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SONY

表示ユニット / Display Unit / Anzeigeeinheit

LY51

お買い上げいただき、ありがとうございます。
ご使用の前に、この取扱説明書を必ずお読みください。
ご使用に際しては、この取扱説明書どおりお使いください。
お読みになった後は、後日お役に立つこともございますので、必ず保管してください。

Read all the instructions in the manual carefully before use and strictly follow them.
Keep the manual for future references.

Lesen Sie die ganze Anleitung vor dem Betrieb aufmerksam durch und folgen Sie beim Betrieb des Geräts den Anweisungen. Bewahren Sie diese Bedienungsanleitung zum späferen Nachlesen griffbereit auf.

取扱説明書 / Instruction Manual / Bedienungsanleitung

第1版 (改訂2) / 1st Edition (Revised 2) / 1.Auflage (Version 2)

[For EU and EFTA countries]

CE Notice

Making by the symbol CE indicates compliance of the EMC directive and the Low-voltage directive of the European Community. Such marking is indicative meets of exceeds the following technical standards.

EN 55 011 Group 1 Class A :

"Limits and methods of measurement of electromagnetic disturbance characteristics of industrial, scientific and medical (ISM) radio-frequency equipment"

EN 50 082-2 :

"Electromagnetic compatibility - Generic immunity standard Part 2 : Industrial environment"

EN 61 010-1 :

"Safety requirements for electrical equipment for measurement, control and laboratory use Part 1: General requirements"

警告

本装置を機械指令 (EN 60 204-1) の適合を受ける機器にご使用の場合は、その規格に適合するように方策を講じてから、ご使用ください。

Warning

When using this device with equipment governed by Machine Directives EN 60 204-1, measures should be taken to ensure conformance with those directives.

Warnung

Wenn dieses Gerät mit Ausrüstungsteilen verwendet wird, die von den Maschinenrichtlinien EN 60 204-1 geregelt werden, müssen Maßnahmen ergriffen werden, um eine Übereinstimmung mit diesen Normen zu gewährleisten.

[For the customers in U.S.A.]

WARNING

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

[For the customers in Australia]

Australian EMC Notice

This product complies with the following Australian EMC standards.

AS/NZS 4252.1 /94 EMC Generic Immunity Part1

AS/NZS 2064.1 /91 EMCISM Equipment

Safety Precautions

Sony Precision Technology products are designed in full consideration of safety. However, improper handling during operation or installation is dangerous and may lead to fire, electric shock or other accidents resulting in serious injury or death. In addition, these actions may also worsen machine performance.
Therefore, be sure to observe the following safety precautions in order to prevent these types of accidents, and to read these “Safety Precautions” before operating, installing, maintaining, inspecting, repairing or otherwise working on this unit.

Warning Indication Meanings

The following indications are used throughout this manual, and their contents should be understood before reading the text.

⚠ Warning!

Failure to observe these precautions may lead to fire, electric shock or other accidents resulting in serious injury or death.

⚠ Caution!

Failure to observe these precautions may lead to electric shock or other accidents resulting in injury or damage to surrounding objects.

Note

This indicates precautions which should be observed to ensure proper handling of the equipment.

⚠ Warning!

- Do not use the display unit with voltages other than the indicated power voltage, and do not connect multiple plugs to a single outlet as this may result in fire or electric shock.



- Do not damage, modify, excessively bend, pull on, place heavy objects on or heat the power cord, as this may damage the power cord and result in fire or electric shock.

- Do not handle the power plug with wet hands as this may result in electric shock.

- The power cord contains a safety ground. Make sure to connect this ground. Failure to do so may result in electric shock or fire.
(See “4-1. Connection of Cables” on page 113.)



- Do not open the cover of the display unit to disassemble or modify the unit or to replace the fuses, as this may result in burns or injury. These actions may also damage the internal circuitry.

⚠ Caution!



- When unplugging the power plug, do not pull on the power cord as this may damage the cord and result in fire or electrical shock. Be sure to grip the power plug when unplugging it from the socket.

- The unit does not have an explosion-proof structure. Therefore, do not use the unit in an atmosphere charged with inflammable gases as this may result in fire.



- When the unit will not be used for an extended period of time, be sure to unplug the power plug from the socket for safety.

- Be sure to turn off the power before connecting or disconnecting power and signal connectors in order to prevent damage or misoperation.



- The unit does not have an earthquake-proof structure. Therefore, do not use the unit in moving areas or areas exposed to strong shocks.

- Do not block the ventilation holes on the sides and bottom of the unit. (Position the unit 10 cm or more away from walls.) Also, take care not to allow dirt or foreign objects enter the inside of the unit. In particular, metal chips entering the unit may cause shorts and damage the internal circuits.

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PREPARATIONS

Be sure to read this section before use.

1. NOTES TO USERS

Read all instructions carefully before starting use.
Save this MANUAL for future reference.

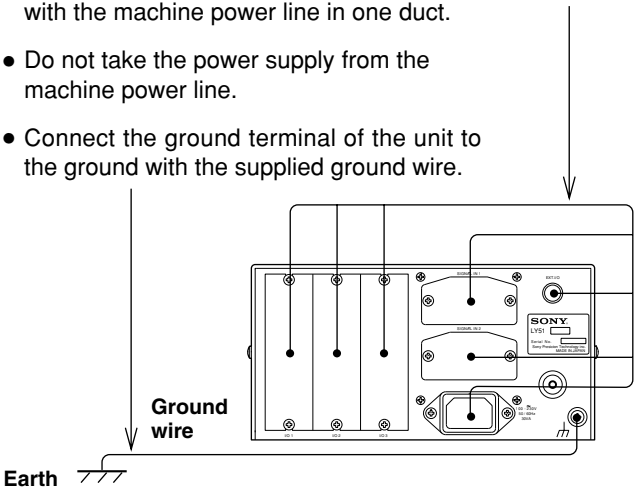
1-1. General Precautions

When using Sony Precision Technology products, observe the following general precautions along with those given specially in this manual to ensure proper use of the products.

- Before and during operations, be sure to check that our products function properly.
- Provide adequate safety measures to prevent damages in case our products should develop malfunctions.
- Use outside indicated specifications or purposes and modification of our products will void any warranty of the functions and performance as specified of our products.
- When using our products in combination with other equipment, the functions and performances as noted in this manual may not be attained, depending on operating and environmental conditions.

1-2. Handling Instructions

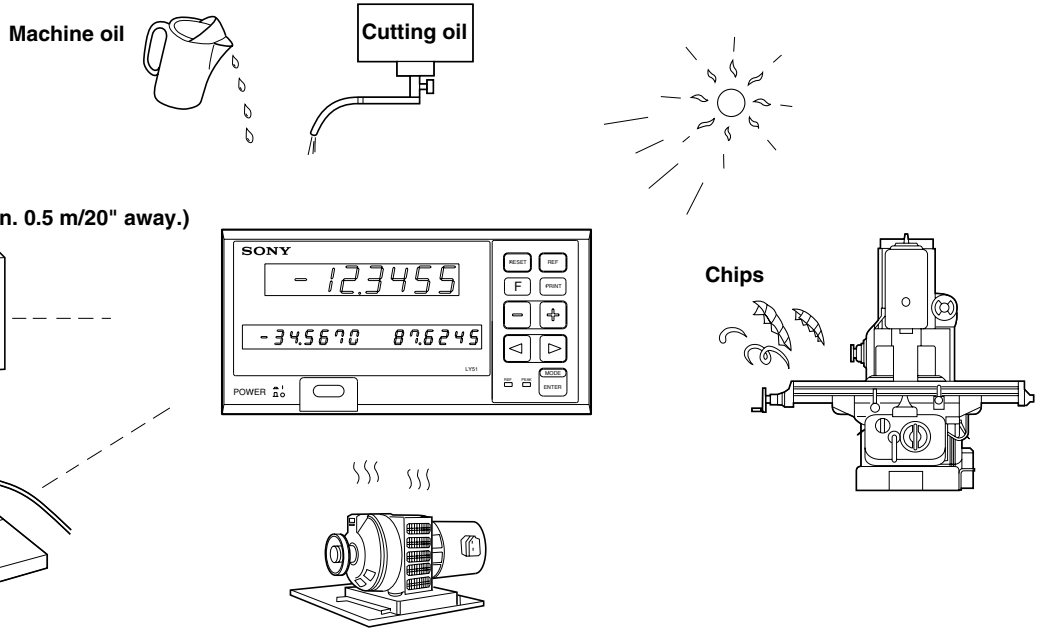
- Do not route the connecting cable and power cord together with the machine power line in one duct.
- Do not take the power supply from the machine power line.
- Connect the ground terminal of the unit to the ground with the supplied ground wire.



- When the power supply voltage is lower than specified, the display may not be illuminated even with the POWER switch turned on. Be sure to use the power in the specified range.
- Once the POWER switch is turned off, leave it for at least 3 seconds before turning it on again. Otherwise malfunction may be caused.
- Note that if the power is interrupted momentarily or the voltage drops temporarily below the normal operating range, an alarm may work or malfunction may occur.

English

- Place the display unit more than 0.5 m/20" away from a high voltage source, large current source, large power relay, and similar device.
- For installation of the display unit, avoid the location exposed to chips, cutting oil, or machine oil. If unavoidable, take adequate countermeasures.
- Do not put on a vinyl cover directly over the display unit or put it in a closed container.
- The ambient temperature should be in the range of 0°C to 40°C (32°F to 104°F).
- Avoid exposure to direct sunlight, hot blast, or heated air.



1-3. Cautions on Operation

- When there is a malfunction, related characters as shown in “8. ALARM DISPLAY/OUTPUT” are displayed instead of numbers. Refer to that section for information.
- When you make an error in operation, or when an alarm message is displayed, retry the operation.
- Be sure to operate each key and external input signal (contact point) correctly in accordance with the operating procedures. Otherwise, an operational error may occur.
- Be sure to perform operations and connections such as that of each I/O (BCD) in accordance with explanations given in each section. Unless you operate the unit correctly, operational error or unit malfunction may occur.

Notes on storing the initial setting data

Data input by the initial settings is written to a flash memory. The display goes blank and the REF and PEAK lamps flash while the memory is being written. Absolutely do not turn off the power while the memory is being written. (If the power is turned off, the memory cannot be written and the settings must be made again.) The memory is written in the following three cases.

a. When the power is turned on.
b. When the menu settings are ended.
c. When RESET key is pressed to end the initial settings and start the count display.

2. FEATURES

(1) High-reliability zero point reference function

Once the zero point is loaded, this function checks the value every time the zero point is passed. If the position value fails to correspond for 3 counts or more, the unit will send an alarm signal to inform of the error.

Using this alarm signal, count mis-operation damage due to error counting is kept to a minimum. (This function can be enabled and disabled.)

(2) Peak hold function useful for counting up measured data

This function holds the maximum, minimum and peak-to-peak values during measurement. (The unit can execute this function even while it performs the optional comparator function.)

(3) Various external input functions for automatic measurement

The unit has external reset, external recall and universal contact point inputs which enable operation by external input signals (contact point). This allows the unit to be used for automatic measurement. (The universal input can be used to input various signals according to the initial settings.)

(4) Easy system assembly by rack mounting

The counter is designed for standard installation in a rack, making it easy to assemble in a system.

(5) Selectable display resolution

You can select the most suitable display resolution. However, the selectable resolutions vary depending on the input scale unit.

(6) Data storage function

The display resolution and other initial setting values are stored even after you turn off the power. Therefore, once these values are set, they do not need to be set again next time you use the unit.

The preset value, current value and other data are also stored even after you turn off the power. You do not need to set the data next time you use the unit. (The current value storage function can be enabled and disabled.)

(7) Collective automatic setting of initial setting items

Various initial setting items can be input using a specification code. This allows various setting items to be determined automatically at once. (Initial settings can also be input individually.)

(8) Abundant output functions

Up to 3 optional I/O units can be inserted to support a wide variety of measuring systems.

- **BCD output (option)**
  You can retrieve various data by BCD output using the optional BCD unit LZ51-B. (Current, maximum, minimum and peak-to-peak values)

- **Comparator function useful for sorting parts (option)**
  By using the optional comparator units LZ51-K/R, the comparator setting values can be compared with the current value to determine the data size. An output signal informs the unit of the comparison results. (There are two types of comparator units: relay output type and open collector type.) Using this signal, the unit can sort out parts.
  Note that the unit can execute this function even while it performs the peak hold function.
  Also, up to 16 sets consisting of 1 to 4 points of comparator setting values can be stored.
  The various settings can be switched using key operations or external contact point input.

- **RS-232C I/O (option)**
  By using the optional RS-232C unit LZ51-C, you can retrieve the current, maximum, minimum and peak-to-peak values using the RS-232C. Comparator setting values and judgement results can also be retrieved by using the RS-232C together with the comparator units. Also, key operations and other operations can be input as RS-232C commands.

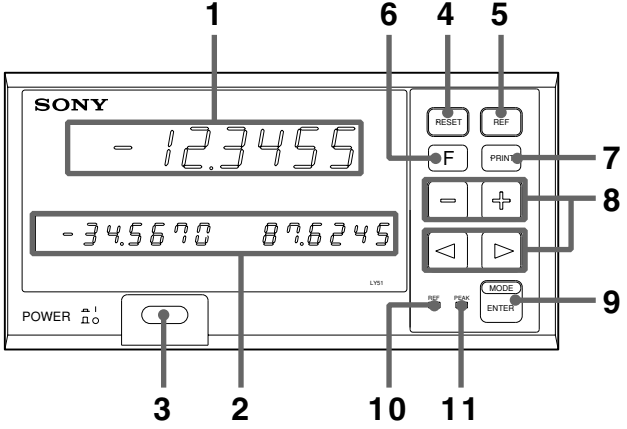
- **A/B phase (up/down) output (option)**
  By using the optional A/B phase output unit LZ51-H, you can output the input scale signal unit as an A/B phase or up/down signal. (The selection switches between A/B phase or up/down signal.) Output signals are output by line driver and open collector.
  (You can select either the 1st axis or the 2nd axis with the initial settings. You cannot output both axes at the same time.)

Note Only one of each type of option unit can be used. Two or more boards of the same type cannot be used simultaneously.

3. NAME AND FUNCTION OF EACH PART

This section gives the name of each part of the LY51 display unit and briefly describes the function. See the respective section for a detailed description of each function.

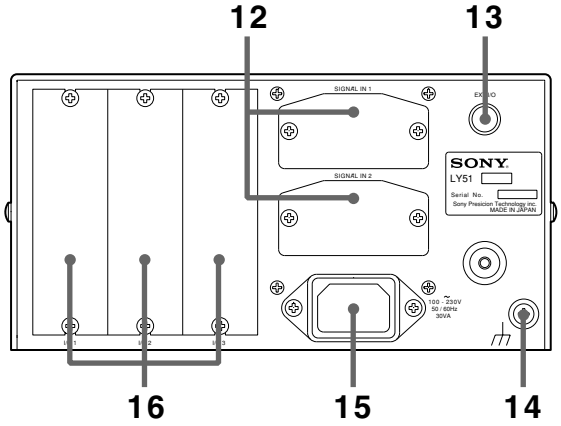
[Front panel]



No.	Function	Description
1	**Main display**	Displays the current value. Can also be switched to display the maximum, minimum and peak-to-peak values and other data (selected by the initial settings).
2	**Sub-display**	Displays the comparator judgement results and the maximum, minimum, and current values. Also displays the item when performing the various settings.
3	**POWER switch**	Turns the power on and off.
4	**RESET key**	Resets the current value. Interrupts the various setting modes.
5	**REF (zero point) key**	Used for various operations related to the zero point.
6	**F (function) key**	Selects the various setting items.
7	**PRINT key**	Used when the RS-232C unit LZ51-C (option) is connected (data output key to the RS-232C).
8	**Data set keys**	Used to input the various setting items.
9	**MODE/ENTER key**	Switches the mode and enters the various setting items.
10	**REF (zero point mode display) indicator**	Lights and flashes when you press the zero point key and perform operations related to the zero point.
11	**PEAK (peak mode display) indicator**	Lights when peak values (maximum, minimum and peak-to-peak values) are displayed on the main display.

English

[Rear panel]



No.	Function	Description
12	**Scale unit input**	Inputs the scale unit signal.
13	**EXT. I/O connector**	Used for contact point inputs such as external reset and alarm output.
14	**Ground terminal**	GND connection terminal. Be sure to ground the machine with the supplied ground wire before use.
15	**AC IN connector**	Connect the power cord.
16	**Extension unit slots**	Used for optional extension units.

4. INSTALLATION AND CONNECTION
(Before operation)

Before operating the display unit, please read this section thoroughly for proper use of the unit.
Also, make sure that you install and set the display unit correctly in accordance with this manual.

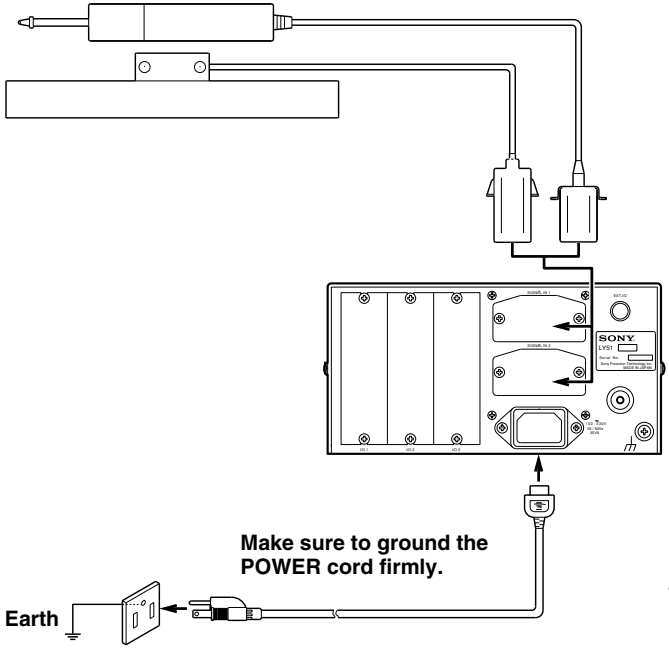
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4-1. Connection of Cables

Fasten connecting cables to stationary members to prevent accidental disconnections.
Be sure to turn off the power of the display unit before connecting or disconnecting the scale unit.

⚠ Warning!
The POWER cord contains a safety ground. Make sure to connect this ground. Failure to do so may result in electric shock or fire.

⚠ Caution!
The LY51 display unit has an insulated frame GND and circuit GND, but the connected scale unit may not be insulated. In these cases, applying a voltage other than 0 V to the frame GND may damage the display and scale units. Consult your service agent or the Service Division of Sony Precision Technology concerning the scale unit GND when applying a voltage other than 0 V to the frame.



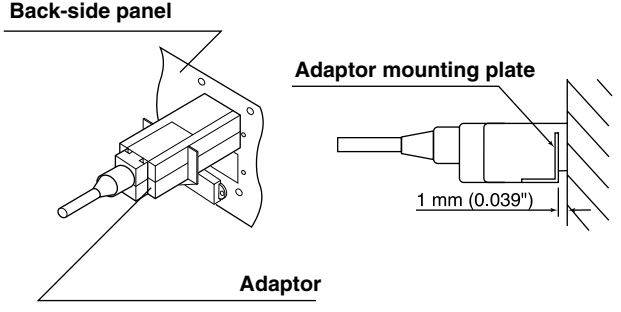
English

Precautions for connecting the scale

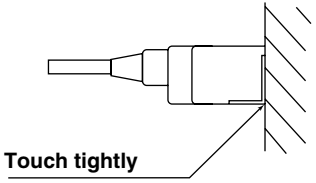
- These are precautions for connecting the scale to the display unit.
- Since a precision connector is used for this unit, please be careful connect to the display unit in a gentle way following the order described below.

Procedure of connecting the cable

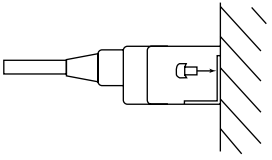
1. Insert the adapter of the cable getly to the joint of the unit. (There is approximately 1 mm/0.039" clearance between the mounting plate and the backside of the display unit.)



2. Push the connector (approximately 1 mm/0.039") until the mounting plate touches the back-side panel of the display.



3. Fix the mounting plate using the screws of the removed cover plate. (Be sure to fix the mounting plate using the same screws. Using a different type of screw may cause noise or other problems resulting in misoperation.)



4. Turn on the power of the display unit and make sure if if operates normally.

4-2. Installing the Display Unit

Since the LY51 display unit is designed to be mounted in line measurement devices, you can mount the unit on a panel. (See Fig. 1.)

1. Mounting the display unit on the panel

- When you mount the display unit on the panel, cut out an opening of the dimensions shown. (See Fig. 2.)
- Mount the display unit on the panel using the supplied plate. The display unit can be mounted from the front or back of the panel. When mounting the display unit from the front of the panel, remove the rubber legs.

> **⚠ Warning!**
> Use the supplied screws when attaching the plate to the display unit. Using screws other than those specified may damage the internal parts of the display panel and result in electric shock.

2. When you use the unit as a stand-alone display unit

- Position the display unit on the four rubber legs attached to the bottom side of the unit.

> **⚠ Warning!**
> When removing and then reattaching the rubber legs, be sure to use the screws supplied with the rubber legs. Using screws other than those specified may damage the internal parts of the display panel and result in electric shock.

The LY51 display unit is classified as an INSTALLATION CATEGORY II, POLLUTION DEGREE 2 device.

(Unit: mm/inch)

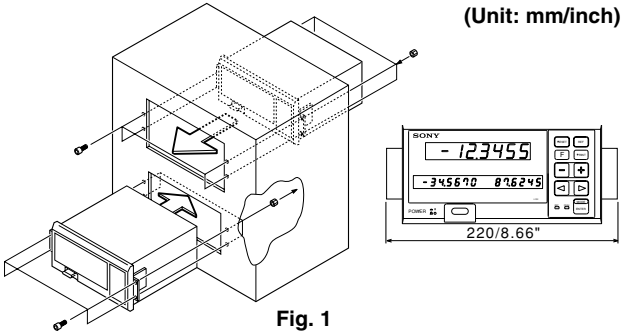
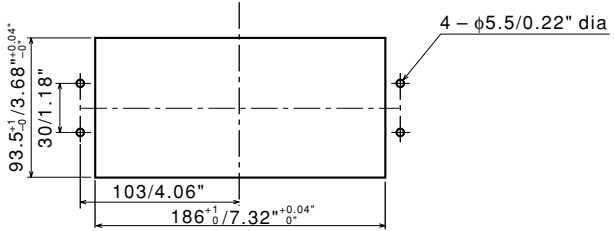


Fig. 1

Panel cut-out diagram

[Mounting the display unit from the panel front]



[Mounting the display unit from the panel rear]

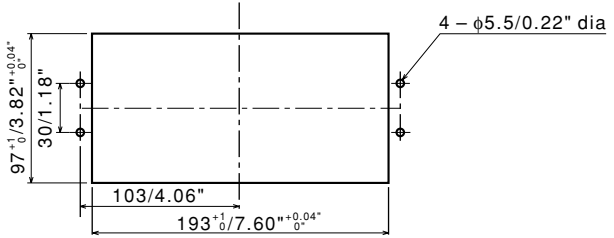


Fig. 2

English

4-3. Connection of Expansion Units

When connecting expansion units, be sure to connect the units correctly in accordance with the instruction manuals supplied with each unit.

> ⚠ **Caution!**
> Failure to install expansion units correctly in accordance with the procedures may result in misoperation or damage.

Also, two or more expansion units of the same type cannot be used simultaneously. Only one of each type of unit can be used.

> ⚠ **Caution!**
> Connecting two or more of the same boards may result in misoperation or damage.

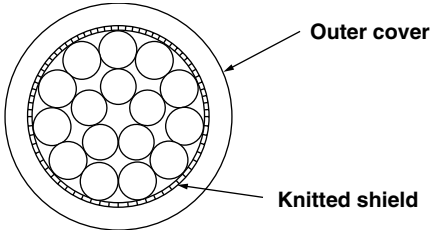
Relay output type and open collector type comparator units cannot be used simultaneously without modification. Consult your service agent or the MS Service Division of Sony Precision Technology when you wish to use these comparator units together.

4-4. I/O Connector

Interface cable

Use a shielded cable as shown in the figure below for the interface cable to be connected to the I/O connector. Connect the shielding to the shell of the I/O connector. Connect the 0 V separately from the shielded cable. (Please procure the connector and shielded cable.)

Sectional diagram of interface cable

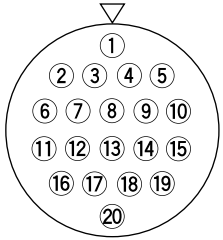


Input signal pin assignment

1	G2	8	+Vcc	15	EX. OUT2
2	EX. RESET	9	+5 V	16	CMP0 (Note)
3	NC	10	EX. OUT1	17	CMP1 (Note)
4	NC	11	EX. IN	18	CMP2 (Note)
5	NC	12	NC	19	CMP3 (Note)
6	EX. RCL	13	TTL1	20	0 V
7	NC	14	TTL2		

Note: These pins are used when the optional comparetor units LZ51-K or LZ51-R are inserted.

Connector pin arrangement (as seen on the rear panel)



Connector : Hirose Electric round multipolar connector HR25-9TP-20P or equivalent product

English

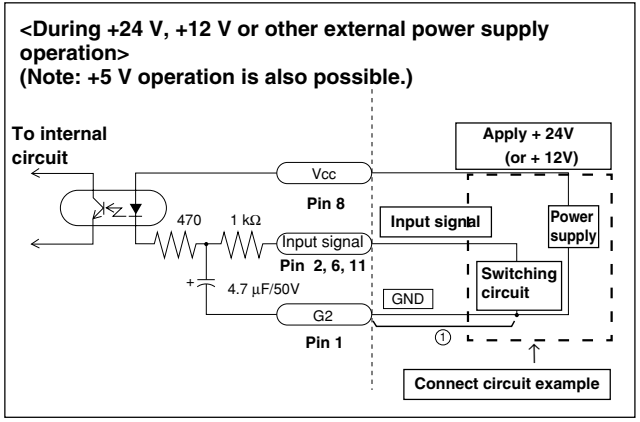
4-4-1. Overview of External Contact Point Input

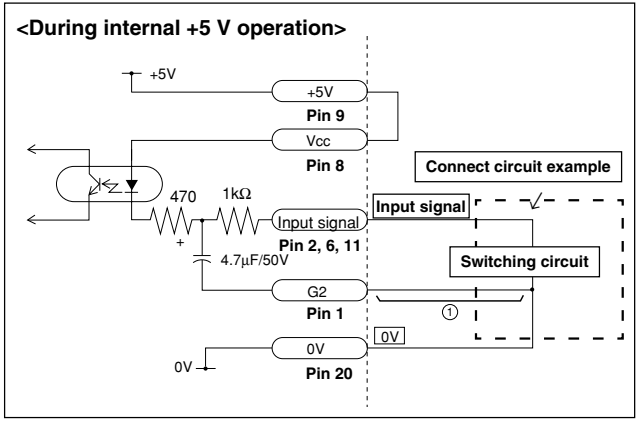
Input circuit of external input signal

- When you use the external input, connect the external input terminal to GND (common terminal) for at least 25 ms. When you input the external input signal again, provide an OFF time of at least 30 ms.
- We recommend that you use SN75451 or SN75452 as electronic switches.
- Use a shielded connection cable and connect the shielding to the shell of the I/O connector. Connect the common cable separately from the shielded cable. (Please procure the switch and shielded cable.)

Note When using this contact point input as an external zero point, you can only use contact point switches or other ON/OFF signals. You cannot use Sony Precision Technology Magne-switches.

- **Input circuit**





Input circuit delay time

When a signal is input, the input circuit produces a delay time until the signal is transmitted to the internal processing block. Care should be taken as this delay time varies widely according to the operating voltage of the input circuit.
(Example)

During +5 V operation,
there is a delay time of approximately 3 ms until the signal is transmitted internally.

During +24 V operation,
there is a delay time of approximately 350 μs until the signal is transmitted internally.

The processing time from when the signal is transmitted internally until the set number is actually switched varies according to the operating conditions. When not using any expansion unit, this processing time is a minimum of about 10 ms. When expansion units are installed, this time increases.
The delay time can be greatly shortened by not connecting portion ① of the circuit shown on the previous page. In this case, however, misoperation occurs easily due to noise, etc. Therefore, be sure to implement sufficient noise countermeasures for use with portion ① not connected.

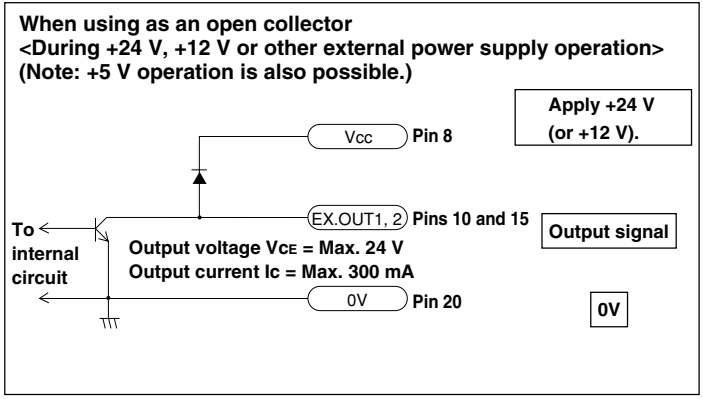
Reference

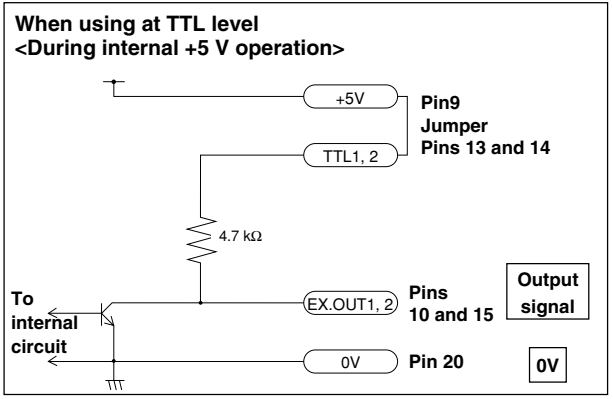
When ① is not connected during +24 V operation:
Delay time = approximately 3 μs
When ① is not connected during +5 V operation:
Delay time = approximately 20 μs

4-4-2. Open Collector Output

- **Output circuit**

  All output signals are output using an open collector equivalent to IC SN75468.





When the universal output is set to zero point output, the output signal goes “H” for the 100 ms when the zero point is passed.

4-4-3. Connection Diagram

(1) During +24 V, +12 V or other external power supply operation

1	G2	Input system circuit GND
2	EX. RESET	External reset input
6	EX. RCL	External recall input
8	+Vcc	Power supplyz
10	EX. OUT1	Universal output 1
11	EX. IN	Universal input
15	EX. OUT2	Universal output 2
16	CMP0	Comparator setting value switching input 1
17	CMP1	Comparator setting value switching input 2
18	CMP2	Comparator setting value switching input 3
19	CMP3	Comparator setting value switching input 4
20	0 V	Output system circuit GND

Used when the LZ51-K or LZ51-R is inserted.

(2) During internal +5 V operatin

1	G2	Input system circuit GND
2	EX. RESET	External reset input
6	EX. RCL	External recall input
8	+Vcc	Power supply
9	+5 V	Internal circuit (+5 V)
10	EX. OUT1	Universal output 1
11	EX. IN	Universal input
13	TTL1	Pull-up resistance 1
14	TTL2	Pull-up resistance 2
15	EX. OUT2	Universal output 2
16	CMP0	Comparator setting value switching input 1
17	CMP1	Comparator setting value switching input 2
18	CMP2	Comparator setting value switching input 3
19	CMP3	Comparator setting value switching input 4
20	0 V	Output system circuit GND

Con-nected by jumpers.

Used when the LZ51-K or LZ51-R is inserted.

English

4-5. Checking the Initial Settings

The resolution of the LY51 display unit changes according to the input scale unit. The resolution is set automatically for some scale units including Magnescales, Digirulers and GA but must be set for use with other scale units. Be sure to set the correct resolution. Otherwise, the correct value cannot be displayed.
Note that once the initial settings are made, they will remain stored even when you turn off the power. You need not perform the settings again unless you want to modify them.

Note 1: You cannot select a display resolution value higher than the resolution set for the input signal.
Note 2: If you change the input signal resolution, be sure to set the display resolution once more. Otherwise, the display resolution setting may change.
Note 3: When you have re-entered the initial settings, be sure to re-enter the comparator setting values and other values as well. Otherwise, faulty operations may occur.

See “4-6. Initial Settings” on page 123 for the initial setting method.

4-6. Initial Settings (Be sure to perform these preparatory operations before use.)

Initial setting mode

The initial setting display mode results in the following cases.

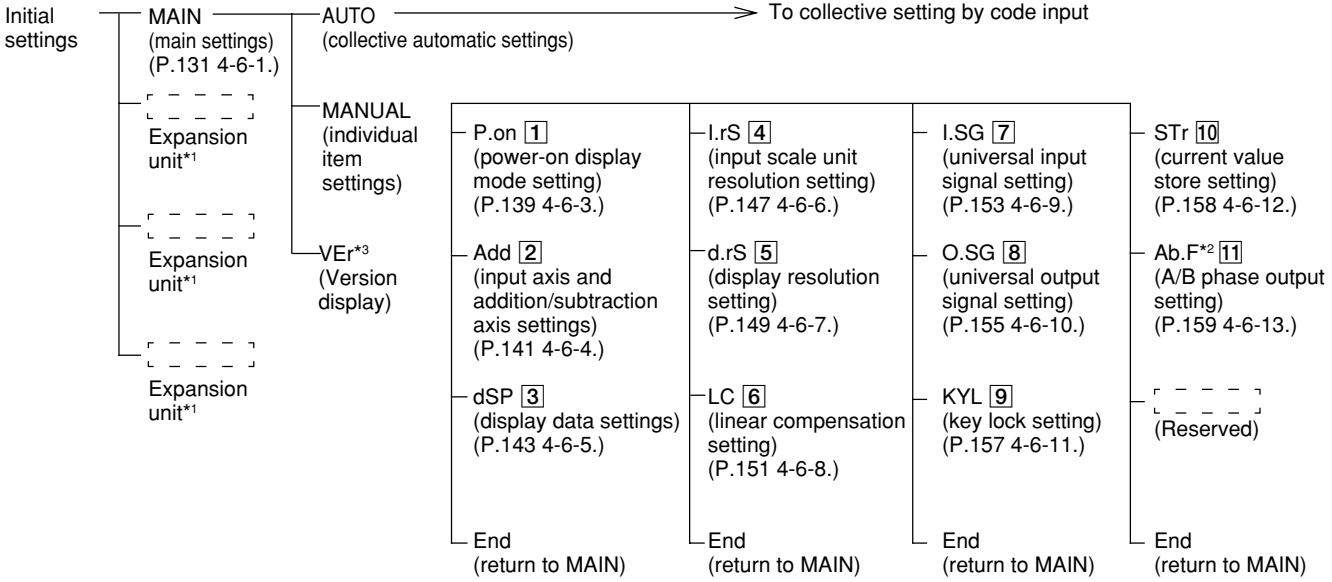
1. When the power is turned on while depressing RESET
2. When the power is first turned on (when the initial settings have not been made)
3. When stored data has been lost (resetting the initial settings)
4. When expansion units have been added or removed, or when the scale unit type has been changed
5. When the “power-on display mode” is set to the initial setting mode by the initial settings*

* The display when the power is turned on can be selected from the “initial setting status” and “normal count” displays.

The various initial settings can either be set individually or input collectively.

- The initial settings can be performed by one of the following two methods.
  AUTO (Collective automatic settings): Code input according to a code table (See P.137 and 138.)
  MANUAL (Individual item settings): Setting using the display (See the configuration on P.124.)
  The initial settings should be performed separately for the “main unit” and the “expansion unit”.

Initial setting menu configuration



*1 Displayed when an expansion unit (option) is inserted.
*2 Valid when expansion unit LZ51-H (option) is inserted.
*3 “End” for Ver. 01.14 and earlier versions instead of “VEr”.
The boxed numbers for the items above refer to the numbers of the descriptions (“Initial value” and “Setting Hints”) starting from the next page.

English

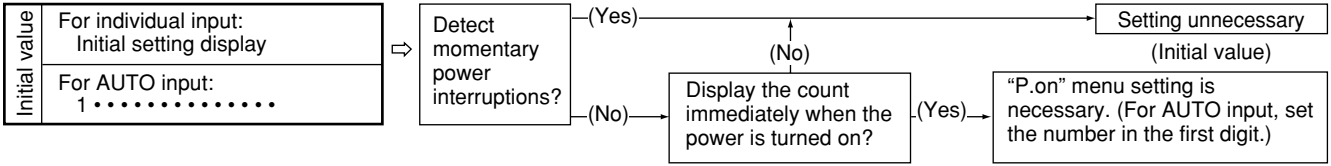
“Initial value” and “Setting Hints”

The initial values are input to the initial setting items. Therefore, it is not necessary to set all items and operation is possible simply by setting only the necessary items. (See “Initial setting menu configuration” on the previous page.) The “initial values” and “setting hints” for each setting item are given below.

Note Stored data may be lost or the settings may have changed. Therefore, be sure to check the setting contents even of items which do not need to be set to make sure these settings are okay.

1 Power-on display mode setting

This sets whether to display the initial settings or to display the count immediately when the power is turned on.

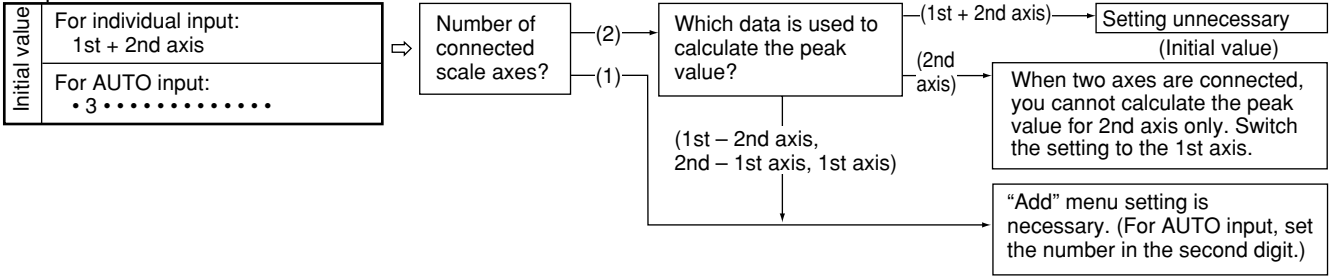


2 Input axis and addition/subtraction axis settings

This sets the number of connected scale unit axes. It also performs the addition/subtraction axis setting when two axes are connected. This setting is used to calculate the peak value (maximum, minimum and peak-to-peak values).

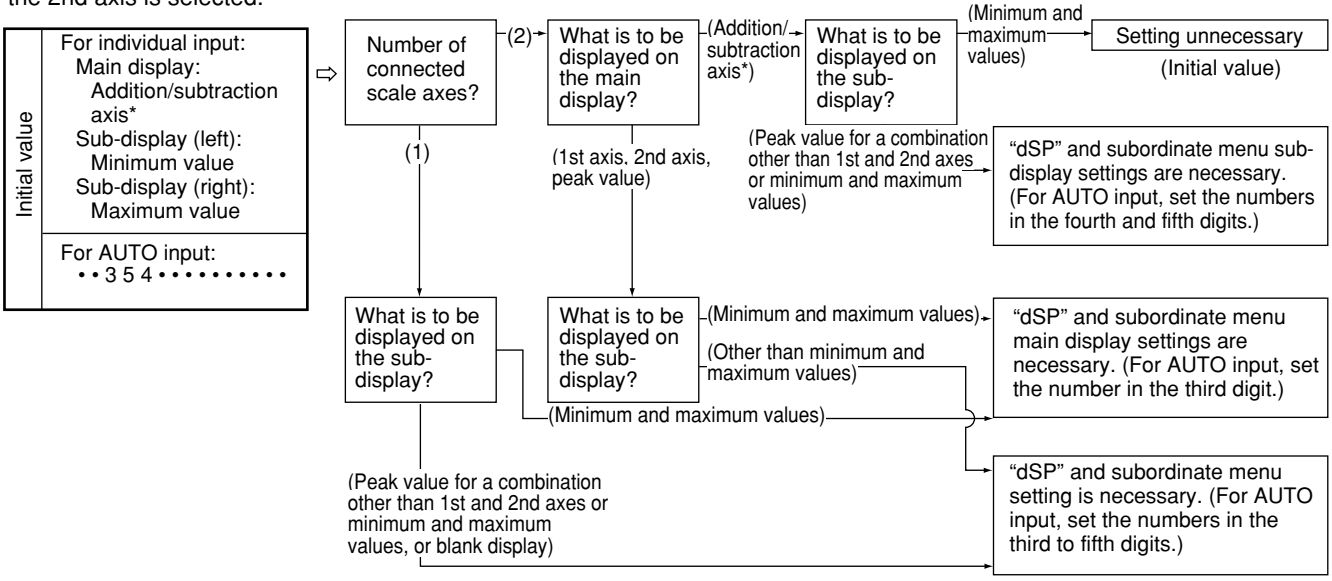
When 1st axis only or 2nd axis only is selected, the data for that axis is used to calculate the peak value.

When addition/subtraction axis is selected and this setting is 1st + 2nd axis, 1st – 2nd axis or 2nd – 1st axis, the peak value is calculated using the respective data. However, when 1st and 2nd axes independent is selected, the 1st axis becomes the main axis and is used as the current value for calculating the peak value. The 2nd axis becomes the auxiliary axis and does not affect the peak value calculation.



3 Display data setting

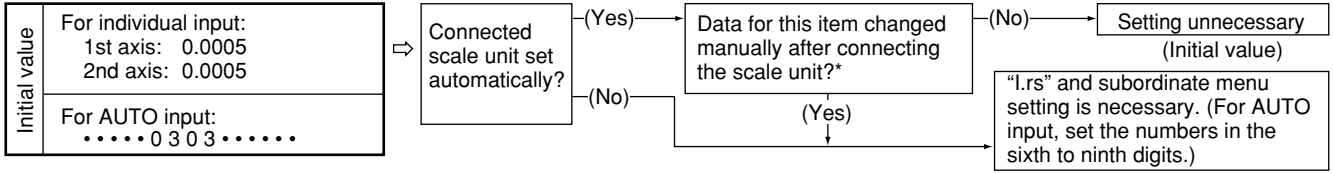
This sets the data to be displayed on the main and sub-displays. The current value or the peak value (maximum, minimum and peak-to-peak values) can be displayed on the main display. If the peak value is selected for the main display, the display can be switched with the current value by pressing MODE/ENTER key. (The current value is the value selected in item 2 above.) The current value, peak value or the judgment results when a comparator unit is connected can be displayed on the sub-display. If the number of connected scale axes is set to "1" in item 2 above, the display goes blank when the unconnected axis is selected as the display data. For example, if 1st axis only is selected in item 2 above, the respective display goes blank when the 2nd axis is selected.



* When 1st and 2nd axes independent is selected for the addition/subtraction axis, the 1st axis is used.

4 Input scale unit resolution setting

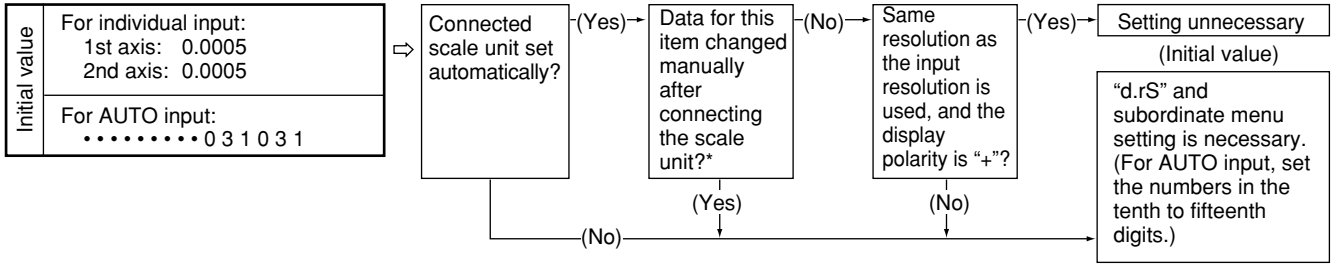
This sets the input scale unit resolution. This item is automatically set for some scale units. See “4-6-6. Input scale unit resolution setting” (P.147) for details. The resolution of axes not selected in item 2 is automatically set to “None”. For example, if 1st axis only is selected in item 2, the resolution of the 2nd axis is “None”.



* Automatically set scale units are set automatically only when the scale unit is initially connected. If you change the setting value manually after connection, the setting does not automatically return to the original value.

5 Display resolution setting

This sets the display data resolution. You cannot set a resolution smaller than that set in item 4 above. See “4-6-7. Display resolution” (P.149) for details.



* If you set the display resolution to “None”, the display is blank for that axis.

English

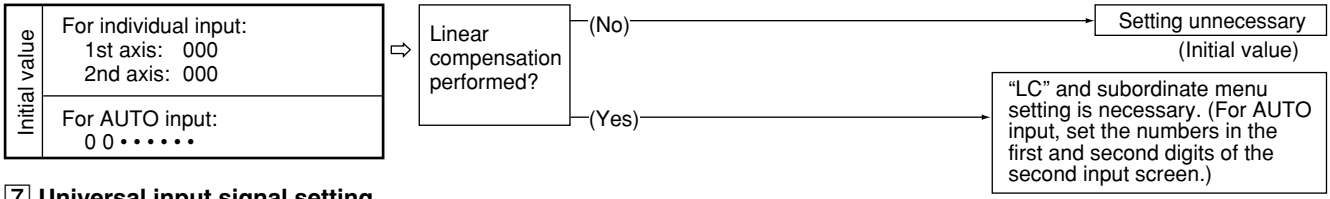
The LY51 has a large number of initial setting items, so the input screen changes to the next page from this item for AUTO input. (n1 (M1) → n2 (M2))

6 Linear compensation setting

You can input the linear compensation in 1 µm units up to a maximum 600 µm.
However, note that the following items should be observed during input to ensure correct operation.

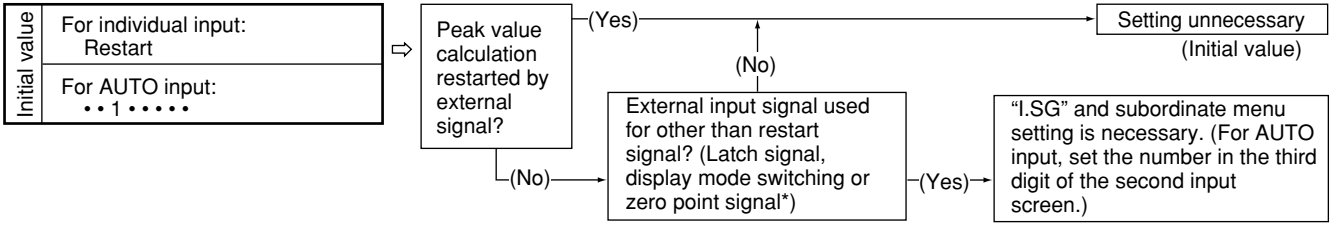
Notes
- Do not input a smaller value than the input resolution.
  [Example] If item 4 is set to 0.01 (= 10 µm), input a value of 10 µm or more. Do not input 1 to 9 µm.
- Do not input a value that results in a fraction. Input a value that is an integer multiple of the input resolution.
  [Example] If item 4 is set to 0.01 (= 10 µm), input 10 µm, 20 µm, etc. Do not input 11 µm, 12 µm, etc.

* If the input resolution is 0.0005 mm or less, input the value in 1 µm units.



7 Universal input signal setting

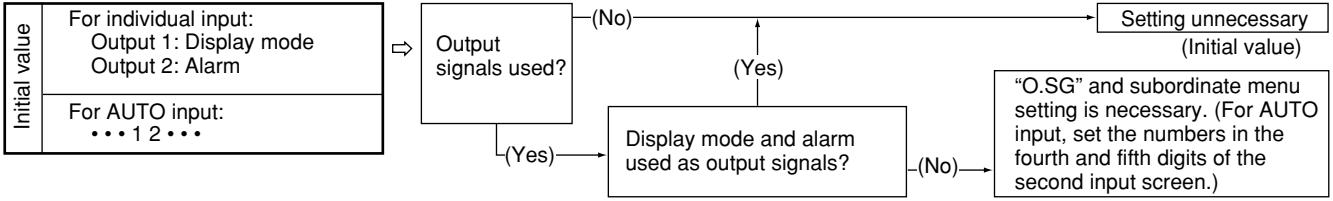
The universal input signal function can be changed according to the purpose of use.



* The zero point signal here uses a limit switch or other contact point signal. It does not use a Sony Precision Technology zero point sensor.

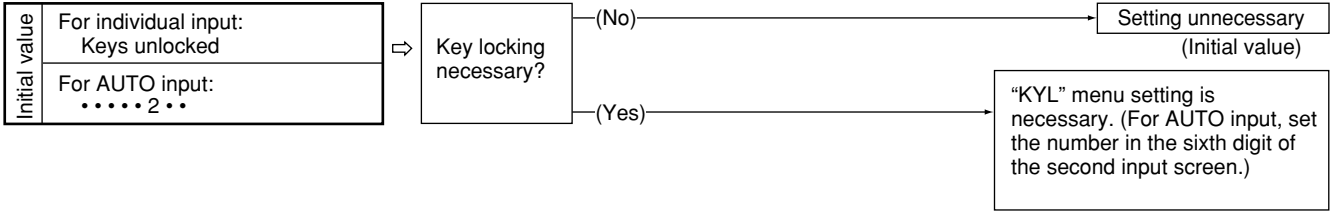
8 Universal output signal setting

The universal output signal function can be changed according to the purpose of use. There are two outputs.



9 Key lock setting

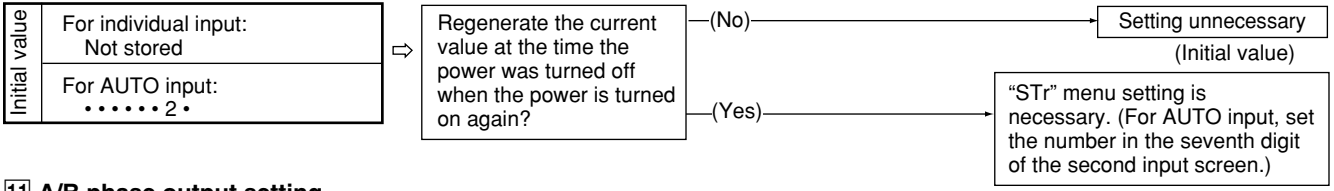
The key lock function lets you prohibit key operations during count operation. When there is no need to change settings during actual operation, setting this function in advance prevents workers from inadvertently changing the setting contents.



English

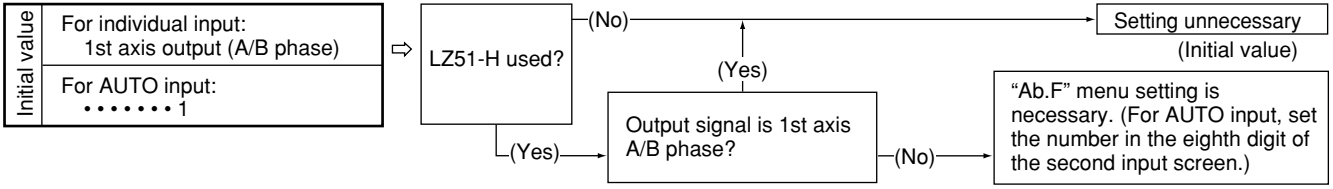
10 Current value store setting

This function lets you recall the current value at the time the power was turned off when the power is turned on again.



11 A/B phase output setting

This sets the output signal when the optional expansion unit LZ51-H is connected. When not using the LZ51-H, setting is unnecessary.



4-6-1. Menu selection

Notes on storing the initial setting data

Data input by the initial settings is written to a flash memory. The display goes blank and the REF and PEAK lamps flash while the memory is being written. Absolutely do not turn off the power while the memory is being written. (If the power is turned off, the memory cannot be written and the settings must be made again.) The memory is written in the following three cases.

a. When the power is turned on.
b. When the menu settings are ended.
c. When RESET key is pressed to end the initial settings and start the count display.

1. Any of operations [1] to [5] in "Initial setting mode" on page 123.

When no initial settings have been input or when the stored data has been lost, "d.Error" is displayed. In all other cases, the display is blank.
When an expansion unit is inserted, the unit setting display appears in the "–" portion.



2. Select the desired item with the cursor movement keys [◁] [▷].

The selected item flashes.

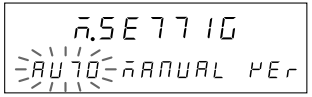
3. Press [ENTER] while "MAIN" is flashing.

The LY51 initial setting screen appears.

4. Select the desired item with the cursor movement keys ◁ ▷.

The selected item flashes.
(1) “AUTO” : collective automatic setting
(2) “MANUAL” : individual item setting
(3) “VEr” : version display
“End” for Ver. 01.14 and earlier versions instead of “VEr”.

Main display
Sub-display



(1) (2) (3)

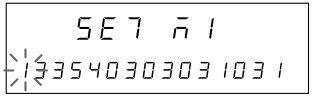
The procedures are divided into cases (1) to (4) below.
(1) When AUTO is selected
(2) When MANUAL is selected
(3) When VEr is selected
(4) When RESET is pressed
The operations for each case are described below.

(1) When AUTO is selected

5. Select “AUTO” and press ENTER .

The collective automatic setting screen appears.
Perform the settings according to the LY51 collective automatic setting code table.
See “4-6-2. Collective Automatic Setting” on page 135.

Main display
Sub-display



English

(2) When MANUAL is selected

5. Select “MANUAL” and press [ENTER].

The individual item setting menu screen appears. See the settings for each item.

(1) “P.on” : Power-on display mode setting (P.139 4-6-3.)
(2) “Add” : Input axis and addition/subtraction axis settings (P.141 4-6-4.)
(3) “dSP” : Display data settings (P.143 4-6-5.)

The item menu is switched using [F].

(4) “I.rS” : Input scale unit resolution setting (P.147 4-6-6.)
(5) “d.rS” : Display resolution (P.149 4-6-7.)
(6) “LC” : Linear compensation setting (P.151 4-6-8.)

The item menu is switched using [F].

(7) “I.SG” : Universal input signal setting (P.153 4-6-9.)
(8) “O.SG”: Universal output signal setting (P.155 4-6-10.)
(9) “KYL” : Key lock setting (P.157 4-6-11.)

The item menu is switched using [F].

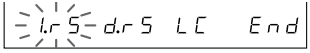
(10) “STr” : Current value store enable/disable (P.158 4-6-12.)
(11) “Ab.F” : A/B phase output setting (P.159 4-6-13.)
(12) Selecting “End” and pressing [ENTER] or pressing [RESET] ends the processing and returns to the previous menu.

Main display



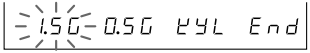
(1) (2) (3) (12)

Sub-display



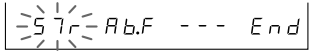
(4) (5) (6) (12)

Sub-display



(7) (8) (9) (12)

Sub-display



(10) (11) (12)

English

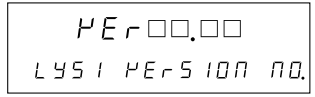
(3) When VEr is selected

5. Select "VEr" and press [ENTER].

Displays the version.
To quit the display, press [RESET] or [ENTER].

Note Ver. 01.14 and earlier versions do not have a version display menu. In these cases, the "End" display results.

Main display
Sub-display



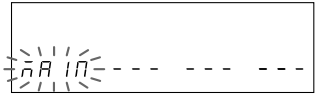
□□.□□ : Version No.

(4) When [RESET] is pressed

5. Press [RESET].

Ends the LY51 initial settings and returns to the initial setting menu.

Main display
Sub-display



English

4-6-2. Collective automatic setting

The initial setting items can be set at once using code input.
This section describes the method for setting various items at once using code input. See the individual item descriptions below for a detailed description of each item.

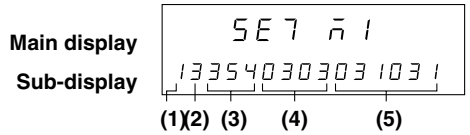
(Continued from 4-6-1 (1).) (P.132)

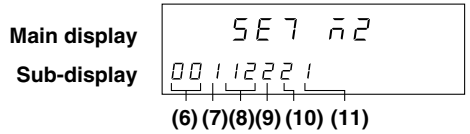
1. Select the desired item with the cursor movement keys [◁] [▷].

Shift the selected digit using the cursor movement keys [◁] [▷].

Press [−] [+].

Press [−] [+] to change the number.
Switch between code input tables (1) and (2) using [F] .
If you press [ENTER] while code input table (1) is displayed, the display switches to code input table (2).





Note: To input the display resolution (5) in inches, press [REF] twice before inputting the value. "SET n1=" appears in the main display to indicate inch input.

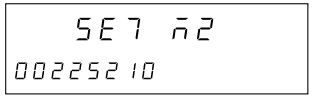
English

• To enter the set code

2. Press (ENTER) while code input table (2) is displayed.

Enters the setting contents. (Flashing → Lighted steadily)
The setting contents light steadily for approximately 2 seconds for confirmation.
When linear compensation is enabled, the settings do not end and operation shifts to the linear compensation value input. The input method is the same as “4-6-8. Linear compensation setting” (P.151).

Main display
Sub-display

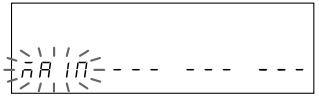


(Lights)

↓

(After approx. 2 sec.)

Main display
Sub-display

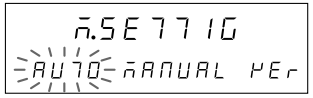


• To interrupt the settings

2. Press (RESET).

Interrupts the collective automatic settings.
(Previous setting contents remain.)

Main display
Sub-display



English

LY51 collective code input table (1)

Power-on mode	Input axis, addition/subtraction axis	Display axis			Input resolution		Display resolution (* : Press REF , then input.)					
1st digit	2nd digit	3rd digit	4th digit	5th digit	6th and 7th digit	8th and 9th digit	10th and 11th digit		12th digit	13th and 14th digit		15th digit
		Main display	Sub-display 1	Sub-display 2	1st axis	2nd axis	1st axis		Polarity	2nd axis		Polarity
Initial setting	1st axis only	Current value (1st axis only)	Current value (1st axis only)	Current value (1st axis only)	None	None	mm None	inch* None	Positive	mm None	inch* None	Positive
1	1	1	1	1	00	00	00	00	1	00	00	1
Count display	2nd axis only	Current value (2nd axis only)	Current value (2nd axis only)	Current value (2nd axis only)	0.00005	0.00005	0.00005	0.000002	Negative	0.00005	0.000002	Negative
2	2	2	2	2	01	01	01	13	2	01	13	2
	1st + 2nd axes	Current value (Addition/ Subtraction axis)	Current value (Addition/ Subtraction axis)	Current value (Addition/ Subtraction axis)	0.0001	0.0001	0.0001	0.000005		0.0001	0.000005	
	3	3	3	3	02	02	02	14		02	14	
	1st – 2nd axis	Maximum value	Maximum value	Maximum value	0.0005	0.0005	0.0005	0.00002		0.0005	0.00002	
	4	4	4	4	03	03	03	15		03	15	
	2nd – 1st axis	Minimum value	Minimum value	Minimum value	0.001	0.001	0.001	0.00005		0.001	0.00005	
	5	5	5	5	04	04	04	16		04	16	
	1st, 2nd axes	Peak-to-peak value	Peak-to-peak value	Peak-to-peak value	0.002	0.002	0.002	0.0001		0.002	0.0001	
	6	6	6	6	05	05	05	17		05	17	
					0.005	0.005	0.005	0.0002		0.005	0.0002	
					06	06	06	18		06	18	
					0.01	0.01	0.01	0.0005		0.01	0.0005	
					07	07	07	19		07	19	
					0.02	0.02	0.02	0.001		0.02	0.001	
					08	08	08	20		08	20	
					0.025	0.025	0.025	0.002		0.025	0.002	
					09	09	09	21		09	21	
					0.05	0.05	0.05	0.005		0.05	0.005	
					10	10	10	22		10	22	
					0.1	0.1	0.1			0.1		
					11	11	11			11		

English

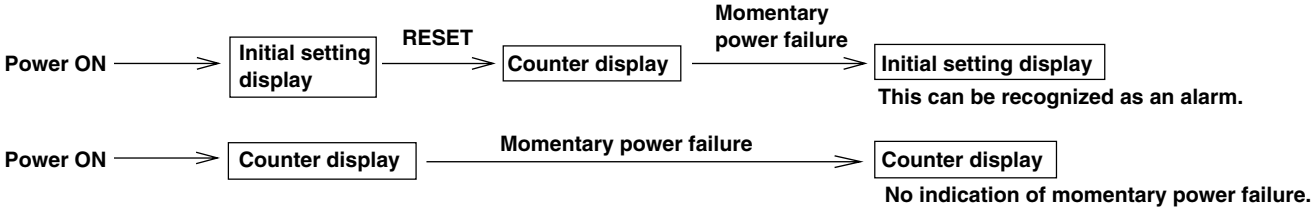
LY51 collective code input table (2)

Linear compensation		Universal input	Universal output		Key lock	Current value storage	A/B phase output
1st digit	**2nd digit**	**3rd digit**	**4th digit**	**5th digit**	**6th digit**	**7th digit**	**8th digit**
1st axis	**2nd axis**		**Output 1**	**Output 2**			
None	None	Restart	Display mode	Display mode	Locked	Stored	LZ51-H not used
0	0	1	1	1	1	1	0
Present	Present	Latch	Alarm	Alarm	Unlocked	Not stored	1st axis output (A/B phase)
1	1	2	2	2	2	2	1
		Zero point	Zero point	Zero point			1st axis output (up/down)
		3	3	3			2
		Mode switching mode	Zero point reference mode	Zero point reference			2nd axis output (A/B phase)
		4	4	4			3
		(Print)	Zero point alarm	Zero point alarm			2nd axis output (up/down)
		5	5	5			4

English

4-6-3. Power-on display mode setting

By setting the display mode when the power is turned on in the initial settings, this can be used as an alarm for when a momentary power failure occurs.



(Continued from 4-6-1 (2).) (P.133)

1. Select "P.on" and press [ENTER].

The power-on display mode can be selected from the initial setting mode (INIT) or the counter mode (COUNT).
The selected item flashes.
"INIT" : initial setting mode
"COUNT" : counter mode
The initial value is the initial setting mode (INIT).

Main display SET P.on
Sub-display INIT COUNT End

2. Select the desired item with the cursor movement keys [◁] [▷].

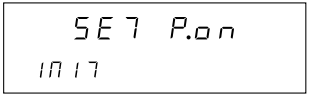
English

• To enter the settings

3. After selecting the desired item, press (ENTER).

Enters the power-on display mode.
(In this case, initial setting mode (INIT) is selected.)
The setting contents light steadily for
approximately 2 seconds for confirmation.

Main display
Sub-display



(Lights)

↓

(After approx. 2 sec.)

Main display
Sub-display



• To interrupt the settings

3. Press (RESET)
or select "End" and press (ENTER).

Interrupts the power-on display mode settings.
(Previous setting contents remain.)

Main display
Sub-display



English

4-6-4. Input axis and addition/subtraction axis settings

This sets whether a 1 or 2-axis scale unit is connected. It also performs the addition/subtraction axis setting in the case of 2-axis input.
The peak hold value is calculated using the axes selected here as the current value.

(Continued from 4-6-1 (2).) (P.133)

1. Select "Add" and press [ENTER].

Selects whether the input axis is the 1st or 2nd axis only or both the 1st and 2nd axes.
The selected item flashes.
"1" : 1st axis only input
"2" : 2nd axis only input
"12" : 1st and 2nd axes input
The initial value is 1st and 2nd axis input (12).

Main display SET Add
Sub-display 1 2 12 End

2. Select the desired item with the cursor movement keys [◁] [▷].

• To enter the settings

3. Select the desired item and press [ENTER].

Enters the input axis and addition subtraction axis settings.
(In this case, 1st axis only input (1) is selected.)
The setting contents light steadily for approximately 2 seconds for confirmation.
However, if "12" (1st and 2nd axes input) is selected, the setting is not entered and operation shifts to the addition/subtraction axis setting. (See the procedures below.)

Main display SET Add
Sub-display 1

(Lights)

↓

(After approx. 2 sec.)

Main display n.nANUAL
Sub-display P.on Add dSP End

English

4. Select the desired item with the cursor movement keys ◁ ▷.

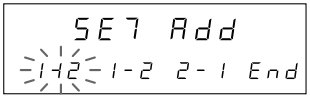
The selected item flashes.
"1+2" : 1st and 2nd axes added
"1–2" : 2nd axis subtracted from 1st axis
"2–1" : 1st axis subtracted from 2nd axis

Press F.

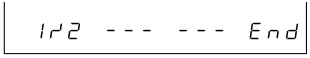
The item menu is switched using F.
"1/2" : 1st and 2nd axes independent

Note When the 1st and 2nd axes are independent, peak hold and other operations are performed for the 1st axis.

Main display
Sub-display



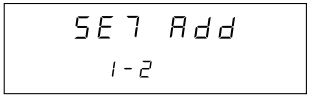
Sub-display



5. Select the necessary items and press ENTER.

Enters the item.
(In this case, 2nd axis subtracted from 1st axis (1–2) is selected.)
The setting contents light steadily for approximately 2 seconds for confirmation.

Main display
Sub-display



(Lights)
↓
(After approx. 2 sec.)

Main display
Sub-display

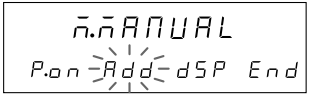


• To interrupt the settings

3. Press RESET or select "End" and press ENTER.

Interrupts the input axis and addition/subtraction axis settings.
(Previous setting contents remain.)

Main display
Sub-display



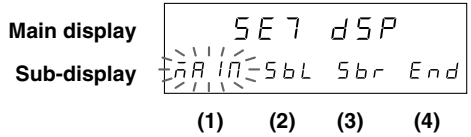
4-6-5. Display data settings

This sets the data to be displayed. (The display changes when the comparator units LZ51-K or LZ51-R are connected. In these cases, see the instruction manual of the comparator unit.)
You can select blank display for axes that are not input by this setting. For example, if the input is set to 1st axis only by the previous item, the display is blank when the 2nd axis is selected for this item.

(Continued from 4-6-1 (2).) (P.133)

1. Select "dSP" and press [ENTER].

Sets the data displayed on the main and sub-displays.
The selected item flashes.
(1) "MAIN" : Main display setting
(2) "SbL" : Sub-display (left side) setting
(3) "Sbr" : Sub-display (right side) setting
(4) Select "End" and press [ENTER] or press [RESET] to end the setting operation and return to the MANUAL (individual item setting) menu.



2. Select the desired item with the cursor movement keys [◁] [▷].

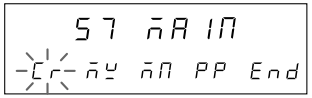
At this point, the operations are divided into cases (1) to (4) below.
(1) Main display setting
(2) Sub-display (left side) setting
(3) Sub-display (right side) setting
(4) End settings
The operations for each case are described below.

(1) Main display setting (Continued from P.143.)

3. Select "MAIN" and press [ENTER].

Sets the data displayed on the main display.
The selected item flashes.
"Cr" : Current value
"MX" : Maximum value
"MN" : Minimum value
"PP" : Peak-to-peak value
The initial setting is the current value 1st and 2nd axes addition/subtraction (Cr).

Main display
Sub-display



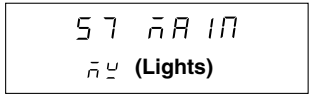
4. Select the desired item with the cursor movement keys [◁] [▷].

• To enter the settings

5. Select the data you wish to display and press [ENTER].

Enters the data displayed on the main display.
(In this case, the maximum value (MX) is selected.)
The setting contents light steadily for approximately 2 seconds for confirmation.
When the current value is selected, the settings do not end.
The 1st axis (1), 2nd axis (2) and addition axis (Add) selection appears.
Select the data you wish to display and press [ENTER].

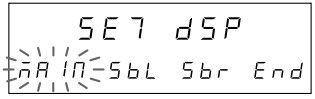
Main display
Sub-display



↓

(After approx. 2 sec.)

Main display
Sub-display

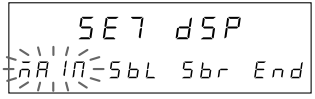


• To interrupt the settings

5. Press [RESET] or select "End" and press [ENTER].

Interrupts the main display setting.
(Previous setting contents remain.)

Main display
Sub-display



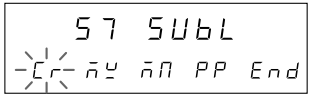
English

(2) Sub-display (left side) setting (Continued from P.143.)

3. Select "SbL" and press [ENTER].

Selects the data displayed on the left side of the sub-display.
The selected item flashes.
The initial setting is the minimum (MN) value.

Main display
Sub-display



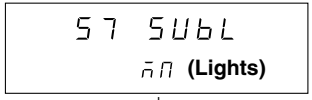
4. Select the desired item with the cursor movement keys [◁] [▷].

• To enter the settings

5. Select the data you wish to display and press [ENTER].

Enters the data displayed on the left side of the sub-display.
(In this case, the minimum value (MN) is selected.)
The setting contents light steadily for approximately 2 seconds for confirmation.

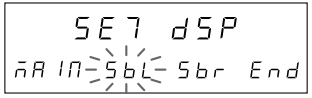
Main display
Sub-display



↓

(After approx. 2 sec.)

Main display
Sub-display

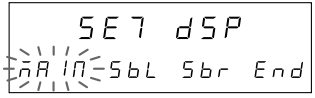


• To interrupt the settings

5. Press [RESET] or select "End" and press [ENTER].

Interrupts the sub-display (left side) setting.
(Previous setting contents remain.)

Main display
Sub-display



English

(3) Sub-display (right side) setting (Continued from P.143.)

3. Select "Sbr" and press [ENTER].

Selects the data displayed on the right side of the sub-display.
The selected item flashes.
The initial setting is the maximum value (MX).

Main display / **Sub-display**



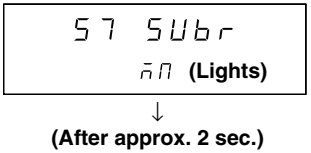
4. Select the desired item with the cursor movement keys [◁] [▷].

• To enter the settings

5. Select the data you wish to display and press [ENTER].

Enters the data displayed on the right side of the sub-display.
(In this case, the minimum value (MN) is selected.)
The setting contents light steadily for approximately 2 seconds for confirmation.

Main display / **Sub-display**

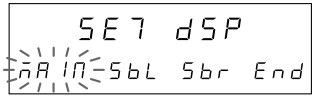


• To interrupt the settings

5. Press [RESET] or select "End" and press [ENTER].

Interrupts the sub-display (right side) setting.
(Previous setting contents remain.)

Main display / **Sub-display**



(4) End settings (Continued from P.143.)

3. Select "End" and press ENTER or press RESET .

Ends the display data settings.

Main display n.nANUAL

Sub-display P.on Add dSP End

4-6-6. Input scale unit resolution setting

The resolution is set automatically for some scale units including Magnescales, Digirulers and GA.

Magnescale: 0.0005 mm
Digiruler: 0.01 mm
GA: 0.005 mm

The resolution must be set for other scale units. Be sure to read the instruction manual of the scale unit used and set the correct input resolution. If an incorrect resolution is set, counting cannot be performed properly. (Axes without scale unit input need not be set. The resolution of axes not selected in item 4-6-4. is "None". For example, if the input is set to 1st axis only, the resolution of the 2nd axis is "None".) See the "Collective code input table (1)" on P.137 for the resolutions which can be set. Automatic setting is performed when the power is first turned on, or when the power is turned on again but the input scale unit type has changed from before. Automatic setting is not performed if the input scale unit status is the same as before. Note that the settings in items 4-6-4. and 4-6-5. above may also change when automatic setting is performed.

(Continued from 4-6-1 (2).) (P.133)

1. Select "I.rS" and press ENTER .

The 1st and 2nd axis input resolution can be set.
The selected item flashes.

Main display SET I.rS

Sub-display 1S 1G 2S 1G End

2. Select the desired item with the cursor movement keys ◁ ▷.

(1) 1st axis (2nd axis) input resolution setting (Continued from P.147.)

3. Select "1SIG" and press [ENTER].
(Select "2SIG" for the 2nd axis.)

The 1st axis input resolution can be set.

Main display / **Sub-display**



4. Press [−] [+].

The resolution changes.

Note The speed at which the display flashes becomes faster if the resolution is changed for an automatically set scale unit.

Main display / **Sub-display**

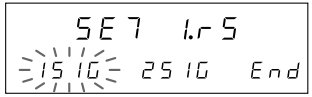


• To enter the settings

5. Set the required resolution and press [ENTER].

The 1st axis resolution is set.

Main display / **Sub-display**

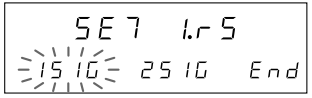


• To interrupt the settings

5. Press [RESET].

Interrupts the input scale resolution setting.
(Previous setting contents remain.)

Main display / **Sub-display**

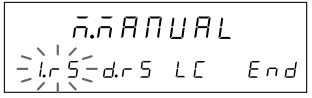


(2) End settings (Continued from P.147.)

3. Select "End" and press [ENTER] or press [RESET].

Ends the input scale resolution setting.

Main display / **Sub-display**



4-6-7. Display resolution

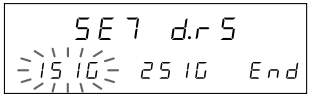
You cannot select a display resolution value higher than the resolution of the input scale unit signal. (Axes without scale unit input need not be set. The resolution of axes set to “None” by item 4-6-6. are also “None” for this item.) See the “Collective code input table (1)” on P.137 for the display resolutions which can be displayed.

(Continued from 4-6-1 (2).) (P.133)

1. Select “d.rS” and press [ENTER].

The 1st and 2nd axis display resolution can be set.
The selected item flashes.

Main display / **Sub-display**



2. Select the desired item with the cursor movement keys [◁] [▷].

(1) 1st axis (2nd axis) display resolution setting

3. Select “1SIG” and press [ENTER].
(Select “2SIG” for the 2nd axis.)

The 1st axis display resolution can be set.

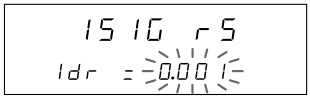
Main display / **Sub-display**



4. Press [−] [+]. (Press [REF].)

The resolution changes.
After all of the “+” resolutions have appeared, the “–” resolutions appear. (Pressing [REF] twice changes the display resolution to inches.)

Main display / **Sub-display**



English

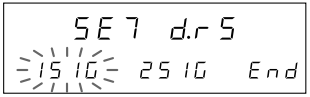
• To enter the settings

5. Set the required resolution and press ENTER.

The 1st axis display resolution is set.

Main display

Sub-display



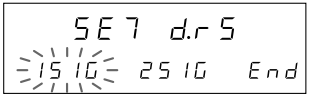
• To interrupt the settings

5. Press RESET.

Interrupts the display resolution settings.
(Previous setting contents remain.)

Main display

Sub-display



(2) End settings (Continued from P.149.)

3. Select "End" and press ENTER or press RESET.

Ends the display resolution settings.

Main display

Sub-display



English

4-6-8. Linear compensation setting

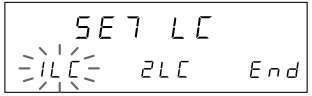
The linear compensation is the amount of compensation per 1 m, and can be input in 1 μm units up to a maximum ±600 μm. Input the linear compensation using the same minimum units as the input resolution in item 4-6-6. so that there are no fractions. (Otherwise, compensation cannot be applied correctly.) For example, input the linear compensation in 10 μm units for 0.01 mm input.

(Continued from 4-6-1 (2).) (P.133)

1. Select "LC" and press [ENTER].

The 1st and 2nd axis linear compensation can be set.
The selected item flashes.

Main display / **Sub-display**



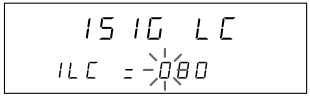
2. Select the desired item with the cursor movement keys [◁] [▷].

(1) 1st axis (2nd axis) linear compensation setting

3. Select "1LC" and press [ENTER].
(Select "2LC" for the 2nd axis.)

The 1st axis linear compensation can be set.

Main display / **Sub-display**



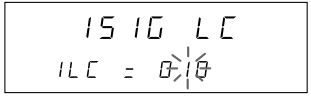
4. Press [−] [+].

The number changes each time [−] [+] is pressed.

Press [◁] [▷].

The digit changes each time [◁] [▷] is pressed.

Main display / **Sub-display**



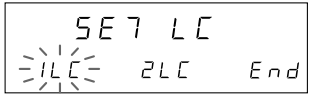
• To enter the settings

5. Set the required linear compensation and press ENTER.

The 1st axis linear compensation is set.

Main display

Sub-display



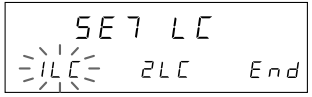
• To interrupt the settings

5. Press RESET.

Interrupts the linear compensation settings.
(Previous setting contents remain.)

Main display

Sub-display



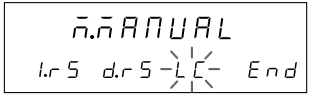
(2) End settings (Continued from P.151.)

3. Select "End" and press ENTER or press RESET.

Ends the linear compensation settings.

Main display

Sub-display



4-6-9. Universal input signal setting

The setting changes when the RS-232C unit LZ51-C (option) is connected. In this case, see the instruction manual of the RS-232C unit.

(Continued from 4-6-1 (2).) (P.133)

1. Select "I.SG" and press [ENTER].

Selects the universal input signal.
"rST" : External restart (peak value restart)
"LCH" : External latch (Display latch)
"rEF" : External zero point (When using a contact point switch as a zero point, the zero point is detected at the falling edge of this signal.)

Main display SET I.SG
Sub-display rST LCH rEF End

Press [F].

The item menu is switched using [F].
"Mod" : Mode switching
The selected item flashes.
The initial setting is external restart (rST).

Sub-display Mod --- --- End

2. Select the desired item with the cursor movement keys [◁] [▷].

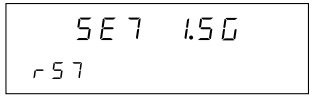
English

• To enter the settings

3. After selecting the desired item, press ENTER.

Enters the universal input signal settings.
(In this case, external restart (rST) is selected.)
The setting contents light steadily for approximately 2 seconds for confirmation.

Main display / **Sub-display**



(Lights)

↓

(After approx. 2 sec.)

Main display / **Sub-display**



• To interrupt the settings

3. Select "End" and press ENTER or press RESET.

Interrupts the universal input signal settings.
(Previous setting contents remain.)

Main display / **Sub-display**



English

4-6-10. Universal output signal setting

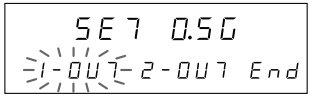
When the universal output is set to zero point output, the output signal goes “H” for the 100 ms when the zero point is passed.

(Continued from 4-6-1 (2).) (P.133)

1. Select “O.SG” and press [ENTER].

Sets the universal output signal.
The selected item flashes.

Main display / **Sub-display**

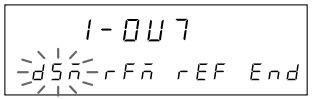


2. Select the desired item with the cursor movement keys [◁] [▷].

(1) Output signal 1 (output signal 2) setting

3. Select “1-OUT” and press [ENTER].
(Select “2-OUT” for output signal 2.)

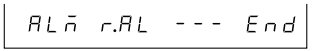
Main display / **Sub-display**



Sets the universal output signal 1.
“dSM”: Display mode (“H” output during peak display)
“rFM” : Zero point reference mode
(“H” output in reference mode)
“rEF” : Zero point (“H” output during zero point input)

Press [F].

Sub-display



The item menu is switched using [F].
“ALM”: Alarm (“H” output when an alarm occurs)
“r.AL” : Zero point alarm (“H” output when an alarm occurs)
The selected item flashes.
The initial setting is display mode (dSM).
(The initial setting for output signal 2 is alarm (ALM).)

4. Select the desired item with the cursor movement keys [◁] [▷].

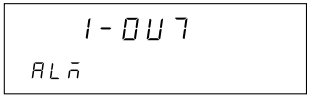
English

• To enter the settings

5. Select the required signal and press (ENTER)**.**

Enters the universal output 1 setting.
(In this case, alarm (ALM) is selected.)
The setting contents light steadily for approximately 2 seconds for confirmation.

Main display
Sub-display

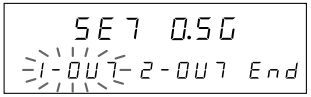


(Lights)

↓

(After approx. 2 sec.)

Main display
Sub-display

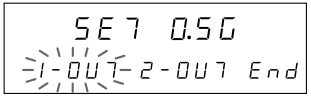


• To interrupt the settings

5. Select "End" and press (ENTER)
or press (RESET)**.**

Interrupts the universal output signal settings.
(Previous setting contents remain.)

Main display
Sub-display

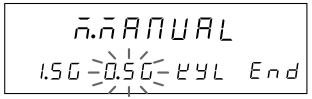


(2) End settings (Continued from P.155.)

3. Select "End" and press (ENTER)
or press (RESET)**.**

Ends the universal output signal settings.

Main display
Sub-display



4-6-11. Key lock setting

Key operations during operation can be prohibited to prevent workers from inadvertently changing the settings.
When the keys are locked, all key operations except for the initial settings are prohibited.

(Continued from 4-6-1 (2).) (P.133)

1. Select "KYL" and press [ENTER].

Key operations during operation can be enabled (LOCK) or disabled (UNLOCK).
The selected item flashes.
The initial setting is disable (UNLOCK).

Main display SET KYL
Sub-display LOCK -UNLOCK- End

2. Select the desired item with the cursor movement keys [◁] [▷].

• To enter the settings

3. After selecting the desired item, press [ENTER].

Enters the key lock setting.
(In this case, enable (LOCK) is selected.)
The setting contents light steadily for approximately 2 seconds for confirmation.

Main display SET KYL
Sub-display LOCK **(Lights)**

↓ **(After approx. 2 sec.)**

Main display M.MANUAL
Sub-display 1.5G 0.5G -KYL- End

• To interrupt the settings

3. Select "End" and press [ENTER] or press [RESET].

Interrupts the key lock settings.
(Previous setting contents remain.)

Main display M.MANUAL
Sub-display 1.5G 0.5G -KYL- End

4-6-12. Current value store enable/disable

The unit can be set to store or not store the current value when the power is turned off.

(Continued from 4-6-1 (2).) (P.133)

1. Select "STr" and press [ENTER].

Selects whether or not to store the current value when the power is turned off.
The selected item flashes.
The initial setting is not stored (NonSTr).

Main display SET STr
Sub-display STr NonSTr End

2. Select the desired item with the cursor movement keys [◁] [▷].

• To enter the settings

3. Select the required item and press [ENTER].

Enters the current value store setting.
(In this case, store (STr) is selected.)
The setting contents light steadily for approximately 2 seconds for confirmation.

Main display SET STr
Sub-display STr **(Lights)**

↓ **(After approx. 2 sec.)**

Main display MANUAL
Sub-display STr Ab.F --- End

• To interrupt the settings

3. Select "End" and press [ENTER] or press [RESET].

Interrupts the current value store settings.
(Previous setting contents remain.)

Main display MANUAL
Sub-display STr Ab.F --- End

4-6-13. A/B phase output setting

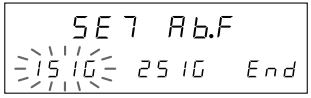
This function is valid only when using the optional LZ51-H. The setting is invalid in all other cases.

(Continued from 4-6-1 (2).) (P.133)

1. Select "Ab.F" and press [ENTER].

Selects the output axis.
The selected item flashes.
The initial setting is 1st axis output (1SIG).

Main display / **Sub-display**

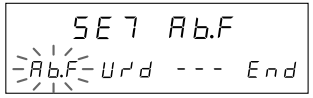


2. Select the desired item with the cursor movement keys [◁] [▷].

3. Select 1st axis or 2nd axis and press [ENTER].

Operation shifts to the A/B phase or up/down selection.
The selected item flashes.
The initial setting is A/B phase (Ab.F).

Main display / **Sub-display**



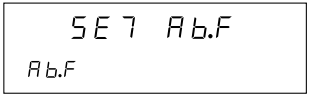
4. Select the desired item with the cursor movement keys [◁] [▷].

• To enter the settings

5. Select the required signal and press ENTER.

Enters the output signal.
(In this case, 1st axis A/B phase output (Ab.F) is selected.)
The setting contents light steadily for approximately 2 seconds for confirmation.

Main display / **Sub-display**



(Lights)

↓

(After approx. 2 sec.)

Main display / **Sub-display**



• To interrupt the settings

5. Select "End" and press ENTER or press RESET.

Interrupts the A/B phase output settings.
(Previous setting contents remain.)

Main display / **Sub-display**



English

OPERATIONS

Refer to this section during normal use.

5. FUNCTIONS

This section gives information on the special functions of the LY51 display unit.

5-1. Peak Hold Function

This function holds the minimum and maximum measured values and peak-to-peak value*. This function is enabled when the restart signal is input or when a reset or preset is performed.

* Peak-to-peak value is the difference between the maximum and minimum values.

If the current value is an error when the power is turned on, the peak value (minimum, maximum and peak-to-peak values) displays the error message “Error”. If an error occurs with the current value during measurement, the previously calculated peak value remains.

5-2. Zero Point Reference Function

Once you load the zero point, the zero point reference mode is selected.

When the zero point reference mode starts operating, the display unit receives a zero point signal whenever the zero point is passed. The unit will determine whether the position at which the zero point is passed corresponds to the position at which the zero point was first loaded. If the positions do not correspond for three counts or more, the error message “r.Error” will be displayed as the zero point error.

In other words, each time the zero point signal is received, the zero point position is verified.

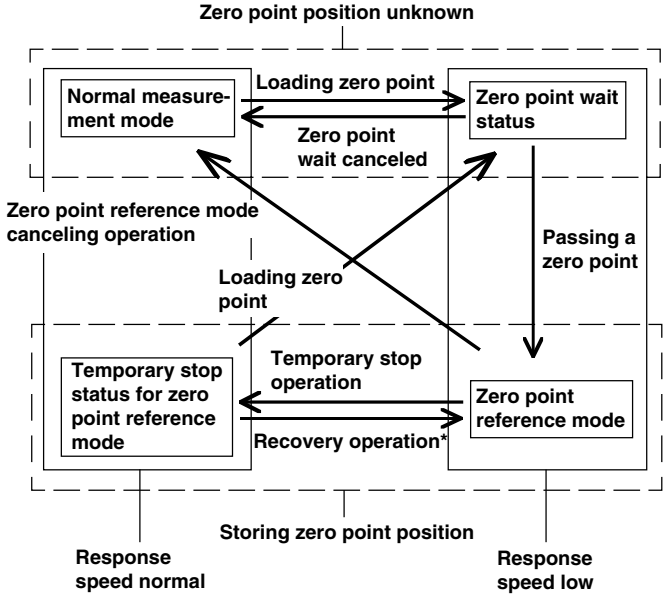
This function causes the unit to always wait for the zero point signal and therefore lowers the response speed (response frequency). To cancel this condition, the temporary stop status for the zero point reference mode is provided.

When the temporary stop status for the zero point reference mode is enabled, the unit holds the memory of the zero point position but does not perform zero point signal reference upon receiving the signal. Therefore, measurements can be performed at the same response speed (response frequency) as for normal measurement. When you want to verify the zero point again, cancel the temporary stop status of the zero point reference mode to restart zero point signal reference to ensure that the zero point position has not shifted.

If you do not need to verify the zero point position by zero point signal reference after loading the zero point once, cancel the zero point reference mode and enter normal measurement mode. (→ To normal measurement mode)
Unlike the temporary stop status of the zero point reference mode, the unit will not hold the memory of the previous zero point position once you cancel the zero point reference mode. Therefore, you will not be able to verify the zero point position by zero point signal reference.

Notes

1. When using the external universal input as a zero point, you cannot use the zero point input from the scale unit. At this time if the scale unit input is both the 1st and 2nd axes, the input data for the 1st axis is used as the zero point.
2. The DRQ input signal of the BCD unit is not accepted while using the zero point reference function. (This also applies during zero point wait load and hold.) The zero point signal has priority, so the DRQ signal is ignored.



* "Temporary stop status" differs from "cancellation" in that you can restart the zero point reference mode.

6. FUNCTIONS OF KEYS AND EXTERNAL CONTACT POINT INPUTS

This section briefly explains the functions of each key and external contact point input in accordance with the display status of the display unit.
See "7. OPERATION" for actual operations.

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6-2. REF (Zero Point Key) 165
6-3. F (Function Key) 165
6-4. PRINT (Print Key) 166
6-5. − + / ◁ ▷ (Data Set Keys) 166
6-6. MODE ENTER (Mode/Enter Key) 167
6-7. External Universal Input 167

English

6-1. RESET (Reset Key) and External Reset Input

Display	Operation performed	Operating procedure	Related sections
During initial setting mode	Ends the initial setting mode and starts the measurement mode.	Page 169: 7-1-1. Ending the initial settings	
During measurement mode	Sets the current value to “0”. Clears both maximum and minimum values and restarts the measurement mode. When waiting for a zero point, the wait status is canceled.	Page 169: 7-1-2. Resetting the current value	Normal measurement and zero point reference mode measurement → Page 162: 5-2. Zero Point Reference Function
When an error message is displayed (“Error” and “r.Error”)	Cancels the error message and returns to the measurement mode. If the zero point reference mode was executed before the error occurred, RESET will cancel the zero point reference mode. As a result, the reference point position is also canceled. The point at which RESET was pressed will be set as a reference point. If the unit was being used in the zero point reference mode, you have to reload the position of the reference point once more. Clears the maximum and minimum values and restarts the operation.	Page 170: 7-1-3. Resetting the error display	Error messages → Page 186: 8. ALARM DISPLAY/ OUTPUT Loading the zero point → Page 172: 7-2-2. Zero point load
During zero point wait status and zero point reference mode	Cancels the zero point wait status and the zero point reference mode. To restart the zero point reference mode, load the zero point once more.	Page 175: 7-2-7. Canceling the zero point reference mode	Temporary stop and canceling of the zero point reference mode → Page 162: 5-2. Zero Point Reference Function
During function setting mode	When RESET is pressed part-way through the various function settings, the setting operations are canceled and the unit returns to the mode before the setting operation. (This is the same when RESET is pressed while inputting the initial setting items.)		

6-2. REF (Zero Point Key)

Display	Operation performed	Operating procedure	Related sections
During initial setting mode	Ignored		
During measurement mode	Starts the mode for performing zero point related processing.	Page 171: 7-2. Zero Point Key Operations	
When an error message is displayed (“Error” and “r.Error”)	Ignored		

6-3. F (Function Key)

Used when setting the various functions.

Display	Operation performed	Operating procedure	Related sections
During initial setting mode	Selects the various setting item menus.	Page 123: 4-6. Initial Settings	
During measurement mode	Selects the various functions.	Page 176: 7-3. Function Key Operations	
When an error message is displayed (“Error” and “r.Error”)	Ignored		

6-4. PRINT (Print Key)

This key is used when the RS-232C unit LZ51-C (option) is connected. See the LZ51-C instruction manual for operation contents.

Display	Operation performed	Operating procedure	Related sections
During initial setting mode	Ignored		
During measurement mode (during normal measurement and zero point reference mode measurement)	Ignored (This is valid only when the LZ51-C is connected.)		
When an error message is displayed (“Error” and “r.Error”)	Ignored		

6-5. − / + / ◁ / ▷ (Data Set Keys)

These keys are used to set the various setting items. See the operation procedure for the respective setting items.

Display	Operation performed	Operating procedure	Related sections
During initial setting mode	Changes and selects the various setting items.		Page 123: 4-6. Initial Settings
During measurement mode	Ignored		
During function setting mode	Pressing F during the measurement mode starts the function setting mode. In this mode, the data set keys are used to change and select the various setting items.		Page 176: 7-3. Function Key Operations
When an error message is displayed (“Error” and “r.Error”)	Ignored		

6-6. MODE/ENTER (Mode/Enter Key)

Display	Operation performed	Operating procedure	Related sections
During initial setting mode	Selects and enters the item to be set with the initial settings.	Page 123: 4-6. Initial Settings	
During measurement mode	Switches the main display between the current value and the peak value when the main display is set to display the peak value by the initial settings.	Page 181: 7-5. Mode Switching	
During function setting mode	Enters the various setting items.	Page 176: 7-3. Function Key Operations	
When an error message is displayed (“Error” and “r.Error”)	Ignored		

6-7. External Universal Input

When you connect a switch or an electronic switch (IC) to the external universal input pin, it operates as the input set by the initial settings.

Display	Operation performed	Operating procedure	Related sections
During initial setting mode	Ignored		
During measurement mode (during normal measurement and zero point reference mode measurement)	Operates as the function set by the initial settings.	Page 182: 7-6. External Contact Point Input Operations	Peak hold →Page 162: 5-1. Peak Hold Function
When an error message is displayed (“Error” and “r.Error”)	Ignored		

English

7. OPERATION

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7-5. Mode Switching 181

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7-6-1. External restart 182
7-6-2. External latch 182
7-6-3. External zero point 183
7-6-4. External mode input 183
7-6-5. External print input 183

English

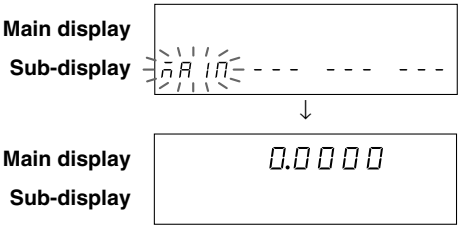
7-1. Resetting

The current value and error display can be reset using the RESET key or external reset input.

7-1-1. Ending the initial settings

Press RESET.

When you press RESET while the first initial setting menu is displayed, the initial settings are ended and the count display appears.



7-1-2. Resetting the current value

This sets the current value to “0”. It also clears the maximum, minimum and peak-to-peak values and sets them to “0”, allowing the operation to be restarted from the beginning.

Press RESET or input the external reset.

Clears the maximum, minimum and peak-to-peak values and sets them to “0”.
When waiting for a zero point, the zero point wait status is also canceled.



English

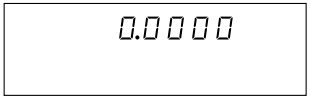
7-1-3. Resetting the error display

This clears the “Error” and “r.Error” displays.

Press RESET or input the external reset.

Clears the maximum, minimum and peak-to-peak values and sets them to “0”.
The zero point reference mode is also canceled.

Main display
Sub-display



7-1-4. Canceling

This cancels the operation part-way through initial setting and function key operations.

Press RESET.

Initial setting and function key operations currently underway are canceled.

Main display
Sub-display

(Previous display)

7-2. Zero Point Key Operations

Various operations related to zero point functions can be executed.

Zero point key operation menu configuration

- REF
  - LOAd (Zero point load) 7-2-2.
  - HLd (Zero point hold/zero poit reference hold) 7-2-3.
  - OFL (Zero point offset load) 7-2-4.
  - rLd (Zero point reference load) 7-2-5.
  - rOF (Temporarily stopping/recovering the zero point reference mode) 7-2-6.
  - rCL (Canceling the zero point reference mode) 7-2-7.
  - End (Ends the zero point key operation menu settings)

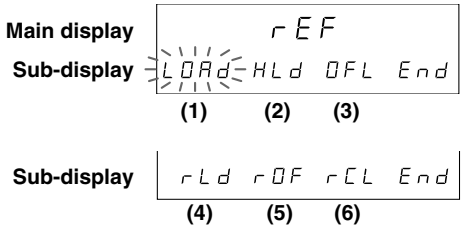
7-2-1. Selecting the zero point menus

1. Press [REF].

The zero point operation items appear.
(1) "LOAd" : Zero point load
(2) "HLd" : Zero point hold
(3) "OFL" : Zero point offset load

Press [REF].

The item menu is switched using [REF].
(4) "rLd" : Zero point reference load
(5) "rOF" : Temporarily stopping/recovering the zero point reference mode
(6) "rCL" : Canceling the zero point reference mode
The selected item flashes.



2. Select the desired item with the cursor movement keys [◁] [▷].

At this point, operation shifts to the various items. See the operations for each item.

7-2-2. Zero point load

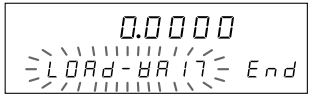
This starts the counting from the point when the zero point is passed. The maximum, minimum and peak-to-peak values are set to “0” and the operation restarts from the beginning.
When zero point load is performed during the zero point reference mode, the zero point reference mode is canceled.

(Continued from 7-2-1.) (P.171)

1. Select “LOAd” and press [ENTER].

The unit is placed in the zero point load wait status.
The REF LED flashes.
You can interrupt the operation by moving the cursor to “End” and pressing [ENTER].

Main display
Sub-display



2. (Zero point passed)

The REF LED goes off and counting starts.

Main display
Sub-display



7-2-3. Zero point hold

This holds the display at the point when the zero point is passed. Internal counting continues.
When the zero point is held during the zero point reference mode, operation continues in this mode.

(Continued from 7-2-1.) (P.171)

1. Select “HOLd” and press [ENTER].

The unit is placed in the zero point hold wait status.
The REF LED flashes.
You can interrupt the operation by moving the cursor to “End” and pressing [ENTER].

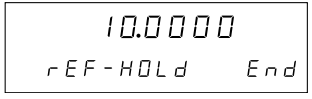
Main display
Sub-display



2. (Zero point passed)

The REF LED goes off and the display is held. (During the zero point reference mode, the REF LED remains lighted.)
Holding is canceled by moving the cursor to “End” and pressing [ENTER].

Main display
Sub-display



7-2-4. Zero point offset load

This starts the counting from the set value at the point when the zero point is passed. The maximum, minimum and peak-to-peak values restart from the set value.
When the zero point is loaded during the zero point reference mode, the zero point reference mode is canceled.

(Continued from 7-2-1.) (P.171)

1. Select "OFL" and press [ENTER].

The unit is placed in the zero point load wait status.
The REF LED flashes.
You can interrupt the operation by moving the cursor to "End" and pressing [ENTER].

Main display LOAd
Sub-display L 8000000

2. Input the offset value.

Press [−] [+] to change the number.
Press [◁] [▷] to change the digit.

3. Set the required offset value and press [ENTER].

4. (Zero point passed)

The REF LED goes off and counting starts.

Main display 25.0005
Sub-display

English

7-2-5. Zero point reference load

This starts the counting from the point when the zero point is passed. The maximum, minimum and peak-to-peak values are set to “0” and the operation restarts from the beginning.
The zero point reference mode starts after the zero point is passed.

(Continued from 7-2-1.) (P.171)

1. Select “rLd” and press ENTER.

The unit is placed in the zero point load wait status.
The REF LED flashes.
You can interrupt the operation by moving the cursor to “End” and pressing ENTER.

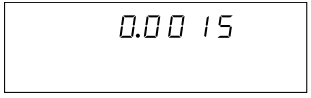
Main display
Sub-display



2. (Zero point passed)

The REF LED lights, the zero point reference mode starts, and counting starts.

Main display
Sub-display



7-2-6. Temporarily stopping/recovering the zero point reference mode

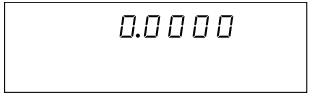
This temporarily stops the zero point reference mode. This operation is valid only during the zero point reference mode. When executed while the zero point reference mode is temporarily stopped, operation recovers to the zero point reference mode.

(Continued from 7-2-1.) (P.171)

1. Select “rOF” and press ENTER.

The REF LED goes off.
The zero point reference mode is temporarily stopped.

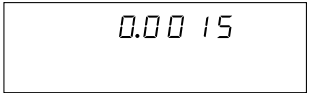
Main display
Sub-display



2. Select “rOF” and press ENTER.

The REF LED lights and operation recovers to the zero point reference mode.

Main display
Sub-display



7-2-7. Canceling the zero point reference mode

This cancels the zero point reference mode. This operation is valid only during the zero point reference mode.

(Continued from 7-2-1.) (P.171)

1. Select "rCL" and press ENTER.

The REF LED goes off.
The zero point reference mode is canceled.

Main display 0.0000
Sub-display

Note This operation differs from temporarily stopping the zero point reference mode in that operation cannot recover to the zero point reference mode. To restart the zero point reference mode, perform the procedure again from zero point reference load.

7-3. Function Key Operations

Various operations can be performed in a menu format using the [F] key .
When optional I/O units are connected, menu items may be added.
See the instruction manuals of the I/O units for the additional menus.

(1) Presetting operation, recalling the preset value
(2) Restarting operation
(3) Absolute value display (2 seconds)
(4) Operation for each axis

Function key menu configuration

- FUNC
  - PrS (Preset) 7-3-2.
  - rST (Restart) 7-3-3.
  - AbS (Absolute value display) 7-3-4.
  - AXIS *(Operation for each axis) 7-3-5.
    - PrESET (Preset for each axis)
    - rESET (Reset for each axis)
  - End (Ends function key processing)

* This cannot be selected for 1st axis only or 2nd axis only input.

7-3-1. Menu selection

1. Press [F].

The various function items are displayed.
(1) “PrS” : Presetting
(2) “rST” : Restarting
(3) “AbS” : Absolute value display

Press [F].

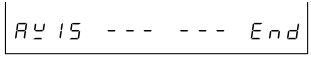
The item menu is switched using [F].
(4) “AXIS” : Operation for each axis (This cannot be selected for the 1st axis only or 2nd axis only input settings.)
Select “End” and press [ENTER] or press [RESET] to end the function key menu settings.

Main display



(1) (2) (3)

Sub-display



(4)

2. Select the desired item using the cursor movement keys [◁] [▷] and press [ENTER].

Enters the selected item.

At this point, operation shifts to the various items. See the operations for each item.

English

7-3-2. Presetting operation, recalling the preset value

This establishes a preset value with respect to the current value selected by the initial settings. Peak value calculation restarts when the presetting operation is executed. When the presetting operation is executed during 1st and 2nd axis addition/subtraction, the preset value is as follows.

1 + 2:1st axis = preset value, 2nd axis = reset
1 – 2:1st axis = preset value, 2nd axis = reset
2 – 1:1st axis = reset, 2nd axis = preset value
1,2: 1st axis = preset, 2nd axis = unchanged

To set a preset value for each axis, see “7-3-5. Operation for each axis”.

(Continued from 7-3-1.) (P.177)

1. Select “PrS” and press [ENTER].

The preset value input appears on the sub-display. When recalling the preset value, the previous value appears. In this case, press [ENTER] immediately without performing the next operation. Operation can also be interrupted by pressing [RESET] . (Return to the FUNC (function key) menu.)

Main display PrESET
Sub-display P = □□□□□□□

2. Press [−] [+].

Press [−] [+] to change the number.

Press [◁] [▷].

Press [◁] [▷] to change the digit

3. Set the required preset value and press [ENTER].

The preset value is set for the current value and the peak value is recalculated.

Main display
Sub-display **(Display corresponding to the preset value)**

7-3-3. Restarting operation

(Continued from 7-3-1.) (P.177)

1. Select "rST" and press [ENTER].

The peak value is cleared and is recalculated from the current value at that point.

Main display / **Sub-display**: **Maximum value, Minimum value → Current value / Peak-to-peak value → 0**

7-3-4. Absolute value display

(Continued from 7-3-1.) (P.177)

1. Select "ABS" and press [ENTER].

The absolute value of the current value appears on the main display for approximately 2 seconds.
If a resetting or presetting operation is not executed after passing the zero point, the zero point value will be the same as the current value (absolute value indication).

Note This value is displayed only and is not output.

Main display / **Sub-display**: **(Absolute value)**

7-3-5. Operation for each axis

When there are two input scale axes, the LY51 performs presetting and resetting operation for the addition/subtraction results.

	Preset operation		Reset operation
1st axis + 2nd axis:	1st axis = preset value,	2nd axis = reset,	1st and 2nd axes both reset
1st axis – 2nd axis:	1st axis = preset value,	2nd axis = reset,	1st and 2nd axes both reset
2nd axis – 1st axis:	1st axis = reset,	2nd axis = preset value,	1st and 2nd axes both reset
1st and 2nd axes independent:	1st axis = preset,	2nd axis = unchanged,	1st and 2nd axes both reset

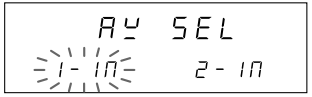
Therefore, use this function to perform operations separately for each axis. (This operation cannot be selected for the 1st axis only or 2nd axis only input settings.)

(Continued from 7-3-1.) (P.177)

1. Select "AXIS" and press [ENTER].

Select operation for the 1st axis or the 2nd axis.

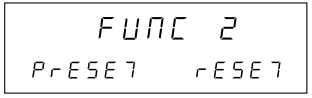
Main display
Sub-display



2. Select axis and press [ENTER].

Select preset or reset.

Main display
Sub-display



3. Select reset and press [ENTER].

The value of only the selected axis is reset.

Select preset and press [ENTER].

Resetting operation is performed for only the selected axis. Hereafter, operation is the same as in "7-3-2. Presetting operation". Peak value calculation is also restarted when this operation is performed.

Main display
Sub-display



7-4. Print Key Operations

When the LZ51-C (option) is connected, this outputs data to the RS-232C. See the LZ51-C instruction manual for the output data.
These operations are the same when the external universal input is set to external print.
When the LZ51-C is not connected, print key operations are invalid.

7-5. Mode Switching

You can switch the display by pressing the MODE key.
When the main display is set to the peak value (maximum, minimum and peak-to-peak values) by the initial settings, pressing the MODE key lets you view the current value. The current value is the axes selected by the initial setting item “4-6-4. Input axis and addition/subtraction axis settings”.

1. Press MODE while the PEAK LED is lighted.

The PEAK LED turns off and the main display shows the current value.

The PEAK LED turns off.

2. Press MODE while the PEAK LED is off.

The PEAK LED turns on and the main display shows the peak value.

The PEAK LED turns on.

When the main display is set to the current value by the initial settings, the display does not change.

7-6. External Contact Point Input Operations

The external contact points include external reset, external recall and external universal input. See “7-1. Resetting” for the external reset and “7-3-2. Presetting operation, recalling the preset value” for the external recall.
This section describes the external universal input. Various types of functions can be allotted to the external universal input by the initial settings.
These functions are described below.

7-6-1. External restart

Input the external restart.

Recalculates the peak value.

The maximum and minimum values are set to the current value at that time and the peak-to-peak value is set to “0”.

7-6-2. External latch

This holds the display. When the BCD unit LZ51-B (option) is connected, the function canges. See the LZ51-B instruction manual for details.

Input the external latch.

The display is held during latch input. However, when the BCD unit LZ51-B is connected, the function changes.

The display is held.

7-6-3. External zero point

This performs the same operation as scale unit zero point input. However, since a photo-coupler is inserted to protect the external contact point, the response time is slower than that for the scale unit zero point.

Note

The external zero point allows a contact point switch to be used as a zero point. It does not support Sony Precision Technology Magne-switches.

Input the external zero point.	The display is held.
The input is processed as zero point input only during the zero point wait status.	

7-6-4. External mode input

This functions as the display mode switching input. See “7-5. Mode Switching”.

7-6-5. External print input

This is valid only when the RS-232C unit LZ51-C (option) is connected. See “7-4. Print Key Operations”.

MAINTENANCE

Refer to this section when operation is incorrect.

8. ALARM DISPLAY/OUTPUT

Display	Symptom	Cause
No indication	Power supply failure	**A momentary power failure occured.** **(Only when the power-on mode is set to the initial setting mode)** Output : An error status is output to the I/O. (Note 1) An alarm signal is output.
Error	Max. speed exceeded Unconnected scale unit Broken cable	**The maximum response speed is exceeded at the scale unit.** **The scale unit is not connected.** **The cable is broken.** Output : An error status is output to the I/O. (Note 1) An alarm signal is output.
r.Error	Excessive zero point speed or displacement of zero point position	**The maximum response speed of the zero point is exceeded at the scale unit during zero point detection.** **The zero point position is displaced for 3 counts or more during zero point reference mode.** Output : An error status is output to the I/O. (Note 1) An alarm signal is output.
d.Error	Stored data error	**The contents of stored data are changed or lost due to noise. (Note 2)**
UN 17.CHG	Unit change	**This is displayed when the power is turned on again but the type of expansion unit has changed from before.** Even if the power-on display mode is set to count, initial setting is required if the type of expansion unit has changed.

Note 1: The alarm signal is output only when the universal output is set to Alarm (“ALM”).
Note 2: When the stored data error is displayed, perform the initial settings.

9. MAINTENANCE AND INSPECTION

9-1. Troubleshooting

Should any problem occur with the unit, make the following simple tests to determine whether or not servicing is required.

The unit does not turn on (or does not turn on sometimes).	● Turn off the POWER switch and turn it on after one or two minutes. ● Make sure the power cord is connected properly. ● Make sure a fuse is not blown. ● Make sure the operating voltage range is correct.
The display turned blank*. (Power alarm)	● Make sure the power cord is connected properly. ● Make sure there are no strong noise disturbances. (Replace the scale unit with one that has a normal axis.) ● Turn off the POWER switch and turn it on after three seconds. ● Reset the unit.
r.Error **or** Error **is displayed. (Alarm)**	● Make sure the scale unit connector is firmly fixed with screws. ● Check the scale unit cable for damage and breaks. ● Make sure the maximum response speed at the scale unit is not exceeded. Make sure there are no strong vibrations. ● Make sure there are no strong noise disturbances. (Replace the scale unit with one that has a normal axis.) ● Turn off the POWER switch and turn it on after three seconds. ● Reset the unit.
The unit does not measure data.	● Turn off the POWER switch and turn it on after three seconds. ● Make sure the scale unit connection is not loose. (Replace the scale unit with one that has a normal axis.)

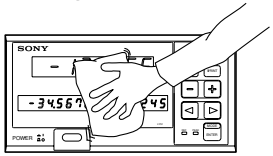
* Only when the power-on display mode is set to the initial setting mode.

The unit gives an incorrect count (or gives an incorrect count sometimes).	☞	● Turn off the POWER switch and turn it on after three seconds. ● Make sure the scale unit connection is not loose. ● Make sure the unit is completely grounded. Make sure the grounding portion is not rusted or bent. ● Make sure the power voltage does not exceed the allowable range using the AC stabilizing circuit AVR. ● Make sure the grounding location and method are correct. ● Make sure the input scale unit resolution settings are correct. (If they are incorrect, perform the initial settings again.)
The unit does not give accurate data.	☞	● Make sure the unit always counts correctly. ● Make sure there are no problems in the mechanical system. (Check for bending and play. Check after any mechanical adjustments.) ● Make sure there is no temperature difference at a particular part (scale unit, machine, work). ● Make sure the input scale resolution settings are correct. (If they are incorrect, perform the initial settings again.)
Key operation is not possible.	☞	● Is the key lock function enabled? (Reset item 4-6-11. (P.157).) ● Has the external contact point input been left on? The external contact point input functions as one of the keys, so other keys do not operate while it is on.

Upon determining the trouble cause using the above table, take appropriate action.
If you think the unit requires servicing, contact your Sony Precision Technology distributor.

9-2. Maintenance

Removing stains and dirt on the display and cabinet

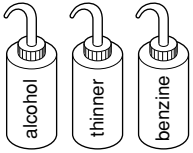


Wipe with a dry cotton cloth.

For tough stains and dirt

Use a neutral detergent diluted with water.





English

DATA

This section describes the product specifications, dimensions and accessories, etc.

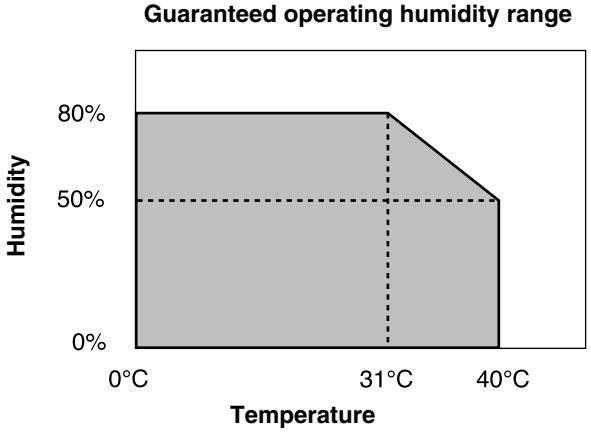
10. SPECIFICATIONS

Item	Contents
Main display (LED)	Signed 7 digit data (leading zero suppression, floating minus)
	Displayable data Selectable from current value (1st axis input data, 2nd axis input data, 1st/2nd axes addition/subtraction data), and maximum, minimum and peak-to-peak values with respect to current value
Sub-display (LED)	Signed 7 digit data x 2 (leading zero suppression, floating minus) Various setting information
	Displayable data Same as main display or comparator setting values
Alarm message display	1) Temporary power failure 2) Maximum response speed exceeded/input scale unit disconneced 3) Stored data error 4) Zero point reference error/response speed exceeded during zero point detection (= maximum response frequency 50 kHz)
Display resolution	According to the type of input scale unit (See P.147)
Input scale units	1 axis from Magnescale, Digiruler, DG-B/DL-B, DE-B and GA Note 1)
Addition/subtraction scale units	1 axis from Magnescale, Digiruler, DG-B/DL-B, DE-B and GA Note 1)
Reset function	Display value set to 0 by key operation or external reset.
Preset function	Preset value set by key operation.
Recall function	Preset value recalled by key operation or external recall.
Data storage function	Display value and preset data stored when power is turned off (Nonvolatile memory). (Function enable/disable can be selected by the initial settings.)
Linear compensation	Adds or subtracts the unit length to the display when the scale has moved for a certain distance (maximum ±600 μm).

Note 1) The optional adapter DZ51 is necessary when connecting the DG-B series/DL-B series/DL-BR series.

Item	Contents
Zero point	Zero point (load, offset load, hold, reference load)
Data latch	Display latch (When an expansion unit is added. Output can also be latched.)
Expansion boards (option)	Selectable from three types: BCD, RS-232C, comparator (relay, open collector) A/B phase (up/down) output (Only one of each type of unit can be used. Two or more units of the same type cannot be used simultaneously.)
Cabinet ground	Insulated from circuit ground (However, this ground is not insulated for some connected scale units. → See the note on page 113.)
Power voltage	Rated ∿100 – 230 V AC, 50/60 Hz 30 VA (Operating range ∿90 – 250 V AC)
Operating temperature/ humidity range	0 to 40°C (32 to 104°F) (See P.194 for the humidity.)
Storage temperature/ humidity range	–20 to 60°C (–4 to 140°F) (20 to 90% RH, no condensation)
Environmental conditions	• Indoor use only • Maximum operating altitude 2,000 m • INSTALLATION CATEGORY II • POLLUTION DEGREE 2
Dimensions	See “12. DIMENSIONS”.
Weight	Approximately 2 kg

Note When using the LY51 with AC 200 V systems, use a separately procured power cord having a withstand voltage of AC 250 V and a safety earth wire.



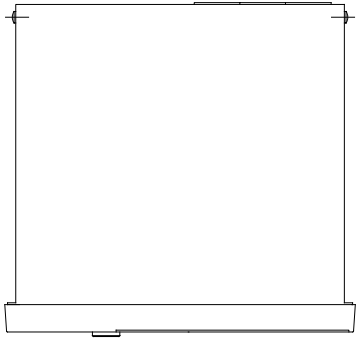
11. ACCESSORIES

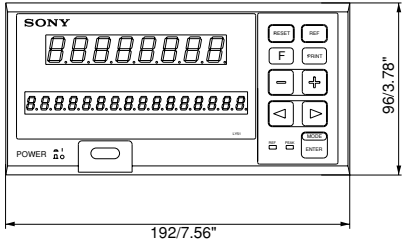
Instruction Manual	(1)
Power cord	(1)
Ground wire	(1)
External I/O connector	(1)
Installation plate	(2)
(Screws (+K3 x 5)	(8))

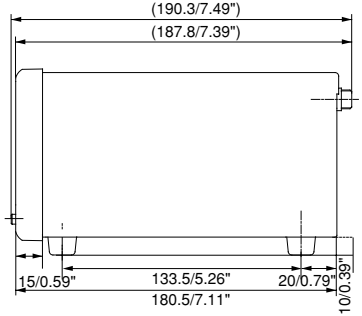
12. DIMENSIONS

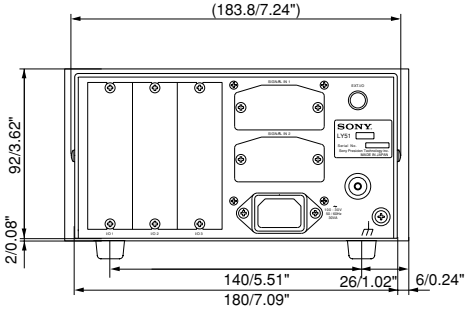
The outside appearance and specifications of this product are subject to partial change without notice.

(Unit: mm/inch)









With the rubber legs removed, the mounting screws should extend to the inside of the frame by 3 mm (0.12") or less.

English

13. LIST OF DISPLAY CHARACTERS

The LY51 displays various messages to assist operation.
However, the display has only a limited number of segments so many characters are difficult read. Therefore, these characters are listed below for reference.

Character	Display	Character	Display	Character	Display	Character	Display	Character	Display
1		A		O		a	—	o	
2		B	—	P		b		p	
3		C		Q	—	c		q	
4		D	—	R	—	d		r	
5		E		S		e	—	s	—
6		F		T		f	—	t	
7		G		U		g	—	u	
8		H		V		h		v	—
9		I		W		i		w	
0		J		X		j	—	x	—
/		K		Y		k	—	y	
?		L		Z		l	—	z	—
+		M				m	—		
=		N				n			

English

14. QUICK REFERENCE

External I/O
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- Input circuit (connected circuit example) P.118
- Input circuit delay time P.119
- Output circuit (connected circuit example) P.120
- Connection diagram P.121
- Alarm output P.155, 186

Rack mount
- Panel cut-out dimensions P.115
- Dimensions including the panel mounting plate P.115

Installation and connection
- Notes when connecting scale units P.114
- Notes when connecting expansion units P.116
- Notes on grounding P.113
- Note on mounting screws P.115
- Input scale unit initial settings P.141, 147, 149

Initial settings
- Selecting the initial setting items ..... P.125 to 130
- Setting operations ..... P.131 to 160
- Setting all items at once P.135
- Collective input code table P.137, 138
- Setting A/B phase unit P.159

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- Checking the version P.134

Functions
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- Automatic resolution setting P.147
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- Universal input signal P.153, 182
- Universal output signal P.155
- Key lock P.157
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- Zero point reference mode P.162
- Display latch P.118, 153,182
- Key operations for each axis P.180
- External zero point P.118, 183

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