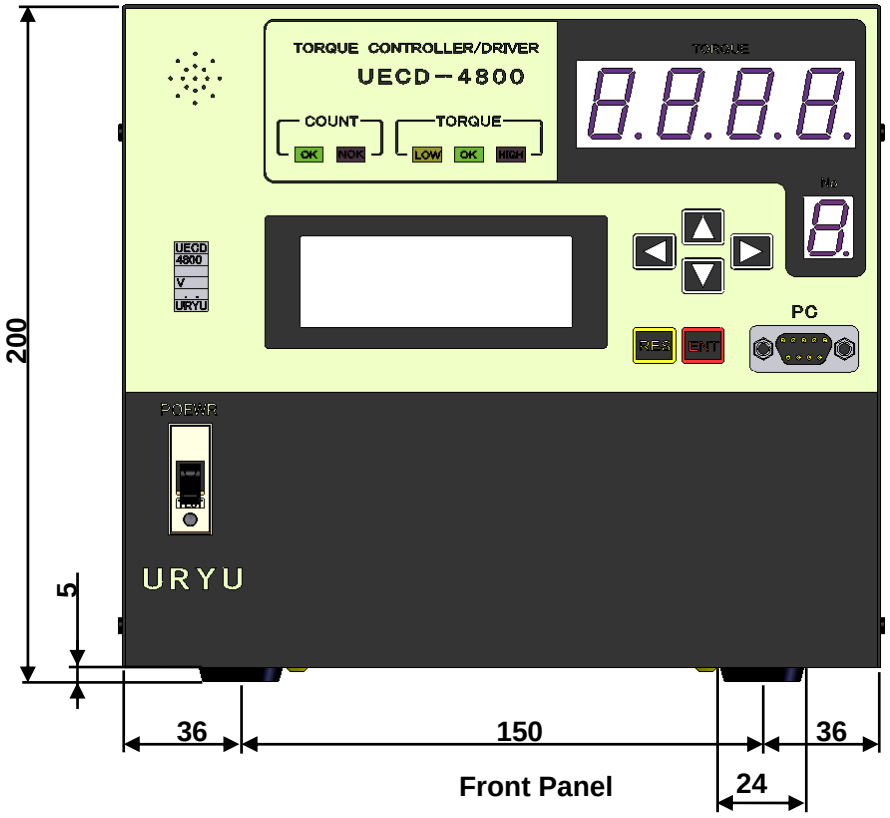
2.2. **LCD Screen Diagram (1)**

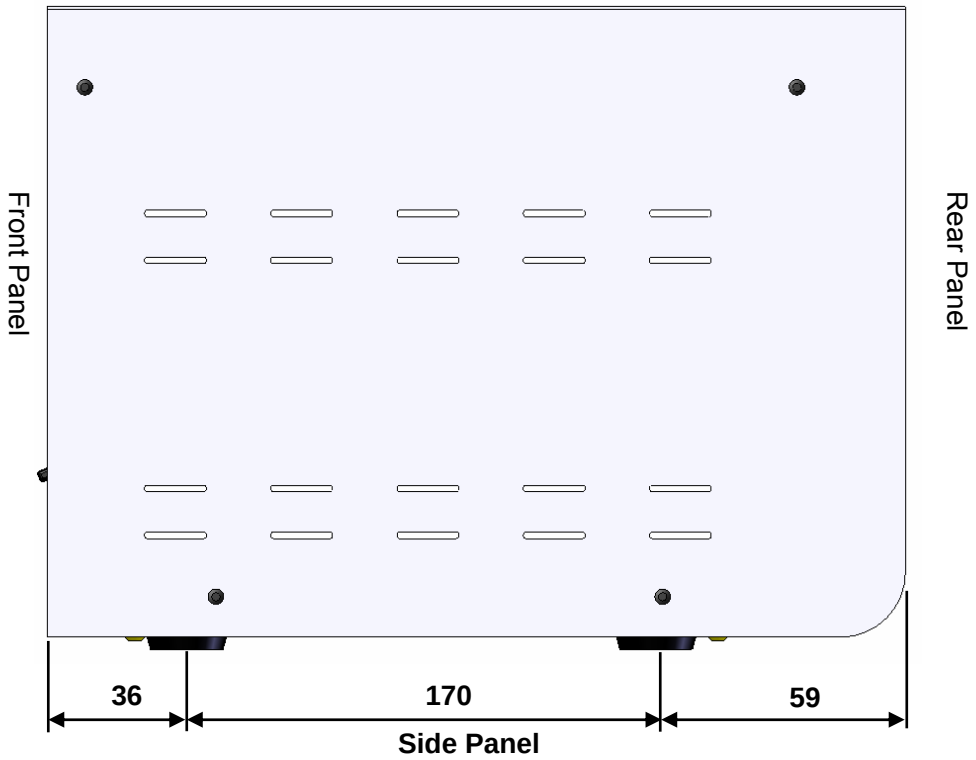


2.3. **LCD Screen Diagram (2)**



2.4. **Dimensions**





2.5. **Features**

1. Self-Diagnosis Function
   When UECD controller is switched on, it performs self-diagnosis by checking ROM → RAM → A/D → ZERO / CAL in a row for 10 seconds.
2. The UECD controller has functions of various fastening error detections and fastener number count down.
3. Makes setup or changeover of fastening torque, fastener number count and other controls for maximum 8 different kinds (work 1 to 8). Fastening torque level can get changed within the same work number by using the program number change.
4. Tool's maintenance is possible by counting both total cycle numbers (how many fasteners) and/or total pulse numbers.
5. Input / Output check and error messages can be checked from your PC screen or the front panel of UECD-4800 with the buzzer sounding.
6. Can set up and monitor various control values and setting values either on the front panel or on your PC screen.
7. Memorized maximum 12,000 pieces of fastening data without the data of day and time, and or maximum 5,400 pieces fastening data with the data of day and time.
8. Following functions are available through your PC. Please refer to the instruction manual of the UEC-4800 setup software for details.
   - Upload and receipt of the setting values
   - Fastening result data receipt and automatic storage
   - Fastening waveform data receipt and automatic storage
   - Statistic data receipt
9. Ethernet (TCP/IP) capable
   - Upload and receipt of the setting values
   - Upload of the fastening result, waveform data and the statistic data
10. The data output serial port comes standard with the UECD controller.

2.6. **Installation**

Install and fix controller firmly by paying attention to the following points.

2.6.1. **Place**

1) Within a building where no water or direct rays of the sun enters because UECD-4800 is not the waterproof structure.
2) Place where UECD-4800 does not suffer from corrosives, flammable gas, grinding fluid, oil mist, metal powders, and etc.
3) Well-ventilated place with less moisture, dust or waste.
4) Less vibration place
5) Place where you can disconnect power cord from power socket immediately when anything unusual occurs to UECD-4800.
6) Set in a dust-free box in case of use under environment of contamination degree 3.

2.6.2. **Environmental Conditions**

Item	Conditions
Place	Indoors only
Operation temperature	0 – 50 degree (no freeze)
Humidity	90% RH or less (no dew)
Preservation Temperature	0 – 50 degree (no freeze)
Preservation Humidity	90% RH or less (no dew)
Vibration	5.6 m/s^2 or less (10 – 60 Hz)
Altitude	Less than 1,000 m above sea level
Over voltage Category	Category III *1
Contamination Degree	Degree 2

*1. The above categorization is of the over voltage category (I, II or III), and contamination level (1, 2, 3) as per IEC664. UECD-4800 has been categorized as the over voltage category III and the contamination degree 2 as per the above.

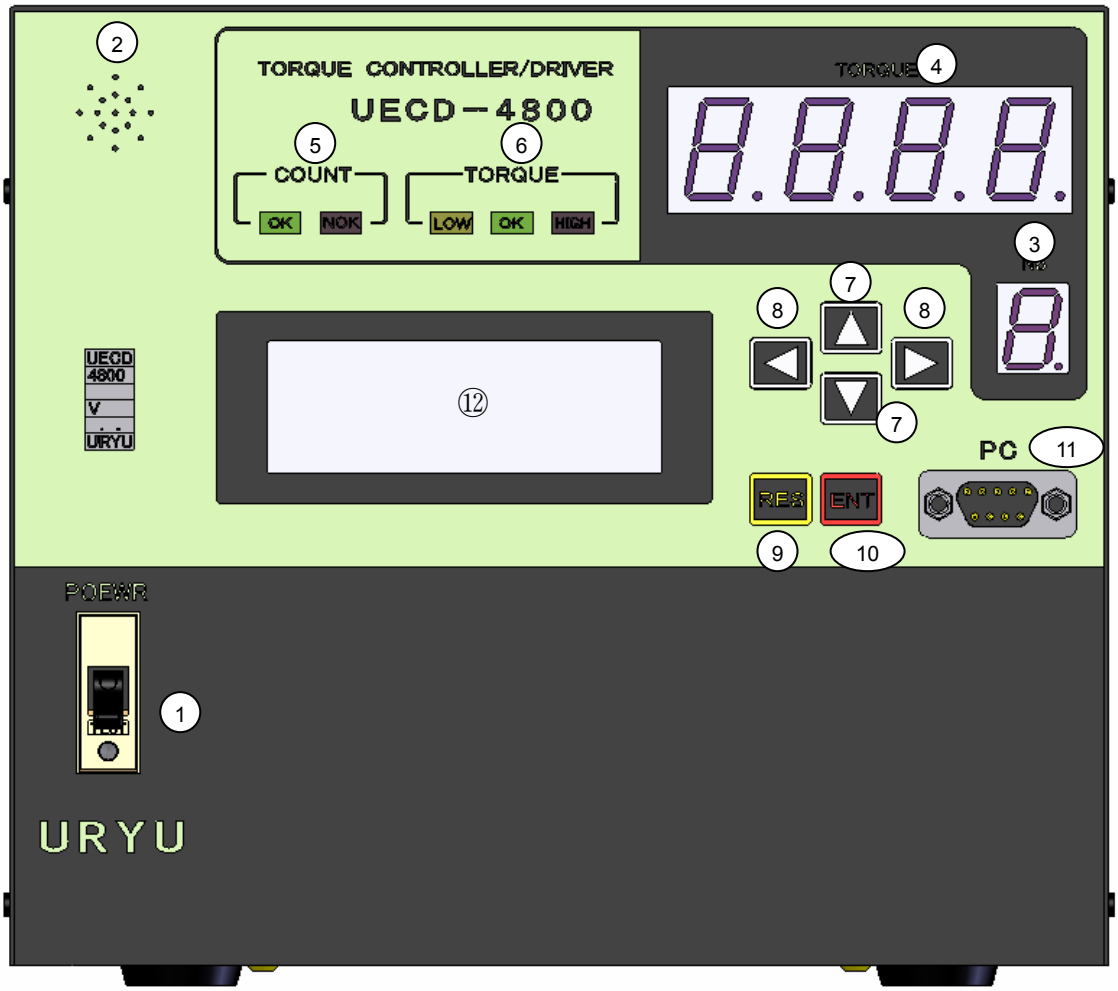
Note: IEC International Electric Standard Committee

3. **Specifications**

<table>
<tr><th colspan="2">Items</th><th colspan="2">Descriptions</th></tr>
<tr><td colspan="2">Power source</td><td colspan="2">AC100 – 240V ± 10%</td></tr>
<tr><td colspan="2">Frequency</td><td colspan="2">50 / 60Hz</td></tr>
<tr><td colspan="2">Anti-noise</td><td colspan="2">1000V　1μS (by noise simulation)</td></tr>
<tr><td colspan="2">Insulation resistance</td><td colspan="2">DC500V　Greater than 10MΩ</td></tr>
<tr><td colspan="2">Consumption</td><td colspan="2">About 50 – 400 VA</td></tr>
<tr><td colspan="2">Weight</td><td colspan="2">About 10 – 12 kilo grams</td></tr>
<tr><td colspan="2">Dimensions</td><td colspan="2">265 (D) x 222 (W) x 200(H)</td></tr>
<tr><td colspan="2">Main Functions</td><td colspan="2">Torque control, Torque monitor
Fastener number count</td></tr>
<tr><td colspan="2" rowspan="2">Setup</td><td colspan="2">From Front Panel</td></tr>
<tr><td colspan="2">By PC (exclusive URYU setup software, common for UEC-4800/4800TP and UECD-4800/4800TP Electric driver integrated type, is necessary.)</td></tr>
<tr><td colspan="2" rowspan="3">Display</td><td colspan="2">Torque resolution ±2048 (12 bit by A/D use)</td></tr>
<tr><td>LCD type</td><td>Touch Panel Type</td></tr>
<tr><td><u>LCD (20 letters x 4 lines)</u>
Work number, Bolt count number,
Tightening time, Pulse blow number, and
Settings displayed
<u>1-digit Digital Display (DPM)</u>
Work number displayed
<u>4-digit Digital Display (DPM)</u>
Torque reading displayed</td><td>320 x 240 dot
(25 letters x 15 lines – in case of Japanese two-byte character)</td></tr>
<tr><td colspan="2" rowspan="2">Lamp
(LED)</td><td colspan="2">Total Lamp (for Count Judgment) : OK (green) / NOK (red)</td></tr>
<tr><td colspan="2">Torque Lamp (for Torque Judgment) : LOW (yellow) / OK(green) / HIGH(red)</td></tr>
<tr><td rowspan="2">Terminal Block</td><td>Input</td><td colspan="2">Operation Voltage/Current : DC24V / about 10mA
5 terminals available (programmable)　Note: Contact input necessary</td></tr>
<tr><td>Output</td><td colspan="2">Contact Capacity : DC30V, 1A
5 terminals available (programmable), VALVE</td></tr>
<tr><td colspan="2">Oscillograph output</td><td colspan="2">Plug Size: JIS C6560 single small head plug ϕ3.5 x 15
UECD outputs filter-processed torque waveform from analog jack.
Cable: UK-PLUG (Part Number: 909-483-0)</td></tr>
<tr><td colspan="2">Key</td><td colspan="2">LCD: ▲▼◀▶, RES(RESET), ENT(ENTER)
Touch Panel: ENT(ENTER), RES.(RESET) & 10 key</td></tr>
<tr><td colspan="2" rowspan="4">Option</td><td colspan="2">Front Panel (touch panel type)
Part Name: Touch Panel Assembly　Part Number: 910-074-0</td></tr>
<tr><td colspan="2">Front panel (LCD type)
Part Name: UECD-LCD Panel Assembly　Part Number: 910-075-0</td></tr>
<tr><td colspan="2">Part name: PC Cable　Part Number: 910-219-0
Straight PC Cable for RS232C
D-sub 9-pin female - D-sub 9-pin female 3 meter long</td></tr>
<tr><td colspan="2">Part Name: Tool Cable (CE) 6H3M　Part Number: 910-546-0
Part Name: Tool Cable (CE) 6H5M　Part Number: 910-547-0
Part Name: Coiled Tool Cable (CE)　Part Number: 910-532-0</td></tr>
</table>

4. Parts Names and Functions

4.1. Front Panel



① Power Switch

Switch for power supply. Lift the lever to switch on the UECD controller. Turn off when you do not use.

② Buzzer

It sounds to announce for the confirmation of fastening, various errors, various NOK or key input.

③ 1-digit 7 segment display (No.)

It displays the work number now being selected.

④ 4-digit 7 segment display (TORQUE)

It displays the measurement values and setting values.

⑤ COUNT Lamp

OK: It lights when all the preset number of fasteners are tightened up.

NOK: It lights when the preset number of fasteners are not tightened up at the time of judgment.

⑥ TORQUE Lamp

LOW: It lights when the measurement value is less than the preset lower limit value at the time of judgment.

OK: It lights when the measurement value is within the preset upper and lower limit values at the time of judgment.

HIGH : It lights when the measurement value is more than the preset upper limit value.

⑦ ▲▼ These are used to move the cursor in the menu screen and increase/or decrease the setting values.

⑧ ◀▶ These are used to select the unit of the value when the setting values are changed in

the writing mode.

⑨ RES Key Switch

It usually works to reset all. When NOK happens and it is pressed, it resets NOK.

⑩ ENT Key Switch

It stops the buzzer, confirms the input of setting value and move to the writing mode by pressing and holding it more than three seconds.

⑪ PC Connector (D-sub 9 pin)

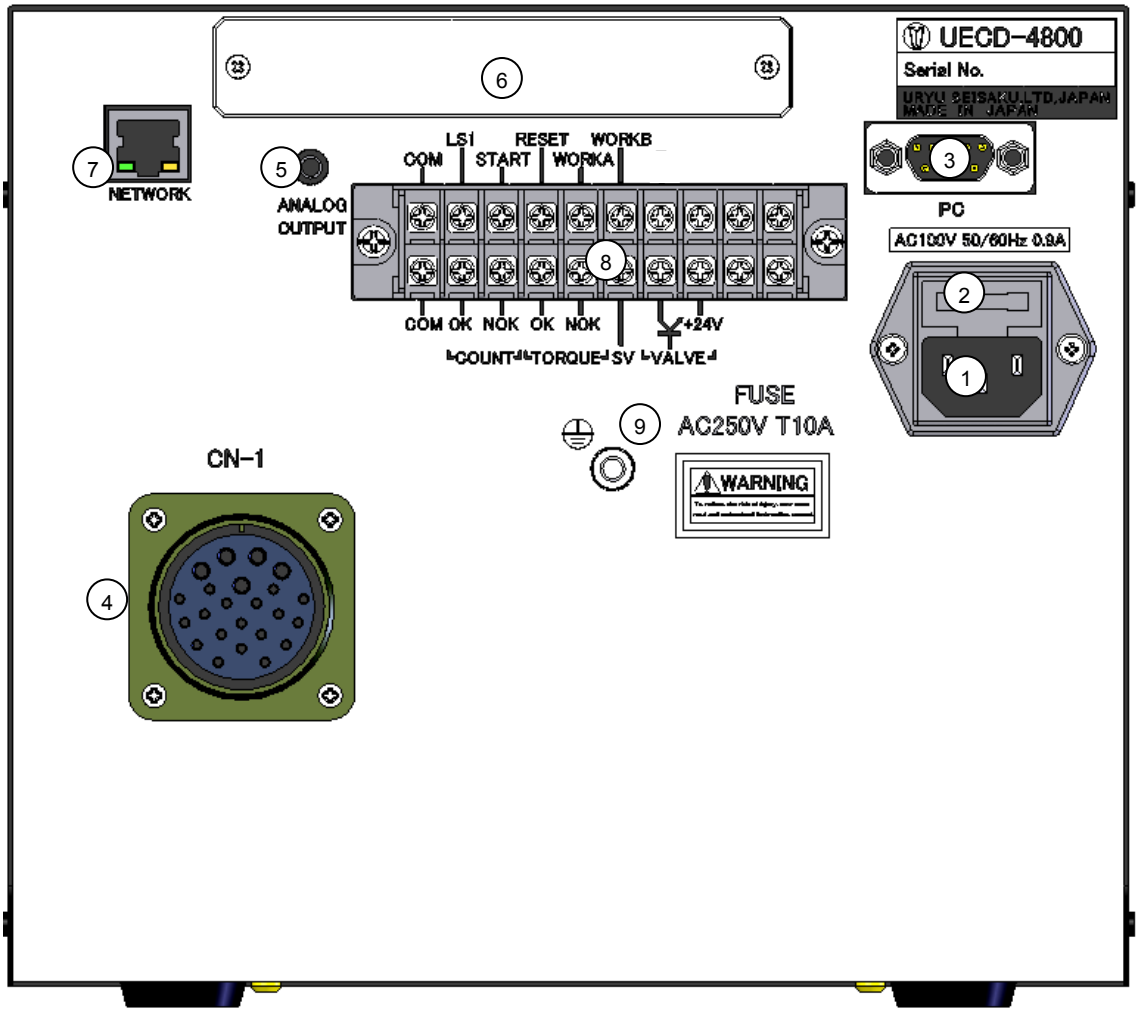
Connector cable between the PC for set up.

Use a straight cable.

⑫ LCD Display (20 digit x 4 line)

Fastening time, pulse blow number, unfastened fastener number etc. and parameters are displayed.

4. 2. **Rear Panel**



① Power cord box

Connect the power cord.

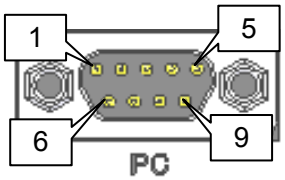
Make sure to ground the grounding wire of the power receptacle.

② Fuse holder

Protections fuse of UECD (T10A)

③ PC connector (D-sub 9-pin male)

RS232C serial port for the data input and output. Connect to the serial printer, PLC, PC, or the barcode reader.



Pin Purpose	
Pin No.	Signal
1	FG (frame ground)
2	TXD (Transmit Data)
3	RXD (Receive Data)
4	DSR (Data Set Ready)
5	SG (Signal Ground)
6	DTR (Data Terminal Ready)
7	CTS (Clear to Send)
8	RTS (Request to Send)
9	Not Used

④ Connector for tool cable

Connect a tool cable from a tool.

⑤ Analog output terminal

Terminal for the torque waveform output. Please refer to 15. Torque Waveform Measuring Procedure and 16. ANALOG output terminal for details.

⑥ Space for the optional board

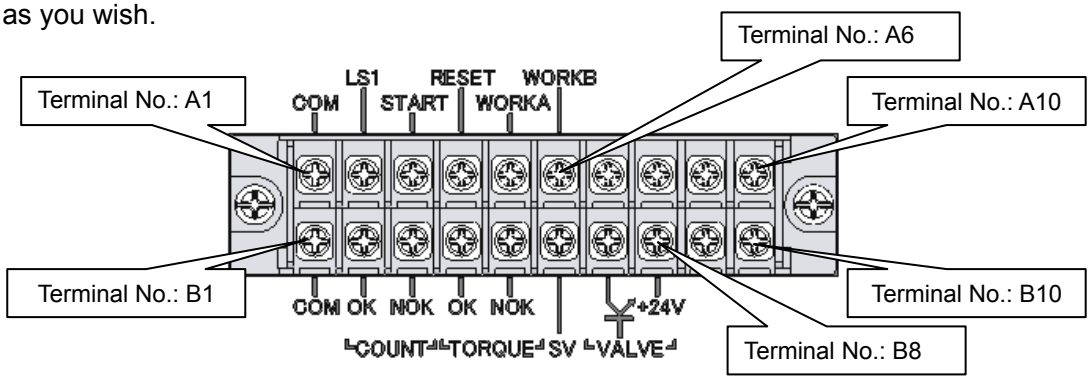
Space for the optional board.

⑦ Network connector

Connector for Ethernet.

⑧ Input and Output terminals (programmable)

The I/O terminals are programmable. This allows you to assign signals A2 – A6 & B2 – B6 to outputs, as you wish.



Note: The signal assignment pattern may be different from the above picture due to the difference in controller versions.

Terminal	Signal allocations	Terminal	Signal allocations
A1	COM: Common terminal for input terminals (-)	B1	COM: Common terminal for output terminals
A2	LS 1: Input the line control signal	B2	COUNT OK: Output COUNT OK signal until timer comes up
A3	START: External start	B3	COUNT NOK: Output COUNT NOK signal until NOK is cleared
A4	RESET: Use to clear NOK	B4	TORQUE OK: Output TRQUE OK signal until timer comes up
A5	WORK A: Input for the work No. change	B5	TORQUE NOK: Output TORQUE NOK signal until NOK is cleared
A6	WORK B: Input for the work No. change	B6	SV: Output for change of slow speed or full speed. Output SV signal when the measured torque reaches the start torque.
A7	Not used	B7	VALVE: Valve Output (0V)
A8		B8	VALVE COM: +24
A9		B9	Not used
A10		B10	

※Be sure to check the signal assignments before wiring.

※Contact input is necessary for the input to the input terminals A1 and A2 – A6.

※Output terminals of B1 and B2 – B6 is the no-voltage output. Wiring should be made at DC24V or less.

※Use Y-shape crimp contact or round-shape contact for the wiring to terminals.

⑨ Grounding terminal

Terminal for grounding. Be sure to use this terminal if the power cord doesn't have a ground wire.

5. **Operation**

5.1. **Preparation**

1) Connect the power cable to the power supply.
2) Connect Sensor Cable to CN-1 Connector of UECD, and connect a tool cable to a tool.
3) Switch on UECD-4800, and it makes the self-diagnosis check for 10 seconds. Carry out the visual check of the front LED lamps. 7 segment screen displays 「8.」 「8.8.8.8.」 and buzzer sounds.
4) The DPM displays 「 1.」 (work no.) 「___0. 0」 when there is nothing wrong with UECD-4800.

5.2. **Key operation**

1) Switch on UECD, and it makes the self-diagnosis check. After it is over, the screen changes to the measurement screen.
2) Press ENT in the measurement screen to go to the menu screen (DISPLAY SELECT).
3) Press RES in the measurement screen to clear the fastening error or make the ZERO/CAL check.
4) Move the cursor: → up or down by ▲▼
5) When the screen consists of two or more pages, the current page number and the total page numbers are shown in the upper right of the screen.
6) Press ▼ in the measurement screen to move to the next page, and press ▲ to move to the previous page.
7) Press ENT and hold it more than 3 seconds to enter the writing mode, and setting values get changeable.
8) While in the writing mode, press ▼ in the fourth line to move to the next page, and press ▲ in the first line to move back to the previous page.
9) Press ▲ or ◀ in the first line of the first screen to move to the previous screen.
10) Point the cursor [→] to the screen name you want to move, and press ENT to move to the screen you select.
11) Press RES in any screen to move back to the measurement screen.

5.3. **Setting**

There are two ways available, either by PC or by key switch on the front panel of UECD-4800 to change the setting values.

(1) By PC (Please refer to the instruction manual of UEC-4800 setup software for details.)

1) Connect the communication cable, straight cable, to [PC] connector in the front panel of UECD, and connect to PC through RS232C port.
2) Change the setting values in the setup software.
3) Transmit the setting values set up in the setup software to UECD.

(2) By Key Switch in the front panel

1) Move to the screen you want to change the setting value.
   Press ENT and hold more than 3 seconds to enter the writing mode.
2) Tool gets inoperable, and COUNT NOK lamp lights while in the writing mode.
3) By using ▲▼, point the cursor [→] to the setup item you want to change the setting value and press ENT
4) By using ◀▶, point the cursor to the unit of value to be changed.
5) By using ▲, increase the value. By using ▼, decreases the value.
6) After changing the setting values, press ENT to determine the values. Setting values are overwritten in the controller.
7) Escape from the writing mode by pressing RES and move back to the measurement screen. The change of setting values is ended.

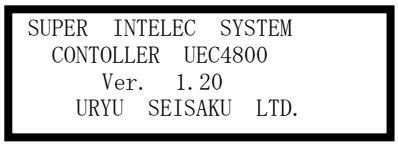
6. **Self-diagnosis check**

UECD-4800 has the self-diagnosis check function to check its component parts and detects the error. When UECD-4800 is turn on, the self-diagnosis check runs for approx. ten seconds from ROM, RAM, A/D, ZERO/CAL etc.

[Self-diagnosis check]

1) LED lamp and Buzzer

7 segment of the front panel displays [8.8.8.8.] [8.], and LCD display becomes as per the following. LED lamps light and buzzer sounds. Visually check every LED lamp lights and buzzer sounds in order.



2) ROM IC performance check

Check if the memory IC (ROM), which memorizes the UECD control program, functions normally.

3) RAM IC performance check

Check if the memory IC (RAM), which memorizes the UECD setting value and various kinds of measurement data, function normally.

4) A/D IC performance check

It checks if the analog-digital converter IC (A/D), which measures the torque data in analog value by CPU, operates properly or not.

5) Setting value storage data check (SUM check)

It checks if there is no error in the setup data memorized in RAM IC

7. IN/OUT CHECK

7.1. KEY CHECK (key input diagnosis)

It is possible to check if the key switch functions in order.

[How to use]

1) Press ENT in the measurement screen to move to the DISPLAY SELECT screen.

2) Point [→] to CHECK SELECT and press ENT. You will move to the IN/OUT CHECK screen.

```
DISPLAY  SELECT
  SETTING
→CHECK  SELECT
  ZERO  SET
```

3) Point [→] to [KEY CHECK] and press ENT.

```
IN/OUT  CHECK  SELECT
→KEY           CHECK
  INPUT       CHECK
  OUTPUT     CHKCK
```

4) Move to the KEY & LCD CHECK screen.

```
KEY&LCD  CHECK
         *********

         *         *
```

5) Select the key and press it, and the pressed key name is displayed in the LCD screen.

Key operation	Screen display
▲	KEY&LCD CHECK ********* * UP * *********
▼	KEY&LCD CHECK ********* * DOWN * *********
▶	KEY&LCD CHECK ********* * RIGTE * *********
◀	KEY&LCD CHECK ********* * LEFT * *********
RES	KEY&LCD CHECK ********* * RESET * *********
ENT	KEY&LCD CHECK ********* * ENTER * *********

6) Press ENT twice in a row to finish KEY CHECK (key input diagnosis), and move back to the IN/OUT CHECK SELECT screen.

7.2. **INPUT/OUTPUT CHECK (wiring diagnosis of the terminals and the tool)**

By monitoring the input condition to the terminal block and making the compulsory signal output to either the terminal block or the tool, UECD checks the incoming wirings of the terminals of UECD, the tool and the sensor cable connected.

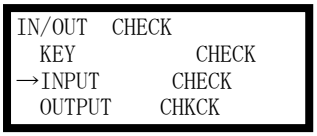
[How to use]

Either by the key switch or through the PC

(1) Input wiring diagnosis by the key switch

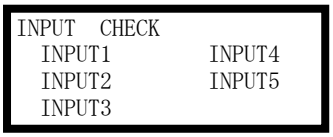
① Press ENT in the MEASURING screen to enter the DISPLAY SELECT screen.

② Point [→] to [CHECK SELECT] and press ENT to move to the IN/OUT CHECK screen.

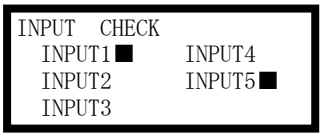


③ Point [→] to [INPUT CHECK] and press ENT to move to the INPUT CHECK screen. UECD gets inoperable and TOTAL NOK lamp lights. 7 segment display shows [-] [- - - -].

④ When there is no signal being input externally, LCD displays becomes as follows;



⑤ When there are any input signals to the terminals, [■] is shown in the right of the terminal name which receives the input signal. Example: When there are input signals coming to the terminal IN2 and IN5,

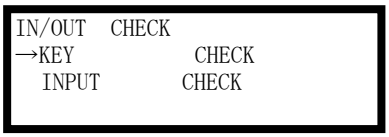


⑥Press RES to release after the key check.

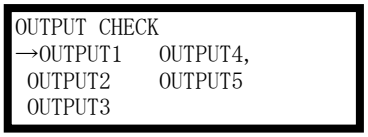
(2) Output wiring diagnosis by the key switch

① Press ENT in the measurement screen to move to the DISPLAY SELECT screen.

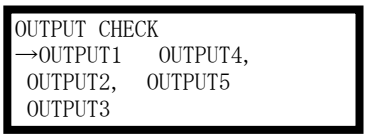
② Point [→] to [CHECK SELECT] and press ENT to move to the IN/OUT CHECK screen.



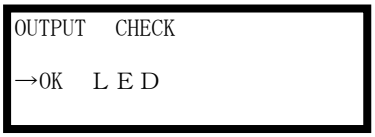
③ Point [→] to [OUTPUT CHECK] and press ENT to move to the OUTPUT CHECK screen. [–] [– – – –] are displayed in the 7 segment display. UECD gets inoperable and TOTAL NOK lamp lights.



④ Point [→] by using ▲▼ to the terminal name you want to output and press ENT. Selected terminal is switched on and [■] is displayed right next to the terminal name. Point [→] to the terminal name now being switched on and press ENT, and the output of selected terminal gets off.



⑤ Point [→] to OUTPUT 5 and press ▼ to move to the output wiring (to the tool) diagnosis screen.



⑥Press RES to release after the key check.

(3) Input/Output check by PC

①Connect the PC to UECD, and launch the setup software.

②Enter the input/output check. UECD gets inoperable.

③Check the wiring by monitoring the input condition, making the compulsory output.

④Escape from the input/output check after finishing. Please refer to the instruction manual of the setup software for details.

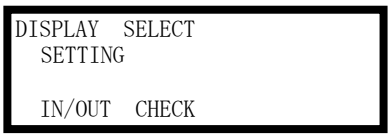
During the input/output wiring diagnosis, the 7 segment display displays [－][— — — —]. UECD gets inoperable and TOTAL NOK lamp lights.

8. **ZERO SET (zero point display)**

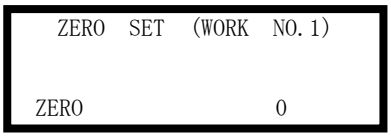
UECD displays the values of the torque sensor's zero point and the CAL number confirmed by the zero check and CAL check. Displayed values are of the absolute values. Minus (-) code is not displayed.

[Key operation]

①Press ENT in the MEASUREMENT screen to move to the DISPLAY SELECT screen.



②Point the arrow [→] to [ZERO SET] and press ENT to move to the ZERO SET screen.



③You will see the current zero point value in [ZERO] item, and [CAL] shows the CAL check value.

9. WORK No. change

UECD makes the work number change by jumer-circuitting the input signal terminals and the common terminal. In accordance to the setting value of WORK SIG. SEL., the input signals to the terminals become different.

Input signal to the terminal		Work number to be selected
WORK SIG. SEL. = 0	WORK SIG. SEL. = 1	
No signal input	WORK 1	WORK 1
WORK A	WORK 2	WORK 2
WORK B	WORK 3	WORK 3
WORK A WORK B	WORK 4	WORK 4
WORK C	WORK 5	WORK 5
WORK A WORK C		WORK 6
WORK B WORK C		WORK 7
WORK A WORK B WORK C		WORK 8

Note: When 1 is set to WORK SIG. SEL., you can use the work number from 1 up to 5.

Following setups are necessary to activate the work number change.

(1) Determine the work number change method
When you want to change the work number by the combination of terminal WORK A, B and C, set 0 to WORK SIG. SEL. of the MODE SETTING screen. When you use the signal input of WORK 1, 2, 3, 4 and 5, set 1 to WORK SIG. SEL. When 1 is set to WORK SIG. SEL., the UECD controller provides the maximum five only. When six or more work numbers are used, set 0 to WORK SIG. SEL.

(2) Allocate the input signal to the terminal block
Enter INPUT 1 screen of the IN/OUT SETTING screen.
① When 0 is set to WORK SIG. SEL.
When the used work numbers are two or less, assign WORK A to any of the input terminal from A1 to A5.
When the used work numbers are four or less, assign WORK A and WORK B to any of the input terminals from A1 to A5.
When the used work numbers are five or more, assign WORK A, WORK B and WORK C to any of the input terminals from A1 to A5.

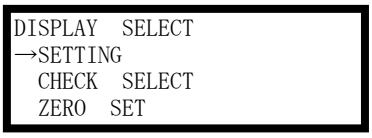
② When 1 is set to WORK SIG. SEL.
Assign WORK 1, 2, 3, 4 and 5 to any of the input terminals A1, A2, A3, A4 and A5 in accordance to the used work number.
i.e.) When the work number to be used is three, assign [Input terminal A3: WORK 1], [Input terminal A4: WORK 2] and [Input terminal A5: WORK 3]. You may assign with the input terminal A1, A2 and A3 to WORK 1, WORK 2 and WORK 3.

10. **Basic setting**

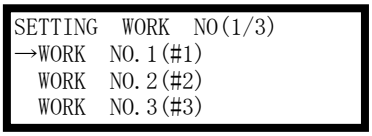
The BASIC SETTING screen is divided into the following ten settings.

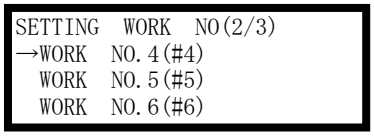
BASIC (Basic setting): Basic settings for the tightening such as CUT (target torque level), LOW (lower limit level), HIGH (upper limit level).
MODE (Mode setting): Settings for the way of line control and the usage selection of the various functions.
TIMER (Timer setting): Settings for the timer of various timers.
DATA OUT SET (Data output setting): Settings for the data output from the RS232C port on the rear panel of UECD-4800.
TOOL CONTROL (Tool control): Settings for the maintenance period of tool by the total fastening numbers / total pulse numbers.
IN/OUTPUT (Terminal allocations setting): Settings of the in/output signals allocated on the terminals.
LAN (LAN setting): Settings of the Ethernet related items like IP address
DRIVER DATA (Driver data): Tool Settings like rpm
MEMORY DATA (Memory data): Settings for the memory data and screen display
PROGRAM SEL (Program No. Change): Settings for the program number change

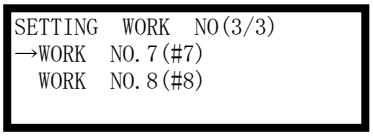
(1) Press ENT in the MEASURING SCREEN to enter the DISPLAY SELECT screen.
Point the arrow [→] to [SETTING] and press ENT.



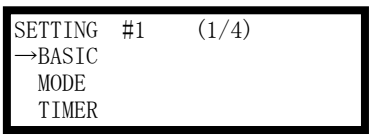
(2) The screen goes to the SETTING WORK NO. screen. Select the work number you want to set up parameters.

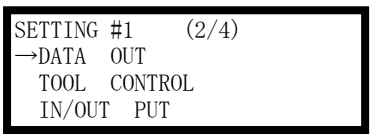


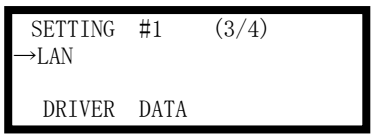


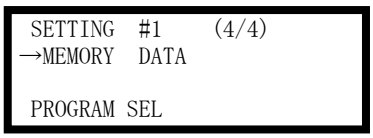


(3) The screen changes to the SETTING screen (setting menu screen). Select the mode name you want to set up parameters.

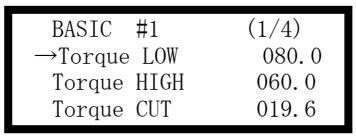


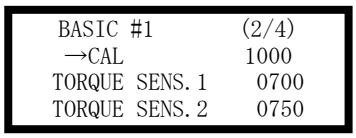


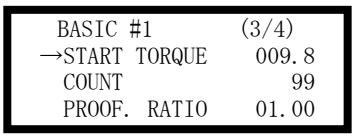


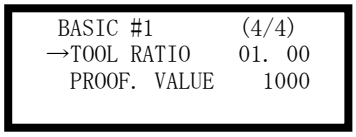


10.1. **BASIC（Basic setting）**









TORQUE LOW (Torque low limit value)
Default: 80.0 [Nm]
Setting range: 0.0 –999.7
Setting condition: Torque low limit value < Torque CUT value
【Function】
Value for the measured torque low limit judgment

TORQUE HIGH (Torque high limit value)
Default: 60.0 [Nm]
Setting range: 0.3 –999.9
Setting condition: Torque CUT value < Torque high limit value
【Function】
Value for the measured torque upper limit judgment

TORQUE CUT (Torque CUT value)
Default: 19.6 [Nm]
Setting range: 0.2 – 999.8
Setting condition: Torque low limit value, Start torque value } < Torque CUT value < Torque upper limit value
【Function】
Fastening-stop torque value under torque control

CAL (CAL value)
Default: 1000
Setting range: 100 - 9999
【Function】
Set the CAL value stamped on the tool

TORQUE SENSOR 1 (Torque sensor resistance value [Ω]) **NOT USED**

【Function】

Resistance value consisting of torque sensor circuit

Do not use this function.

TORQUE SENSOR 2 (Torque sensor rated strain value) **NOT USED**

【Function】

Resistance value consisting of torque sensor circuit

Do not use this function.

START TORQUE (Start torque value)

Default: 9.8

Setting range: 0.1 - 999.7

Setting condition: Start torque value < Snug torque value < Torque CUT value

【Function】

What Start torque value is;

a. Start point of the judgment delay timer

b. Start point of the initial error detection timer

c. Start point of the cycle error detection timer

d. Start point of the torque measurement start delay timer

e. Start point of the fastening time measurement

Note: Enter 1/50 or greater value of the rated torque. Too low start torque value can make it impossible for UECD controller to make OK/NOK judgments and to work on the next cycle.

Guidance)

UEP-50MC/50DMC/60DMC: 4.0 Nm or greater

UEP-60MC/70MC: 8.0 Nm or greater

UEP-80MC: 16.0 Nm or greater

UEP-100MC: 24.0 Nm or greater

COUNT (Fastening number count / former name: COUNT)

Default: 99

Setting value: 1 - 99

【Function】

・Not necessary to set up if you do not use the fastener number count control function.

・Fastening number per work when using the fastener countdown function.

・UECD controller provides COUNT OK/NOK judgments by the setting value of COUNT.

PROOFREADING RATIO

Default: 1.00

Setting range: 0.01 - 9.99

【Function】

This is the proofreading ratio which makes the break-away torque agree to the UECD displayed torque.

TOOL RATIO

Default: 1.00

Setting range: 0.01 – 9.99

【Function】

Reduction ratio of the gear

Input the gear ratio when the tool that has the geared section in front of the torque sensor, like the geared type pulse wrench etc., is used.

PROOFREADING VALUE

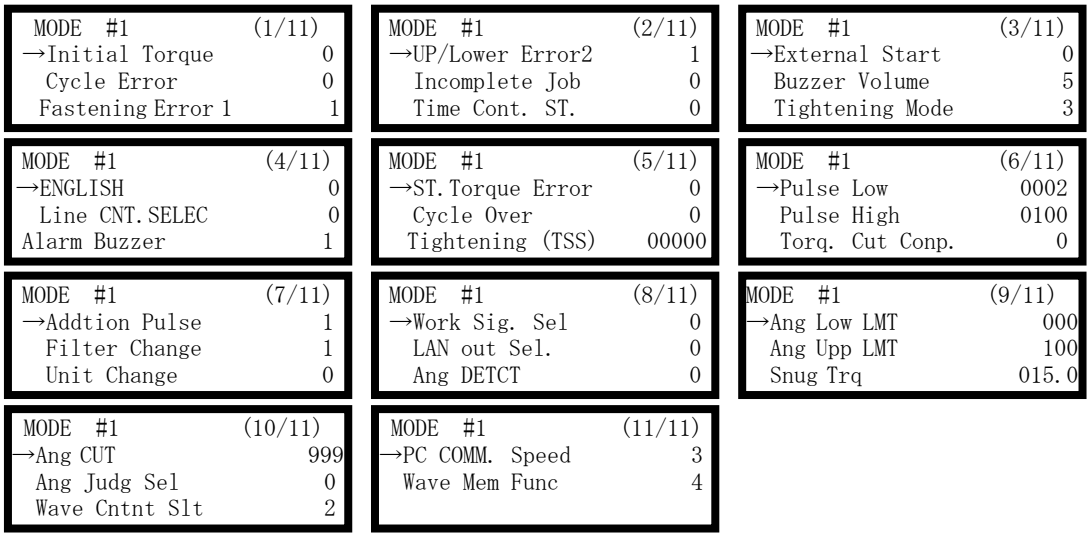
Default: 1000

【Function】

Proofreading ratio x Tool ratio x CAL value

This value enables the UECD-4800 to display the torque readings calculated by the torque signal voltage from torque sensor and by the percentage of sensor rating based on the torque sensor values.

10.2. **MODE (Mode setting)**



INITIAL ERROR (Initial error detection) (former name: MODE 1)

Default: 0

Setting 0: Not detect the initial error

Setting 1: Detect the initial error

【Function】

Use to detect the double-fitting or cross thread.

UECD detects the initial error if the consumed time from torque start level to torque cut value is less than time of the initial error detection timer.

【When UECD detects the error】

・DPM display : [LO.E.] and [Torque measurement value] are displayed by turns.

・Front panel TORQUE lamp will not light.

・Buzzer sounds.

・Terminal: TORQUE NOK is switched on.

【How to reset error】

・When 1 is set to FASTENING ERROR, next operation will reset the last error.

・Press RES in the screen, or switch on reset terminal.

CYCLE ERROR (Cycle error detection) (former name: MODE 2)

Default: 0

Setting 0: Not detect the cycle error

Setting 1: Detect the cycle error

【Function】

Use to regulate fastening time

UECD provides cycle error judgment if measured torque passes torque start level, but does not reach torque cut level when the cycle error detect timer comes up.

【When UECD detects the error】

DPM display: [CYL.E.] and [Torque measurement value] are displayed by turns.

Front panel TORQUE lamp will not light.

Buzzer sounds.

Terminal: TORWUE NOK terminal is switched on.

【How to reset the error】

・When 1 is set to FASTENING ERROR, next operation will reset the last error.

・Press RES in the screen, or switch on reset terminal.

FASTENING ERROR (After of post error detections LO.E/CYL.E/F.E)　(former name: MODE 3)

Default : 1

Setting : 0 UECD gets non-operative status unless RES is pressed or reset terminal is switched on. Valve remains switched on.

Setting : 1 Next operation performs start-reset without pressing RES or switching on reset terminal, and UECD gets operative status.
After an error is detected, continue with the tightening. The torque reading that exceeds start torque causes UECD to reset the error and work on measurements.

UP/LOWER LIMIT ERROR

(After of post upper or lower limit errors TORQUE/PULSE number/ANGLE) (former name : MODE 4)

Default : 1

Setting : 0 UECD gets non-operative status unless RES is pressed or reset terminal is switched on. Valve remains switched on.

Setting : 1 Next operation performs start-reset without pressing RES or switching on reset terminal, and UECD gets operative status.
After an error is detected, continue with the tightening. The torque reading that exceeds start torque causes UECD to reset the error and work on measurements.

INCOMPLETE JOB (Incomplete job error detection)　(former name: MODE 5)

Default : 0

Setting : 0 Not detect incomplete job error

Setting : 1 Detect incomplete job error

【Function】

UECD detects incomplete job error if the fastening is suspended before the torque reaches torque cut value after passing torque start value, like releasing finger from throttle lever due to mistake or socket dropping off.

【When UECD provides the error】

DPM display: [F.E.] and [Torque measurement value] are displayed by turns.

Buzzer sounds.

Terminal: TORQUE NOK terminal is switched on.

【How to reset】

・When 1 is set to FASTENING ERROR, next operation resets the last error.

・Press RES in the screen, or switch on reset terminal.

・This function gets activated when either 3 is set to TIGHTENING MODE.

Note: UECD controller provides the error when the fastening is suspended before the torque reaches the torque cut level, even if the final torque is within low and high torque limits.

TIME CONT. ST. (Compulsory judgment)　(former name: MODE 6)
Default : 0
Setting : 0　Not use
Setting : 1　Stops the tool and makes the compulsory judgment when cycle error detection timer comes up.

【Function】
・Use when you want to control fastening time without cycle error detection.
・UECD compulsory switches on solenoid valve to stop the tool and provides judgment if the tool fails to reach torque cut value beyond start torque value after cycle error detection timer comes up.
・Judgment delay timer starts functioning when the torque gets less than start value after the cycle error detection timer comes up.
・This function gets activated when 0 is set to CYCLE ERROR.

EXTERNAL START (External start specification)　(former name : MODE 11)　**(Not used now)**
Default : 0
Setting : 0　Not use the external start, but the measurement starts by the torque start.
Setting : 1　VALVE is switched on to start measurement, after ZERO/CAL check.
Setting : 2　VALVE will not be switched on to start measurement after ZERO/CAL check.
Setting : 3　VALVE is switched on to start measurement without ZERO/CAL check.

【Function】
・Determine the operation when start terminal is switched on.
・When 1, 2, or 3 is set, the operation starts functioning when external start (start terminal) is switched on.
・Enter 0 for this function.　Currently, this function is not available.

BUZZER VOLUME
Default : 5
Setting range : 1 - 5

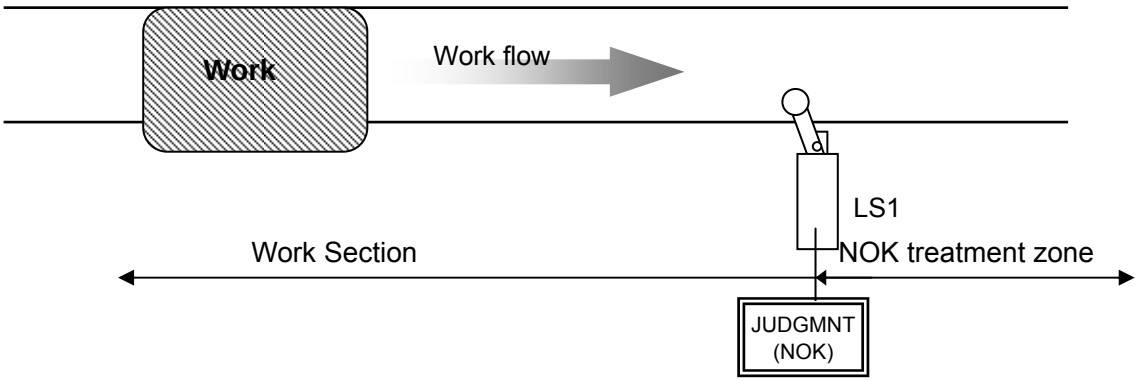
【Function】
・Determine the sound volume of buzzer
・The greater the number grows, the louder the buzzer sounds.　5 is the top volume, and 1 is the lowest volume.

ENGLISH (Selection of language)
Default:　0
Setting : 0　Japanese indication
Setting : 1　English indication

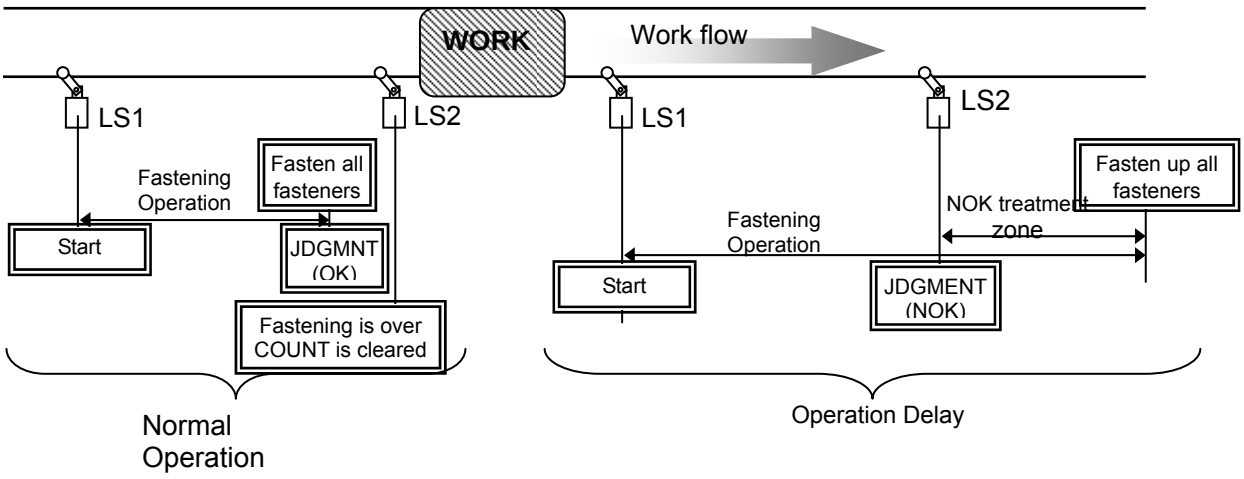
【Function】
・Determine the indication language for touch panel.
・When 0 is set, setup item name becomes [ENGLISH], and when 1 is set, setup item name becomes the Japanese.

CONTROL METHOD (former name : MODE 9)
Default : 3
Setting : 3　Torque control for UEP-MC wrenches
UECD controls and provides the judgment to the measured torque.

LINE CNT. SELECT (Line control method select) (former name : MODE 14)
Default : 0
Setting : 0
UECD is always ready to count down the fasteners, and provides the judgment at the time of limit switch is switched on. UECD provides COUNT OK judgment if the preset number of fasteners is fastened up. When the LS (limit switch) 1 terminal is switched on, UECD is reset and ready for next operation. UECD provides COUNT NOK if any fasteners are left unfastened when LS1 is switched on. Tighten the unfastened fasteners, and UECD provides COUNT OK.
Note: When COUNT NOK is corrected to COUNT OK, the COUNT OK output becomes 1 pulse (1 sec).



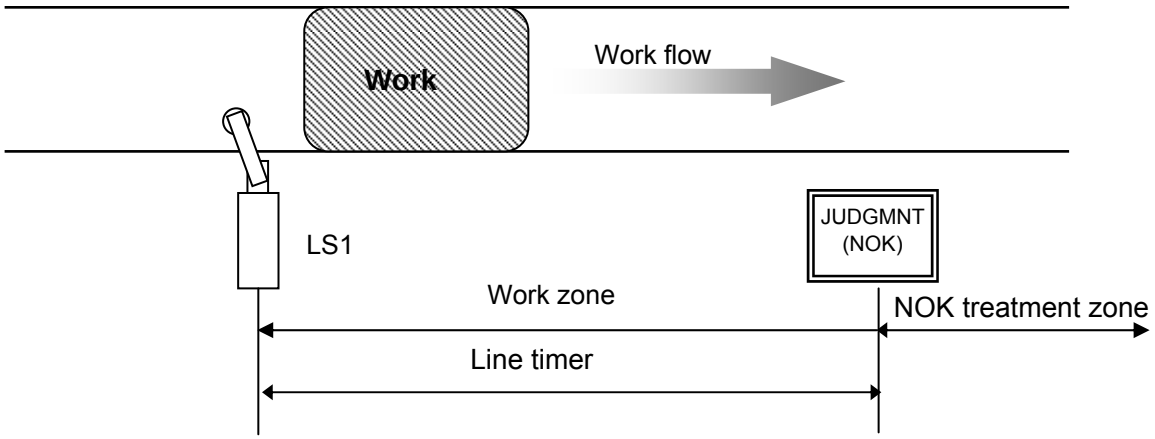
Setting : 1
Determine the work section. Switching on LS1 terminal becomes the start of the operation. Operation is over if the preset fasteners are fastened up until LS2 terminal is switched on. UECD provides COUNT NOK if any fasteners left unfastened when LS2 terminal is switched on. If the unfastened fasteners are fastened up in NOK treatment zone, UECD provides COUNT OK and the operation is over. Even if the unfastened fasteners are fastened up out of work section, UECD does not count down these fasteners.
Note: When COUNT NOK is corrected to COUNT OK, the COUNT OK output becomes 1 pulse (1 sec).



Setting : 2

Switch on the limit switch, and the operation starts and UECD provides the judgment when the timer comes up. Operation starts by switching on LS1 terminal, and the line control timer starts functioning. UECD provides COUNT NOK if the line control timer comes up before the preset number of fasteners is fastened up.

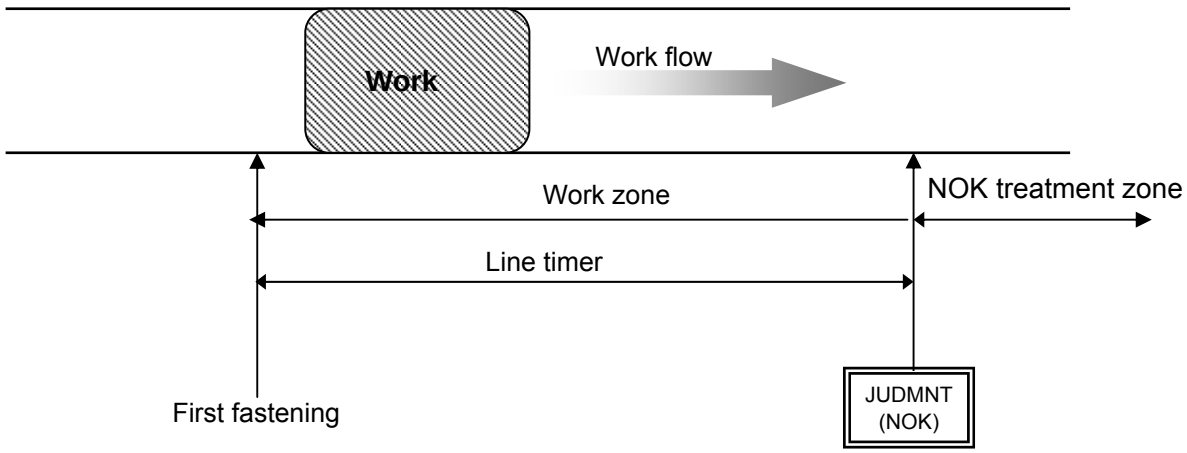
Note: When COUNT NOK is corrected to COUNT OK, the COUNT OK output becomes 1 pulse (1 sec).



Setting: 3

Limit switch is not used, but the line control timer starts functioning by the first fastening operation. Line control timer gets started by either the judgment input of the first fastening or the signal input of QL wrench. UECD provides COUNT OK if the preset fasteners are fastened up, and gets ready for next operation when COUNT OK output signal is switched off. COUNT OK output signal duration time is set up by COUNT OK of TIMER SETTING. UECD provides COUNT NOK if the line control timer comes up before the preset fasteners are fastened up.

Note: When 3 is set to LINE CNT. SELECT, you cannot set up the COUNT OK signal output duration time (COUNT OK : 0). When COUNT NOK is corrected to COUNT OK, the COUNT OK output becomes 1 pulse (2 sec).



Setting 4

By any of WORK 1 – 5 signal input, UECD gets ready to start fastening of the selected work number. Set 1 to WORK SIG. SEL.

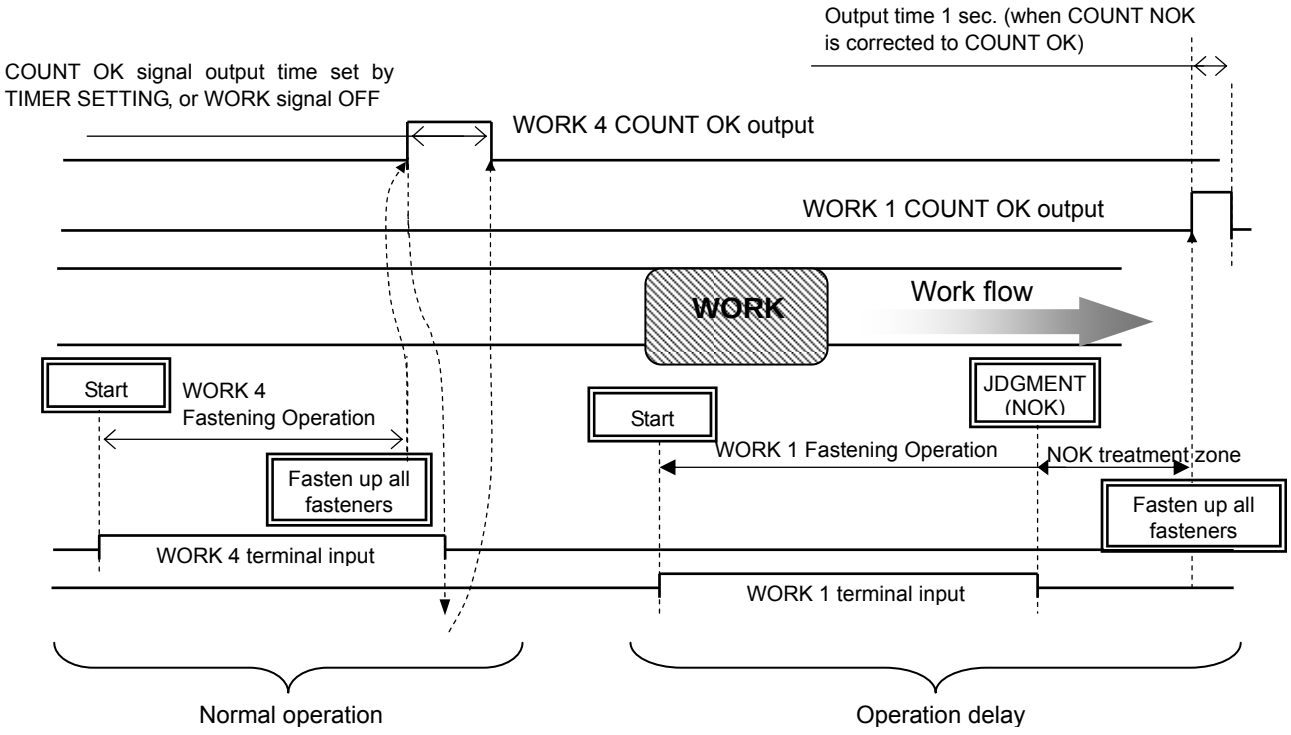
When the preset fasteners are fastened up, COUNT OK signal terminal is switched on corresponding to the selected work number. [WORK 2 COUNT OK] output terminal is switched on when UECD provides COUNT OK of work No. 2.

Set up the COUNT OK signal output duration time per work number in COUNT OK of TIMER SETTING.

UECD provides COUNT OK signal output for 1 second, when COUNT NOK is corrected in NOK treatment zone by fastening the unfastened fasteners or switching on pass terminal.

Make sure to switch off WORK SELECT signal input when COUNT OK signal output is switched on. Switch off WORK SELECT signal input, and COUNT OK signal output is switched off.

UECD provides COUNT NOK when any input signal of WORK 1 – 5 is switched off before the preset fasteners are fastened up.



ALARM BUZZER (Fastening confirmation buzzer output) (former name : MODE 15)
Default : 0
Setting : 0　Buzzer does not sound.
Setting : 1　Buzzer sounds for every OK fastener.
【Function】
・Buzzer gives 1 pulse sound for every OK fastener, and 2 pulses sound for fastener COUNT UP.

ST. TORQUE ERROR (Start torque error detection) (former name : MODE 16) **(Not used now)**
Default : 0
Setting : 0　Not detect the start torque error
Setting : 1　Detect the start torque error
Note: Set to 0.
Not used now

CYCLE OVER (Cycle over time error detection) (former name : MODE 17) **(Not used now)**
Default : 0
Setting : 0　Not detect the cycle over time error
Setting : 1　Detect the cycle over time error
Note: Set to 0.
Not used now

TIGHTENING (Fastening time display (TSS) **(Not used now)**
【Function】
・UECD display the time consumed from the external start signal input to the torque start level.
Note : This is not the setting.
Not used now

PULSE LOW (Pulse blow number low limit value [pulse]) (former name : MODE 34)
Default : 2
Setting range : 0 – 9998 (pulse number low limit value, maximum 9998, < pulse number upper limit value, maximum 9999)
【Function】
・Lower limit value of the pulse blow number that UECD provides pulse number LOW NOK judgment.　UECD provides pulse number LOW NOK when the total pulse number generated from the start torque until the cut torque is less than the pulse number low limit value.
【When UECD detects the error】
・DPM display : [PLS.L.] and [Torque measurement value] are displayed by turns.
・Buzzer sounds.
・Terminal : TORQUE NOK is switched on.
【How to reset】
・When 1 is set to UP/LOWER LIMIT ERROR, next operation performs the start-reset.
・Press RES in the screen, or switch on reset terminal.
Note: This function gets activated when 3 is set to TIGHTENING MODE.

PULSE HIGH (Pulse number upper limit value [pulse]) (former name : MODE 35)
Default : 100
Setting range : 1 – 9999 (Pulse number low limit value, maximum 9998<pulse number upper limit value, maximum 9999)
【Function】
・Pulse numbers that UECD provides pulse number HIGH NOK judgment. UECD counts total pulse numbers generated from torque start level to cut level, and provides pulse number HIGH NOK judgment with solenoid valve closed to stop the tool and the error display when the total pulse number is more than the pulse number upper limit value.
【When UECD detects the error】
・DPM display : [PLS.H.] and [Torque measurement value] are displayed by turns.
・Buzzer sounds.
・Terminal : TORWUE NOK is switched on.
【How to reset】
・When 1 is entered to UP/LOWER LIMIT ERROR, next operation performs the start-reset.
・Press RES in the screen, or switch on reset terminal.
Note: This function gets activated when 3 is set to TIGHTENING MODE.

TORQUE CUT CONP. (Torque measurement during compensation pulsing post CUT level)
Default : 0
Setting : 0 UECD measures, controls and provides final judgment with the highest peak torque display of compensation pulsing under the pulse number counting.
Setting : 1 UECD gives judgment due to torque measurement of pulsing until torque cut level, but does not measure torque of pulsing post torque cut level.

ADDITION PULSE (Compensation pulse numbers post CUT level) (former name : MODE 27)
Default : 1
Setting : 1 – 5
【Function】
・UECD switches on solenoid valve to stop the tool when preset additional pulse numbers have been counted after reaching the torque CUT level.
・This function gets activated when 3 is entered to TIGHTENING MODE.
Note: Set 1 if you do not use this function.

FILTER CHANGE
Default : 1
Note: Not changeable

TORQUE UNIT CHANGE
Default : 0
Setting : 0 Nm
Setting : 1 kgf/cm
Setting : 2 kgf/m
Setting : 3 ft/lbf
Setting : 4 dNm
Note: Not usable with the Japanese style UECD-4800 series

WORK SIG. SEL. (Work signal combination) (former name : MODE 29)
Default : 0
Setting : 0 UECD changes up to 8 work numbers by using the terminals of WORK A, WORK B and WORK C.
Setting : 1 UECD changes up to 5 work numbers by using the input terminals of WORK 1-1 to WORK 1-5.
・Setting 1 is used when LINE CNT. SELECT is set with 4.

ANGLE DETECT (Spare for angle detect) **(Not used now)**
Default: 0
Setting: 0, 1, 2, 3 or 4
Not used now

ANG LOW LMT (Angle low limit value [degree])**(Not used now)**
Default: 0
Setting range : 0 - 999
【Function】
・This is angle low limit judgment value.
・UECD provides angle LOW NOK when measured angle is smaller than preset angle low limit at the time of judgment.
・When 0 is set, UECD does not provide the angle low judgment.

【When UECD detects the error】
DPM display: [ANGLE LOW]
Buzzer sounds.
Terminal: TORQUE NOK terminal is kept switched on until the error is reset.
【How to reset】
When 1 is set to UP/LOWER LIMIT ERROR, next operation performs the start-reset.
Press RES in the screen, or switch on reset terminal.
Not used now

ANG UPP LMT (Angle upper limit value [degree])**(Not used now)**
Default : 0
Setting range : 0 - 999
【Function】
・This is angle high limit judgment value.
・If the setting value is 1 – 999, UECD provides angle HIGH NOK if the measured angle is greater than angle upper limit value.
・If 0 is set, UECD does not provide the angle upper judgment.
【When UECD detects the error】
UECD closes the solenoid valve to stop the tool.
DPM display : [ANGLE HIGH]
Buzzer sounds.
Terminal: TORQUE NOK is kept switched on until the error is reset.
【How to reset】
When 1 is set to UP/LOWER LIMIT ERROR, next operation performs the start-reset.
Press RES in the screen, or switch on reset terminal.
Not used now

SNUG TRQ (Snug torque) **(Not used now)**
Default: 15.0
Setting range : 0.0 – 999.8
Setting condition : Start torque value < snug torque value < CUT torque value
【Function】
・This is the torque from when UECD started measuring the angle.
Not used now

ANG CUT (Angle CUT value) **(Not used now)**
Default : 999
Setting range : 0 - 999
【Function】
This is the fastening stop angle judgment value when the angle control is effective.
Not used now

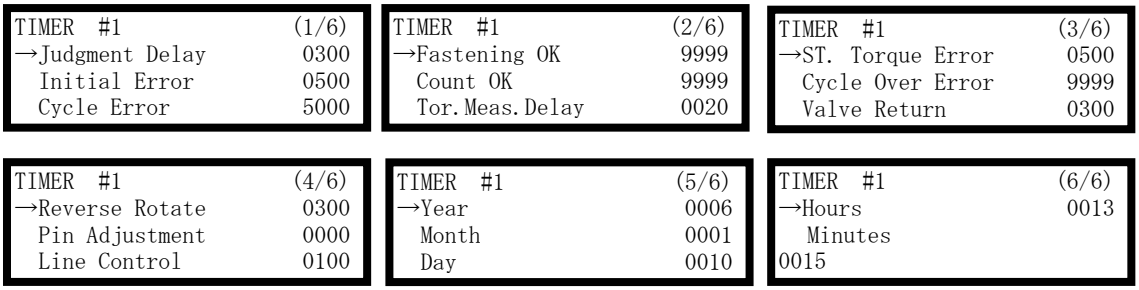
ANG JUDG SEL (Angle judgment select) **(Not used now)**
Default : 0
Setting : 0 Not provide the angle judgment.
Setting : 1 Provides the angle judgment and detects the error.
Setting : 2 Provides the angle judgment and detects the WRN instead of the error.
【Function 】
・This is to select if UECD provides the angle high and low judgment and the snug angle high and low limit error judgment (or high and low limit warning).
・When 1 is set, UECD provides fastening NOK when detecting the error.
・When 2 is set, UECD does not provide fastening OK/NOK judgment, but provides WARNING (WRN) and counts down the fasteners.
Not used now

WAVE CNTNT SLT (Waveform data contents select)
Default : 0
Setting : 0 100μsec
Setting : 1 1 msec
Setting : 2 2 msec
Setting : 3 5 msec
【Function】
・When 0 is set, UECD displays the measured torque waveform without peak holding on the screen, and output the data to outside (100μsec sampling).
・When one of 1, 2 or 3 is set, the measured torque waveform is converted to the peak hold waveform per 1msec/2msec/5msec on the screen and UECD outputs the date to outside.
・When 0 is set to this mode, and when the waveform data is sent to the waveform data screen of the UECD-4800 setup software, the buffer of the waveform becomes 5. When one of 1, 2 or 3 is set, the buffer becomes 50.

PC COMM. SPEED (PC communication speed / former name : MODE 46)
Default : 3
Setting : 1 9600 bps
Setting : 2 19200 bps
Setting : 3 38400 bps
【Function】
Note: This is to determine the communication speed between UECD and PC. This is not the communication speed of the data output port in rear of UECD.
Note: Switch off UECD after you change the setting value of the PC port communication speed. Setting value will not be overwritten unless UEC is once switched off.

WAVE MEM FUNC (Waveform memory function select)
Default : 4
Setting : 1 Not memorize
Setting : 2 Memorize and notice both with the display message and buzzer sound
Setting : 3 Memorize and notice with the display message, but not sound the buzzer
Setting : 4 Memorize the wave data, but not notice with neither the display message nor the buzzer sound.
【Function】
This is to determine if or not UECD memorize the waveform data, and if or not provide the notice by either the display message [buFE.] or buzzer sound or both when the memory becomes full. Note that the memory capacity depends upon the settings of this function.

10.3. **TIMER (TIMER setting)**



JUDGMENT DELAY (Judgment delay timer / former name : TIMER 1)
Default : 300 [msec]
Setting range : 100 – 9999 [msec]
【Function】
・This is to set time interval how long UECD delays judgment output after one fastening has been completed.
・Use this timer as the torque measurement end point when UECD is in control operation.
・Take torque spike after CUT into your consideration to determine length of this timer.
【Guideline of set value】
・300 [msec] for oil pulse wrenches
・500 [msec] for continuous tool like angle nutrunners

INITIAL ERROR (Initial error detection timer / former name : TIMER 2)
Default : 500 [msec]
Setting range : 1 – 9999 [msec]
【Function】
・Use this timer when mode 1 INITIAL ERROR is set to 1.
・This is to determine the minimum time from start torque to cut torque. UECD provides NOK if the torque reaches cut torque earlier than this timer comes up.
・This timer starts functioning when measured torque reaches start torque level.

CYCLE ERROR (Cycle error detection timer / former name : TIMER 3)
Default : 5000
Setting range : 1 – 9999 [msec]
【Function】
・This is to determine the maximum time from start torque to cut torque. UECD provides NOK if the torque does not reach cut torque even after this timer comes up.
・This timer starts functioning when measured torque reaches start torque level.
・It is necessary to set this timer when 1 is set to CYCLE ERROR (former name : MODE 2) or when 1 is set to TIME CONT. ST. (former name : MODE 6).

FASTENING OK (Fastening OK signal output timer / former name : TIMER 4)
Default : 9999
Setting range : 0 – 9999 [msec]
【Function】
・This is to determine the fastening OK signal output duration time from output terminal TORQUE OK. Not necessary to set up this timer usually.
・Set up this timer only when duration of output signal affects external PLC or circuit.
・Set 0, and UECD maintains signal output until next cycle starts.
・UECD stops firing Torque OK signal when the next operation starts, even while this timer is on.

COUNT OK (COUNT OK signal output timer / former name : TIMER 5)
Default : 9999
Setting range : 0 – 9999[msec]
【Function】
・Determine COUNT OK signal output duration time from output terminal COUNT OK.
・Set 0, and UECD maintains signal output until next cycle.

TORQ. MEAS. DELAY (Torque measurement start delay timer / former name : TIMER 6)
Default : 20
Setting range : 0 – 9999 [msec]
【Function】
・UECD starts torque measurement when this timer comes up. (UECD does not measure the torque until this timer comes up.)
・Timer starts functioning when the torque reaches start torque level. (When the external start is used, the timer starts functioning when start terminal is switched on.)
・Use this timer when the torque spike can happen at the bolt or nut seating point.

ST. TORQUE ERROR (Start torque error detection timer / former name : TIMER 7) **(Not used now)**
Default : 500
Setting range : 1 – 9999 [msec]
【Function】
・This timer starts functioning when START terminal is switched on.
・Set this timer when 1 is set to ST. TORQUE ERROR.
Not used now

CYCLE OVER ERROR (Cycle over error detection timer / former name : TIMER 8) **(Not used now)**
Default : 9999
Setting range : 1 – 9999 [msec]
【Function】
・This timer starts functioning when START terminal is switched on.
・Set this timer when 1 is set to CYCLE OVER (former name : MODE 17).
Not used now

VALVE RETURN (Valve return timer / former name : TIMER 20)
Default : 300
Setting range : 1 – 9999 [msec]
【Function】
・This timer starts functioning when the judgment delay timer comes up, and UECD switch off the valve (valve on) when this timer comes up.

REVERSE ROTATION (Reverse rotation complete delay timer / former name : TIMER 21) **(Not used now)**
Default : 300
Setting range : 0 – 9999 [msec]
【Function】
・Use this timer when 9 is set to TIGHTENING MODE.
Not used now

PIN ADJUSTMENT (Pin hole alignment timer / former name : TIMER 40)
Default : 0
Setting range : 0 – 9999 [msec]
【Function】
・Use this timer to align bolt pin and the hole in a line.
・This timer starts functioning when UECD provides the torque judgment. UECD suspends torque measurement until this timer comes up. Turn the fastener to align bolt pin and a hole in a line while UECD suspends torque measurement.
Note: Set 0 if you do not do pin hole alignment.

LINE CONTROL (Line control timer / former name : TIMER 50)
Default : 100
Setting range : 1 – 9999 [sec]
【Function】
・Use this timer when either 2 or 3 is set to LINE CNT. SELECT (former name : MODE 14). This timer is to make line control by time.

YEAR
Default : 0
Setting range : 0 – 99 [Year]
【Function】
・This is to set the year of calendar timer of UECD.
・Enter 0, and the year of calendar timer is set to [Year 2000]. Enter 6, and the year of calendar time is set to [Year2006].

MONTH
Default : 0
Setting range : 1 – 12 [Month]
【Function】
・This is to set the month of calendar timer of UECD.

DAY
Default : 0
Setting range : 1 – 31 [Day]
【Function】
・This is to set the day of calendar timer of UECD.

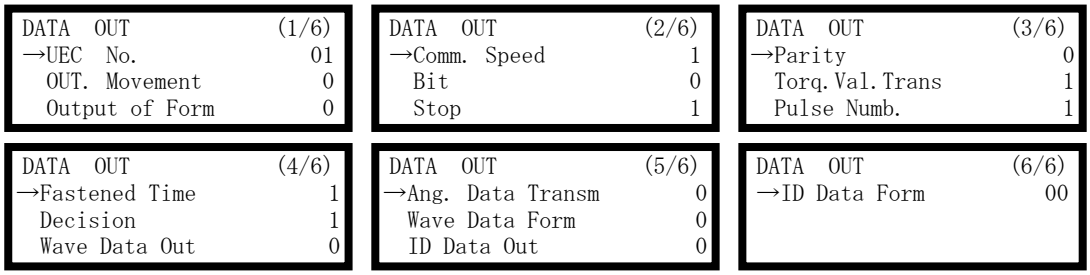
HOUR
Default : 0
Setting range : 0 – 24 [Hour]
【Function】
・This is to set the time of hour of calendar timer of UECD.

MINUTS [Minutes]
Default : 0
Setting range : 0 – 59 [Minutes]
【Function】
・This is to set the time of minutes of calendar timer of UECD.

SECONDS
Default : 0
Setting range : 0 – 59 [Seconds]
【Function】
・This is to set the time of minutes of calendar timer of UECD.

10.4. **Data output setting**

Determine the contents of the output data and memory data sent through the serial port of the rear panel of UECD controller.



UEC NO. (former name : MODE 98)
Default : 1
Setting : 1 – 25
【Function】
Give every UECD its own number when plural UECDs are in use connected to PC by RS232C.

OUT. MOVEMENT (former name : MODE 58)
Default : 0
Setting : 0 Output all data through RS232C
Setting : 1 Output only the following errors through RS232C
・Torque/Pulse blow number [PLS.L.PLS.H.]/High & Low angle errors
・Fastening errors [LO.E./CYL.E./F.E.]
Setting : 2 Not output through RS232C

OUTPUT OF FORM (Data system select for RS232C output / former name : MODE 59)
Default : 0
Setting : 0 # - CR
Setting : 1 # - LF
Setting : 2 ENQ, No ACK/NAK – ET
Setting : 4 UEC-4500 type (correspond with the UEC software version 1.22 and later one)
Setting : 5 UEC-4100 type (correspond with the UEC software version 1.22 and later one)
【Function】
Determine system of the contents of output data sent through RS232C port in rear of UECD.

COMM. SPEED
(Communication speed select for RS232C output baud rate / former name : MODE 60)
Default : 1
Setting : 0 4800 bps
Setting : 1 9600 bps
Setting : 2 19200 bps
【Function】
This is to determine the baud rate of the output data sent through data output RS232C port.
Note: This is not the communication speed between PC and UECD.

BIT (Bit length select for the RS232C output / former name : MODE 61)
Default : 1
Setting : 0　7 bit
Setting : 1　8 bit
【Function】
This is to determine the bit length of output data sent through data output RS232C port.

STOP (Stop bit select for the RS232C output / former name : MODE 62)
Default : 0
Setting : 0　1 bit
Setting : 1　2 bit
【Function】
This is to determine the stop bit of output data sent through data output RS232C port.

PARITY (Parity bit select for the RS232C output / former name : MODE 63)
Default : 0
Setting : 0　No parity
Setting : 1　Even number parity
Setting : 2　Odd number parity
【Function】
This is to determine the parity check of output data sent through data output RS232C port.

TORQ. VAL. TRANS (Torque value transmit select / former name : MODE 64)
Default : 1
Setting : 0　Not output
Setting : 1　Output (5 byte including the decimal point)
【Function】
This is to determine whether include or not the torque value in the output data transmitted through data output RS232C port.

PULSE NUMB. (Pulse blow number output select / former name : MODE 67)
Default : 1
Setting : 0　Not output
Setting : 1　Output
【Function】
This is to determine whether include or not the pulse blow number in the output data transmitted through data output RS232C port.

FASTENED TIME (Fastening time output select / former name : MODE 68)
Default : 1
Setting : 0　Not output
Setting : 1　Output (4 bytes)
【Function】
This is to determine whether include or not the fastening time from start torque till cut torque in output data transmitted through data output RS232C port.

DECISION (Fastening judgment output select / former name : MODE 69)
Default : 1
Setting : 0 Not output
Setting : 1 Output
【Function】
This is to determine whether include or not the judgment in output data sent through data output RS232C port.

Contents	ASCII code	HEX code
TORQUE OK	@	40H
START LEVEL ERROR	C	43H
CYCLE ERROR	D	44H
INITIAL ERROR	E	45H
CYCLE OVER ERROR	F	46H
INCOMPLETE JOB ERROR	G	47H
TORQUE LOW NOKK	H	48H
TORQUE HIGH NOK	I	49H
PULSE LOW NOK	L	4CH
PULSE HIGH NOK	M	4DH
PASS	P	50H
QL	Q	51H

WAVE DATA CNTNT SLCT (Wave data content output select)
Default : 1
Setting : 0 Not output
Setting : 1 Output
【Function】
This is to determine whether output or not the waveform data to UEC-4800 setup software.
It does not effect to the RS232C output of the rear panel.

ANG DATA TRANSM SLCT (Fastening angle output select / former name : MODE 65)
Default : 1
Setting : 0 Not output (“0000” will be transmitted.)
Setting : 1 Output (4 bytes)
【Function】
This is to determine whether include or not the angle in output data sent through data output RS232C port.

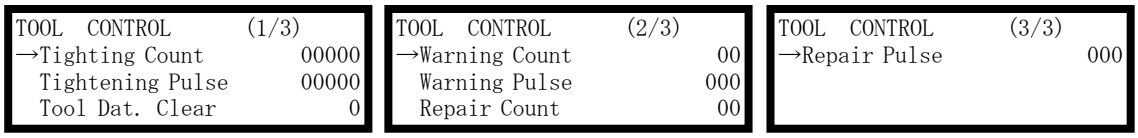
WAVE DATA FORM (Wave form data output select)
Default : 0
Setting : 0 Send by Binary format (2 byte per data)
Setting : 1 Send by ASCII format (4 byte per data)
【Function】
This is to determine the file format to send waveform data to the UEC-4800 setup software.
Set 0 (Binary) at present.

ID DATA SLCT (ID data output select)
Default : 0
Setting : 0 Not output
Setting : 1 Output
【Function】
This is to determine whether include or not ID number in output data sent through data output RS232C port.

ID DATA NUMB. (ID data digit number)
Default : 0
Setting range : 1 - 48
【Function】
This is to determine the digit number of VIN NO.
The digit that is not used should be filled with [0].

10.5. **Tool Control**

UECD can memorize the total fastening number and pulse number since a tool is brought into use. It enables UECD to provide a notice of simple maintenance such as oil change by [WARNING COUNT/PULSE] and parts replacement/overhaul by [REPAIR COUNT/PULSE].



TIGHTENING COUNT (Total tightening count number [1 unit : 10,000 fasteners])
Default : 0
Setting range : 0 – 99999 [1 unit : 10,000 fasteners]
・This is total fastening number of the tool now in use since the start of use.
・Fastening numbers of NOK fasteners are also included.

TIGHTENING PULSE (Total fastening pulse blow number [1 unit : 10,000 pulses])
Default : 0
Display range : 0 – 99999 [1 unit : 10,000 pulses]
・This is the total pulse blow number of the tool now in use since the start of use.
・Pulse blow numbers of NOK fasteners are also included.

TOOL DAT. CLEAR (Tool data clear)
Default : Y
Set to 1 to clear the total fastening number and pulse number.
Note : This is not setting.

WARNING COUNT (Warning count number [1 unit : 10,000 fasteners])
Default : 00
Setting range : 0 – 9998 [1 unit : 10,000 fasteners]
・UECD displays a warning message when the total fastening number reaches preset cycles.
・Set the fastening number that you are going to repair a tool next time.
【Display status when fastening number reaches warning cycle】
・Buzzer sounds. Press ENT to stop.
・7 segment displays [kcH.E.]
Note: Set [0] when not use.

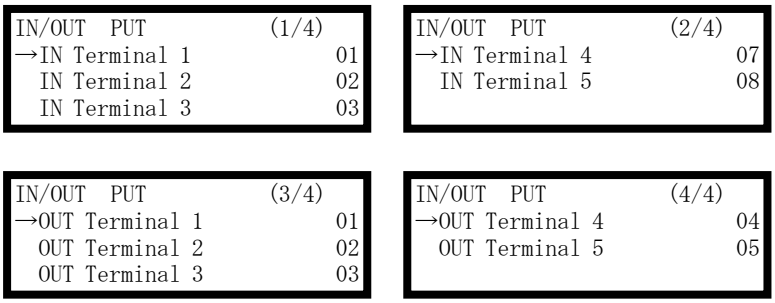
WARNING PULSE (Warning pulse blow number [1 unit : 10,000 pulses])
Default : 00
Setting range : 0 – 9998 [1 unit : 10,000 pulses]
・UECD displays a warning message when the total pulse blow number reaches preset pulses.
・Set the number of pulse blow that you are going to repair like oil change a tool next time.
【Display status when number of pulse blow reaches warning pulse】
・Buzzer sounds. Press ENT to stop.
・7 segment displays [kcP.E.]
Note: Set [0] when not use.

REPAIR COUNT (Repair count number [1 unit : 10,000 fasteners])
Default : 00
Setting range : 0 – 9999 [1 unit : 10,000 fasteners]
・UECD will let you know by a message when the total fastening number reaches preset cycle.
【Display status when the total fastening number reaches repair cycles】
・Buzzer sounds.
・CAUTION terminal is switched on.
・7 segment displays [rPH.E.]
Note: Set [0] when not use.

REPAIR PULSE (Repair pulse blow number [1 unit : 10,000 pulses])
Default : 000
Setting range : 0 – 9999 [1 unit : 10,000 pulses]
・UECD lets you know by a message when the total pulse blow number reaches the preset pulses.
［Output status when the total pulse blow number reaches the preset pulses］
・Buzzer sounds.
・CAUTION terminal is switched on.
・7 segment displays [rPP.E.]
Note : Set [0] when not use.

10.6. **IN/OUT PUT (Setting of signal allocations of input/output terminal board)**

Signal allocations of input and output terminal board is free format. You can change signal allocations as required by setting.



Setting of input terminals

Set the signal allocations of input terminals by IN TERMINAL 1 to IN TERMINAL 5.

Default and name of terminal

Setup item	Default (function)	Name of terminal
IN TERMINAL 1	1 (LS1)	LS1
IN TERMINAL 2	2 (START)	START
IN TERMINAL 3	3 (RESET)	RESET
IN TERMINAL 4	7 (WORK A)	WORK A
IN TERMINAL 5	8 (WORK B)	WORK B

Setup item

Setting	Signal	Function
1	LS 1	When 0 is set to LINE CNT. SELECT, provide judgment signal. When either 1 or 2 is set, provide start fastening process signal.
2	START	External start
3	RESET	Reset the number of unfastened fasteners. (Reset the error, but hold the number of unfastened fasteners when an error happens.)
4	LS 2	Judgment (use when 1 is set to LINE CNT. SELECT)
5	PASS	Compulsory completion Provide COUNT OK compulsory even if there are unfastened fasters.
6	QL	Signal for QL wrench. Count down the fasteners.
7	WORK A	Signal for WORK select. Select WORK No. 1 – 8 by the signal combination of WORKS A – C. Use when 0 is set to WORK SIG. SEL.
8	WORK B	
9	WORK C	
10	WORK 1	Signal for WORK select Select WORK No. 1 – 5 by the input signal combination of WORK 1 – 5. Use when 1 is set to WORK SIG. SEL.
11	WORK 2	
12	WORK 3	
13	WORK 4	
14	WORK 5	
15	CUT	Disable a tool externally

Note: It is not possible to assign same signal to two or more terminals.

Setting of output terminals

Set up the signal allocations of output terminals by OUT TERMINAL 1 – OUT TERMINAL 5.

Default and name of terminal

Setup item	Default (function)	Name of terminal
OUT TERMINAL 1	1 (COUNT OK)	COUNT OK
OUT TERMINAL 2	2 (COUNT NOK)	COUNT NOK
OUT TERMINAL 3	3 (TORQUE OK)	TORQUE OK
OUT TERMINAL 4	4 (TORQUE NOK)	TORQUE NOK
OUT TERMINAL 5	5 (SV)	SV

Setup item

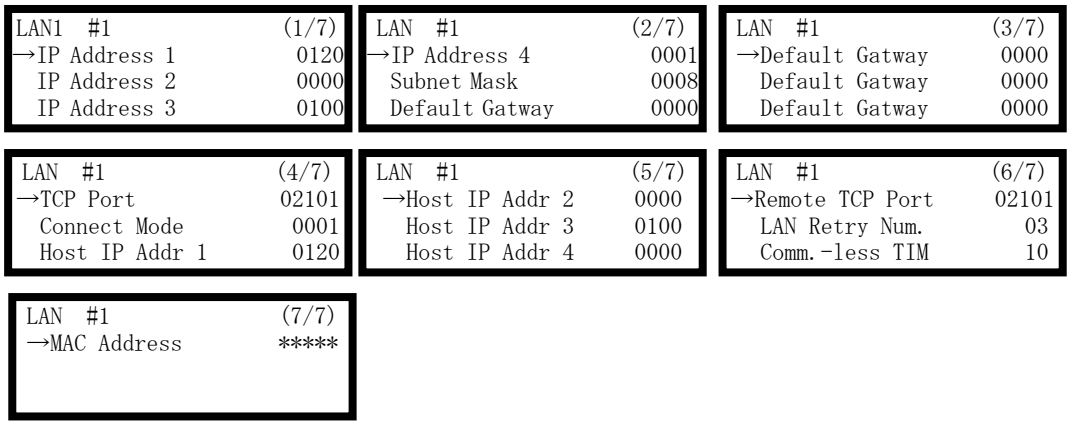
Setting	Signal	Function
1	COUNT OK	Count OK signal Signal output duration time is set by COUNT OK of TIMER SETTING. The UECD controller stops sending this signal when it receives the RESET or LS signal even while COUNT OK is being sent.
2	COUNT NOK	Count NOK signal Provide COUNT NOK signal output until COUNT NOK is cleared.
3	TORQUE OK	Torque OK signal Signal output duration time is set by FASTENING OK of TIMER SETTING. The UECD controller stops sending this signal when the next operation starts even while TORQUE OK is being sent.
4	TORQUE NOK	Torque NOK signal Provide TORQUE NOK signal output until TORQUE NOK is cleared.
5	SV	Provide the signal output when torque reaches the start torque.
6	TORQUE LOW NOK	Provide the signal output when the torque low NOK judgment is provided.
7	TORQUE HIGH NOK	Provide the signal output when the torque high NOK judgment is provided.
8	OPERATION RANGE	Provide the signal output while the fastening is in process.
9	CPU RUN	Provide the signal output when UECD is in operation. Switch off when UECD gets inoperable status while the setting is overwritten.
10	CAUTION	Caution signal Provide this signal output when the cumulative fastening number or pulse blow number reaches the preset repair fastener number or pulse blow number.
11	WORK A ANSWER	WORK Answer Provide answer output signal of active work No.
12	WORK B ANSWER	
13	WORK C ANSWER	
14	WK 1 COUNT OK	COUNT OK per WORK NO.
15	WK 2 COUNT OK	
16	WK 3 COUNT OK	
17	WK 4 COUNT OK	
18	WK 5 COUNT OK	

Note : It is not possible to assign same signal to two or more terminals.

10.7. **LAN (LAN setting)**

This is to set up for the Ethernet connection.

Set up the values in LAN SETTING screen, and [LAn] is displayed. After you changed the setting values all, please do not press RES until [LAn] goes off. It takes approx. 20 seconds.



IP ADDRESS 1 - 4
Default : 120.0.100.1
Setting range : 0 - 255
[Function]
This is to determine the IP address of UECD.

SUBNET MASK
Default : 0008
Setting range : 1 - 31
Setting:

1	(255.	255.	255.	254)
8	(255.	255.	255.	0)
16	(255.	255.	0.	0)
24	(255.	0.	0.	0)
31	(128.	0.	0.	0)

[Function]
This is to set up Subnet mask.

DEFAULT GATEWAY
Default : 0. 0. 0. 0.
Setting range : 0 – 255
[Function]
This is to set the default gateway.
Set up when connecting to PC via router.

TCP PORT
Default : 2101
Setting range : 0 – 9999
[Function]
This is to set up the TCP port of UECD.

CONNECT MODE (Connection mode)
Default : 1
Setting : 0 Set UECD as host
Setting : 1 Set UECD as client
[Function]
Allocate [1] (UECD as client) to this function.

HOST IP ADDR 1 – 4 (HOST IP address)
Default : 120.0.100.0
Setting range : 0 - 255
[Function]
Enter the IP address of the PC which is used for the setup.

REMOTE TCP POR (Remote TCP port)
Default : 2101
[Function]
This is to set up TCP port of PC which communicates to UECD.
Set up with same value of TCP port of UECD.

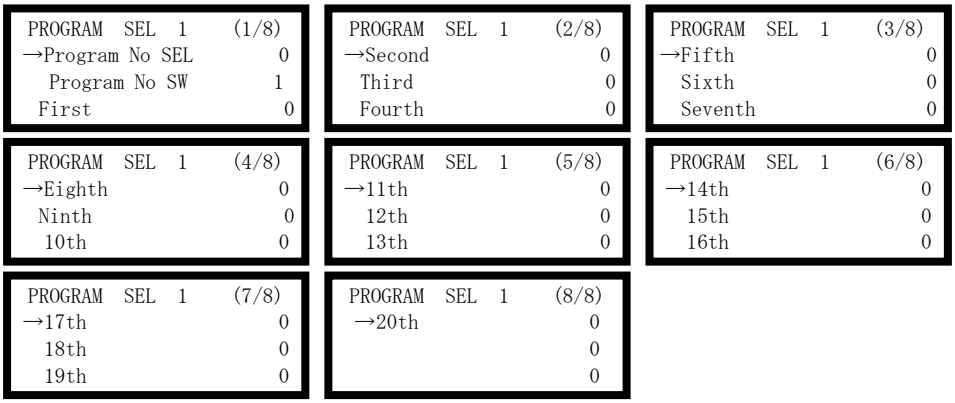
LAN RETRY NUM. (LAN retry number)
Default : 3
Setting range : 0 - 10
This is to determine the retry number to be made.

Comm.-less time (LAN no responding limit time)
Default : 10
Setting range : 0 - 10
This is to determine the waiting time in case of no responding.

MAC ADDRESS
Default : Assign unique address
Setting range : 0 - 9999
Mac address of UECD.
Impossible to change the setting value.

10.8. **Program Number Change**

This is to set the program number choice. Maximum 8 kinds (fastening torque, judgment values of torque and angle etc.) of program can be set up within same work number by using the program number change function. It is possible to set up maximum 20 fasteners under same work number. 8 kinds of work number (from program 1 to 8) can be set up for first fastener up to 20th fastener.
Note: This function is available in UECD-4800 version 1.15 and later version.



PROGRAM NO SEL (Program number change select)
Default : 0
Setting : 0 Not use
Setting : 1 Use, and program number is selected by signal input from terminal of UECD.
Setting : 2 Select program number by the 32 byte data received on the serial port on the rear panel. Set 1 to ID DATA OUT, and set 32 to ID DATA NUMB in the DATA OUT SETTING screen.
Setting : 3 Receive work number signal from 48 byte data received on the serial port on the rear panel. Set 1 to ID DATA OUT, and set 48 to ID DATA NUMB in the DATA OUT SETTING screen.

【Function】
・This is to determine whether use or not the program number choice, and how to change program number.
・When setting value is changed from 0 to any of 1 – 3 or vice versa, UECD clears memory data. It is because UECD memorizes program number when program number choice is used.

PRGRAM NO SW (Program number change switch)
Default : 0
Setting : 0 Switch to next work number only when UECD provides fastening OK.
Setting : 1 Switch to next work number whichever UECD provides fastening OK/NOK.
Setting : 2 Switch to next work number when UECD provides OK or torque HIGH NOK.
【Function】
・This is to determine the condition to have UECD switched to next work number when program number choice is used.

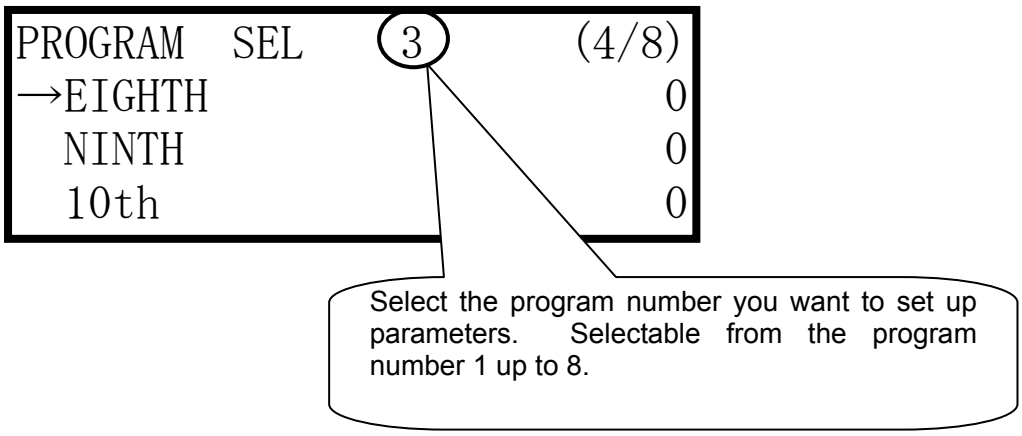
FIRST – 20TH FASTENER
Default : 0
Setting range : 0 - 8
Setting : 0 Fastening is ended.
1 – 8 : Fastening is performed per setting of selected work number.

【Function】

・This is to determine which fastener is fastened by which setting of work number.

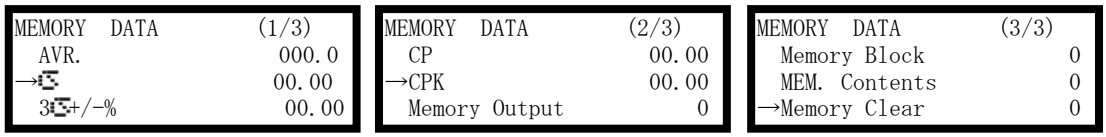
【Setting example】

Set either 1 or 2 to PRGRAM NO SEL, and set 1 to First, Second and Third fastener, and 2 to Fourth fastener. First, second and third fastener is fastened up to CUT values of WORK 1 setting, and judged in accordance to WORK 1 setting. Fourth fastener is fastened in accordance to WORK 2 setting. Set 0 to fifth fastener, if the fastening is ended with fourth fastener.
When either 1 or 2 is set to PROGRAM NO SEL, it is possible to fasten up to 20 fasteners. It is possible to set up work number to each fastener from first up to 20th.
Work number combination is settable with maximum 8 kinds from program 1 to 8.
When 3 is set to PROGRAM NO SEL, work number combination and fastening number are decided and received from the serial port on the rear panel.



10.9. **MEMORY DATA**

This is to set up the setting of memory data and the display or the clear of the calculated value from the memory data.



AVR (Average value)　(former name: MODE 82)
Function
・Displays average value of memorized data
Note: This is not a setting value.

$$\bar{x} = \frac{x_1 + x_2 + \sim + x_n}{n}$$

$\bar{x}$: Average
n : Number of Data Points

σ (σ value) (former name MODE 83)
Function
・Displays σ value of memorized data
Note: This is not a setting value.

$$\sigma = \sqrt{\left[\frac{1}{n-1} \sum (x_n - \bar{x})^2 \right]}$$

σ: Standard deviation

3σ+/- (3 σ value / Average value plus-minus % value / former name MODE 84)
Function
・Displays the 3σ / Average value (deviation value) of the memorized data

$$3\sigma \text{ value} = \frac{3\sigma}{\bar{X}} \times 100\%$$

3σ value : Rate of variability

CP (CP value / former name MODE 85)
Function
・Displays CP value of memorized data
・Displayed value is calculated one from the selected work number setting value (torque high and low limit value)
Note: This is not a setting value.

$$CP = \frac{\text{Upper limit} - \text{Lower limit}}{6\sigma}$$

CP = Process Capability Index

CPK (CPK value / former name MODE 86)
・Displays CPK value of memorized data
・Displayed value is the calculated one from the selected work number setting values (torque high and low limit value).
Note : This is not a setting value.

$$CPK = \frac{B}{3\sigma}$$

B1 : Upper limit – Average
B2 : Average – Lower limit

B : Smaller value between B1 and B2
CPK : Process Capability Index (deviation of average inclusive)

MEMORY BLOCK (Memory data block / former name : MODE 87)
Default : 3
Setting : 1 UECD stores data of work number all in one without time/date and ID number. (Maximum 12,000 pcs.)
Setting : 2 UECD stores data per work number without time/date nor ID number. (Maximum 1,500 pcs.)
Setting : 3 UECD stores data of work number all in one including time/date, but without ID number. (Maximum 5,400 pcs.)
Setting : 4 UECD stores data per work number including time/date, but without ID number. (Maximum 680 pcs.)
Setting : 5 UECD stores data of work number all in one including time/date and ID number. (Maximum 2,200 pcs.)
Setting : 6 UECD stores data per work number including time/data and ID number. (Maximum 270 pcs.)

【Function】
・This is to determine whether per work number or work number 1 - 8 all in one, and whether include time/data and ID number UECD stores the data.
・When the data is stored per work number, the storable maximum data becomes 1/8 of the one stored by batch. UECD drops old data to memorize new data one by one after the data storage comes to the maximum.
・When the data is stored with time/date, the storable maximum data becomes approx. 1/2.
・UECD calculates average value, CPK value etc. per block.

MEM. CONTENTS (memory content / former name MODE 88)
Default : 0
Setting : 0 Not memorize the fastening data
Setting : 1 Memorize all fastening data
UECD provides warning by the buzzer and the warning display [COUP] when the data storage comes to the last 10 pieces to maximum memory. Switch on RESET terminal or press the reset key, and the display will go off. But UECD provides warning with same way, if you continue fastening.
Setting : 2 Same as the setting 1, but not provide the warning of the maximum memory.
Setting : 3 Memorize only OK data and provide the warning of the maximum memory
Setting : 4 Same as the setting 3, but not provide the warning of the maximum memory
Function
・This is to determine what to memorize and whether to warn the maximum memory when the data storage comes to the last 10 pieces to maximum memory.
・All memorized data is cleared when the setting value is changed.

MEMORY CLEAR (clear of the memorized data / former name MODE 89)
Function
・When it is set to [1], UECD clears all the memorized data of the specified work number.
・[-CLE] is displayed on the display and press ENT again to execute the data clear.
・Same can be done through PC by pressing F9 MEM.CLR in the statistic screen of the setup software.

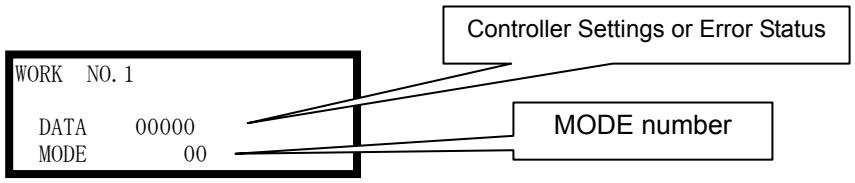
UNUS. HIST. CL (clear the unusual history)
【Function】
・Set to [1] to clear the history of the error or trouble like CAL error, ZERO error etc. (other than the errors included in the fastening data) memorized in UECD-4800.

10.10. **DRIVER DATA**

The Driver Data screen allows you to program the rpm and acceleration time of the tool. When it fires any error related to driver, the UECD controller shows an error message on screen. Please correct the error.

Note 1: Be sure to make the appropriate driver settings. The inappropriate settings may cause a tool not to work.

Note 2: The programming setup software that comes with UECD controller will not allow you to work on the driver settings.



(1) How to change the driver settings

1. Press ◀ key once. The mode number starts flushing up on screen.
2. Select the mode number that you desire to change with ▲&▼ keys and press ◀ key.
3. Change the settings with ▲&▼ keys.
4. Press ▶ key to enter the changed settings into controller.
5. Repeat the above 1 – 4 procedures if there are more settings to be changed. After all the changes are made, press RES key to go back to the measuring screen.

(2) Setup Items

MODE 00 (Full Speed RPM)
Default : 2,000 rpm
Recommended Setting Range :1,500 ~ 2,500 rpm
Programmable Setting Range : 0 ~ 3,000 rpm
【Function】
・This is to determine how fast the UEP-MC tool runs in operation.

MODE 01 (Slow Speed RPM)
Default : 500 rpm
Recommended Setting Range :500 ~ 2,500 rpm
Programmable Setting Range : 0 ~ 3,000 rpm
【Function】
・This is to determine how slowly UEP-MC tool runs in operation.

MODE 02 (Acceleration Time)
Default : 0.05 seconds
Programmable Setting Range : 0.00 ~ 3,600 rpm
【Function】
・This is to determine how fast the UEP-MC tool reaches 1,000 rpm from 0 rpm.

MODE 03 (Slow Down Time)
Default : 0.05 seconds
Programmable Setting Range : 0.00 ~ 3,600 rpm
【Function】
・This is to determine how fast the UEP-MC tool reaches 0 rpm from 1,000 rpm.

MODE 04 (Fastening Control Method)
Default : 2
Setting : 0 Timer Controlled Fastening
Setting : 1 Blow Number Controlled Fastening
Setting : 2 Torque Controlled Fastening
【Function】
・This is to determine the control method of the tool.
Use the setting 2 only.

MODE 05 (Fastening Time Setting) **(Not used now)**
Default : 0.5 seconds
Programmable Setting Range : 0.0 ~ 5.0 seconds
【Function】
・Use this function when the MODE 04 is set to 0 only. Never touch this function.

MODE 06 (Blow Number Setting) **(Not used now)**
Default : 15
Programmable Setting Range : 0 ~ 100 blows
【Function】
・Use this function when the MODE 04 is set to 1 only. Never touch this function.

MODE 07 (OK Outputs Signal Timer) **(Not used now)**
Default : 0.1
Programmable Setting Range : 0.1 ~ 0.3 seconds
【Function】
・Never touch this function.

MODE 08 (Start Level Detection Value) **(Not used now)**
Default : 60
Programmable Setting Range : 0 ~ 255
【Function】
・This is to determine the value to detect the bolt/nut seating. Use this function when the MODE 04 is set to 0 or 1. Never touch this function.

MODE 09 (Overriding Method for NOK Tightening) **(Not used now)**
Default : 0
Programmable Setting Range : 0, 1, & 2

11. Functions

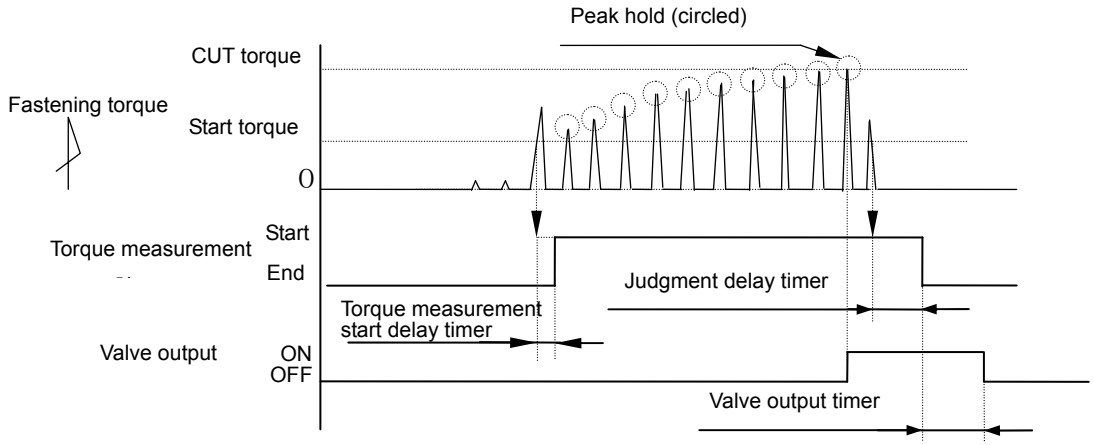
11.1. Fastening control

Control method : 3 UEP-MC Wrench Torque Control Tool

1) UEP-MC Wrench Torque control

This is to control torque of UEP-MC wrench. UECD starts torque measurement when detecting the start torque or greater torque, and switches on valve terminal to stop the tool when reaching torque cut level. UECD provides judgment when judgment delay timer comes up after torque gets lower than start torque.

When torque measurement delay timer is set up, it starts functioning when detecting start torque or greater torque. UECD cancels torque spike at the bolt seating point by suspending torque measurement until torque measurement start delay timer comes up, and then starts torque measurement.



12. Upper and Low limit judgment

UECD provides judgment whether or not the detected torque, angle or pulse number is within upper and low limit. Upper and low limit judgment is made against torque or pulse numbers until fastening is completed. Upper and low limit of torque is set in [TORQUE LOW] and [TORQUE HIGH] in the BASIC SETTING screen. Upper and low limit of pulse number is set in [PULSE LOW (pulse blow number lower limit)] and [PULSE HIGH (pulse blow number higher limit)] in the MODE SETTING screen.

[Judgment]

(1) OK judgment when the measurement value is within upper and low limit. (OK)

- Front panel OK LED lamp lights in green.
- UECD output TORQUE OK.
- When 1 is set to ALARM BUZZER, UECD gives single sounding “Pi” for each fastener OK result, and double sounding “Pi-Pi” for COUNT OK.

(2) HIGH NOK judgment when the measurement is confirmed higher than upper limit. (TORQUE HIGH NOK)

- Front panel HIGH LED lamp lights in red.
- Buzzer sounds.
- UECD outputs TORQUE NOK.
- UECD outputs TORQUE HIGH.

(3) ANGLE HIGH NOK judgment when the angle measurement is confirmed higher than high limit. (ANGLE HIGH NOK)

- ANGLE HIGH error message
- Buzzer sounds.
- UECD outputs TORQUE NOK.

(4) Judgment when pulse number is greater than pulse number upper limit.

- Front panel displays [PLS.H] and [Torque measurement value] by turns.
- Buzzer sounds.
- UECD outputs TORQUE NOK.

(5) LOW NOK judgment when the measurement is confirmed lower than low limit. (TORQUE LOW NOK)

* Front panel LOW LED lamp lights in yellow.
* Buzzer sounds.
* UECD outputs TORQUE NOK.
- UECD outputs TORQUE LOW NOK.

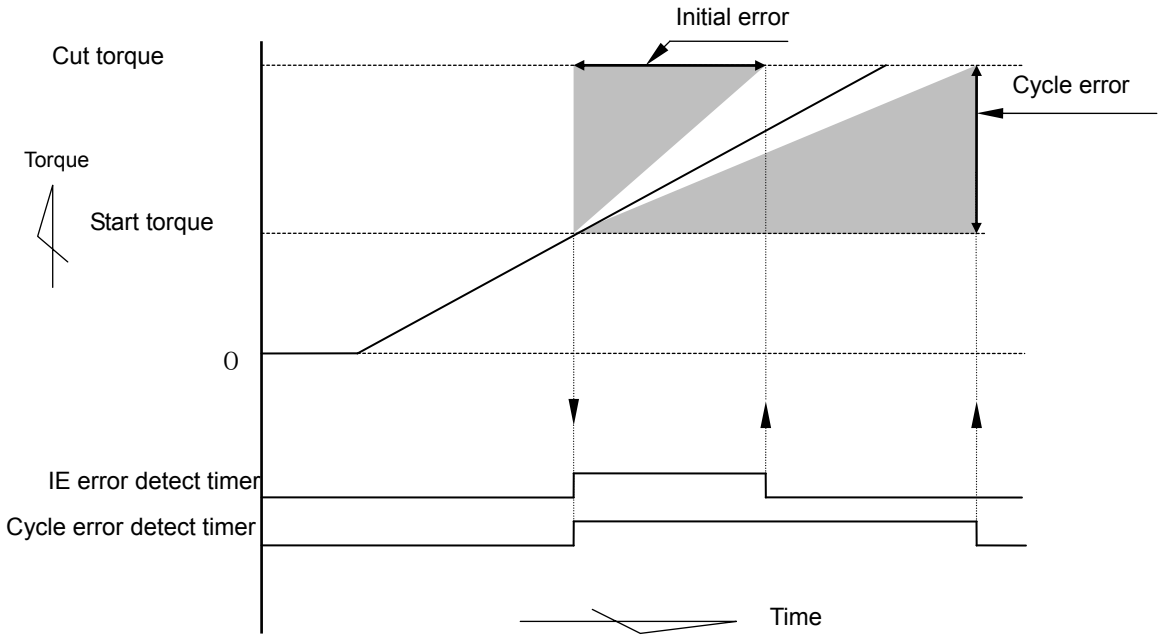
(6) ANGLE LOW NOK judgment when the angle measurement is confirmed lower than low limit. (ANGLE LOW NOK)

* ANGLE HIGH error message
* Buzzer sounds.
* UECD outputs TORQUE NOK.

(7) Judgment when pulse number is less than pulse number low limit. (PULSE LOW NOK)

・Front panel displays [PLS.L.] and [Torque measurement value] by turns.
・Buzzer sounds.
・UECD outputs TORQUE NOK.

12.1. **Torque change degree zone monitor**



Note 1: “IE error” stands for “Initial Error”.

Note 2: Above is an example of linear torque change curve.

1) Initial error [LO.E.]

UECD provides the error when the time from start torque to cut torque is shorter than the time of initial error detect timer.

［Setting value］

・Initial error detect select: 1

・Initial error detect timer : 1 – 9999 [msec]

［How to set］

・Determine the setting value by monitoring the time from start torque to cut torque of the correct fastening.

2) Cycle error [CYL.E.]

UECD provides the error when the time from start torque to cut torque is longer than the time of cycle error detect timer.

［Setting value］

・Cycle error detect select : 1

・Cycle error detect timer : 1 – 9999 [msec]

［How to set］

・Determine the setting value by monitoring the time from start torque to cut torque of the correct fastening.

13. Torque Sensor Wiring Diagnosis

UECD is capable of checking torque sensor cable's damage, break or short circuit. The error detection is made when ZERO/CAL check is in action.

13.1. Error detection

1) ZERO check

UECD checks how much the voltage of torque sensor will change from 0(V) under no load condition. UECD detects ZERO error if the voltage variation (DPM display zero point) becomes out of the range of plus or minus 6% of the rated torque.

2) CAL check

UECD checks whether sensor setting value in UECD is appropriate to the connected torque sensor's wiring and the specifications. UECD checks if the torque sensor output signal is within 100±6% of the CAL value by applying simulative electric pressure to the torque sensor so as to put the torque sensor in the virtual condition under rated load strain.

UECD detects CAL error if the torque sensor is not connected with UECD correctly, or its wiring and the specifications does not fit to UECD set up.

13.2. ZERO/CAL check perform timing

- When self-diagnosis function is running by switching on UECD.
- When RES is pressed or RESET terminal is switched on.
- When [F6 ZERO CAL] on the ZERO POINT ADJUSTMENT screen of the UEC-4800 setup software is pressed.

When error is detected

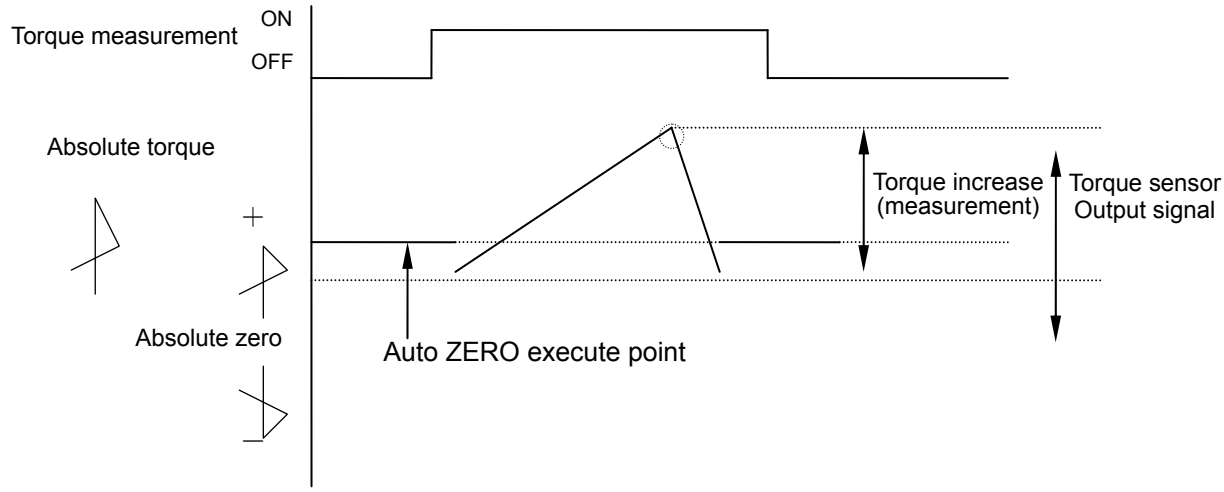
- ZERO error : [0.E.] and [Torque measurement value] are displayed alternately.
- CAL error: [CAL.E.] and [Torque measurement value] are displayed alternately.
- Buzzer sounds.
- TORQUE NOK terminal is switched on.

14. **Auto ZERO**

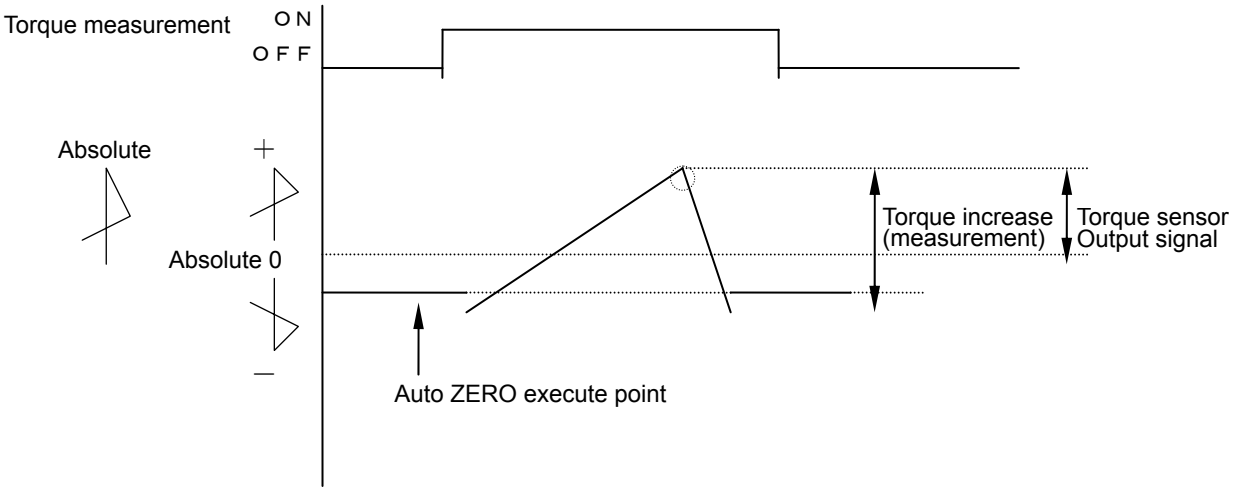
This is a function to do correct torque value measurement by doing automatic correction measured torque variation due to torque sensor's ZERO point deviation. UECD memorizes ZERO point deviation confirmed by ZERO/CAL check, includes the deviation degree in torque sensor signal, and converts the adjusted torque signal to torque value. This auto ZERO will not function when ZERO/CAL error occurs.

Examples of AUTO ZERO

1) When ZERO/CAL check detects plus (+) side deviation.



2) When ZERO/CAL check detects (-) side deviation



Auto ZERO execute timing

UECD executes AUTO ZERO after ZERO/CAL check.

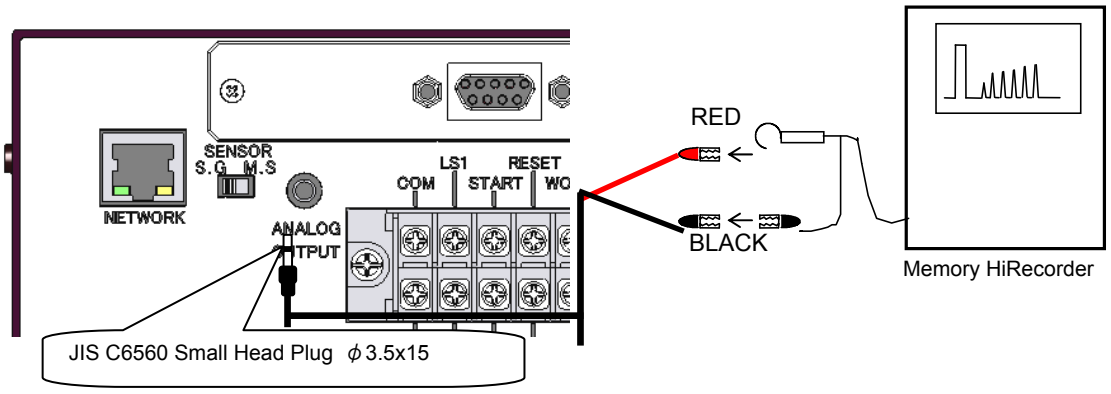
- At the time of self-diagnosis when UECD is switched on.
- When pressing RES, or RESET TERMINAL is switched on.
- When START is switched on

15. Torque waveform measuring procedure

Following explains how to measure the torque waveform by using the memory hicorder or memory scoop.

1) Make sure that the setting values are correctly set up. Check especially that the specifications of the torque sensor connected to the UECD-4800 agrees to the setting value of the torque sensor, and the CAL value is set up correctly.

2) Connect the waveform measurement equipment to UECD-4800.



Note) UK-PLUG's red wire : torque signal
UK-PLUG's black wire : 0V (GND)

3) Press RES to have the UECD-4800 measure CAL waveform height (rated torque applied electric pressure). UECD-4800 makes the CAL check.

4) Confirm CAL waveform height, and then set and adjust waveform measurement equipment.

5) Perform torque waveform measurement.

16. **ANALOG OUTPUT terminal**

UECD outputs the analog torque signal voltage in real time by having the torque sensor output signal voltage amplified by 1000 times, filtered and attenuated.

1) Torque sensor output voltage specification table

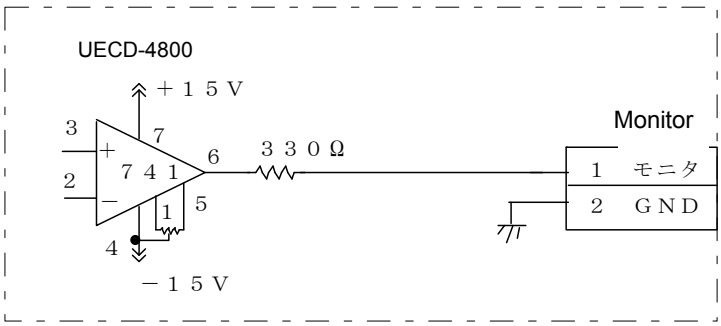
Following is output voltage (x V) when rated load torque is applied to torque sensors.

Torque sensor specifications	ANALOG output voltage (x V)
UEP-MC Magnetostrictive Sensor	DC 1.5V

2) How to convert analog output voltage to torque value

$$\text{Torque Value} = \frac{\text{Output voltage when strained by fastening } (\Delta V)}{\text{Output voltage when applied rated load } (1.5V)} \times \text{Rated torque value}$$

3) Analog output terminal specifications



4) Analog output terminal

Plug size: JIS C6560 single small head plug ø3.5x15

17. Error

17.1. Error message & contents

ZERO Error: [0.E.] and [NG measurements] are displayed alternately.
・When more that ±6% deviation off from rated value is detected.

CAL Error: [CAL.E.] and [NG measurements] are displayed alternately.
・When more than 100±6% deviation off from rated value is detected

Buffer Full Error: [buF.E.] and [Torque measurements] are displayed alternately.
・This error is fired when more angle data to a buffer than the memory unit can accommodate is flowed into it (buffer overflow). The memory capacity is programmable on mode settings of "WAVEFORM MEMORY FUNCTION SELECT". If it is set to either 1 or 4, this message does not come up.

Setting Error: [S.E.] is displayed.
・When not settable setting value is input. When the setting value is out of the setting range or interlock value is input.

Driver Error:[Errd] is displayed.
・This error is fired when any error related to driver is detected.

Driver Error:[S.E.] is displayed.
・When not settable setting value is input. When the setting value is out of the setting range or interlock value is input.

Pulse Number LOW NOK: [PLSL.] and [Torque measurements] are displayed alternately.
・When the pulse number is less than pulse number low limit.

Pulse Number HIGH NOK: [PLSH] and [Torque measurements] are displayed alternately.
・When the pulse number is over than pulse number high limit.

Initial Error: [IOE.] and [NG measurements] are displayed alternately.
・When fastening torque reaches CUT torque before initial error detection timer comes up.

Cycle Error: [CYL.E.] and [NG measurements] are displayed alternately.
・When fastening torque does not reach CUT torque before cycle error detection timer comes up.

Fastening Suspension Error: [F.E.] is displayed.
・When the fastening is suspended before the torque reaches CUT torque.

Start Torque Error: [S.L.E.] is displayed.
・Start torque error detect timer starts functioning when start terminal is switched on. When the torque does not reach start torque before this timer comes up.

Cycle Over Error: [CYOE.] is displayed.
・Cycle over error detect timer starts functioning when start terminal is switched on. When the fastening operation (judgment) is not completed before this timer comes up.

Warning Count Number Error: [tcNE.] is displayed.
・When the total fastening cycle reaches the warning cycle setting value.

Warning Pulse Number Error: [tcPE.] is displayed.
・When the total fastening pulse number reaches the warning pulse number setting value.

Repair Count Number Error: [rPNE.] is displayed.
・When the total fastening cycle reached the repair number setting value.

Repair Pulse Number Error: [rPPE.] is displayed.
・When the total pulse number reaches the repair pulse number setting value.

Warning Memory Error: [COUP] is displayed.
・When the memory remaining volume gets less than -10 from the maximum memory data.

ROM Error: [Er.01] is displayed.
・When ROM of board is broken down or causes malfunction for some reasons.

RAM Error: [Er.02] is displayed.
・When RAM of board is broken down or causes malfunction for some reasons.

A/D Error: [Er.03] is displayed.
・When A/D of board is broken down or causes malfunction for some reasons.

SUM Check Error: [Er.05] is displayed.
・When the setting data memorized in RAM have error.

Blown Fuse
・When the AC fuse (Refer to 4.2 Rear panel ②) is blown, UECD cannot be powered on.
・When the DC24V fuse on the board inside UECD is blown, DC24V won't be outputted.

Low Voltage: [L] is displayed.
・The UECD output is shut down when the DC voltage of converter (*1) is under 90V. When it is under 60V, the control circuit is reset.

Over Current: [O.C.] is displayed.
・The UECD is protected when the built-in converter outputs more current than rated.

Regenerative Over Voltage: [O.U.] is displayed.
・This error is fired when the built-in converter generates more DC voltage than rated. The UECD is protected when AC100V UECD generates more than DC200V.

Restart Prevention: [r.P.] is displayed.
・When a proper amount of power is supplied again to the UECD after the low voltage is corrected, this feature causes the tool run signal to be cancelled for safety. Note that this feature does not work when the control circuit is reset.

Excessive Load (thermal): [Fhr] is displayed.
・When more motor current flows in the UECD than necessary, the self protection features protects the UECD from the excessive load.

Sensor Error: [E-C.S.] is displayed.
・The self protection features are triggered when the CS sensor error is detected.

CPU Error: [Err] is displayed.
・The self protection features are triggered when the abnormality or error of CPU is detected.

Input Signal Error: [E.S IG] is displayed.
・This error is detected when the tool receives the tool rotation change signal while it is running.

(1) Converter: This is one of the UECD components and converts the AC commercial voltage to DC voltage. Then, it converts the DC voltage to the AC voltage with specified pulsing frequency. The rectifier circuit changing the AC input to DC output is called converter.

CS sensor: CS stands for Commutation Sensor. This sensor is necessary to rotate the UEP tool motor.

17.2. **Recommended Action**

Error	Countermeasure
ZERO error CAL error	・Check the connection between a tool and sensor cable. Or, replace them. ・Check if the tool is running during the checking is being made.
Buffer Full error	・Set the setting of waveform memory function select to 1 or 4.
Setting error	・Check and correct the mode settings parameters. Make sure that they are logically correct like the formula START<CUT.
Initial/Cycle error Pulse number LOW/HIGH Fastening angle LOW/HIGH	・Check any possible double-fitting and/or cross thread fastener. ・Check the alignment of workpiece and bolt. ・Check start torque and cut torque values. ・Check the timers for initial torque spike/cycle incomplete error. *1 ・Check the pulse low/high limits. *1 ・Check the angle low/high limits. *1
Fastening suspension error	・Check the tool performance. ・Check the judgment delay timer is long enough. ・Be sure not to release the trigger before the tool reaches the CUT level.
Warning count/pulse number error	・Recondition the tool like oil change and set the count/pulse number for the next maintenance due time.
Repair count/pulse number error	・Repair or replace a tool, and clear the repair count / pulse number.
Warning memory error	・Download and store the data in the UECD-4800 memory, and then clear the memorized data. ・Review the setting value of MEMORY DATA CONTENTS if this function is not needed.
ROM/RAM error	・Replace the UECD-4800.
A/D error	・Replace the tool or the UECD-4800. ・Check the connection between a tool and sensor cable. Or, replace them.
Sum check error	・If UECD works in order again by switching on or pressing RES, memory can be overwritten by noise. Set all the setting values again as the previous setting values are initialized when UECD is recovered by switching on or pressing RES.
Blown DC24V Fuse on the PC board	・Check the wiring and replace the fuse (model: MH10(1) code number: 909-814-0). Make sure to switch off and disconnect the power cable from AC power receptacle when replacing the fuse.
Driver Error	・The inherent intelligence of UEP system works. Check the error status on the DRIVER DATA screen and switch it on after correcting the problem.
Low Voltage (Sudden Voltage Drop)	・Check the wiring status and / or power supply.
Over Current	・Check the system is not working excessively and / or is correctly grounded.
Regenerative Over voltage	・The sudden tool speed change in operation like short slow-down time or socket coming off may cause this error. Also, the inductance of AC reactor for power factor correction located at the UEPD input may be

	greater than necessary. Select the AC reactor good for each UEPD capacity.
Restart Prevention	・Clear this error after you confirm the safety. The tool starts running when the tool run signal is on. Also, the insufficient amount of power may cause this feature to be triggered. Be sure to supply the UECD with the proper amount of power.
Excessive Load (Thermal)	・Remove the excessive load, change the bolt / nut fastening pattern, and / or use the one size up UECD system.
Sensor Error	・Refer to the Trouble Shooting for more information.
CPU Error	・Check that there is no external noise effect on CPU.
Input Signal Error	・Refer to the Trouble Shooting for more information.

*1: Check the tightening time from start torque to cut, number of pulses, and angle per application to make the appropriate settings.

18. **Troubleshooting**

Phenomenon	Probable Cause	Recommended Action
Driver unit		
Not Powered	・ Not plugged in ・ Switched off ・ Main power voltage drop ・ Incorrect size of UECD connected to UEP tool ・ Short-circuited ・ Blown fuse	●Plug the UECD in. ●Switch on the UECD. ●Make the correct connection. ●Repair or replace the UECD.
Driver Unit Error	・ The inherent intelligence of UEP system works.	●Check the error status on the DRIVER DATA screen and switch it on after correcting the problem.
Sensor error E-C.S. detected *	・ UECD unconnected to UEP tool ・ Broken wire	●Confirm the cable connection. ●Repair or replace the UECD.
Tool		
UEP will not run.	・ Not plugged in ・ Cable misconnection ・ Broken wire ・ Driver unit error ・ Overworking the UEP tool	●Switch on the UEP system. ●Make the correct connection. ●Repair or replace the UEP. ●Remove the excessive load.
UEP runs in a reverse direction.	・ Reverse lever energized in error	●Check the reverse lever position.
UEP will not run correctly.	・ Broken wire ・ Driver error ・ Mode settings incorrectly made – i.e. fastening control method	●Repair or replace the UEP. ●See Chapter 17.2 Recommended Action. ●Work on the correct settings.
Error message E.SIG displayed in operation*	・ Reverse lever energized in error	●Switch it on again.
No tool power	・ Oil leakage	●Repair or replace the UEP.
Heat generated	・ Overworking the UEP tool	●Remove the excessive load.
Not torque controlled	・ Set the MODE 4 of DRIVER DATA to 2. ・ Set the Control Method of MODE settings to 3.	●Confirm the settings.
UEP-MC tool pulsing longer than it should till it shuts off	・ Rise in heat inside UEP-MC ・ Oil leakage	●Remove the excessive load. ●Cool down the tool. ●Repair or replace the UEP-MC.

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