

AD4329A-DLC

Weighing Indicator

INSTRUCTION MANUAL

AND

A&D Company, Ltd.

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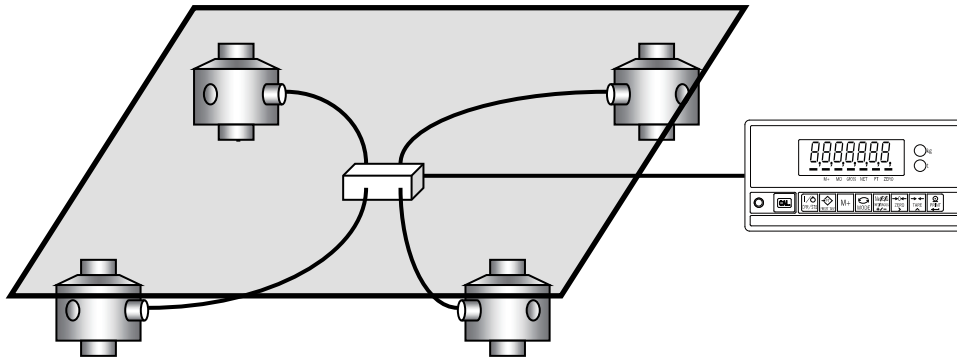
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1. Introduction

AD4329A-DLC is a digital load cell weighing indicator that enables use of truck scales.

By combining the AD4329A-DLC with an A&D digital load cells (LCCD20 series), a weighing system with higher lightning resistance performance can be built, and electronic corner adjustment can be performed easily and precisely. Up to eight digital load cells can be connected in parallel.


AD4329-DLC's interface has standard serial output to enable connection to A&D printers and displays and RS-232C to enable connection to PCs. In addition, comparator relay output can be provided as an option.




1.1. Safety precautions

For safe and correct usage, read the following precautions carefully before using the indicator.


Precautions on design


 WARNING
<ul style="list-style-type: none">● Provide an external safety circuit to the indicator so that the safety of the whole system can be secured even if errors occur in the external power supply or in the indicator.

Precautions on installation

 WARNING
<ul style="list-style-type: none">● Do not use the indicator in the following environments:<ul style="list-style-type: none">- Where the temperature and the humidity exceed the specifications- Where corrosive gases or flammable gases are present- Where the indicator gets wet with oil, chemicals or waterPlease note that securing the indicator to the control panel will provide the indicator outside of the control panel with IP65 protection.● When installing or removing the indicator, be sure to turn off all the external power supplies used beforehand.

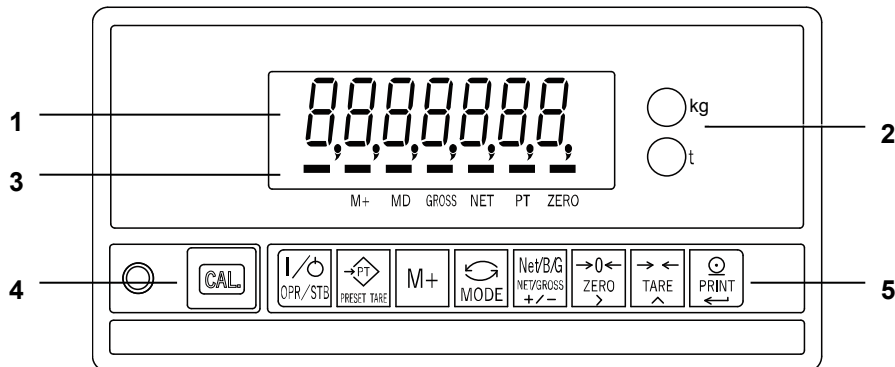
Precautions on wiring

 WARNING
<ul style="list-style-type: none">● When wiring the indicator, be sure to turn off all the external power supplies used beforehand.● When wiring is complete, be sure to attach the terminal block cover provided with the indicator.● Be sure to ground the indicator.

 CAUTION
<ul style="list-style-type: none">● Do not clamp control wires or communication cables with power lines, and do not place them close to power lines.● Place the load cell cable sufficiently away from high frequency circuits such as high voltage power lines and inverter load circuits.

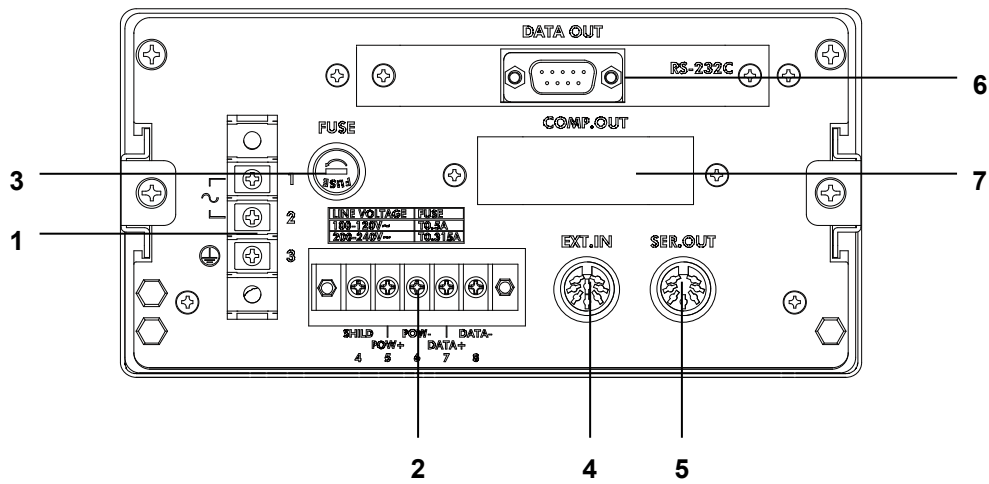
2. Part Names

2. 1. Front panel



No.	Name	Description	
1	Numerical display	Displays weight value or setting value.	
2	Unit display	The set unit illuminates.	
3	Status mark display	M+	Illuminates when the total value is stored.
		MD	Illuminates when the weight value is stable.
		GROSS	Illuminates when the gross value is displayed.
		NET	Illuminates when the net value is displayed.
		PT	Illuminates when the preset tare value is displayed.
		ZERO	Illuminates when the weight value is within 1/4 of the minimum division.
4	Key switch with sealing cover	CAL key	Switches to calibration mode.
5	Key switches	OPR/STB key	Turns the display on/off.
		Preset tare key	Displays the preset tare value.
		M+ key	Adds the current value to the stored total value.
		Mode key	Used for the accumulation function, calibration, unit selection, etc.
		Net/Gross key	Switches between net/gross data display.
		+/- key	Selects the sign when setting the value.
		Zero key	Zeros the current display.
		> key	Selects the place of the digit when setting the value.
		Tare key	Performs tare.
		^ key	Specifies the value for the selected digit when setting a value.
		Print key	Outputs data.
	← key	Finalizes data entry and saves the set value.	

2. 2. Rear panel



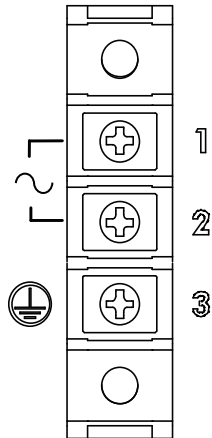
No.	Name
1	AC power input terminal
2	Digital load cell input terminal
3	Fuse holder
4	External control input connector
5	Standard serial output connector
6	RS-232C I/F connector
7	Option 02 (comparator output) slot

2. 3. Accessories



Name	Qty.
Instruction Manual	1
Connector for external control input	1
Connector for standard serial output	1
Spare fuse	1
Rubber foot	4

3. Connecting to Power Supply

3.1. AC power supply input terminal assignment



Use an M4 solderless terminal with a width of 8.6 mm or less

Terminal No.	Symbol	Description
1		AC power input (Live) Unearthed conductive part
2		AC power input (Neutral) Earthed conductive part
3		Ground terminal

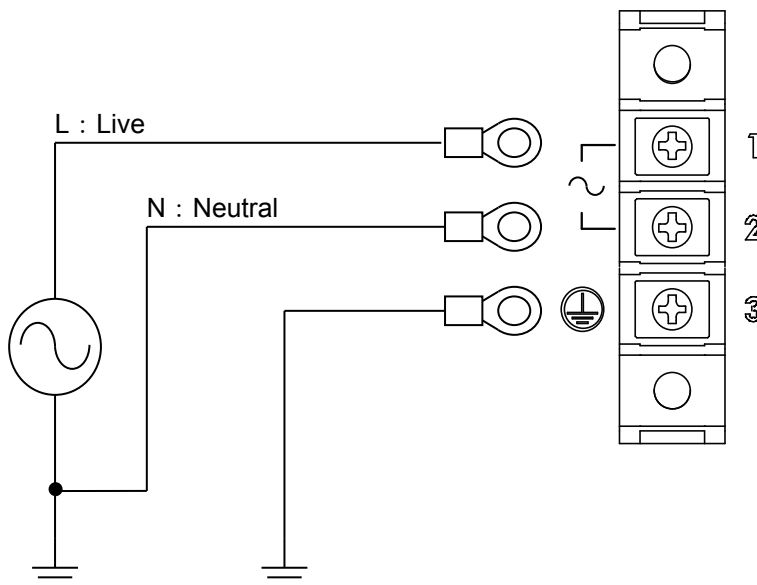
The test below is performed for lightning resistance performance of the AD4329A-DLC.

Impulse withstand voltage test (in the air)

JEC-0202 conformity to impulse voltage and current test

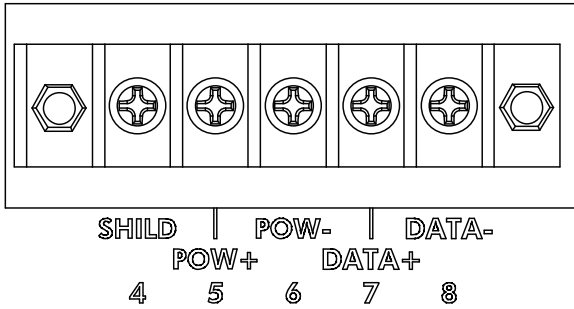
Standard lightning impulse voltage 1000kV

3.2. Connection Diagram



4. Connecting to Digital Load cells

4.1. Load cell input terminal assignment

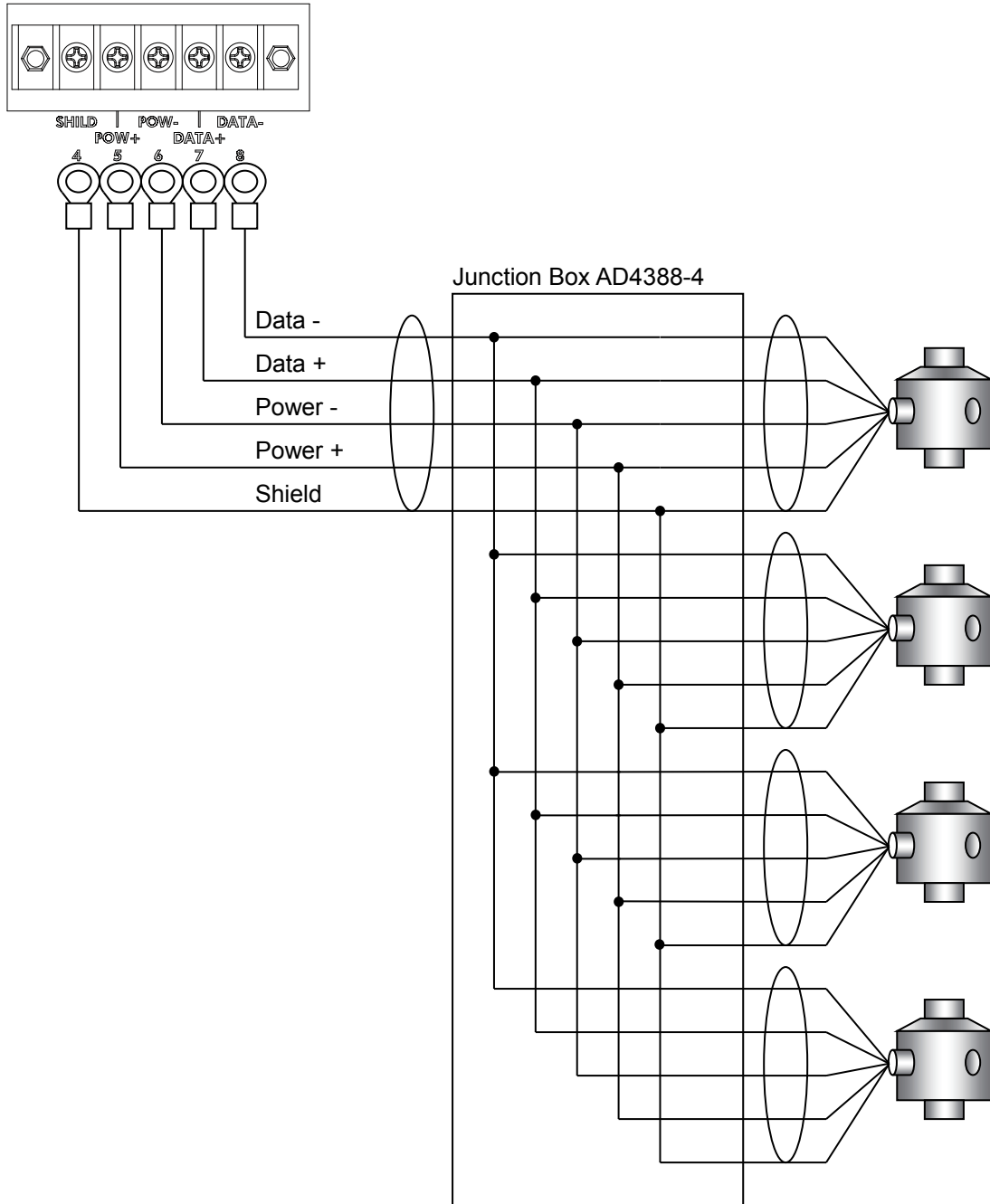


Use an M3 solderless terminal with a width of 6.2 mm or less.

Terminal No.	Symbol	Description
4	SHILD	Shield
5	POW+	Load cell excitation voltage +
6	POW-	Load cell excitation voltage -
7	DATA+	Load cell data +
8	DATA-	Load cell data -

4.2. Connection diagram

When you connect the digital load cells in parallel, use a junction box for digital load cells. Connecting the weighing indicator to four digital load cells is as shown below. Recommended cable is AX-KO3217 (A&D).



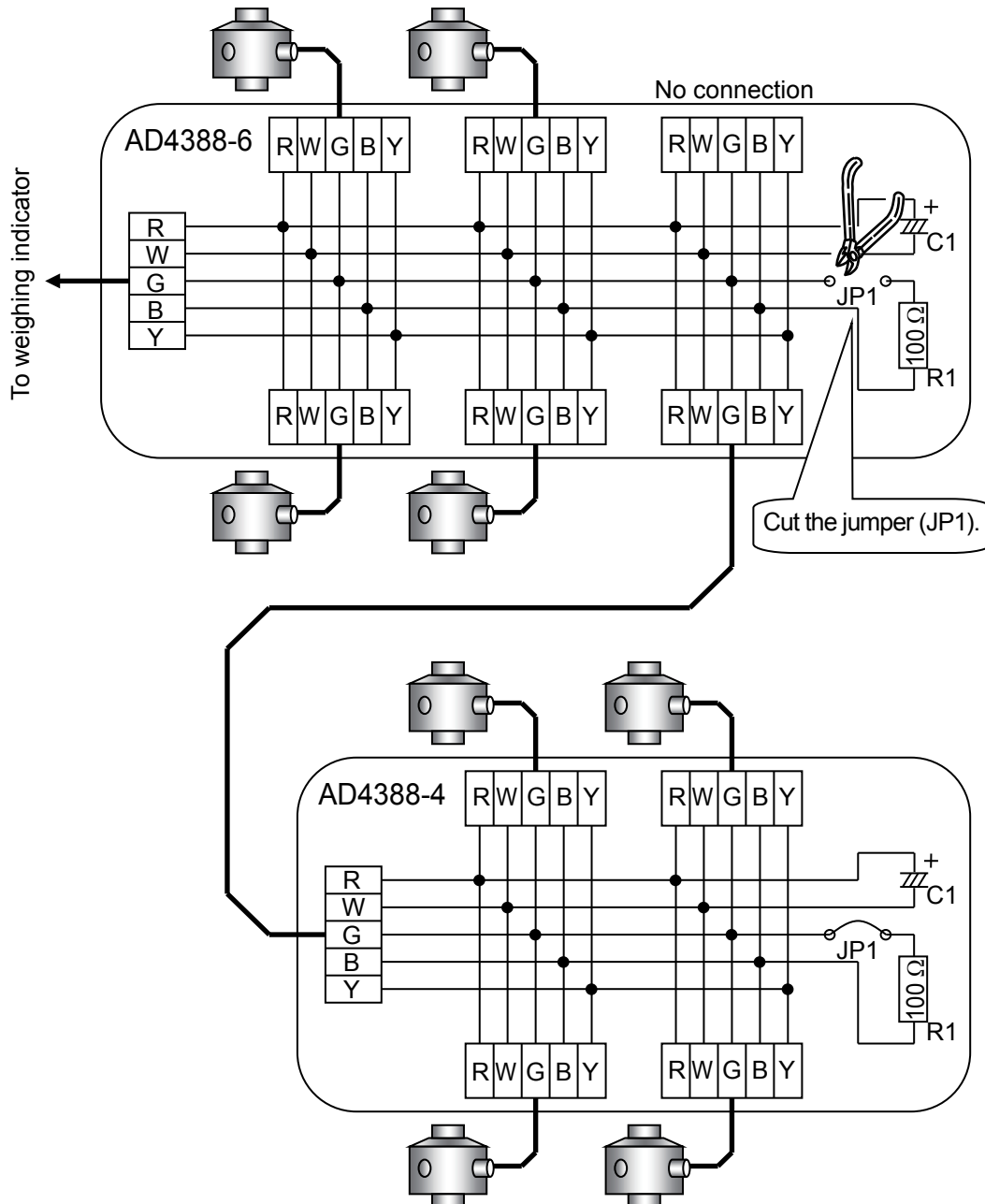
4.3. When connecting more than 6 load cells

When connecting more than six load cells, multiple junction boxes are required.

In that case, to have a termination resistance of $100\ \Omega$, do the following.

Leave the jumper (JP1) in the junction box installed furthest from the weighing indicator as is and cut the jumpers (JP1) in the other junction boxes, using wire cutters.

Fig.4 shown below is an example connection diagram when using an AD4388-4 and an AD4388-6 to connect eight digital load cells.



5. Digital Load Cell Presetting

Before operation, set the number of load cells and serial number.

Before setting, "Error" will appear in the display.

5.1. Setting the number of digital load cells connected

Press [OPR/STB] in weighing mode to go to Standby mode (" . ").

While pressing and holding [MODE], press [OPR/STB] to go to F-function mode (F-0).

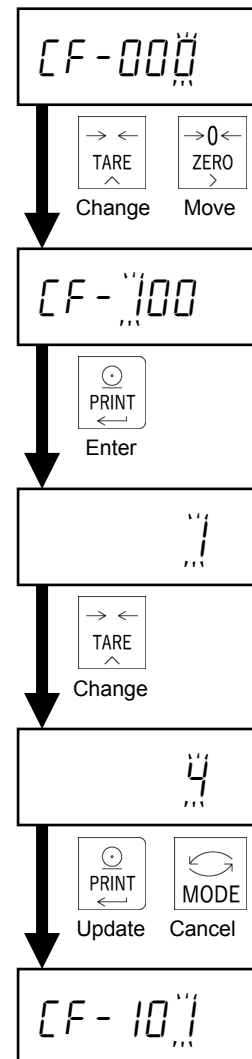
Press [CAL] to go to CF-function mode.

Select "CF-100" by the following key operations.

- [ZERO]: Move the flashing digit.
- [TARE]: Change the value of the flashing digit.
- [PRINT]: Confirm the displayed item.

Change the number of digital load cells connected by the following key operations.

- [TARE]: Change the value of the flashing digit.
- [PRINT]: Update to the new value and return to the item selection.
- [MODE]: Cancel the value setting and return to the item selection.



5.2. Serial number settings of digital load cells

Before operation, check the serial number on the digital load cell. And set the serial number specified for each digital load cell to the AD4329A-DLC.

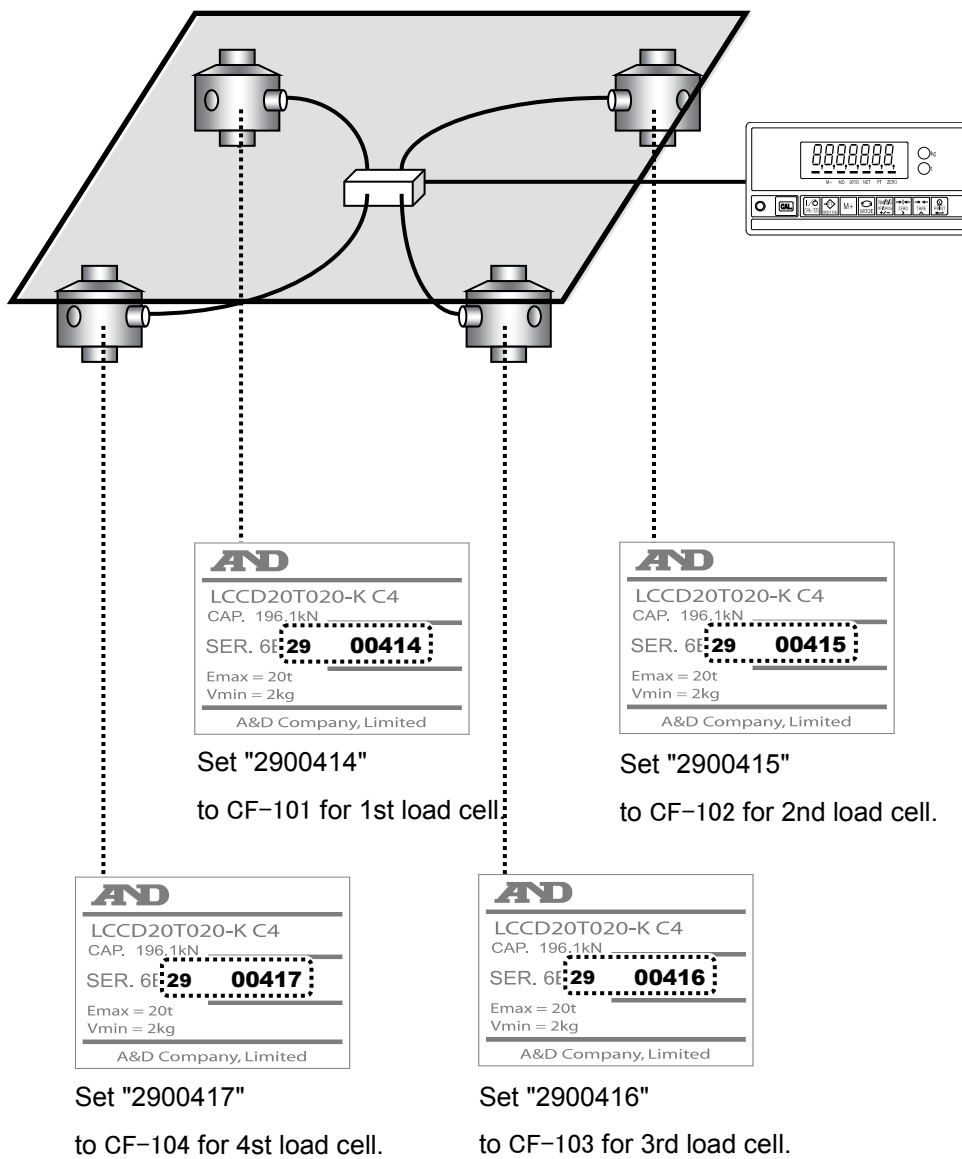
When your weighing scale is built using four digital load cells, the serial numbers for four units must be set.

When setting the serial number, set it in the order for corner adjustment starting from "CF-101".

Check the serial number marked on each digital load cell.

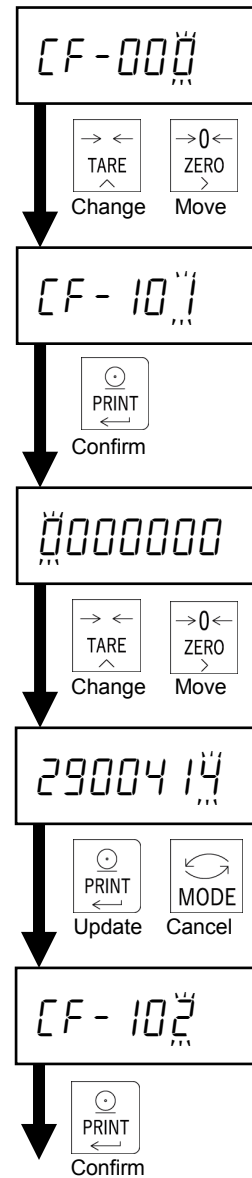
For example, with the LCCD20 series (manufactured by A&D), it is marked on the rating label on the body.

The last seven of the nine digits of serial number "SER." are the serial number to be set.



Select "CF- 10 1" by the following key operations in CF-function mode.

- [ZERO]: Move the flashing digit.
- [TARE]: Change the value of the flashing digit.
- [PRINT]: Confirm the displayed item.



Change the setting value by the following key operations.

- [ZERO]: Move the flashing digit.
- [TARE]: Change the value of the flashing digit.
- [PRINT]: Update to the new value and return to the item selection.
- [MODE]: Cancel the value setting and return to the item selection.

Set the serial numbers for all of the digital load cells connected by using the same procedure.

6. Calibration

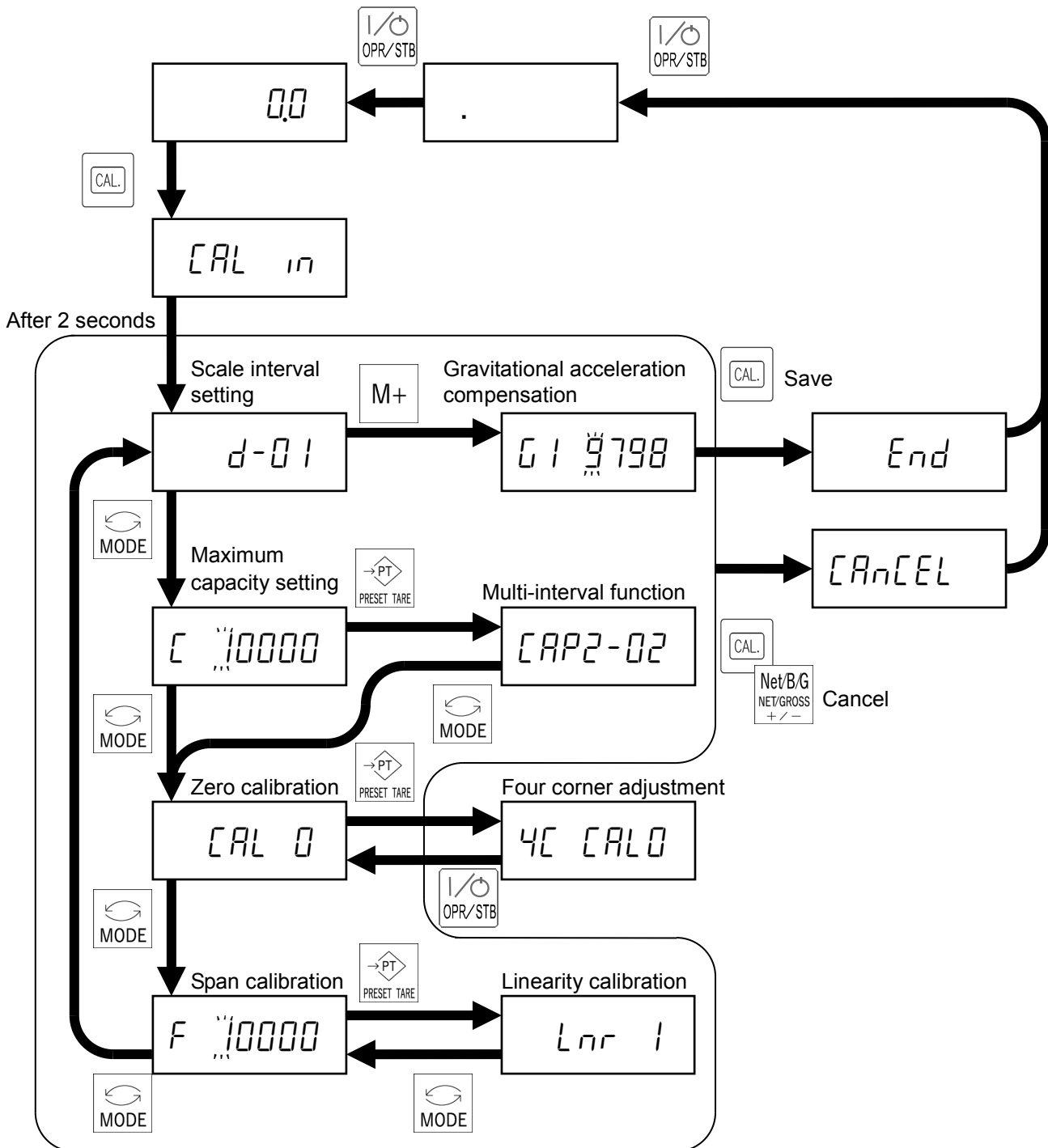
Calibrate the AD4329A-DLC so that it can properly convert the signal from the load cell to a mass value.

Set or execute the following items required for calibration.

- Scale interval (resolution) setting
- Maximum capacity setting
- Four corner adjustment
- Zero calibration
- Span calibration
- Linearity calibration (if necessary)
- Gravity acceleration compensation (if necessary)

Refer to "13.3 CF-function setting method" regarding setting of decimal point position (CF-000) and units (CF-001).

Select the item by the following key operations.



6.1. Scale interval setting

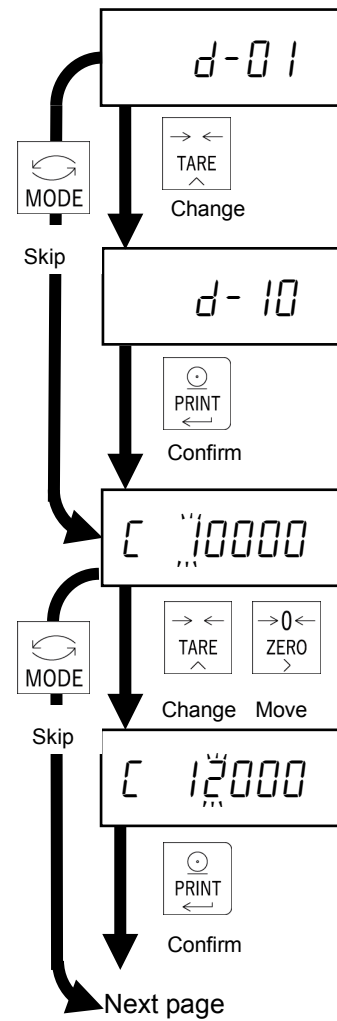
Select a scale interval from 1d, 2d, 5d, 10d, 20d, or 50d by the following key operations.

- [TARE]: Select the scale interval.
- [PRINT]: Confirm the changed value and go to the next item.
- [MODE]: Skip this item and go to the next item.

6.2. Maximum capacity setting

Set a maximum capacity by the following key operations

- [TARE]: Change the value of the flashing digit.
- [ZERO]: Move the flashing digit.
- [PRINT]: Confirm the changed value and go to the next item.
- [MODE]: Skip this item and go to the next item.



6.3. Zero compensation at four corner adjustment

Press [PRESET TARE].

Press [PRINT].

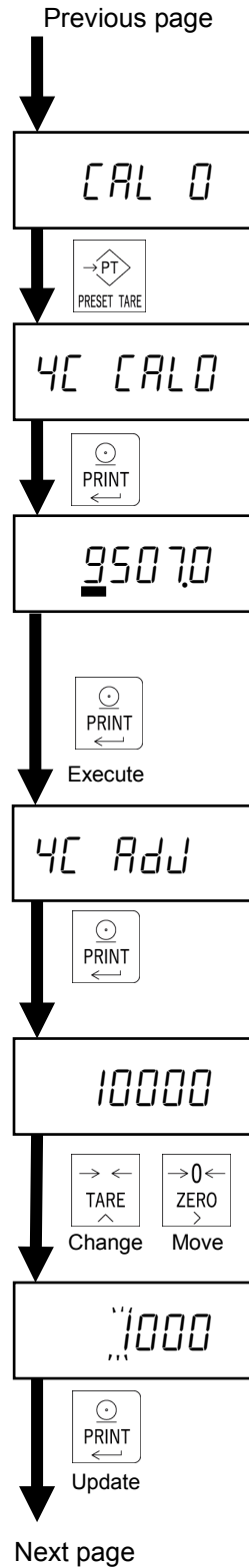
Empty the scale. When the MD mark illuminates, press [PRINT] to execute zero compensation at four corner adjustment and go to the next item.

6.4. Adjustment weight at four corner adjustment

Press [PRINT].

Set an adjustment weight value for corner adjustment by the following key operations.

- [TARE]: Change the value of the flashing digit.
- [ZERO]: Move the flashing digit.
- [PRINT]: Update to the new value and go to the next item.



6.5. Four corner adjustment

The example shown in the figure is when the weighing scale is built using four digital load cells.

Press [PRINT].

Put the adjustment weight on the 1st digital load cell.

When the MD mark illuminates, press [PRINT] to execute corner adjustment for 1st digital load cell.

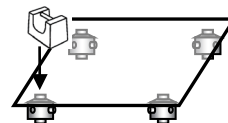
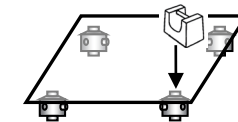
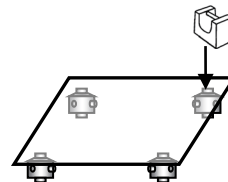
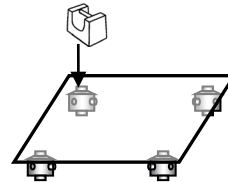
Press [PRINT].

Put the adjustment weight on the 2nd digital load cell.

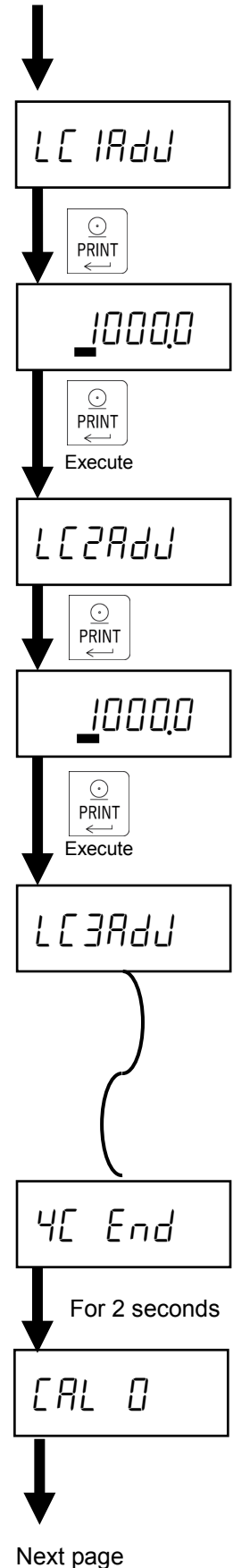
When the MD mark illuminates, press [PRINT] to execute corner adjustment for 2nd digital load cell.

Execute corner adjustment for all of the load cells connected by using the same procedure.

After that, the display proceeds as shown in the example at the right.



Previous page



6.6. Zero calibration

Empty the scale. When the MD mark illuminates, press [PRINT] to execute zero calibration and go to the next item.

If [MODE] is pressed, the zero calibration will be skipped.

6.7. Span calibration

"CAL F" will appear in the display for 2 seconds.

Set the calibration weight by the following key operations.

- [TARE]: Change the value of the flashing digit.
- [ZERO]: Move the flashing digit.
- [MODE]: Skip span calibration, and return to scale interval setting.

Place the calibration weight on the scale.

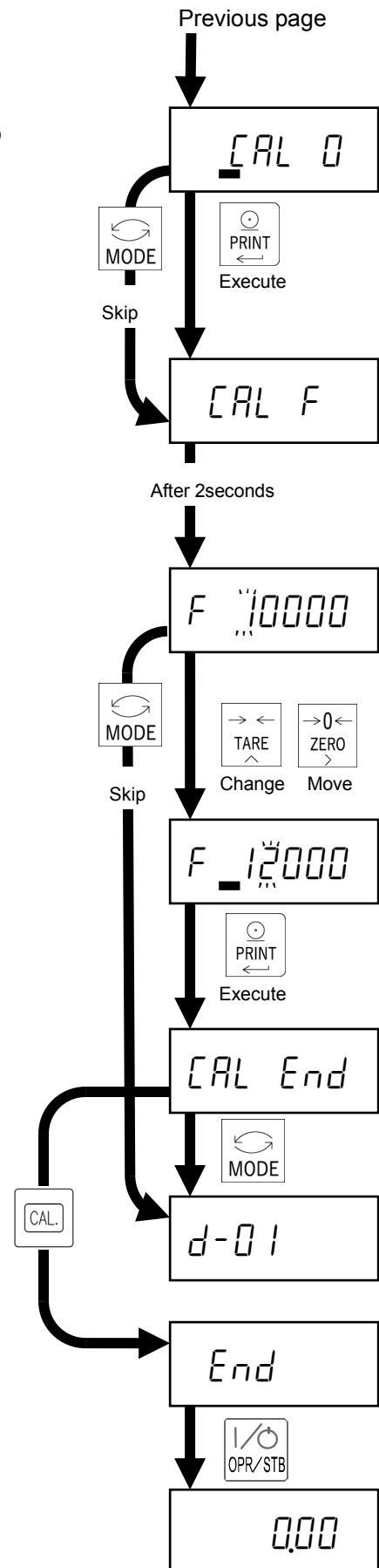
When the MD mark illuminates, press [PRINT] to execute span calibration.

If the calibration was done successfully, "CAL End" is displayed.

Pressing [CAL] finishes the calibration and "End" is displayed.

Pressing [MODE] returns to scale interval setting again.

Pressing [OPR/STB] twice goes to weighing mode.



6.8. Multi-interval function

The multi-interval function divides weighing range into two or three ranges and can change scale interval automatically according to the load applied.

Set the following items to use multi-interval function.

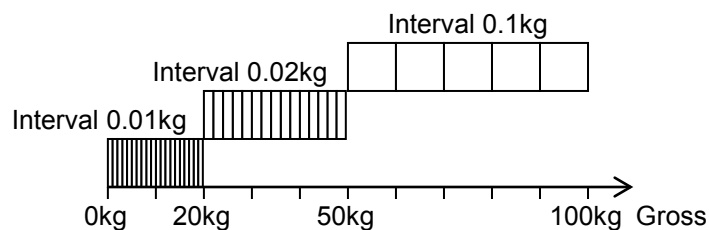
- 1st range maximum capacity and interval
- 2nd range maximum capacity and interval
- 3rd range maximum capacity and interval (if necessary)

The setting value must meet the following conditions:

- 1st range capacity and interval < 2nd range capacity and interval < 3rd range capacity and interval
- 1st range $\frac{\text{Capacity}}{\text{Interval}}$ + 2nd range $\frac{\text{Capacity}}{\text{Interval}}$ + 3rd range $\frac{\text{Capacity}}{\text{Interval}}$ < 10000

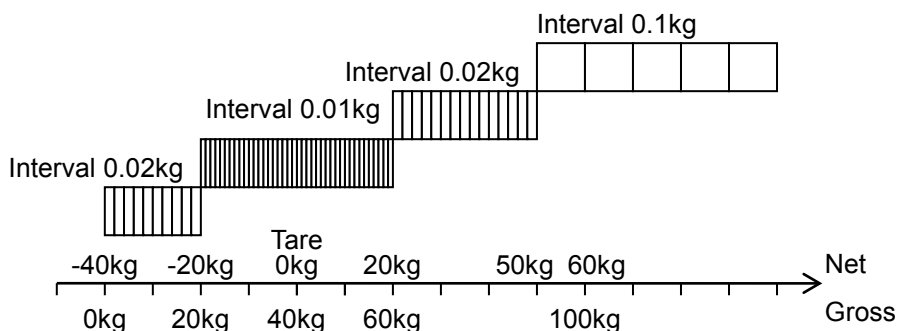
Example1.

Setting value	1st range:	Capacity 20.00kg, Interval 0.01kg
	2nd range:	Capacity 50.00kg, Interval 0.02kg
	3rd range:	Capacity 100.0kg, Interval 0.1kg
Display	When the weighing value is between 0 and 20kg, 1st range (Interval 0.01kg) is selected.	
	When the weighing value is between 20 and 50kg, 2nd range (Interval 0.02kg) is selected.	
	When the weighing value is between 50 and 100kg, 3rd range (Interval 0.1kg) is selected	



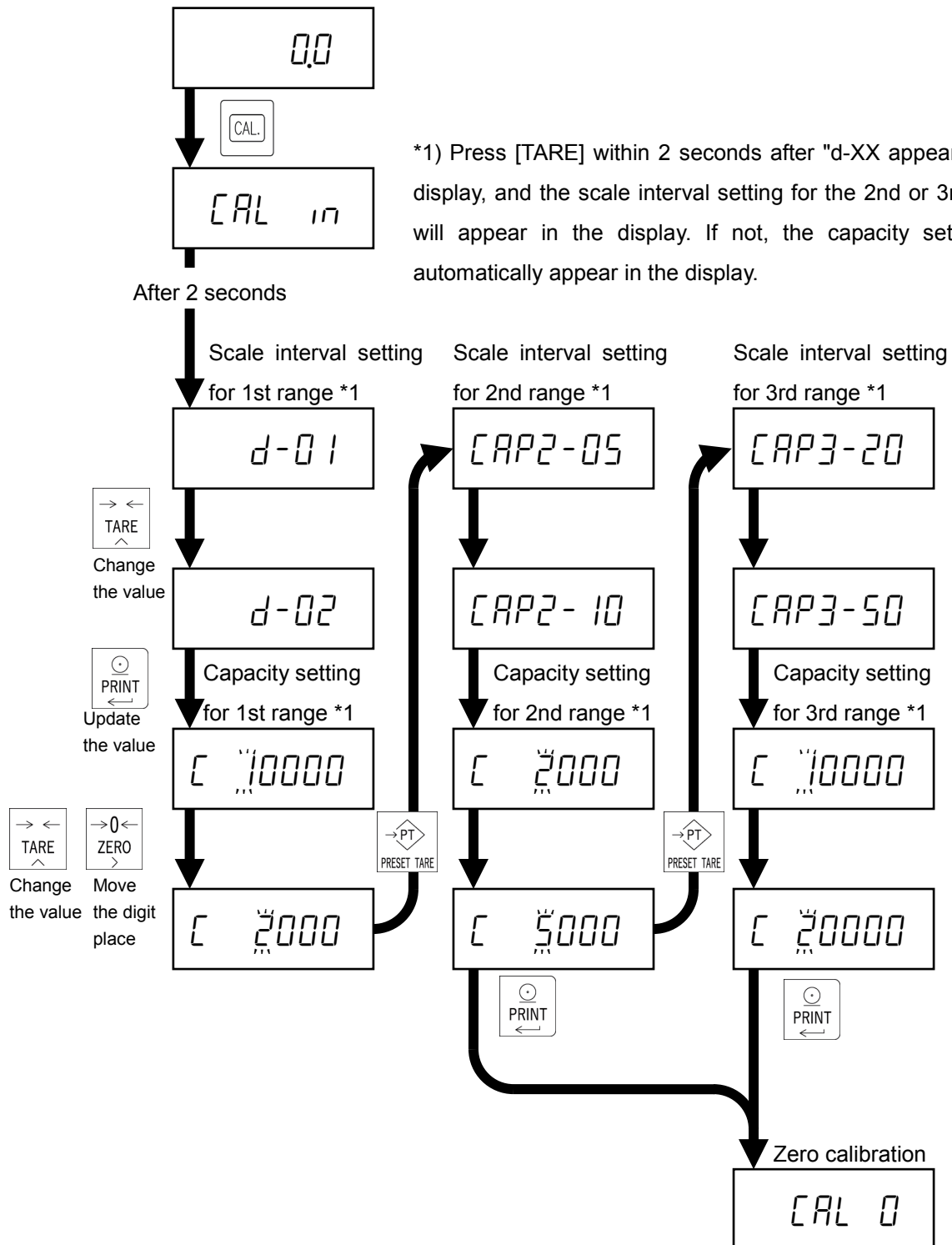
Example 2. The following is net display with Example 1 settings, when the tare value is 40kg.

Display	When the net value is between -40 and -20kg, 2nd range (Interval 0.02kg) is selected.	
	When the net value is between -20 and 20kg, 1st range (Interval 0.01kg) is selected.	
	When the net value is between 20 and 50kg, 2nd range (Interval 0.02kg) is selected.	
	When the net value is between 50 and 60kg, 3rd range (Interval 0.1kg) is selected.	



6.9. Scale interval and capacity settings for each range

Set the scale interval and capacity settings for each range by the following key operations.



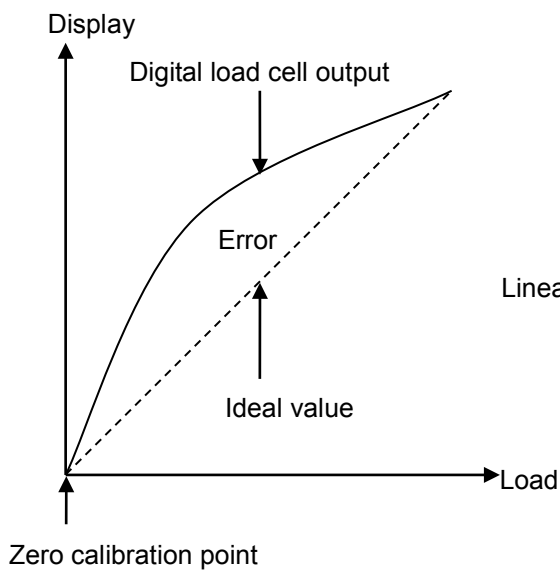
6.10. Linearity calibration

The linearity calibration is used to improve linearity by adjusting it at specified points when the linearity cannot be obtained properly even after calibrating the zero and span point.

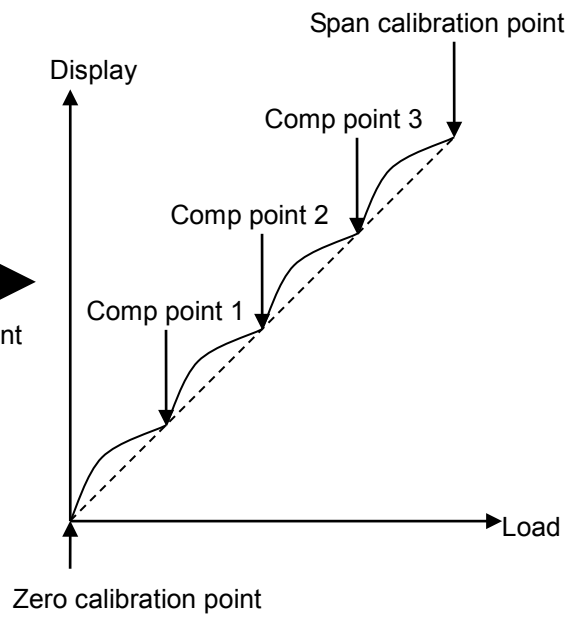
Set the following items to adjust linearity.

- Calibration for compensation point 1
- Calibration for compensation point 2 (If necessary)
- Calibration for compensation point 3 (If necessary)

Before compensation



After compensation



Linearity adjustment

• Linearity adjustment execution

Press [PRESET TARE] in the calibration weight setting for span calibration.

"L 1" will appear in the display for 2 seconds.

Set the adjustment weight by the following key operations:

- [TARE]: Change the value of the flashing digit.
- [ZERO]: Move the flashing digit.
- [MODE]: Delete compensation point 1, 2, and 3 to go to span calibration.

Place the adjustment weight on the scale. When the MD mark illuminates, press [PRINT] to execute adjustment for the point 1.

"L 2" will appear in the display for 2 seconds.

Set the adjustment weight by the following key operations:

- [TARE]: Change the value of the flashing digit.
- [ZERO]: Move the flashing digit.
- [MODE]: Delete compensation point 2 and 3 to go to span calibration.

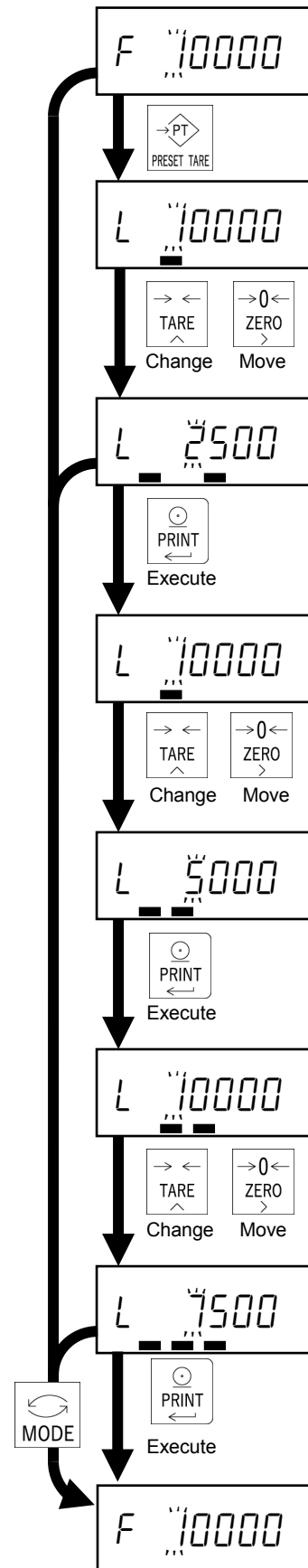
Place the adjustment weight on the scale. When the MD mark illuminates, ON, press [PRINT] to execute adjustment for the point 2.

"L 3" will appear in the display for 2 seconds.

Set the adjustment weight by the following key operations:

- [TARE]: Change the value of the flashing digit.
- [ZERO]: Move the flashing digit.
- [MODE]: Delete compensation point 3 to go to span calibration.

Place the adjustment weight on the scale. When the MD mark illuminates, press [PRINT] to execute adjustment for point 3.



6.11. Gravitational acceleration compensation

A weighing error may occur if there is a difference in gravity acceleration between the usage location and calibration location. This function specifies these gravity accelerations and corrects span error.

Set the following items to use gravitational acceleration compensation,

- Gravitational acceleration of the calibration location
- Gravitational acceleration of the usage location

- Gravitational acceleration compensation settings

Press [M+] in scale interval setting.

Set the gravitational acceleration for the calibration location by the following key operations:

The decimal point is not displayed.

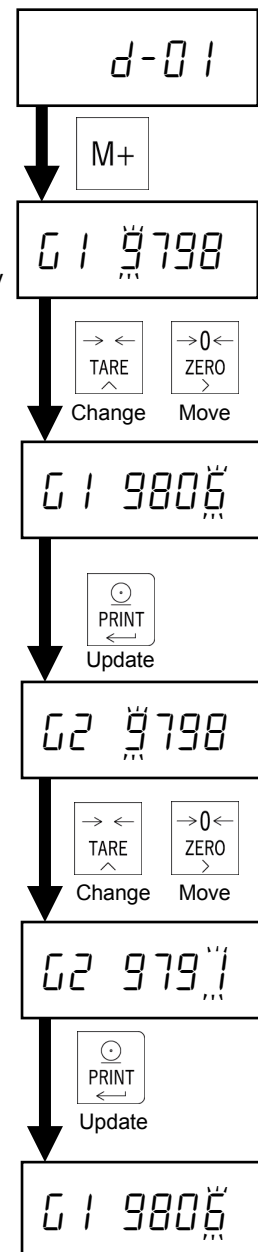
- [TARE]: Change the value of the flashing digit.
- [ZERO]: Move the flashing digit.
- [PRINT]: Update the displayed value as the gravitational acceleration of the calibration location.

Set the gravitational acceleration for the usage location by the following key operations:

The decimal point is not displayed.

- [TARE]: Change the value of the flashing digit.
- [ZERO]: Move the flashing digit.
- [PRINT]: Update the displayed value as the gravitational acceleration of the usage location.

After setting, press [CAL] to move to standby mode.



6.12. Error display

• Error display during calibration

Error display	Description
Err 0	In multi-interval scale, the last division is set to maximum (d50). Therefore, the next division cannot be entered.
Err 1	Shows that maximum capacity / scale interval (resolution) exceeds 10000. Set the resolution to 10000 or less.
Err 4	Shows that the calibration weight setting for span calibration exceeds the maximum capacity. Set the calibration weight setting to the maximum capacity or less.
Err 5	Shows that the calibration weight setting for span calibration is below the scale interval. Set the calibration weight to the scale interval or more.
Err 7	Shows that an output of the weighing unit is smaller than the zero point when the weight is placed on the load cell. Confirm if the weighing unit is properly connected to the weighing indicator and a load is applied in a direction opposite that of the weighing unit.
Err 12	Shows that the last weighing range is larger than the next weighing range.
Err 13	Shows that the adjustment weight settings for linearity adjustment don't meet the following conditions The weight setting for $L_{nr} 1 < \text{The weight setting for } L_{nr} 2 < \text{The weight setting for } L_{nr} 3$
G Err	Shows that gravitational acceleration 1 or 2 is incorrect.
LCn E 0	Shows that there is a problem with the n-th digital load cell.
LCn E 1	Shows that positive overload is applied to the n-th digital load cell.
LCn E 2	Shows that negative overload is applied to the n-th digital load cell.
no LCn	Shows that there is no response from the n-th digital load cell. Confirm the serial number settings, disconnections and damages. Confirm the status of the load cell by using check mode.

Four corners adjustments

Error display	Description
Err 4	Shows that the weight values set at four corner adjustment exceed maximum capacity.
Err 5	Shows that the weight values set at four corner adjustment are smaller than the scale interval.
Err 7	Shows that the value is below zero point even after placing the weight at four corner adjustment.

Pressing [MODE] returns to the previous step.

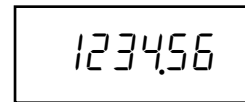
7. Basic Weighing Function

7.1. Weighing mode

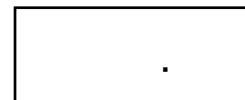
When the AD4329A-DLC is turned on, all the segment of the display illuminate/extinguish for checking the display. Then the AD4329A-DLC is in weighing mode and starts weighing.

The contents in the display in weighing mode are as follows.

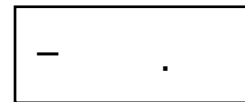
- Weighing value



- Positive overload



- Negative overload



- Error display in weighing mode.

Error display	Description
<i>ErrAd n</i>	The output of the n-th digital load cell is too big. Check the status of the digital load cell in the check mode.
<i>ErrLC n</i>	The n-th digital load cell doesn't respond. Check if serial number setting is correct.
<i>Erroū n</i>	The load on the n-th digital load cell exceeds the rated capacity. Check the actual load.
-----	The load exceeds the power-on zero range. Press [MODE] to check the current load.

7.2. Display OFF (Standby mode)

When [OPR/STB] is pressed, the display is turned off.

7.3. Net / Gross value selection

Every time [NET/GROSS] is pressed, the displayed value is changed between net and gross.

The GROSS mark illuminates when the displayed value is the gross value.

The NET mark illuminates when the displayed value is the net value

7.4. Push zero

Pressing [ZERO] sets the gross value to zero, when the weighing value is within the zero range (CF-002) and the MD mark is illuminated.

7.5. Zero tracking

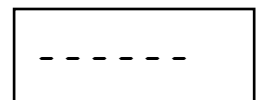
The gross value is set to zero automatically when the gross value meets the zero-tracking condition (F-01).

7.6. Power-on zero

After turning on the power, the gross value is set to zero automatically when the gross value is within the zero range (CF-002).

If you use power-on zero, set power-on zero (CF-005) to 1: Enable (default).

If the gross value is not within zero compensation range, the figure at the right will be displayed.



Pressing [MODE] moves to weighing mode without power-on zero.

7.7. Zero detection

Center of zero is detected and the ZERO mark illuminates when the gross value is within 1/4 of the scale interval.

7.8. Stability detection

Stability is detected and the MD mark illuminates when the weight value meets the stability detection condition (F-02).

7.9. Tare

Tare is a function that saves the current gross value as a tare value and set the net value to zero.

The function is used to display a net value with the container weight subtracted from the total weight if you put an object into a container to weigh it.

- Tare execution

When the MD mark is illuminated, pressing [TARE] saves the tare value and the net value is displayed.

- Tare clear

The tare value is set to 0 by the following operations:

- Pressing [TARE] when the gross value is 0d.
- Power-on zero
- Push zero

7.10. Preset tare

This subtracts a preset tare from the gross value.

If you use the preset tare, set preset tare function (CF-006) to 0: Enable. Default is 1: Disable.

Set the item by the following key operations.

1. Press [PRESET TARE].
2. The current preset tare value is displayed with the preset tare mark illuminated.
3. Press [ZERO] to move the flashing digit. Press [TARE] to change the value of the flashing digit.
4. Press [PRINT] to update the preset tare value to go to weighing mode and display the net value.

7.11. Accumulation

The function accumulates weighing data and stores sum of weight and count of weighing.

Set the following functions to use accumulation function:

- Set accumulation (CF-011) to 1: Enable. Default is 0: Disable.
- Set accumulation mode and operation in minus display ((F-04) from the following settings:

0:	Manual accumulation: Accumulation is not possible in minus display.
1:	Manual accumulation: Accumulation is possible in minus display.
2:	Auto accumulation: Accumulation is not possible in minus display.
3:	Auto accumulation: Accumulation is possible in minus display.

- Set accumulation inhibit range (F-05) from the following settings
0: None, 1: 5d (default), 2: 10d, 3: 20d, 4:50d

● Accumulation execution

- Manual accumulation:
When [M+] is pressed with the MD mark illuminated, accumulation is executed and the display flashes once.
- Auto accumulation:
When the MD mark is illuminated, is executed and the display flashes once.
- If the displayed value is minus, accumulation may not be executed depending on the setting (F-04).
- Once accumulated, it will not be possible to accumulate again until the displayed value is within the accumulation inhibit range.

● Limit of total value and the accumulation count.

- The upper limit of total value is +999999. The lower limit of total value is -999999.
- The upper limit of accumulation count is 999999.

● Display total value

1. Press [MODE] in weighing mode.
2. After "Total" is displayed, the total value is displayed with M+ mark flashing.
3. Press [MODE] again to go to weighing mode.

It is not possible to display the accumulation count.

- Previous accumulation canceling

1. Press [MODE].
2. After "TOTAL" is displayed, the total value is displayed with M+ mark flashing.
3. Press and hold [M+] for 3 seconds or longer.
4. After the display flashes once, the prior accumulation is canceled and the total value returns to the previous one.

It is not possible to cancel via external control input.

- Total value clear

1. Press [MODE].
2. After "TOTAL" is displayed, the total value is displayed with M+ mark flashing.
3. Press and hold [ZERO] for 3 seconds or longer.
4. After the display flashes once, the total value is cleared to 0.

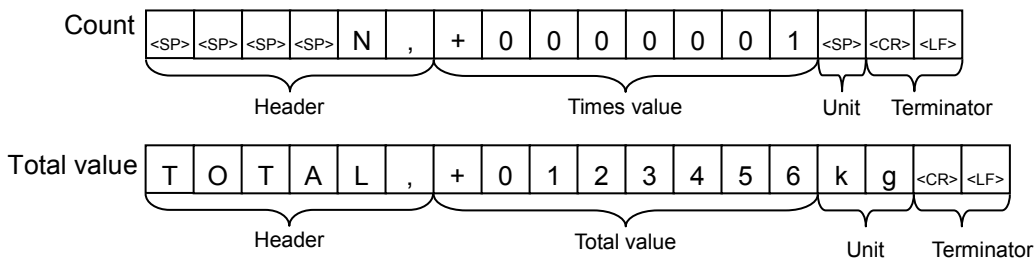
It is not possible to cancel via external control input.

- Data output of total value

- It can output to standard serial output and RS-232C. However, only manual print mode is available.

1. Press [MODE].
2. After "TOTAL" is displayed, the addition mark flashes to display the total value.
3. Press [Print].
4. Outputs the times and the total value in order.

*) Output example



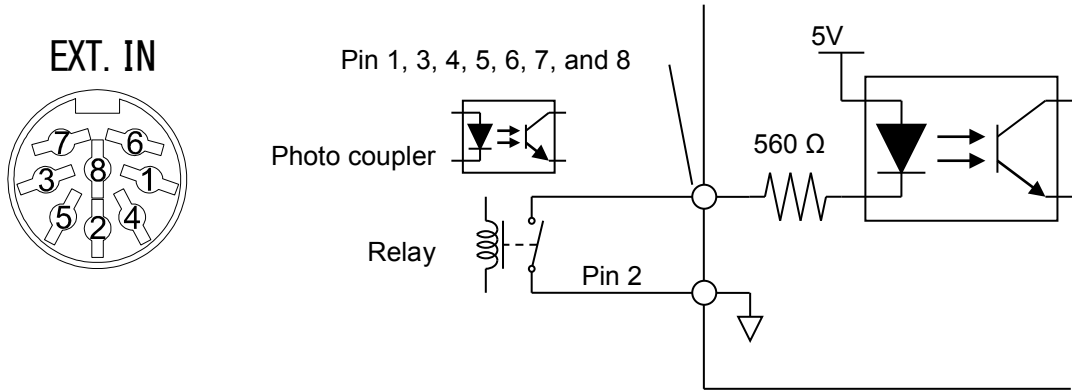
8. External Control Input

It is possible to control the various functions via external control input.

Each function is executed when the input pin is shorted (OFF -> ON). The pulse width is 100 ms or more.

The applicable connector is a DIN connector 8-pin plug.

A TCP0586-715267 manufactured by Hosiden is included as an accessory.



- If you use external control inputs, select the functions for each pin from the following settings:

Pin 1 (F-10) Pin 3 (F-11) Pin 4 (F-12) Pin 5 (F-13) Pin 6 (F-14) Pin 7 (F-15) Pin 8 (F-16)	0:	None (default)
	1:	ZERO key
	2:	TARE key
	3:	PRINT key
	4:	OPR/STB key
	5:	M+ key
	6:	NET / GROSS key
	7:	MODE key
	8:	ON= net / OFF= gross is displayed
	9:	Display the total value
	10:	Display overload
	11:	Release the key lock (F-06)

9. Standard Serial (Current Loop) Output

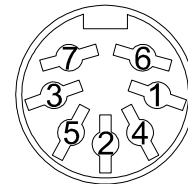
The standard serial output is the interface for connecting to an A&D external indicator or printer.

The applicable connector is a DIN connector 7-pin plug.

A TCP0576-715267 connector manufactured by Hosiden is included as an accessory.

Pin No.	Description
1	NC
2	NC
3	Current loop output, no polarity
4	NC
5	Current loop output, no polarity
6	NC
7	NC
Shell	Frame ground

SER. OUT



Communication specifications

Signal level	Current loop 0..20 mA
Baud rate (F-34)	0:600、 1:1200、 2:2400 bps
Data bit length	7 bits
Parity	Even
Start bit length	1 bit
Stop bit length	1 bit
Code	ASCII
Terminator	CR LF

If you use the standard serial output, configure the following settings:

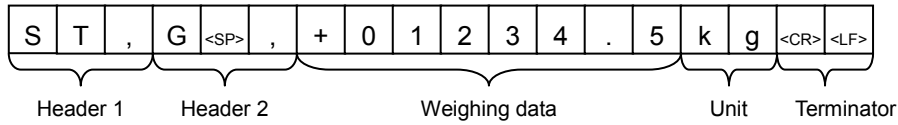
- Select output data (F-30) from the following settings:

0:	Displayed value (default)	
1:	Gross value	
2:	Net value	The preset tare value may be output depending on the setting (CF-007).
3:	Tare value	
4:	Gross + Net + Tare value	If you connect a printer without receive buffer, set the data interval (F-33) to 1: 2 seconds

- Select communication mode (F-31) from the following settings:

0:	Stream (default)	Weighing data is output at the display update rate (F-03).
1:	Auto print	When the MD mark is illuminated, weighing data is output. Once output, it will not be possible to output again until the displayed value is within output inhibition range (F-32)
2:	Manual print	When [PRINT] is pressed with the MD mark illuminated, weighing data is output.

9.1. Output data format



Item	Value	
Header 1	ST,	stable
	US,	The weighing data is unstable
	OL,	overload
Header 2	G<SP>,	gross value
	N<SP>,	The weighing data is net value
	T<SP>,	tare value
	PT,	preset tare value
Weighing data *1	+01234.5	Numerical value with polarity
	+0000000	0
	+<SP><SP><SP><SP>.<SP><SP>	Positive overload
	-<SP><SP><SP><SP>.<SP><SP>	Negative overload
Unit (CF-001) *1	kg	Kilo gram
	<SP>t	Ton

*1) It is possible to select the number of digits and decimal point format for output data (CF-010).

0: Two digits, "." dot

1: Three digits, "." dot

2: Two digits, "," comma

3: Three digits, "," comma

10. Comparator Output (Option-02)

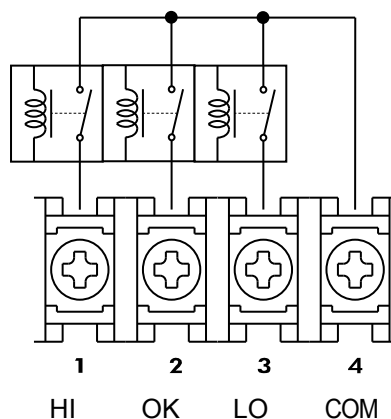
The upper/lower limit value is compared with the weighing value, and the comparator output will turn on (short circuit) when the condition is met.

Conditions	Comparator output
Displayed value > Upper limit	HI
Upper limit \geq Displayed value \geq Lower limit	OK
Lower limit > Displayed value	LO
Positive overload	HI
Negative overload	LO

The comparison with the upper limit is performed with priority.

Contact specification

Rated switching voltage	AC250V 5A、DC30V 5A
Relay parts life	Electronical life span: 100,000 times Mechanical life span: 10 million times



Use an M3 solderless terminal with a width of 6.2 mm or less.

If you use the comparator output, set the following settings:

- Set comparator function (F-20) to 1: Enable. Default is 0: Disable.
- Select comparator function inhibition condition (F-21) from the following settings:
 - 0: None (default).
 - 1: Displayed value is unstable.
 - 2: Displayed value is +5d or less.
 - 3: Displayed value is +5d or less or unstable.
 - 4: Displayed value is within $\pm 5d$.
 - 5: Displayed value is within $\pm 5d$ or unstable.
- Set the upper limit value and the lower limit value.
- Operation example
 - F-20 = 1, F-21 = 2 (not compared when the displayed value is +5d or less.)
 - Upper limit value = 3000, lower limit value = 500

Conditions	HI	OK	LO
Displayed value > 3000	ON		OFF
3000 \geq Displayed value \geq 500		ON	
500 > Displayed value > 5			ON
5 \geq Displayed value	OFF		

• Upper limit and lower limit setting

Press [ON/OFF] in weighing mode.

While pressing and holding [PRINT], press [OPR/STB].

"H," will appear on the display for 2 seconds.

Change the upper limit value by the following key operations.

The decimal point does not appear in the display.

Example: Input 3000 to set 300.0 for the upper limit

- [TARE]: Move the flashing digit.
- [ZERO]: Change the value of the flashing digit.
- [NET/GROSS]: Switch the polarity.
- [PRINT]: Update the value.
- [MODE]: Skip the upper limit value.

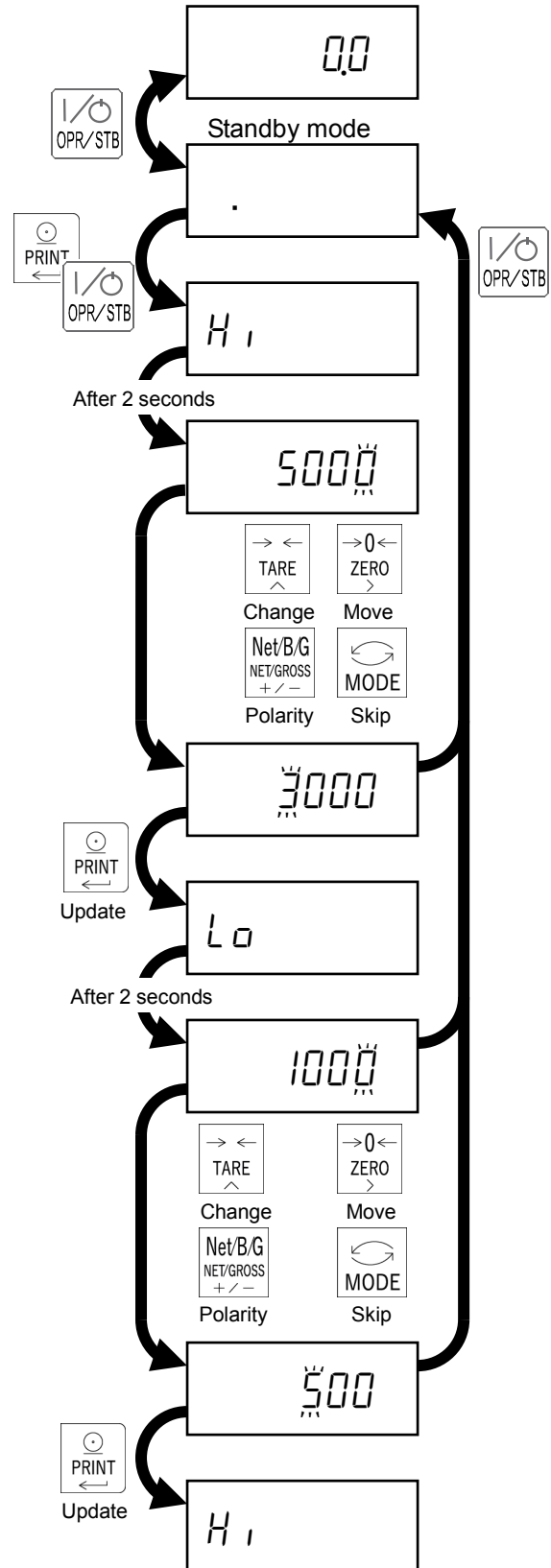
"Lo" will appear on the display for 2 seconds.

Change the lower limit value by the following key operations.

The decimal point does not appear in the display.

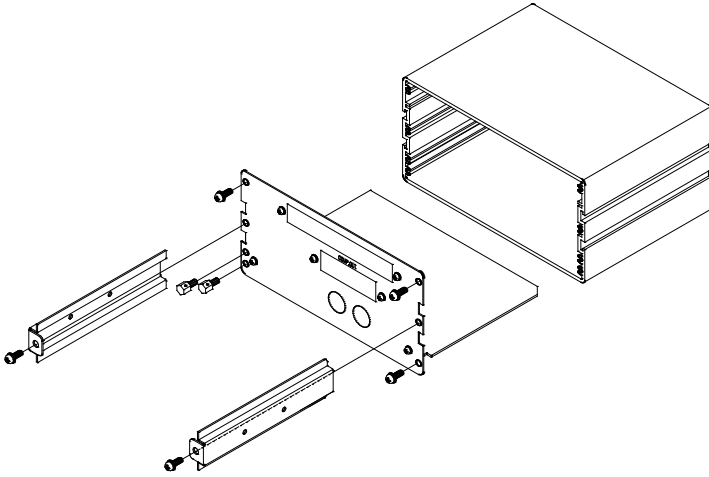
Example: Input 500 to set 50.0 for the lower limit

- [TARE]: Move the flashing digit.
- [ZERO]: Change the value of the flashing digit.
- [NET/GROSS]: Switch the polarity.
- [PRINT]: Update the value
- [MODE]: Skip the lower limit value.

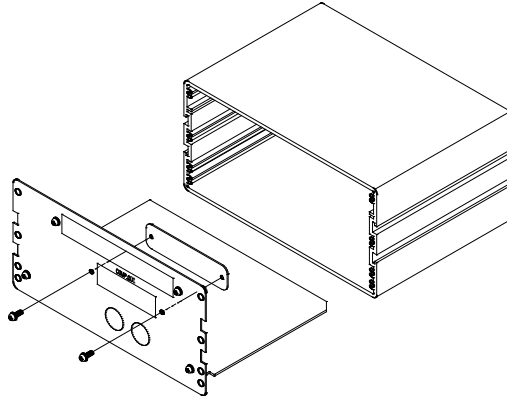


● Installation method

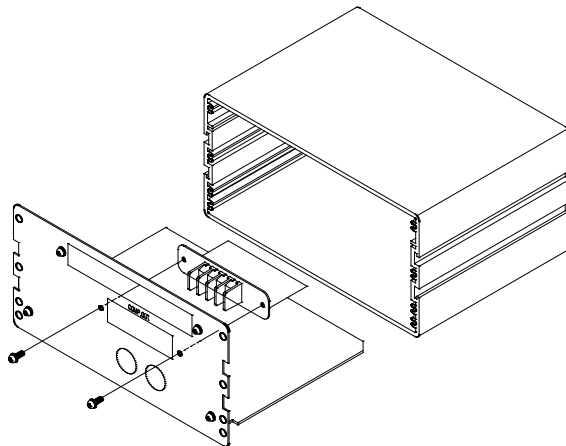
1. Remove four M4 screws and three hex bolts and the slide rail on the rear panel.
2. Remove the rear panel with the main board.



3. Remove two M3 screws on the COMP.OUT slot and the blank panel.



4. Install the comparator output option to the rear panel with two M3 screws.
5. Connect the 5-wire cable between the option board and J5 on the main board.



6. Assemble all parts except the blank panel by the reverse procedure. The blank panel is not used.

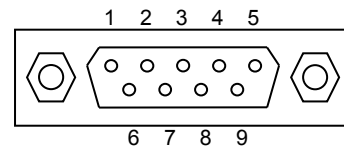
11. RS-232C Interface

RS-232C interface is used to connect the AD4329A-DLC to a PC or PLC.

The applicable connector is a 9-pin D-sub female with inch screws.

The connector is not provided and must be prepared by the user.

Pin No.	Description
1	NC
2	TXD (output)
3	RXD (input)
4	NC
5	SG
6-9	NC



Communication specifications

Signal level	RS-232
Baud rate (F-44)	0:600, 1:1200, 2:2400, 3:4800, 4:9600 bps
Data bit length	7 bits
Parity	Even
Start bit length	1 bit
Stop bit length	1 bit
Code	ASCII
Terminator	<CR> <LF>

If you use RS-232C, configure the following settings:

- Select output data (F-40) from the following settings:

0:	Displayed value (default)	
1:	Gross value	
2:	Net value	The preset tare value may be output depending on the setting (CF-007).
3:	Tare value	
4:	Gross + Net + Tare value	If you connect a printer without receive buffer, set the data interval (F-43) to 1: 2 seconds

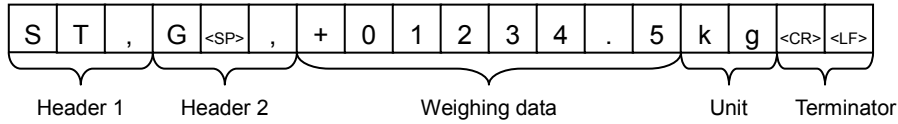
- Select communication mode (F-41) from the following settings:

0:	Stream (default)	Weighing data is output at the display update rate.
1:	Auto print	When the MD mark is illuminated, a weighing data is output. Once output, it will not be possible to output again until the displayed value is within output inhibition range (F-42)
2:	Manual print	When [PRINT] is pressed with the MD mark illuminated, weighing data is output.
3	Command	When a command is received from the master (PC or PLC), data will be read, functions will be executed, or data will be written.

11.1. Output data format

When F-41 is 0 / 1 / 2, the output data format is as follows.

- F-45 = 0: format 1



Item	Value	
Header 1	ST,	stable
	US,	The weighing data is unstable
	OL,	overload
Header 2	G<SP>,	gross value
	N<SP>,	The weighing data is net value
	T<SP>,	tare value
	PT,	preset tare value
Weighing data *1	+01234.5	Numerical value with polarity
	+00000.0	0
	+<SP><SP><SP><SP>.<SP><SP>	Positive overload
	-<SP><SP><SP><SP>.<SP><SP>	Negative overload
Unit (CF-001) *1	kg	Kilograms
	<SP>t	Ton

*1) it is possible to select the number of digits and decimal point format for output data (CF-010).

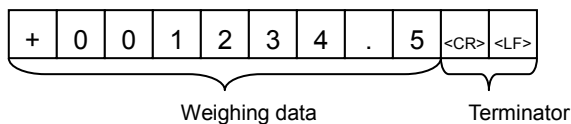
0: Two digits, "." dot

1: Three digits, "." dot

2: Two digits, "," comma

3: Three digits, "," comma

- F-45 = 1: format 2



If overload appears on the display, +99999999 without the decimal point will be output.

11.2. Command format

When F-41 is 3, the master device sends a command. Data will be read, a function will be executed, or data will be written.

- When transmitting the following command, corresponding data will be sent.

RW<CR><LF>	Reading a displayed value
------------	---------------------------

- When transmitting the following command, the function according the command will be executed and the command will be echoed back.

MZ<CR><LF>	Set the current display to the zero point.
MT<CR><LF>	Execute tare
CT<CR><LF>	Clear the tare value
MG<CR><LF>	Switch the display to gross value.
MN<CR><LF>	Switch the display to net value.

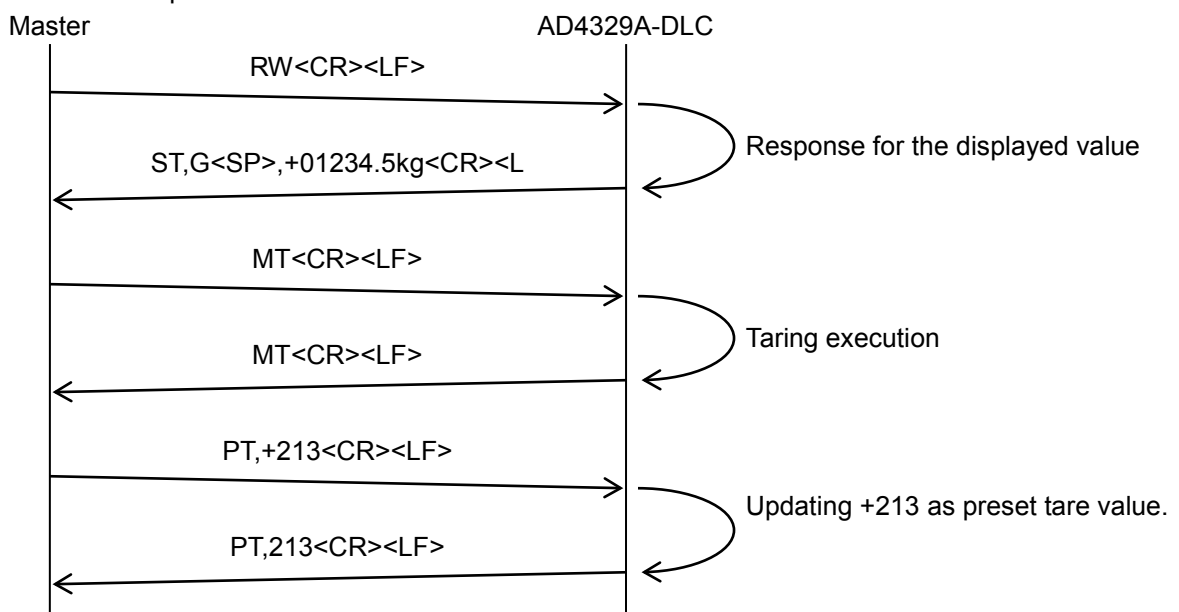
- When transmitting the following command and writing data is sent, the data will be updated and the command and writing data will be echoed back.

PT,+213<CR><LF>	Write a preset tare value. (Command shown at the left will write +213.)
HI,+5000<CR><LF>	Write an upper limit value (Command shown at the left will write +5000.)
LO,-560<CR><LF>	Write a lower limit value (Command shown at the left will write +560.)

- Error response

I<CR><LF>	Response to an unacceptable command.
?<CR><LF>	The command is incorrect.

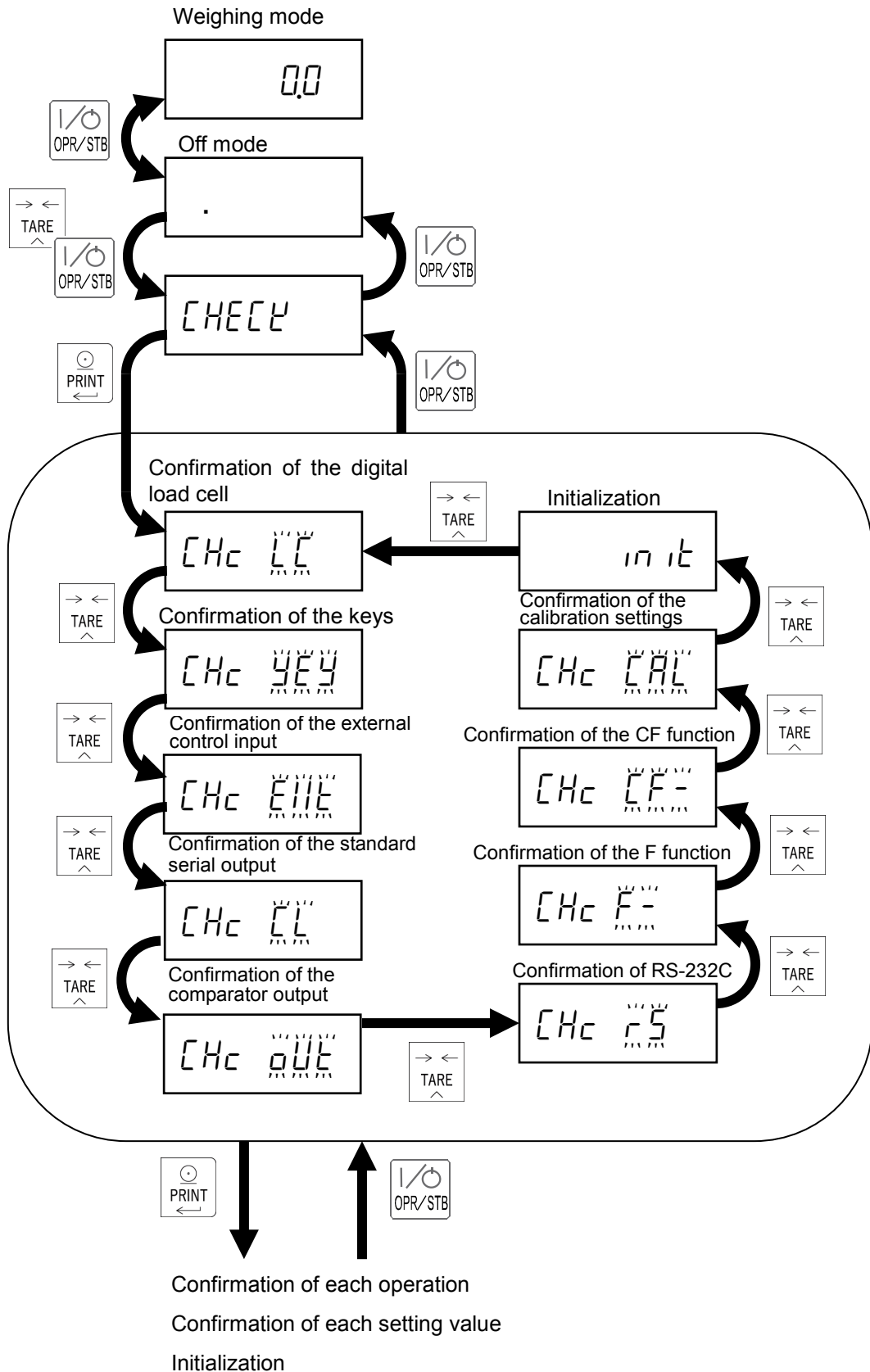
- Communication example



12. Confirming and Initializing the Operations and Setting Values

Confirm and initialize the operations and setting values by using the check mode.

Follow the procedure below to select the items, and then press [PRINT].



12.1. Confirming the digital load cell

The display shows the number of load cells connected in the box indicated by a dotted line.

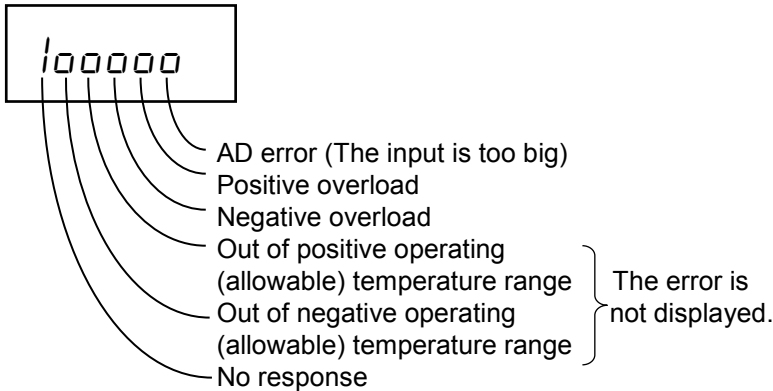
Press [TARE] to select the load cell number to be confirmed.

The example at the right is when the 4th load cell is selected.

After displaying "LC4 uEr" for 2 seconds, the software version of the digital load cell is displayed.

After displaying "LC4 SEt" for 2 seconds, its status is displayed.

When an error occurs, the corresponding "o" on the display is switched to "1".



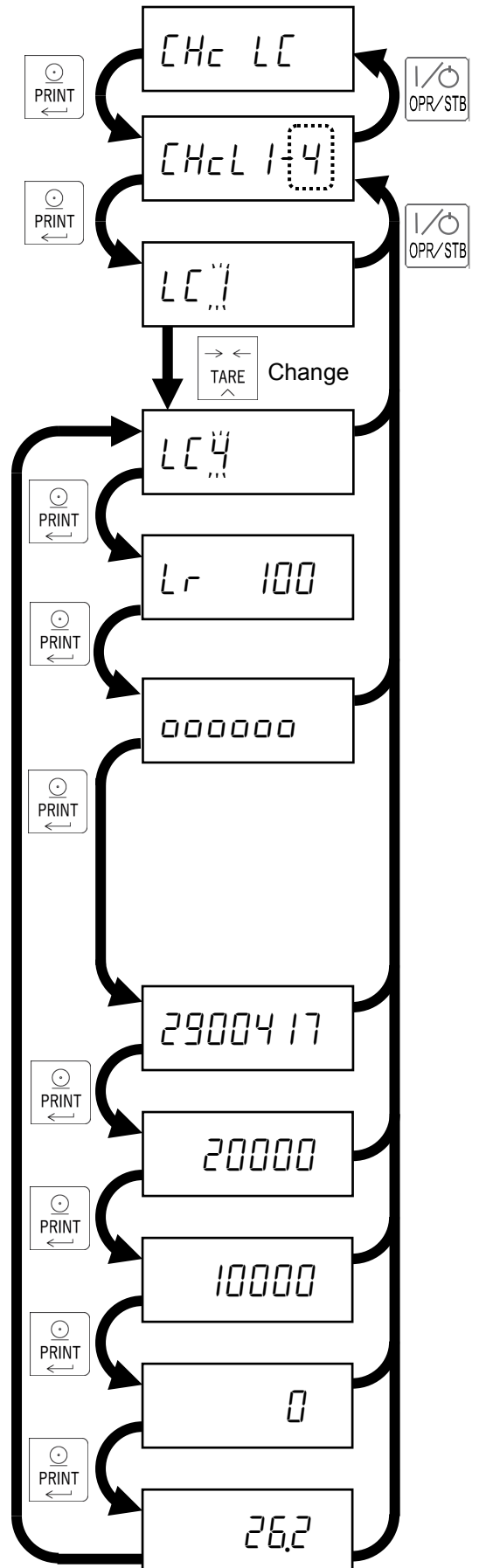
After displaying "LC4 Sn" for 2 seconds, the serial number is displayed.

After displaying "LC4 CAP" for 2 seconds, the rated capacity is displayed.

After displaying "LC4 oAd" for 2 seconds, the actual load applied to the load cell is displayed.

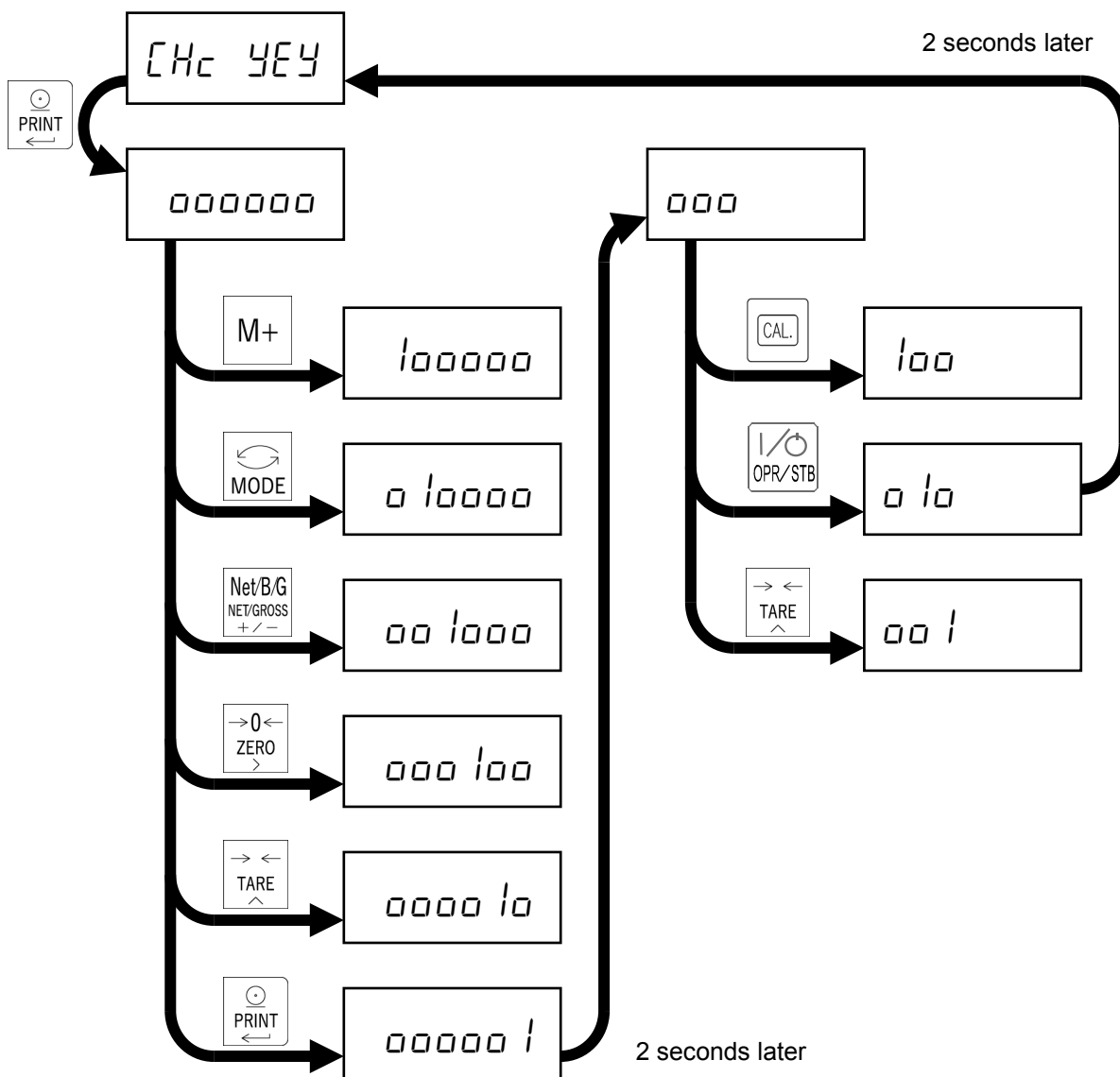
After displaying "LC4 cE" for 2 seconds, the value calibrated is displayed.

After displaying "LC4 tErP" for 2 seconds, the internal temperature (°C) is displayed.



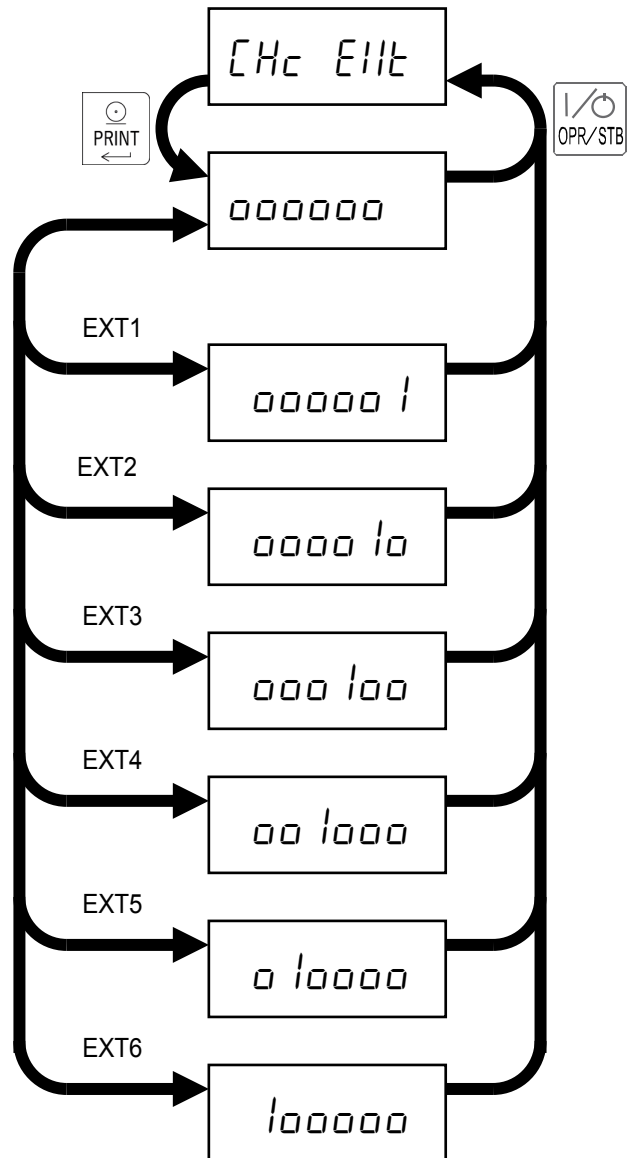
12.2. Confirming the keys

Press the each key to switch the corresponding "o" to "1".



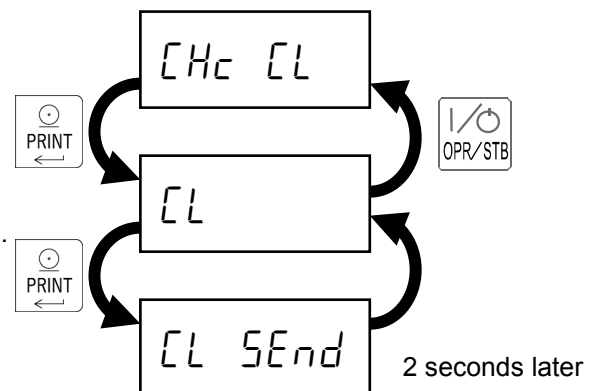
12.3. Confirming the external control input

By short-circuiting between each input terminal and COM, the corresponding "o" to switched to "1".



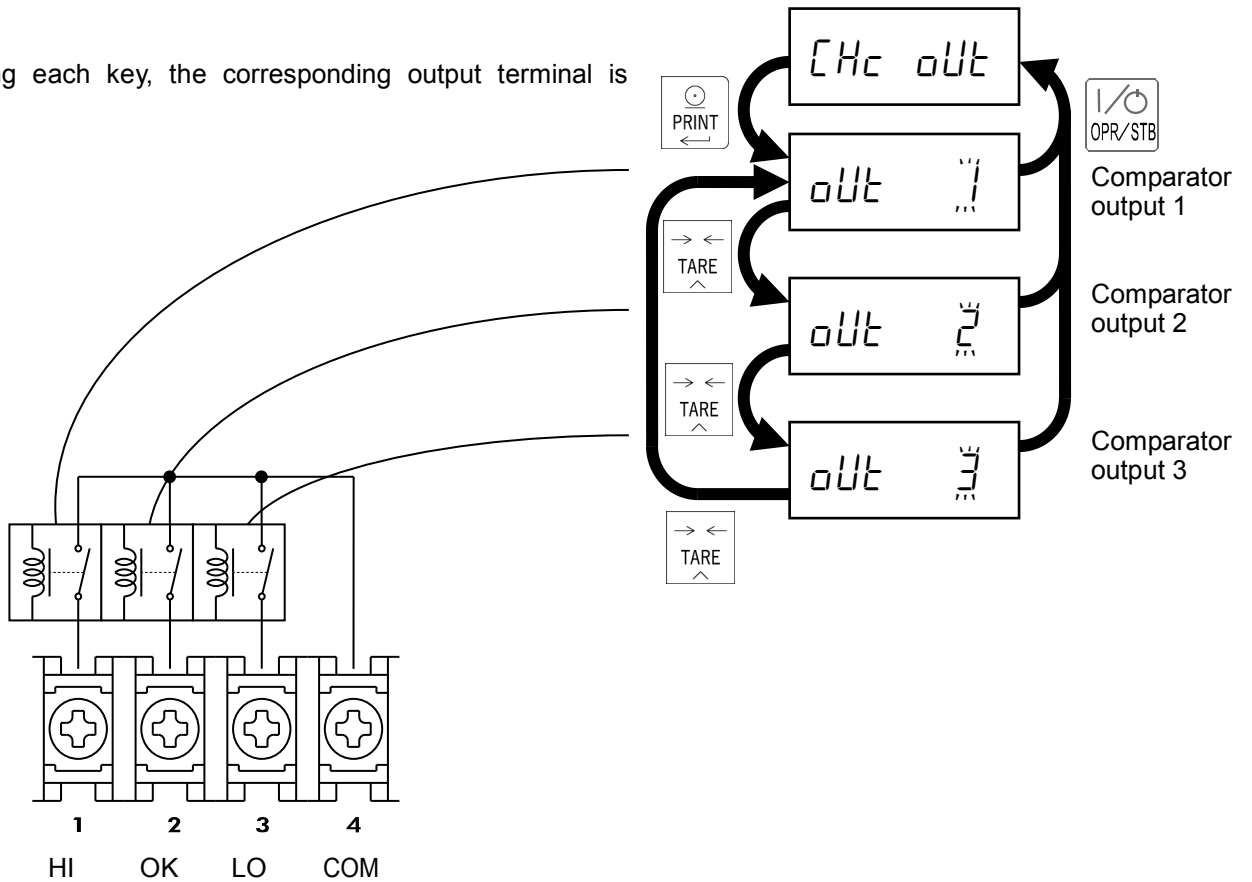
12.4. Confirming the standard serial output

Press [PRINT] to transmit ST,G<SP>,+00000.0kg<CR><LF>.
Communication specifications depend on settings for F-30 to F-34.



12.5. Confirming the comparator outputs

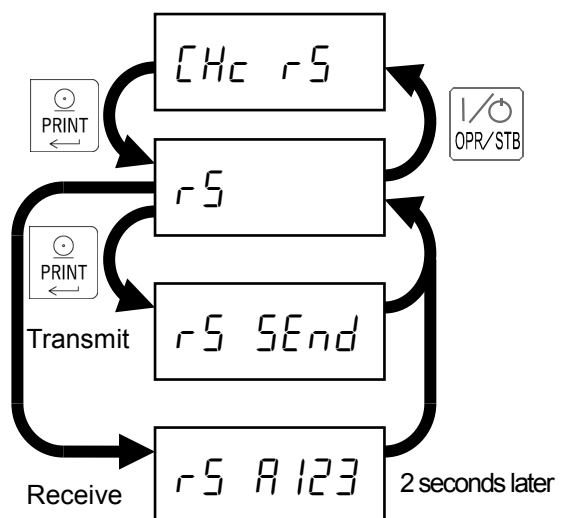
By pressing each key, the corresponding output terminal is turned on.



12.6. Confirming RS-232C

Press [PRINT] to transmit ST,G<SP>,+00000.0kg<CR><LF>. Communication specifications depend on settings for F-40 to F-47.

When receiving data, the first four characters are displayed. The example at the right is when A123<CR><LF> is received. Communication specifications depend on settings for F-40 to F-47.



12.7. Confirming the F function setting values

Operate the following keys to select the items to be confirmed.

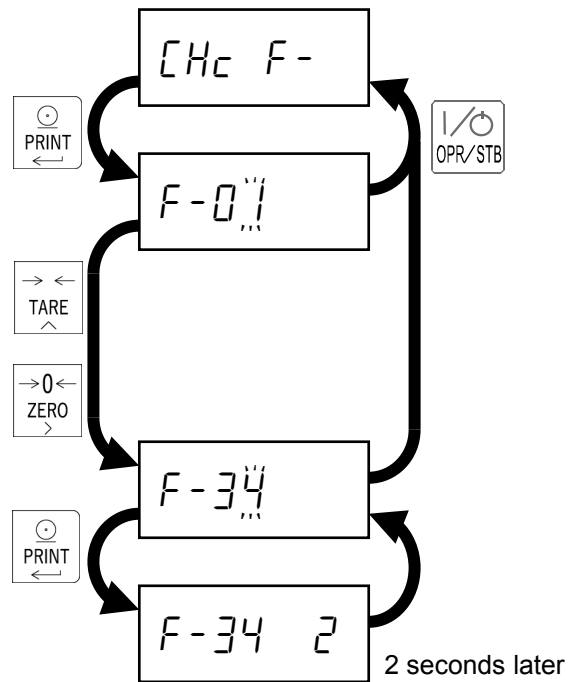
[TARE]: Change the value of the flashing digit.

[ZERO]: Move the flashing digit.

[PRINT]: Display the setting value for the currently displayed item.

Change

Move



12.8. Confirming the CF function setting values

Operate the following keys to select the items to be confirmed.

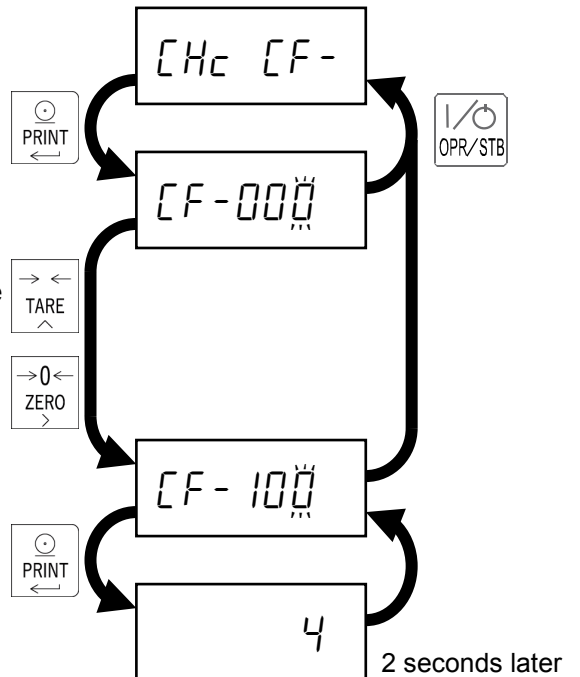
[TARE]: Change the value of the flashing digit.

[ZERO]: Move the flashing digit.

[PRINT]: Display the setting value for the currently displayed item.

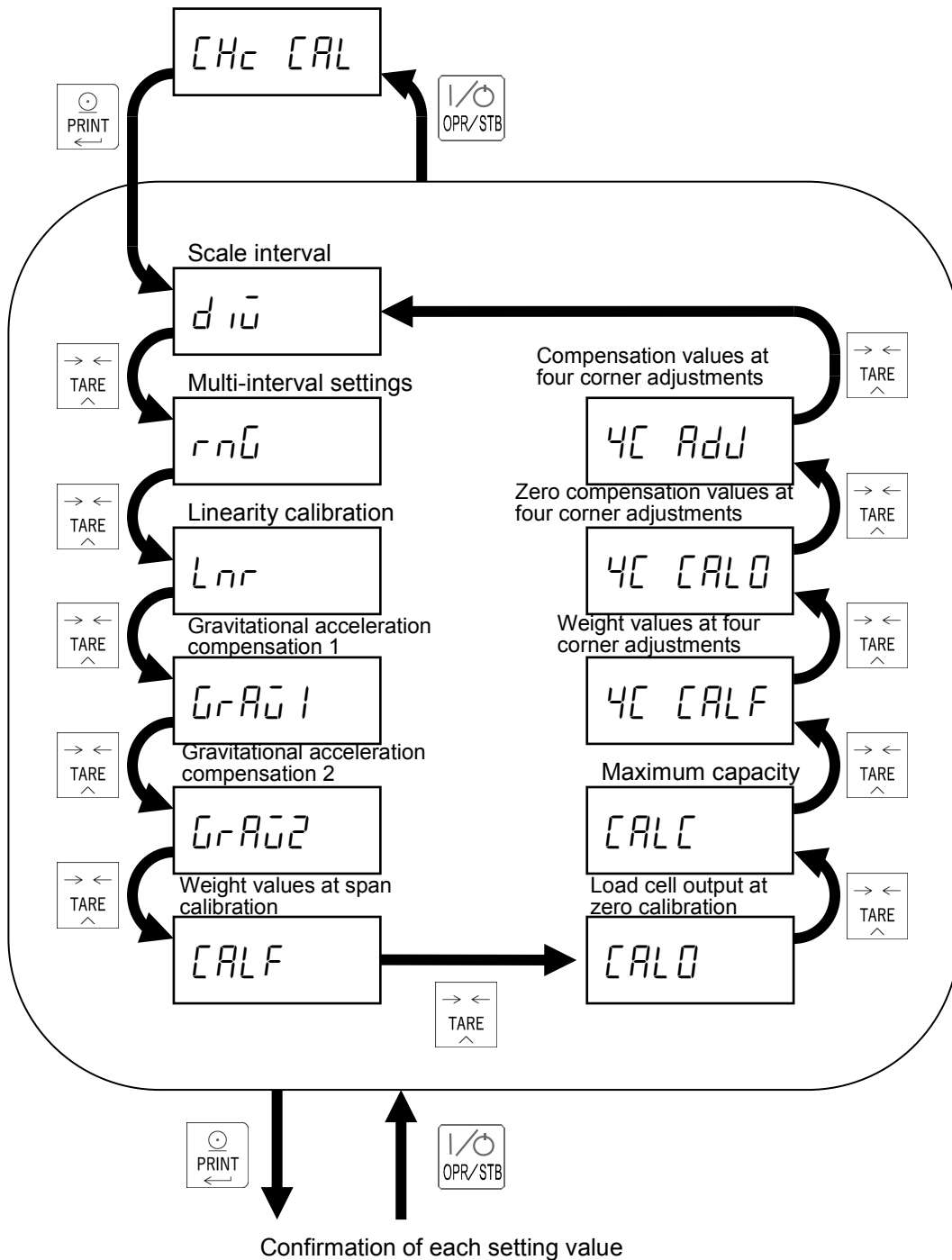
Change

Move



12.9. Confirming the calibration setting values

Follow the procedure below to select the items, and then press [PRINT].



12.9.1. Confirming the scale interval (resolution)

Press [PRINT] to proceed to the next confirmation item after displaying scale interval (resolution) for 2 seconds.

12.9.2. Confirming the multi-interval settings

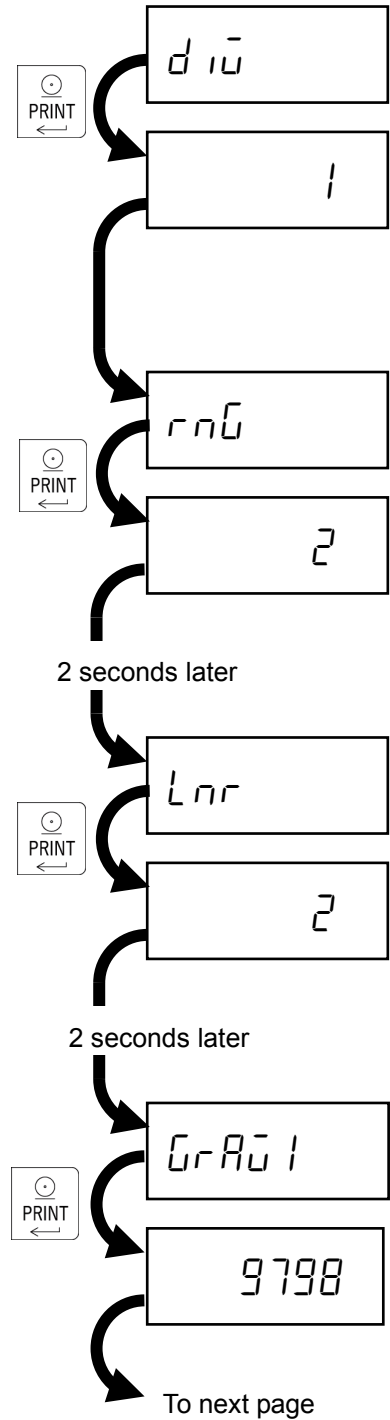
Press [PRINT] to proceed to the next confirmation item after displaying multi-interval settings for 2 seconds.

12.9.3. Confirming the linearity calibration

Press [PRINT] to proceed to the next confirmation item after displaying the number of compensation points for linearity calibration for 2 seconds.

12.9.4. Confirming the gravitational acceleration compensation 1

Press [PRINT] to proceed to the next confirmation item after displaying the setting value for gravitational acceleration compensation 1 for 2 seconds.



12.9.5. Confirming the gravitational acceleration compensation 2

Press [PRINT] to proceed to the next confirmation item after displaying the setting value for gravitational acceleration compensation 2 for 2 seconds

12.9.6. Confirming the weight value at span calibration

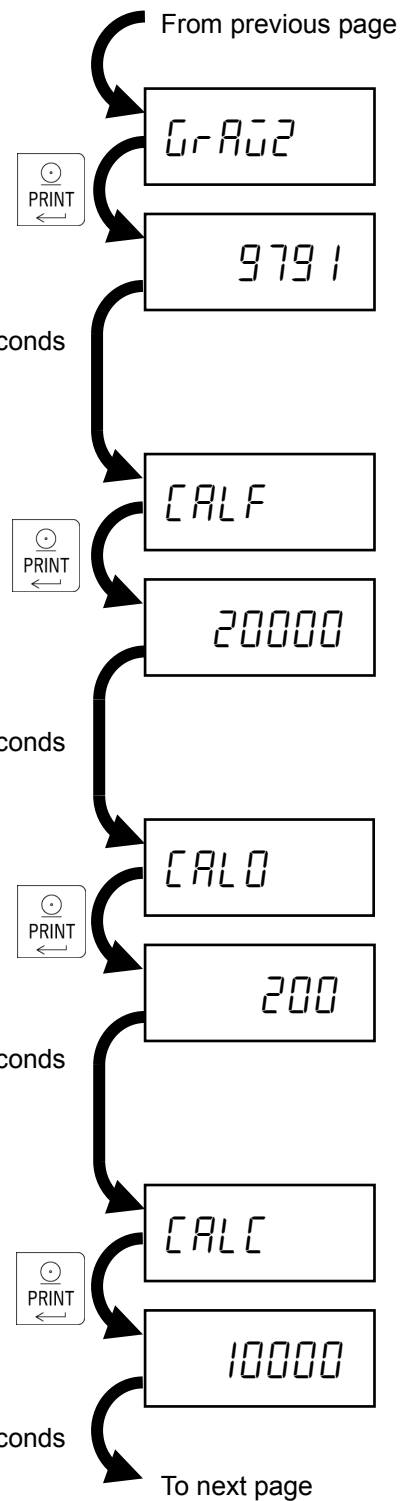
Press [PRINT] to proceed to the next confirmation item after displaying the weight value at span calibration for 2 seconds.

12.9.7. Confirming the load cell output at zero calibration

Press [PRINT] to proceed to the next confirmation item after displaying the load cell output at zero calibration for 2 seconds.

12.9.8. Confirming the maximum capacity

Press [PRINT] to proceed to the next confirmation item after displaying the maximum capacity for 2 seconds.



12.9.9. Confirming the weight value at four corner adjustments

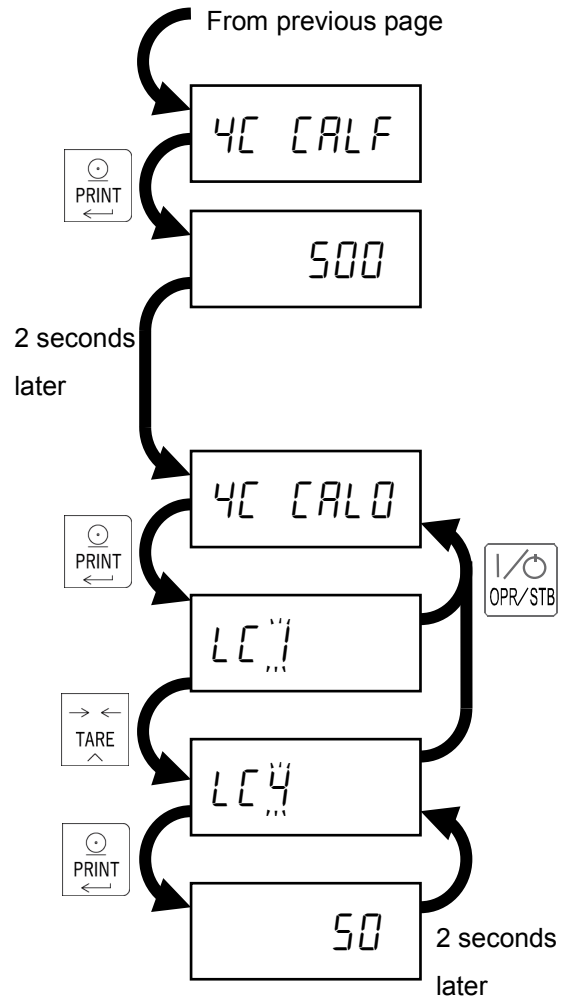
Press [PRINT] to proceed to the next confirmation item after displaying the weight value at four corners adjustments for 2 seconds.

12.9.10. Zero compensation value for four corner adjustments

Press [PRINT].

Operate the following keys to select the item to be confirmed.

- [TARE]: Change the load cell to be confirmed.
- [PRINT]: Return to previous display after displaying the compensation value for 2 seconds.

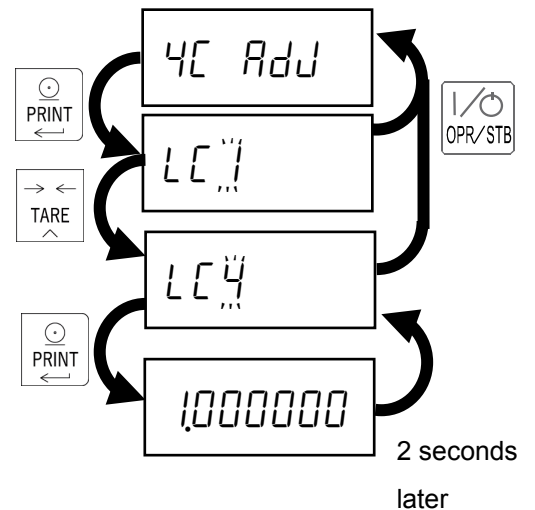


12.9.11. Compensation value for four corner adjustments

Press [PRINT].

Operate the following keys to select the item to be confirmed.

- [TARE]: Change the load cell to be confirmed.
- [PRINT]: Return to previous display after displaying the compensation value for 2 seconds.

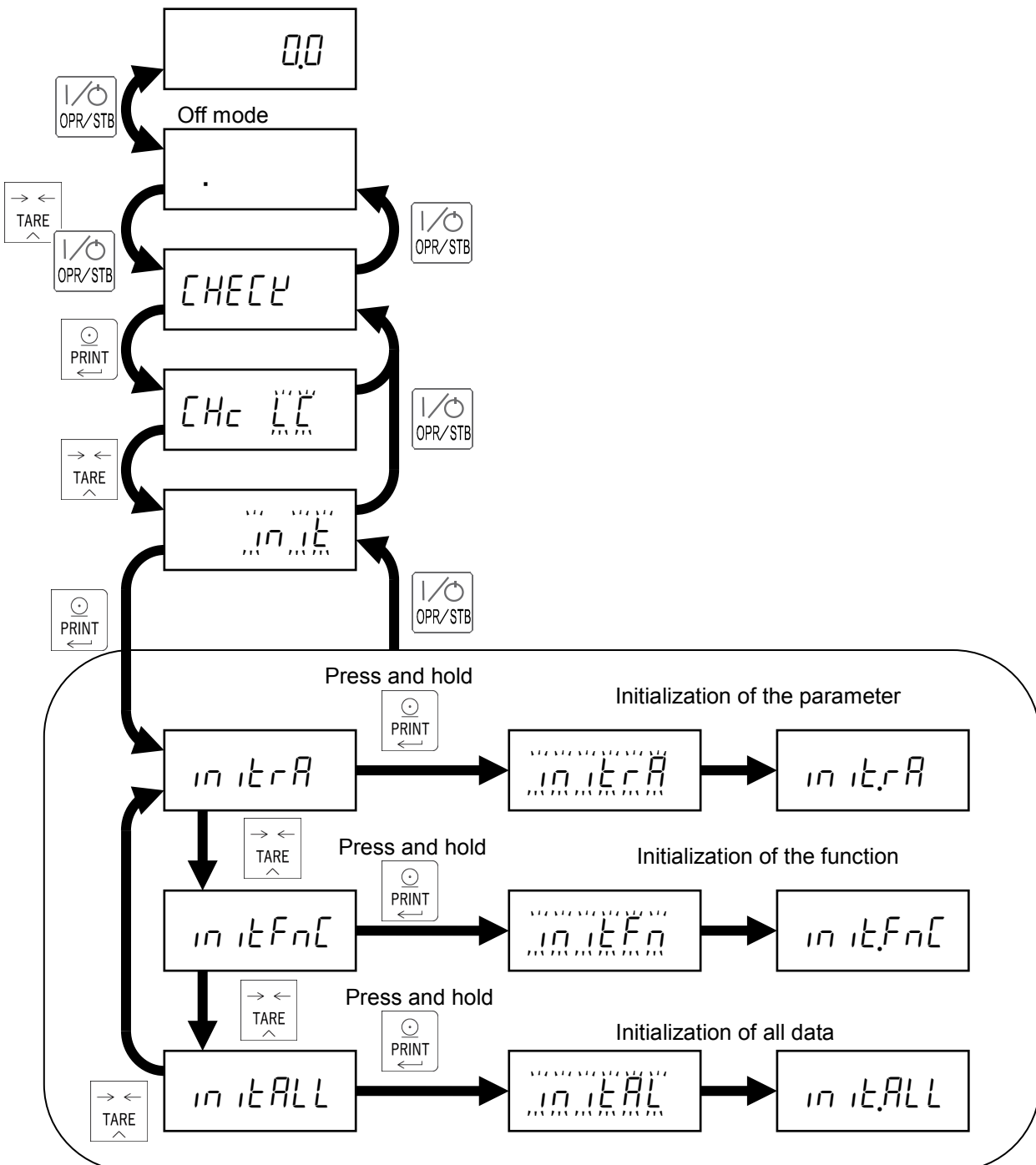


12.10. Initializing

The initialization consists of the following three levels.

Initialization of the parameter	Initializes the push zero value, tare value, total value and accumulation count.
Initialization of the function	Initializes the F function, CF function and comparison values in addition to the parameter.
Initialization of all data	Initializes the calibration settings in addition to the parameter and function, and sets the weighing indicator to the factory settings.

Follow the procedure below to initialize the weighing indicator.



13. Function Setting

13.1. F-function setting method

Press [OPR/STB].

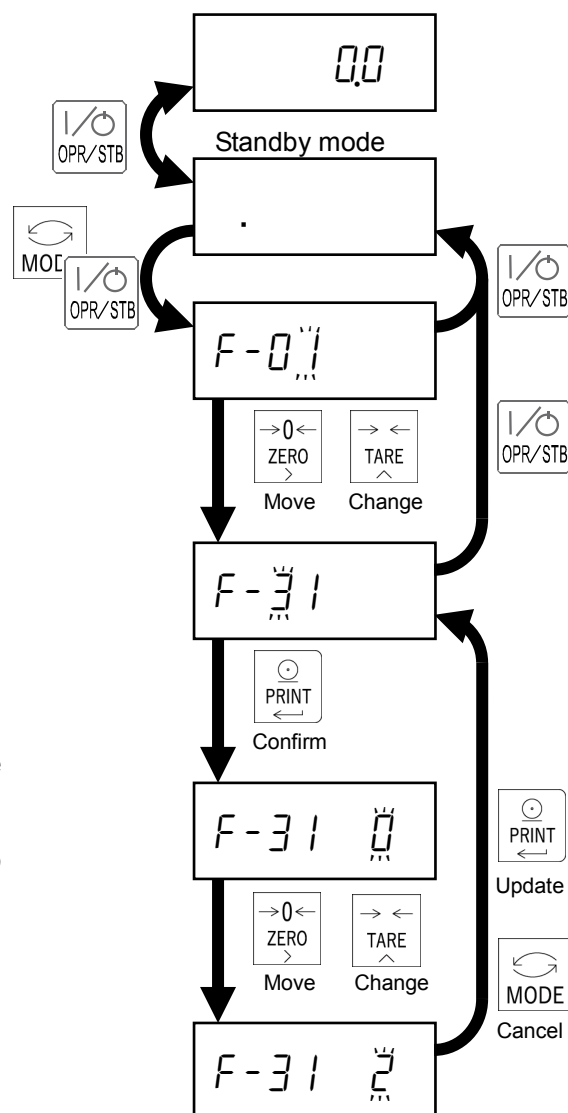
While pressing and holding [MODE], press [OPR/STB].

Select the changing item by the following key operations.

- [ZERO]: Move the flashing digit.
- [TARE]: Change the value of the flashing digit.
- [PRINT]: Confirm the displayed item.

Change the value by the following key operations.

- [ZERO]: Move the flashing digit.
- [TARE]: Change the value of the flashing digit.
- [PRINT]: Update to the new value and return to the item selection.
- [MODE]: Cancel the changed value and return to the item selection.



13.2. F-function list

13.2.1. Basic weighing function

F-	Item	Setting value	Default	User setting
01	Zero tracking condition	0: Not used 1: 0.5 d / 1.0 s 6: 0.5 d / 2.0 s 7: 1.0 d / 2.0 s	7	
02	Stability detection condition Push zero and tare only at stable weight.	6: 0.5 d / 2.0 s 7: 1.0 d / 2.0 s	6	
03	Display update rate	0: 10 times/s 1: 5 times/s	0	
04	Operations at accumulation mode and value polarity condition	0: Manual / Only plus value 1: Manual / Both plus/minus value 2: Auto / Only plus value 3: Auto / Both plus/minus value	0	
05	Accumulation inhibition range	0: 0 d 1: 5 d 2: 10 d 3: 20 d 4: 50 d	1	
06	Key lock in weighing mode Select a target key by [ZERO] key. Select 0: unlock / 1: lock by [TARE] key. If you lock [OPR/STB], turn on the power while pressing and holding [OPR/STB] and [MODE] to go to F-function mode.	X X 0: Unlock 1: Lock 1: [OPR/STB] key 2: [PRESET TARE] key 3: [M+] key 4: [MODE] key 5: [NET/GROSS] key 6: [ZERO] key 7: [TARE] key 8: [PRINT] key	10 20 30 40 50 60 70 80	

13.2.2. External control input

F-	Item		Setting value	Default	User setting
10	External control input function	EXT1 (Pin1)	0: None	0	
11		EXT2 (Pin3)	1: [ZERO] key	0	
12		EXT3 (Pin4)	2: [TARE] key	0	
13		EXT4 (Pin5)	3: [PRINT] key	0	
14		EXT5 (Pin6)	4: [OPR/STB] key	0	
15		EXT6 (Pin7)	5: [M+] key	0	
16		EXT7 (Pin8)	6: [NET/GROSS] key 7: [MODE] key 8: Display ON=NET/OFF=GROSS 9: Display total value 10: Display overload 11: Release key lock (F-06)	0	

13.2.3. Comparator output

F-	Item	Setting value	Default	User setting
20	Comparator function	0: Disable 1: Enable 2: Reserved	0	
21	Comparator function inhibition condition	0: None 1: Displayed value is unstable. 2: Displayed value is +5d or less. 3: Displayed value is +5d or less, or unstable. 4: Displayed value is within ±5d. 5: Displayed value is within ±5d or is unstable.	0	

13.2.4. Standard serial output

F-	Item	Setting value	Default	User setting
30	Output data	0: Displayed value 1: Gross value 2: Net value 3: Tare value 4: Gross + Net + Tare value	0	
31	Communication mode	0: Stream 1: Auto print 2: Manual print	0	
32	Auto print inhibition range	0: +5 d or less 1: Within ± 5 d	0	
33	Data interval at F-30=4	0: None 1: 2 seconds	0	
34	Baud rate	0: 600 bps 1: 1200 bps 2: 2400 bps	2	

13.2.5. RS-232C interface

F-	Item	Setting value	Default	User setting
40	Output data	0: Displayed value 1: Gross value 2: Net value 3: Tare value 4: Gross + Net + Tare value	0	
41	Communication mode	0: Stream 1: Auto print 2: Manual print 3: Command 4: Reserved	0	
42	Auto print inhibition range	0: +5 d or less 1: Within ± 5 d	0	
43	Data interval at F-40=4	0: None 1: 2 seconds	0	
44	Baud rate	0: 600 bps 1: 1200 bps 2: 2400 bps 3: 4800 bps 4: 9600 bps	2	
45	Data format	0: Data format 1 1: Data format 2	0	
46	Reserved		0	

13.3. CF-function setting method

Press [OPR/STB] in weighing mode.

While pressing and holding [MODE], press [OPR/STB].

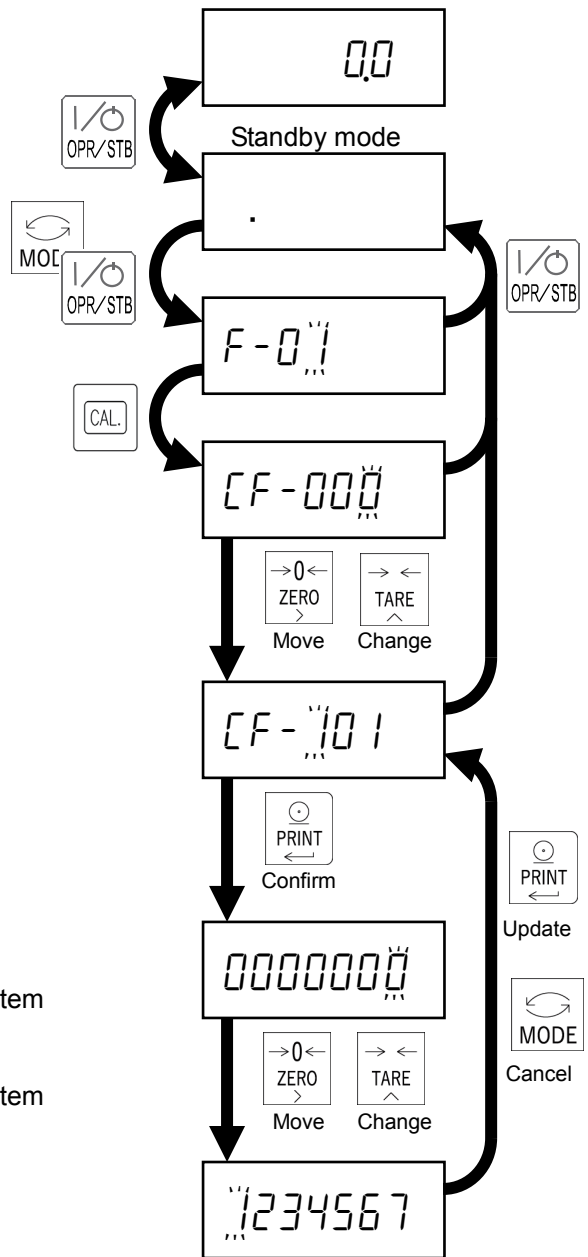
Press [CAL].

Select the item by the following key operations.

- [ZERO]: Move the flashing digit.
- [TARE]: Change the value of the flashing digit.
- [PRINT]: Confirm the displayed item.

Change the value by the following key operations.

- [ZERO]: Move the flashing digit.
- [TARE]: Change the value of the flashing digit.
- [PRINT]: Update to the new value and return to the item selection.
- [MODE]: Cancel the new value and return to the item selection.



13.4. CF-function list

CF-	Item	Setting value	Default	User setting
000	Decimal point position	0: 0 (No decimal point) 1: 0.0 2: 0.00 3: 0.000	1	
001	Unit	0: kg 1: t	0	
002	Push zero range	0: $\pm 2\%$ of the maximum capacity 1: $\pm 10\%$ of the maximum capacity	0	
003	Reserved		1	
004	Zero tracking	0: Gross is 0 when displaying gross 1: Gross is 0 2: Gross is 0 or display is 0	2	
005	Power-on zero	0: Disable 1: Enable	1	
006	Execution Preset tare	0: Enable 1: Disable	1	
007	When outputting the net value, the preset tare value is output as well.	0: Disable 1: Enable	1	
008	Output on over load and unstable state.	0: Disable 1: Enable	0	
009	Reserved		2	
010	Unit number of digits and decimal point for output data	0: Two digits, "." dot 1: Three digits, "." dot 2: Two digits, "," comma 3: Three digits, "," comma	0	
011	Accumulation function	0: Disable 1: Enable	0	
012	Overload condition on negative gross value.	0: Gross < - Maximum capacity 1: Gross < $-20d$	1	
013	Manually print at negative gross value.	0: Enable 1: Disable	1	

CF-	Item	Setting value	Default	User setting
100	Number of digital load cells	1 to 8	4	
101	Serial number of each digital load cell	1st	0000000 to 9999999	000000
102		2nd		
103		3rd		
104		4th		
105		5th		
106		6th		
107		7th		
108		8th		

14. Check the Software Version

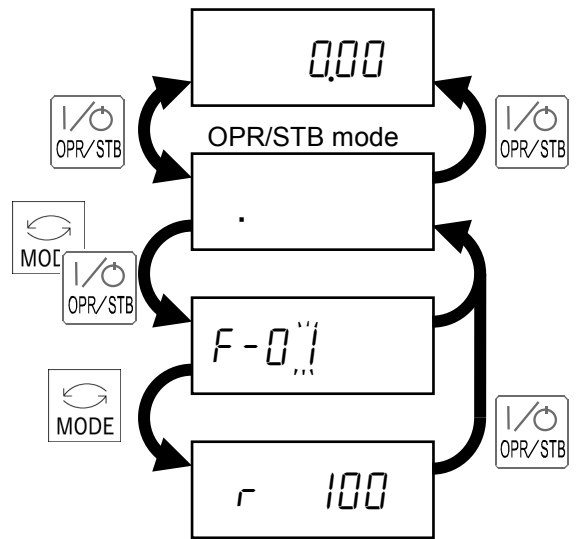
Press [OPR/STB].

While pressing and holding [MODE], press [OPR/STB].

Press [MODE].

The software version will appear.

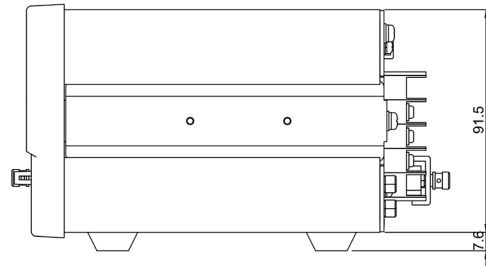
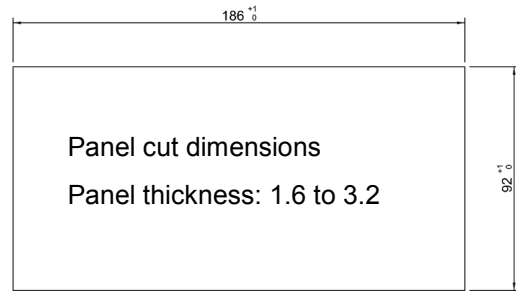
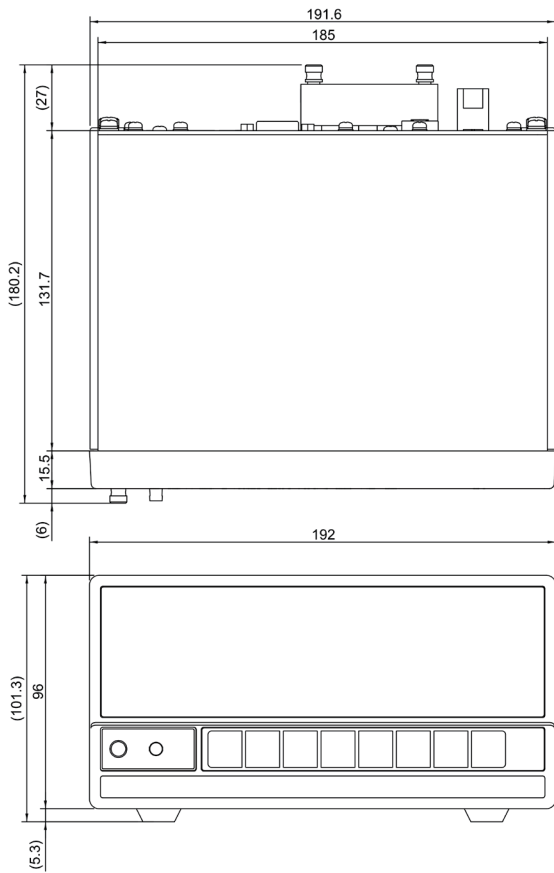
Press [OPR/STB] twice to back to weighing mode.



15. Specifications

Dimensions	192(W) x 96(H) x 165(D)mm
Operating temperature and humidity range	-10 °C to 40 °C Less than 85%RH, non-condensing
Power supply	
Power supply voltage	AC100 / 120 / 200 / 220 / 240 V +10% -15% 50 / 60Hz ±5%
Maximum apparent power	30 VA
Rush current	AC100V : 15A or less, AC200V : 30A or less
Digital load cell input	
Applied voltage	DC8V ±5% 230 mA Up to eight A&D digital load cells can be connected in parallel.
Sampling rate	10 times / s
Display	
Weight display	7-digit LED with character height of 13 mm
Units	kg, t (selectable)
Status lamp	M+, MD, GROSS, NET, PT, ZERO
Key switches	
Key switch	[OPR/STB], [PRESET TARE], [M+], [MODE], [NET/GROSS], [ZERO], [TARE], [PRINT]
Key switch with sealing cover	[CAL]
External input / output	
External control input	Non-voltage contact input 7: points 8-pin DIN connector
RS-232C interface	9-pin D-sub male with inch screws
Standard serial output	7-pin DIN connector
Option	
Comparator output	Mechanical relay output: 3 points

External Dimensions



Unit : mm



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