KEYENCE

96M12875

LK-G5000 Series
Dedicated Touch Panel

LK-HD1001

User's Manual

Read this manual before use.
Keep this manual in a safe place for future reference.

Introduction

This manual contains hardware information and basic operating procedures for the dedicated touch panel display unit LK-HD1001 for use with the LK-G5000 series. In order to take advantage of the functionality of the LK-G5000 series dedicated touch panel display unit LK-HD1001, read and understand the contents of this manual thoroughly.
Keep this manual in a safe place for future reference.
Please deliver this manual to the end users of this product.

Symbols

The following symbols alert you to important messages concerning the prevention of human injury and product damage.

⚠DANGER
Failure to follow the instructions may lead to death or severe injury.

⚠WARNING
Failure to follow the instructions may lead to injury (such as electric shock or burn).

⚠CAUTION
Failure to follow the instructions may lead to property damage or product breakdown.

▶NOTE
Provides additional information on proper operation.

Reference
Provides reference information or useful information about operation.

Safety Precautions

General Cautions

- At startup and during operation, be sure to monitor the functions and performance of this product.
- It is recommended that you take substantial safety measures to avoid any damage in case of product failure.
- Do not modify this product or use it in any way other than as described in the specifications. The warranty will be voided in such cases.
- When this product is used in combination with other devices, functions and performance may be degraded depending on the operating conditions and surrounding environment.
- Do not subject this device or any peripheral equipment to sudden temperature changes. Doing so can cause condensation and damage the equipment.
- To prevent noise-induced operation or failures, route all cabling away from high voltage and power lines.
- The LCD panel may have black or bright specks or uneven brightness, and may exhibit crosstalk (lines or patterns non-existent in the actual image).
  Image retention may become noticeable if the same image is displayed over a prolonged period. This is a feature of LCD screens.

⚠ CAUTION

- Do not press the touch panel (touch switch) with a sharp object such as a pen or screwdriver. Doing so can scratch or damage the touch panel (touch switch).
- Do not apply shock or press the touch panel (touch switch) stronger than necessary. Doing so may damage the touch panel (touch switch).
- Do not wipe the LCD with paint thinner or organic solvents as doing so may damage it. Wipe with a mild detergent diluted with water.

Installation environment

To use this product properly and safely, avoid installing it in the following locations. Doing so may lead to product breakdown.

- Location that is humid, dusty or poorly ventilated
- Location where the temperature becomes high, such as a place exposed to direct sunlight
- Location where there are flammable or corrosive gases
- Location where the product may be directly subjected to vibration or impact
- Location where water, oil or chemicals may splash onto the product

Considerations for improving noise immunity

- Do not install in enclosures where high voltage devices are installed.
- Locate as far away as possible from power lines.
- Locate as far away as possible from devices that generate intense electric or magnetic fields such as solenoids and chopper circuits.
- Use separate conduit for I/O lines, power lines, and high voltage lines to prevent noise-induced erroneous operation.
- Ground protective earth terminals and shield wires to a ground resistance of 100 ohms or less.

Precautions on CE Marking

This device conforms to CE marking directives when the following conditions are met:
Make sure these conditions are met if using this device within the EU nations.
The applicable standards (EMC Directive) are listed below:
EMI:EN61326-1, Class A
EMS:EN61326-1
Limit the length of the power supply cable and all input/output cables that are connected to the terminal panel of the controller to 30 m or less.

Contents

Introduction 2
Safety Precautions 3
General Cautions 3
CAUTION 3
Precautions on CE Marking 4
Contents 5

Chapter 1 Before Use

Checking the Package Contents 1-2
Overview 1-3
LK-G5000 series system configuration 1-3
Functions and features 1-4
Part Names and Functions 1-6
Mounting the Touch Panel 1-7
Mounting Precautions 1-7
Mounting 1-8
Using the Stand 1-10
Connecting the Units 1-12

Chapter 2 Screen Functions and Operation

Names and Functions on the Main Screen 2-2
Flow of Operation 2-3
Basic Settings 2-4
Head Settings 2-4
OUT Settings 2-9
Common Settings 2-16
Environment Settings 2-21
Program Settings 2-23
Copying Programs 2-23
Initializing Programs 2-25
Measurement Value Display 2-26
Received Light Waveform Display 2-28

Chapter 3 Specifications

Specifications 3-2
LK-HD1001 3-2
Dimensions 3-3

Appendices

Troubleshooting A-2
Error Codes A-4
List of Optional Accessories A-6
Maintenance A-7
Replacing the Protection Sheet A-7
Index A-8

Before Use

1

This chapter provides an overview of the LK-HD1001 and explains the names and functions of each part. Read this chapter before using this product.

Checking the Package Contents 1-2

Overview..... 1-3

Part Names and Functions 1-6

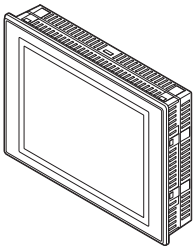
Mounting the Touch Panel 1-7

Connecting the Units 1-12

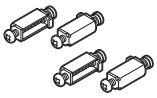
Checking the Package Contents

Check to make sure your package contains these parts.

LK-HD1001 touch panel: 1



Mounting bracket: 4



User's Manual: 1

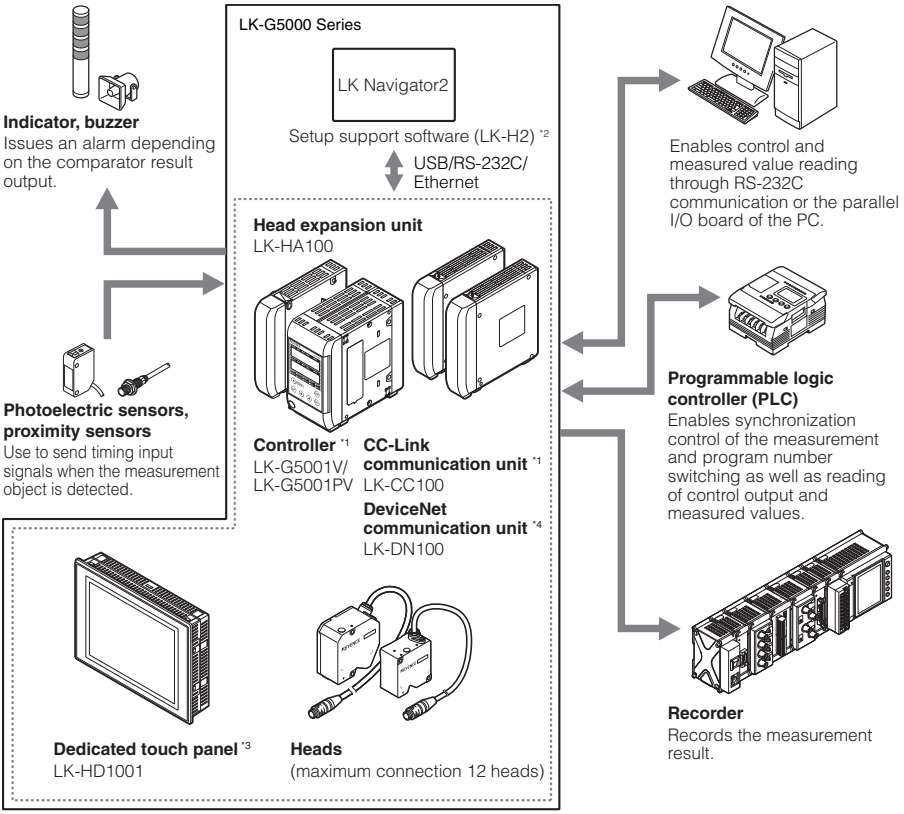
The package contents have been carefully inspected; however, if any component is defective or damaged, contact your nearest KEYENCE office (address listed at the end of this manual).

Refer to "List of Optional Accessories" (A-6) for details on optional parts.

Overview

This touch panel display unit is exclusively designed for visually configuring parameters and monitoring the LK-G5000 series controller. It is used by connecting it to the controller to configure parameters and monitor operating status.

LK-G5000 series system configuration



*1: Refer to the LK-G5000 series User's Manual for further details on the controller LK-G5000 series.

*2: Refer to the LK-Navigator 2 User's Manual (the PDF file is on the CD-ROM) for further details on the setup support software (LK-H2) LK-Navigator 2.

*3: Refer to the LK-HD1001 User's Manual (this document) for further details on the dedicated touch panel LK-HD1001.

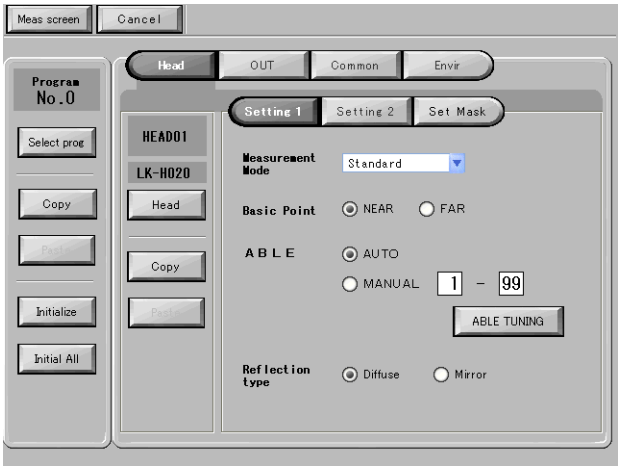
*4: Refer to the LK-CC100/DN100 User's Manual for further details on the CC-Link communication unit LK-CC100 and the DeviceNet LK-DN100 communication unit.

Functions and features

This section explains the major functions and features of this touch panel.

Operation settings

- This touch panel allows you to display the settings in the controller for viewing and editing. It features copy and paste functions for configuring multiple outputs and setting programs in a short amount of time.
- The software settings made on the touch panel will be downloaded into the controller. This touch panel communicates with the controller at the simple press of a button.



The following items can be set from this touch panel.

- Head settings
- OUT settings
- Common settings
- Environment settings

Monitoring functions

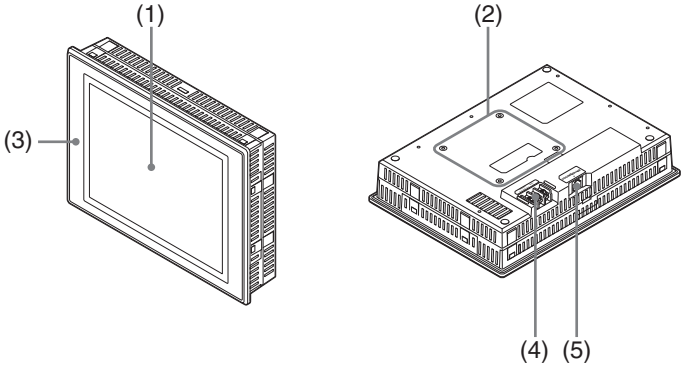
These two items can be monitored.

- Measurement values
- Received light waveform

The screen shown below is a display example of the "Measurement value display".

Part Names and Functions

This section describes the name and functions of each component.



(1) Display area/touch panel

Displays the measurement screen, settings screen, and messages.
Displays buttons used to change the screen and settings.

(2) Stand mount

Mount for the optional stand.

(3) Power indicator

Lit when power is supplied.

(4) Power supply terminals

Connect the power supply (24 VDC ±10%) to these terminals.

(5) TO CONTROLLER port

Connect the connection cable from the controller.

Mounting the Touch Panel

Mount the touch panel using the supplied mounting brackets.

Mounting Precautions

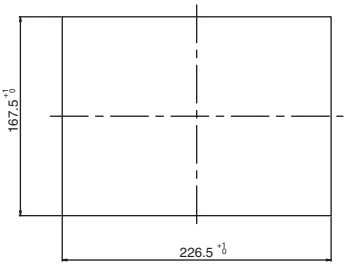
Mounting direction/angle

Mount the touch panel so that the right and left sides are level.

Panel thickness

1.6 to 4.0 mm

Panel cutout



Mounting bracket tightening torque

Tighten to 0.3 to 0.5 Nm.

▶NOTE

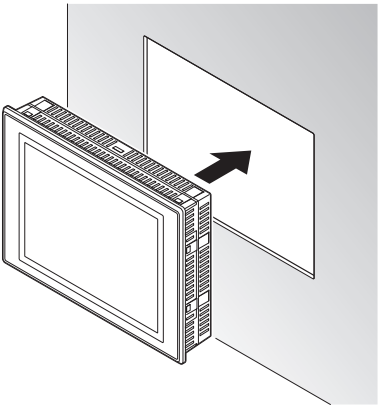
Tightening improperly can cause the panel or case to deform, or damage to the mounting brackets.

Notes to fulfill the protective construction (IP65f) of the panel surface

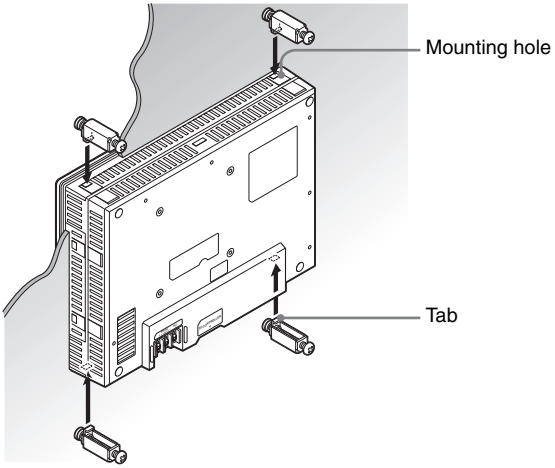
- Be sure the seal is free from dirt and debris.
- Mount in the center of the cutout in the panel.
- Tighten the mounting brackets to the appropriate torque.

Mounting

1 **Insert into the cutout from the front of the panel.**

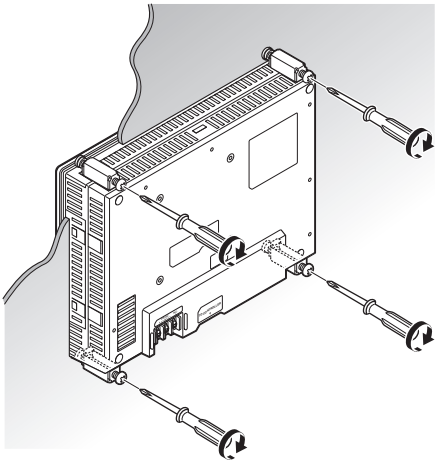


2 **Secure the touch panel using the mounting brackets from the rear side of the panel.**



Turn the screws in the mounting bracket counterclockwise until the tabs at the back of the mounting brackets enter the mounting holes in the touch panel.

3 **Tighten the screws in the mounting brackets by turning clockwise.**

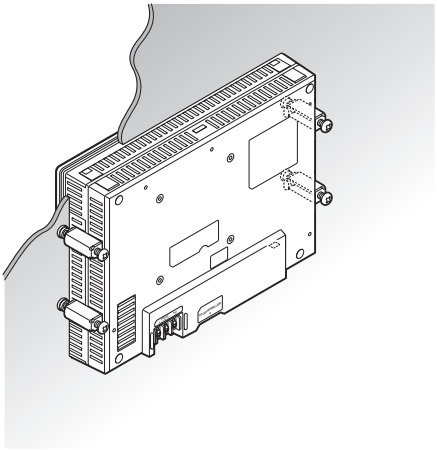


▶NOTE

The tightening torque for the mounting bracket screws is 0.3 to 0.5 Nm.

Reference

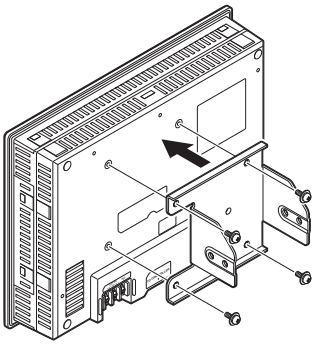
The mounting brackets can also be attached to the left and right sides of the touch panel.



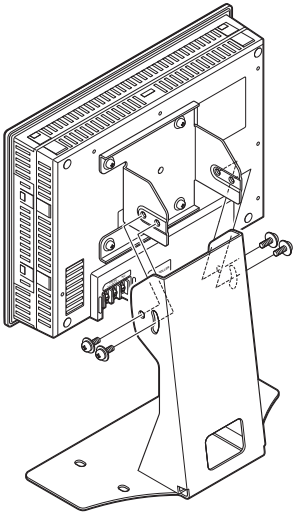
Using the Stand

The separately sold stand (OP-84428) mounts to the rear side of the touch panel with screws.

1 **Attach the stand mounting panel to the rear side of the touch panel using the four M4 screws.**



2 **Attach the stand using the four M6 screws.**

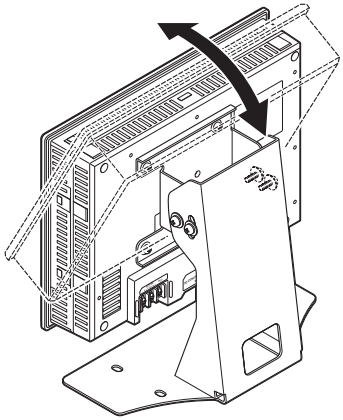


Reference

- The stand mounting holes supports the VESA mounting standard for 75 x 75 mm.
- The stand mounting holes can be used to secure the touch panel to a desk or control cabinet.

Stand tilt angle adjustment

The title angle of the stand can be adjusted according to the location.



Connecting the Units

Connect the touch panel to the controller, then connect the power supply.

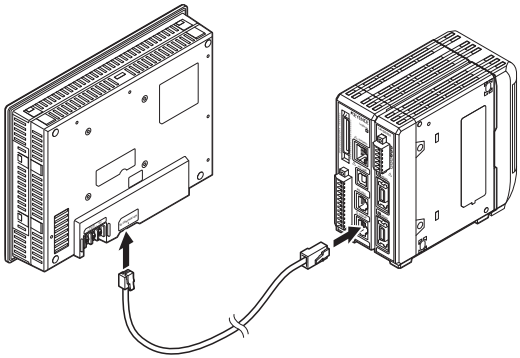
⚠WARNING

Always shut power off to the touch panel before making connections. Failure to obey this warning may lead to electrical shock.

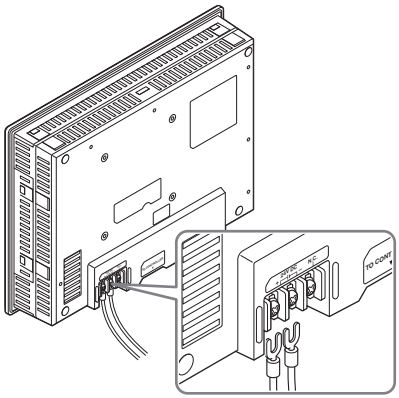
⚠CAUTION

Verify the wiring is correct before turning the power on. Failure to obey this precaution may damage the touch panel and the peripheral devices.

1 **Use the separately sold display panel cable (OP-84427: 0.33 m, OP-51655: 3 m, or OP-51656: 10 m) for the connection between the TO CONTROLLER port on the touch panel and the DISPLAY port on the controller.**



2 **Connect the power supply (24 VDC ±10%) to the power supply terminals.**



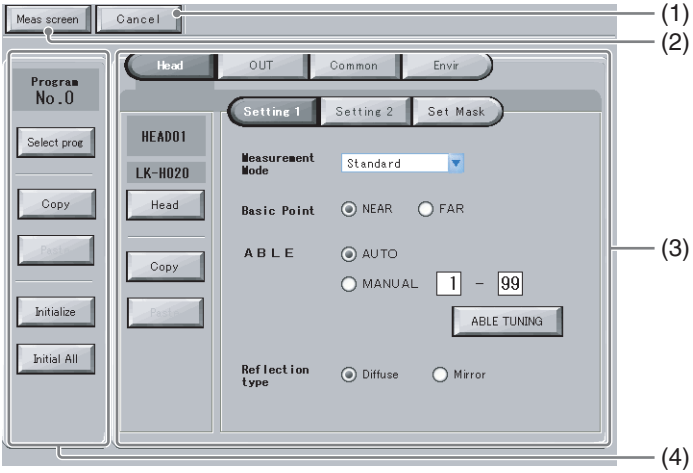
Screen Functions and Operation

2

Names and Functions on the Main Screen 2-2
Flow of Operation 2-3
Basic Settings 2-4
Environment Settings 2-21
Program Settings 2-23
Measurement Value Display 2-26
Received Light Waveform Display 2-28

Names and Functions on the Main Screen

This section explains the names and functions of the main screen.



(1) Cancel

Displays the measurement screen without saving any of the settings.

(2) Meas screen

Displays the measurement screen (Page 2-26).

(3) Settings screen

Changes settings on the touch panel.

(4) Program settings

Selects, copies, and initializes program numbers. Refer to "Program Settings" (Page 2-23) for details.

Flow of Operation

This explanation will show how to assign the input at HEAD01 to the output at OUT01 when turning the touch panel on for the first time.

1. **Connect the controller and touch panel (Page 1-12).**
2. **Start the controller, then turn on the touch panel.**
3. **On the "Environment settings" screen, specify the number of heads, OUTs, and analog outputs being used (Page 2-21).**
4. **Select a program number (Page 2-23).**
5. **Specify the "Common settings" (Page 2-16).**
6. **Configure "HEAD01" (Page 2-4).**
7. **Configure "OUT01" (Page 2-9).**
   This completes the procedure.

Basic Settings

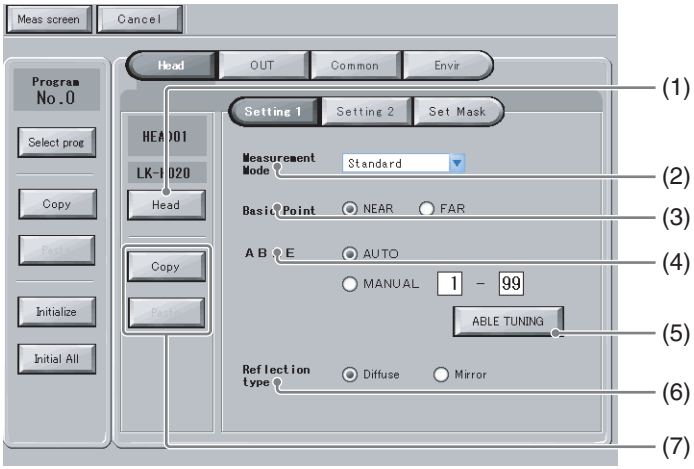
This section explains the basic settings available on the touch panel.

Head Settings

This section explains the functions on the "Head settings" screen.
Configure the head(s) connected to the controller to match the operating environment.

Touch "Head" on the settings screen.

Setting 1



(1) Head

Specifies the head to configure.

Reference

To use three or more heads by using the head expansion unit, change the settings on the "Environment settings" screen (Page 2-21).

(2) Measurement Mode

Selects the object to measure.

(3) Basic Point

If several peaks exist when using the transparent object mode, this control specifies whether to use the peak that is NEAR or FAR from the sensor head as the reference.

(4) ABLE

ABLE sets whether to use AUTO or MANUAL control of the light intensity.

- Normally set to "AUTO".
- If set to "MANUAL", set the upper and lower limits for the light intensity control range (setting range: 1 to 99).

(5) ABLE TUNING

This function uses "ABLE" to calibrate the "MANUAL" setting range according to the actual object. Refer to "Performing the ABLE calibration" (Page 2-6) for details.

(6) Reflection type

Sets the reflection type to diffuse or mirror.

(7) Copy/Paste

Use these buttons to copy head settings to another head (or a head in a different program number). Refer to "Copying the head settings to another head" (Page 2-5) for details.

■ Copying the head settings to another head

This example shows how to copy the settings for HEAD01 to HEAD02.

1 **Complete all settings for HEAD01.**

2 **Touch "Copy".**
"Paste" becomes active.

3 **Touch "Head".**
The "Select head" dialog box appears.

4 **Touch "HEAD02".**

5 **Touch "Paste".**
The settings for HEAD01 are copied to HEAD02.

■ Performing the ABLE calibration

1 **Touch "ABLE TUNING".**

The "ABLE TUNING" dialog box appears.

2 **Touch "Start" to start the ABLE calibration.**

A confirmation dialog box appears to confirm whether to reflect the settings.

3 **Touch "YES".**

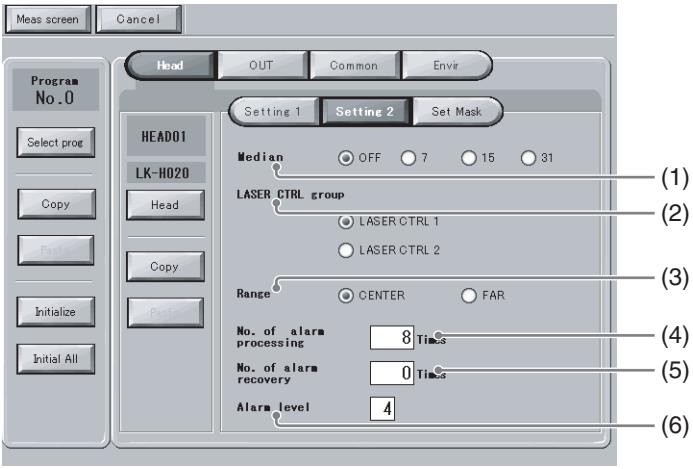
4 **Touch "Stop".**

The ABLE calibration ends. The optimal settings are configured automatically.

▶NOTE

Touching "Cancel" aborts the ABLE calibration and leaves the settings unchanged.

Setting 2



(1) Median

Sets the number of sampling points to use for the median filter.

(2) LASER CTRL group

Sets the LASER control group.

(3) Range

Sets the range.

(4) No. of alarm processing

Sets the number of cycles to hold the most recent valid measurement (Setting range: 0 to 9999).

Process count	Operation
0	Handles alarm immediately
1 to 9998	Holds most recent valid measurement
9999	Alarms off

(5) No. of alarm recovery

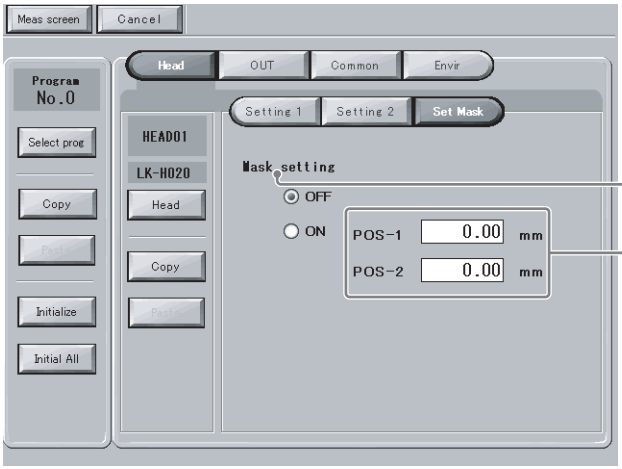
Sets the number of cycles to measure before automatically recovering from the alarm state (Setting range: 0 to 9999).

(6) Alarm level

Sets the alarm sensitivity level from between low (0) to high (9) (default setting: 4).

- Low (0): Weakens alarm detection sensitivity
- High (9): Increases alarm detection sensitivity

Mask setting



(1) Mask setting

Sets whether to enable (ON) or disable (OFF) masking.

(2) Mask boundary

If the "Mask setting" is set to "ON", this control specifies the mask boundary using POS-1 or POS-2.

- If POS-1 < POS-2: masks around POS-1 and POS-2.
- If POS-1 > POS-2: masks between POS-1 and POS-2.
- If POS-1 = POS-2: masking is not applied.

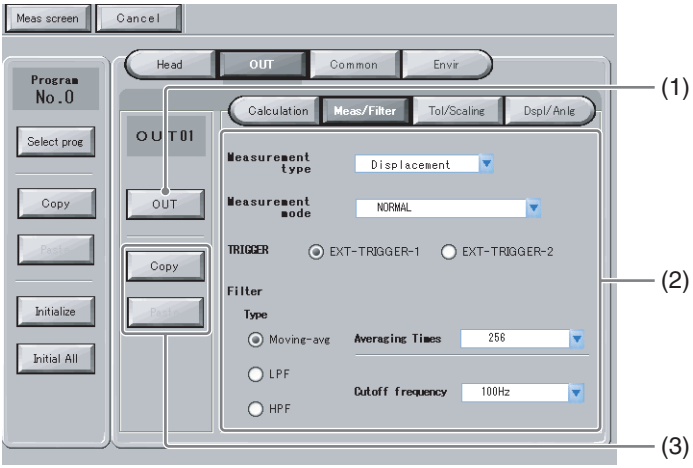
OUT Settings

This section explains the functions on the "OUT settings" screen.
These settings define how the measurement data should be handled according to the operating environment.

To use three or more OUTs by using additional head expansion units
Change the setting on the "Environment settings" screen (Page 2-21).

Touch "OUT" on the settings screen.

Calculation method



(1) OUT

Specifies the OUT to configure.

(2) Calculation

Sets the calculation method according to the measurement mode and target.

Select head

Sets the head number and measurement target to associate with the OUT.
The measurement target can be set if the head measurement mode is set to Transparent or Transparent2.

Select OUT

Sets the OUT number to associate with the OUT.

Add bet. OUT/Sub bet. OUT/AVE bet. OUT/P-P bet. OUT/MAX bet. OUT/MIN bet. OUT

Sets the type of output value to associate with the OUT.

The operation specified from the "Type" options is applied to the checked OUTs.

- Add bet. OUT: Sum of the checked OUTs
- Sub bet. OUT: Difference of the checked OUTs
- AVE bet. OUT: Average of the checked OUTs
- P-P bet. OUT: Maximum to minimum value of the checked OUTs
- MIN bet. OUT: Minimum of the checked OUTs
- MAX bet. OUT: Maximum of the checked OUTs

(3) Copy/Paste

Use this button to copy the OUT settings to another OUT (or an OUT in a different program number).

■ Copying the OUT settings to another OUT

This example explains how to copy the settings for OUT01 to OUT02

1 **Complete all settings for "OUT01".**

2 **Touch "Copy".**

3 **Touch "OUT".**

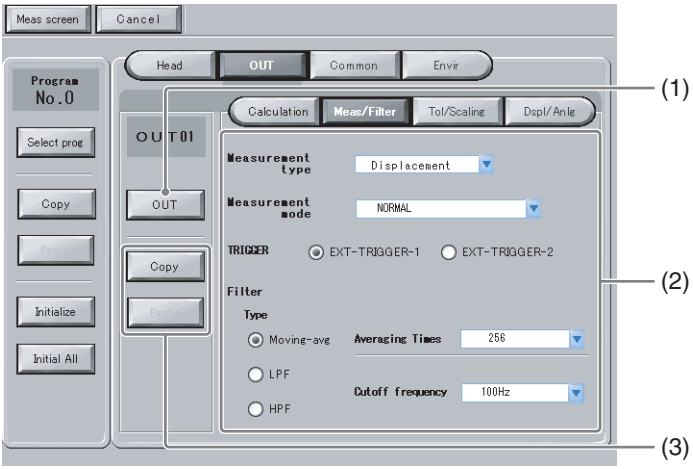
The "Out Settings" dialog box appears.

4 **Touch "OUT02".**

5 **Touch "Paste".**

The settings for OUT01 are copied to OUT02.

Measurement/Filter

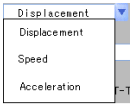


(1) Measurement

Sets the measurement mode and filter type.

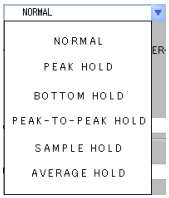
Measurement type

Sets the measurement type.



Measurement mode

Sets the measurement mode.



TRIGGER

Sets a trigger for any "Measurement mode" setting other than "NORMAL".

(2) Filter

Type

Sets the filtering process to apply to the measurement.

Averaging Times

Sets the number of averaging measurements if "Type" is set to "Moving-avg".

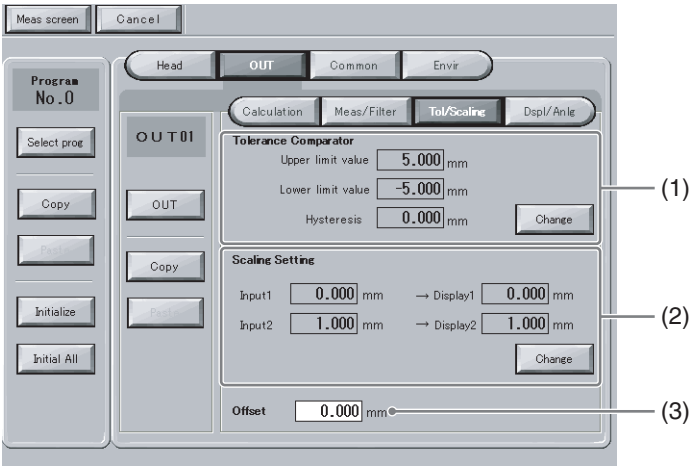
Reference

Fewer average times result in faster measurement data response, while more average times stabilizes the measurement data.

Cutoff frequency

Sets the cutoff frequency if "Type" is set to "LPF" or "HPF".

Tolerance/Scaling



(1) Tolerance setting

Upper limit value
Displays the upper tolerance limit.

Lower limit value
Displays the lower tolerance limit.

Hysteresis
Displays the hysteresis for the tolerance comparator.

Change
Touch to change the upper limit, lower limit, and hysteresis values for the tolerance comparator.
The "Tolerance Comparator" dialog box appears. Enter the desired values and touch "OK".

■ Scaling Setting

Sets the scaling.

Input1/ Display1, Input2/ Display2
Sets how to display the OUT value.

Change
Touch to change the scaling reference values.
The "Scaling Setting" dialog box appears. Enter the desired values and touch "OK".

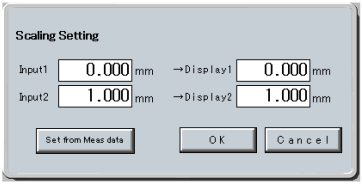
(2) Offset

Sets the offset value.

■ **Setting scaling from measurement data.**

1 **Touch "Change" in the "Scaling Setting" area on the "Tolerance/Scaling" screen.**

The "Scaling Setting" dialog box appears.

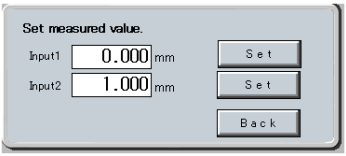


2 **Touch "Set from Meas data".**

A confirmation dialog box appears.

3 **Touch "YES".**

The "Set measured value" dialog box appears.



4 **At the reference surface, touch "Set" for "Input1".**

This sets the measurement data of the reference surface into "Input1".

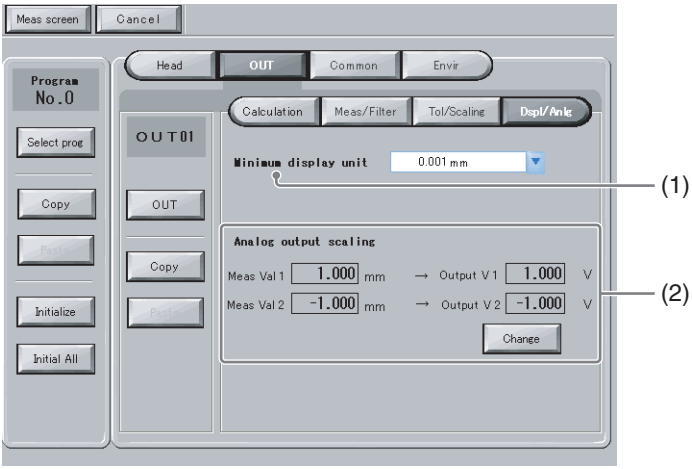
5 **Insert the master work piece, then touch "Set" for "Input2".**

This sets the measurement data of the master work piece into "Input2".

6 **Set the scaling display values in "Display1" and "Display2".**

7 **Touch "OK".**

Display/Analog



(1) Minimum display unit

Sets the decimal point position and number of digits to display for measured and setting values.

Reference

Digits not displayed below the decimal point are rounded off.

▶NOTE

These settings are initialized when the "Minimum display unit" setting is changed:
Scaling, offset, tolerance setting, analog output scaling, auto zero reference value.

(2) Analog output scaling

Displays the scaling for the analog output with respect to the measurement data.

Change

Touch to change the scaling reference values for the analog output.
The "Analog output scaling" dialog box appears. Enter the desired values and touch "OK".

Reference

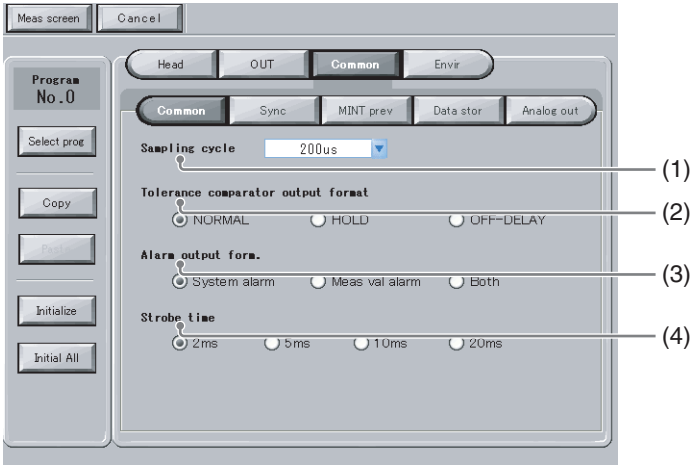
Analog outputs can be scaled within a range of ±10.0 V.

Common Settings

This section explains the functions on the "Common settings" screen.

Touch "Common" on the settings screen.

Common



(1) Sampling cycle

Sets the sampling cycle for measuring.

(2) Tolerance comparator output format

Sets the hold behavior to apply to the tolerance comparator output when the tolerance comparator result changes.

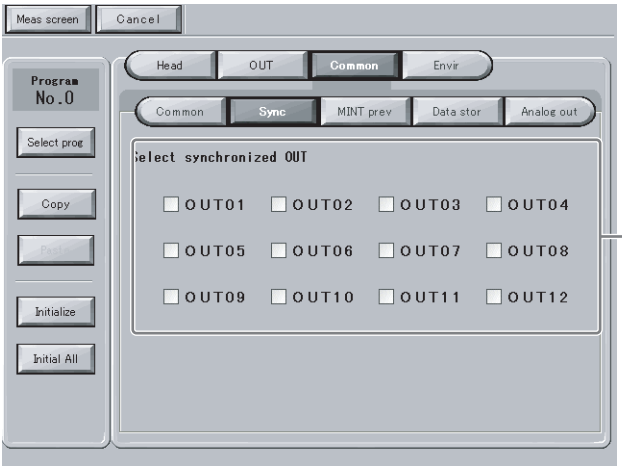
(3) Alarm output form

Sets the alarm output operation.

(4) Strobe time

Sets the strobe time for the binary output when the measurement mode is set to a setting other than Normal.

Synchronization settings



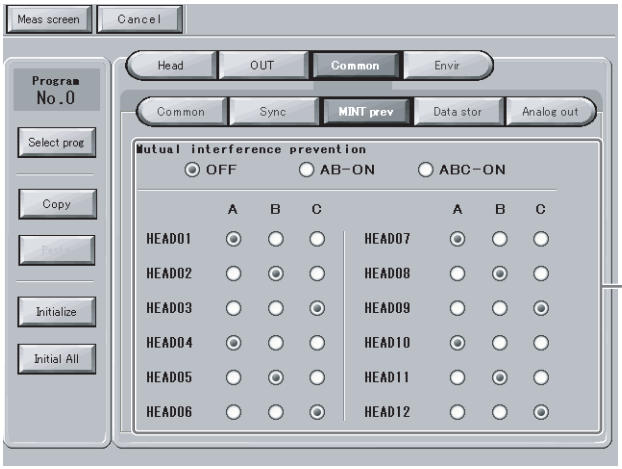
(1) Sync

Check the OUTs to synchronize.

▶NOTE

If the storage cycle (Page 2-19) is set to "Timing input", check the OUT specified for data storage on the "Synchronization settings" screen as well. Otherwise, the data will not be stored.

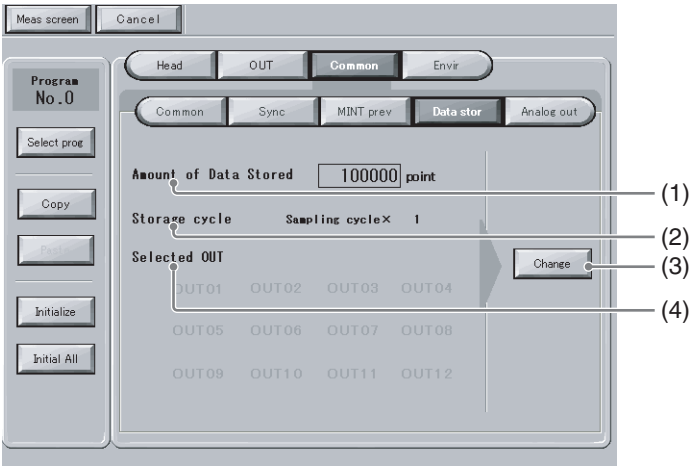
Mutual interference prevention



(1) Mutual interference prevention

Use this setting to prevent mutual interference when multiple head units are connected. Assign each head to a group from A to C. This setting prevents the reflection from interfering between groups A and B, and from groups A to C.

Data storage



(1) Amount of Data Stored

Displays the number of data points to store.

(2) Storage cycle

Displays the interval for data storage.

(3) Change

Touch to change the data storage settings.
The "Data Storage Setting" dialog box appears. Enter the desired values and touch "OK".

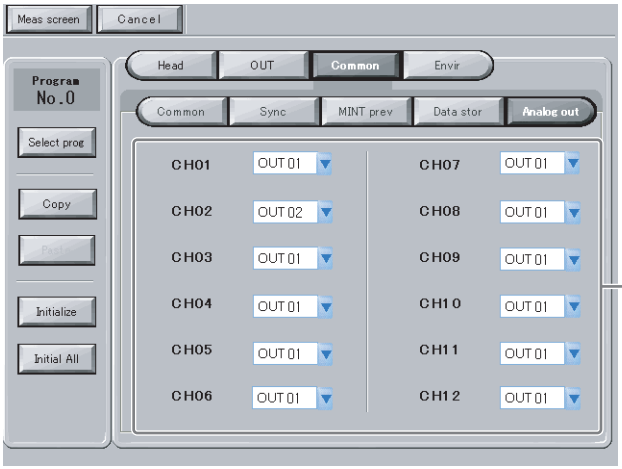
(4) Selected OUT

Displays the OUTs for which data will be stored.

Reference

If the storage cycle is set to "Timing input", the OUT specified for synchronization (Page 2-17) can be selected here.

Analog output



(1) CH01 to CH12

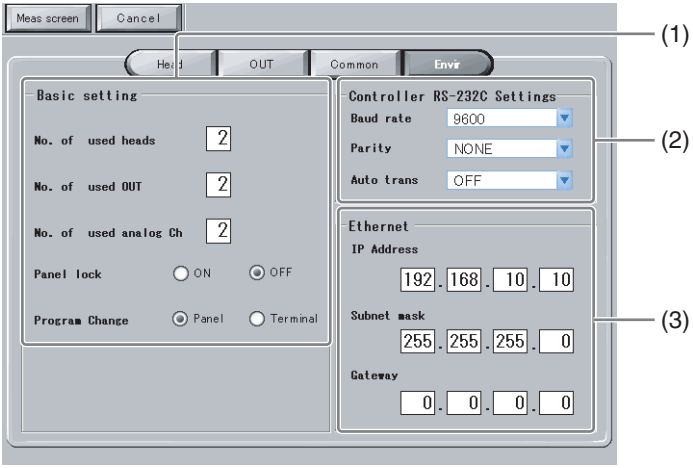
Assigns each analog OUT from the controller to an analog channel from CH01 to CH12.

Environment Settings

This section explains how to configure the operating environment of the controller.

To use three or more OUTs by using the head expansion unit
Before taking any measurements, set the "No. of used heads", "No. of used OUT", and "No. of used analog Ch". Changing the setting for the "No. of used heads" and "No. of used OUT" initializes the other measurement settings.

Touching "Envir" on the settings screen displays the "Environment settings" screen.



(1) Basic setting

No. of used heads
Sets the number of heads the controller can use.

No. of used OUT
Sets the number of OUTs the controller can use.

No. of used analog Ch
Sets the number of analog output channels the controller can use.

Panel lock
Sets whether to lock the display panel connected to the controller.
This setting takes effect after touching "Yes" and returning to the measurement screen.

Program Change
Specifies where programs will be changed from.

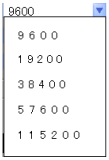
Reference

If set to "Terminal", the touch panel will change to the program number specified at the terminals after returning to the measurement screen.

(2) Controller RS-232C Settings

Baud rate

Sets the communication speed of the controller.



Parity

Sets the parity check method.

Auto trans

Sets whether to automatically download the OUT to the RS-232C interface.

▶NOTE

If you change the RS-232C settings in the "Environment settings" while the controller is connected via the RS-232C interface, the touch panel will download the settings and then change the "PC communication settings".

(3) Ethernet

IP Address

Sets the controller's IP address.

Subnet mask

Sets the subnet mask for the controller.

Gateway

Sets the gateway for the controller.

Program Settings

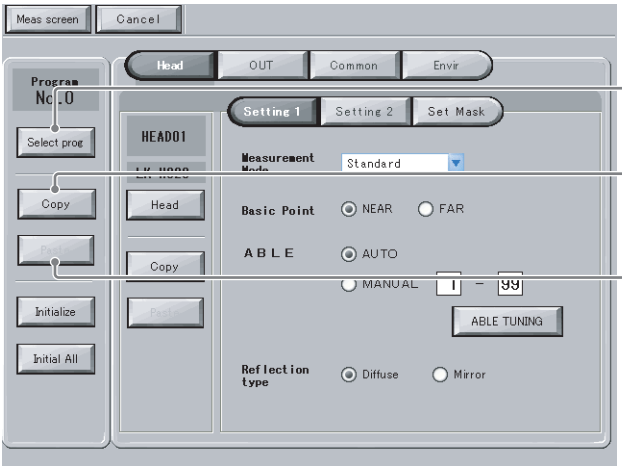
This section explains the procedures for copying and initializing programs registered in the controller.

Copying Programs

Settings can be copied to other program numbers to avoid the trouble of repeating settings.

Reference

The copied settings will overwrite any existing settings in the destination program.



This example shows how to copy program No. 0 to program No. 1.

1 **Touch "Select prog".**

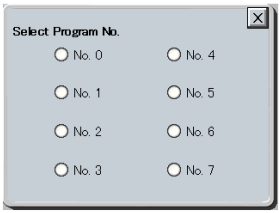
The "Select Program No." dialog box appears.

2 **Touch "No. 0".**

3 **Touch "Copy".**

4 **Touch "Select prog".**

The "Select Program No." dialog box appears.



5 **Touch "No. 1".**

6 **Touch "Paste".**

This copies the settings in program No. 0 to program No. 1.

Initializing Programs

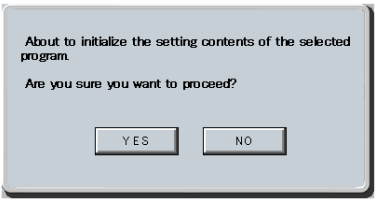
The settings can be initialized to their factory default settings. Initializing erases any existing settings.

1 **Select the program number to initialize.**

In this example, program No.1 is selected.

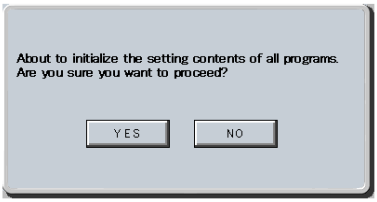
2 **Touch "Initialize".**

A confirmation dialog box appears.



Reference

To initialize the settings in all program numbers, touch "Initial All". The following confirmation dialog box appears when "Initial All" is touched.



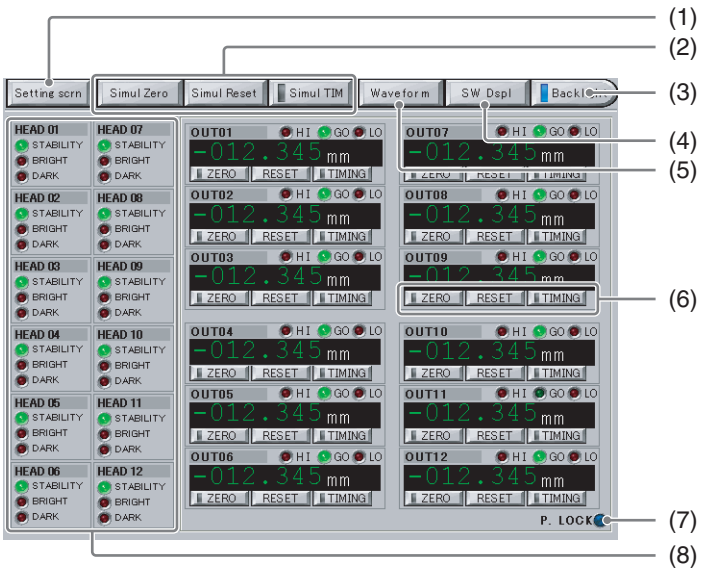
3 **Touch "YES".**

The settings are initialized.

Measurement Value Display

This section explains the "Measurement value display" function available on the touch panel.

Touching "Meas screen" on the settings screen displays the measurement screen.



(1) Setting scrn

Displays the settings screen (Page 2-2).

(2) Display the measurement data after applying simultaneous auto zero, simultaneous reset, or simultaneous timing

Simul Zero

Applies auto zero simultaneously to the OUT with the OUTs set to synchronize.

Simul Reset

Resets the OUT simultaneously with the OUTs set to synchronize.

Simul TIM

Inputs the timing signal to the OUT simultaneously with the OUTs set to synchronize.

(3) Backlight

Turns off the touch panel backlight.

When the backlight is unlit, touching anywhere on the screen turns it on again.

(4) SW Dspl

Each touch switches the number of OUTs displayed.

(5) Waveform

Displays the received waveform display screen (Page 2-28).

(6) Displays the measurement data after applying auto zero, reset, and timing processing

ZERO

The current measurement data is set to the reference value (zero) and then displayed.
Refer to the LK-G5000 series User's Manual, "Chapter 2 Operations during Measurement and Their Functions" (page 2-1) for details on the auto-zero function.

RESET

The measured values are displayed after the processing in the measurement mode and the filter processing are reset to the default values.
Refer to the LK-G5000 series User's Manual, "Chapter 3 Function Settings" (page 3-1) for details on the measurement data reset function.

TIMING

Toggles the timing function between on and off. Refer to the LK-G5000 series User's Manual, "Chapter 3 Function Settings" (page 3-1) for details on the timing function.

(7) P.LOCK

Illuminates when the panel lock is set to ON.

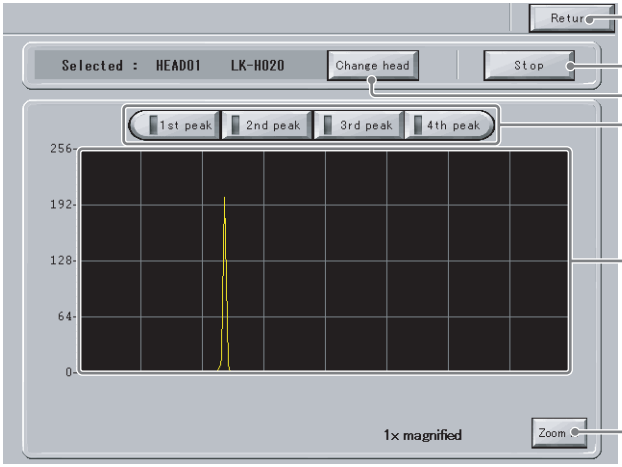
(8) Head status

Displays the head status.
Refer to the LK-G5000 series User's Manual, "Chapter 2 Operations during Measurement and Their Functions" (page 2-1) for details on the displayed information.

Received Light Waveform Display

This section explains the "Received light waveform display" function available on the touch panel.

Touching "Waveform" on the measurement screen displays the waveform display screen.



(1) Return

Returns to the measurement screen.

(2) Change head

Displays the "Select head" dialog box. Select which head to display the received light waveform for.

(3) Start/Stop

Starts acquiring received light data from the controller and displays the most recent waveform. Clicking "Start acquisition" causes the button label to change to "Stop".

(4) 1st peak to 4th peak

If "Measurement mode" is set to "Transparent2", these buttons will apply ABLE processing to the displayed peak waveforms from 1 to 4, and display the resulting waveform. Refer to the LK-G5000 series User's Manual, "Chapter 3 Function Settings" (page 3-1) for details on the ABLE function.

(5) Received light waveform display

Displays the waveform after the controller applies ABLE processing. The waveform is read as follows.

- X axis: Position of received light waveform. The farther left the waveform, the closer the received light waveform is to the head.
- Y axis: Intensity of received light. The higher the waveform, the stronger the light intensity.

(6) Zoom in/Zoom out

Zooms in or out the waveform display.

Specifications

3

This chapter explains the specifications for the touch panel.

Specifications 3-2

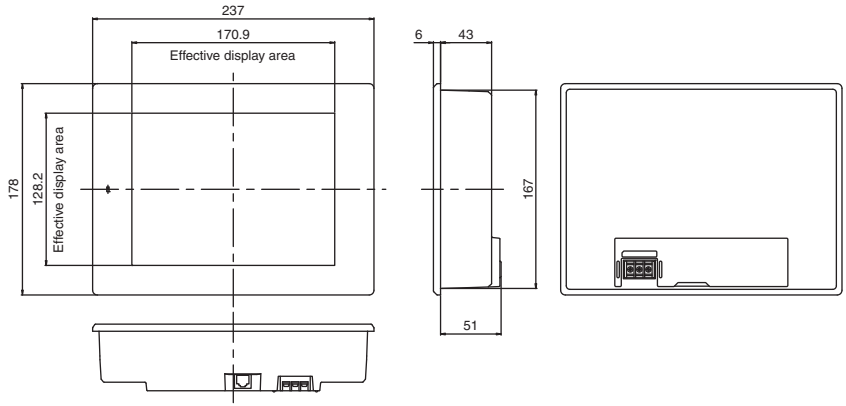
Dimensions 3-3

Specifications

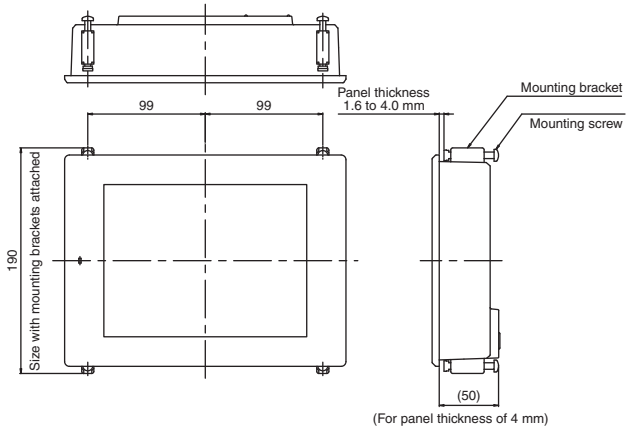
LK-HD1001

Model		LK-HD1001
Model name		LK-G5000 series dedicated touch panel display unit
Display panel	Element	TFT color LCD
	Colors	32768 colors
	Pixels (W x H)	640 x 480
	Effective display area (W x H) (mm)	170.9 x 128. 2
	Life (room temperature and humidity)	Approximtely 50,000 hours
Backlight	Method	White LED (replacement impossible)
	Life	Approximtely 50,000 hours
Touch switch	Activating force	0.98 N or less
	Life	1,000,000 times or more
Communications function		Dedicated support for the LK-G5000 series
Construction		Panel mounted, limited to front panel operation: IP65f -equivalent protection against dust and water droplet intrusion.
Operating atmosphere		Must be reasonably free of dust and corrosive gases
Ambient temperature		0 to +50°C
Relative humidity		35 to 85% RH (no condensation) Use under an absolute humidity of 85% or less at 40°C if ambient temperature exceeds 40°C.
Storage temperature		-10 to +60°C (no freezing)
Storage humidity		35 to 85% RH (no condensation) Store under an absolute humidity of 85% or less at 40°C if ambient temperature exceeds 40°C.
Vibration resistance		10 to 57 Hz 0.3 mm p-p 57 to 500 Hz 2G x,y, and z 3 hours in each direction
Weight		Approximately 1,150 g
Rated voltage		24 VDC ± 10%
Current consumption		1 A or less

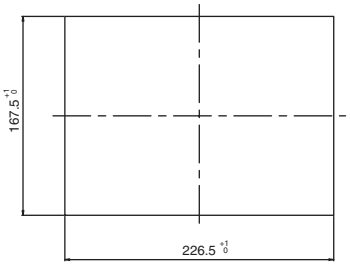
Dimensions



With mounting brackets attached

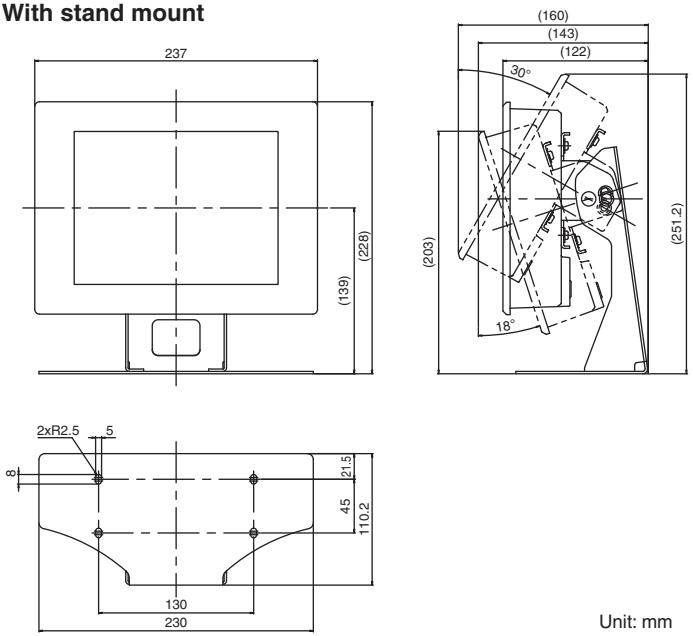


Panel cutout



Unit: mm

With stand mount



Unit: mm

Appendices

This chapter provides other related information.

Troubleshooting **A-2**

Error Codes **A-4**

List of Optional Accessories **A-6**

Maintenance **A-7**

Index **A-8**

Troubleshooting

This section describes the countermeasures against errors or problems that may occur during the operation of this touch panel.

Problem	Possible Cause	Countermeasure
Nothing is displayed on the display panel.	Is the display panel cable properly connected to the controller? Is the power supply cable properly connected?	Connect the power supply cable and display panel cable properly. (Page 1-12)
An error code is displayed.	-	Address the problem by following the instruction provided for the displayed error code. (Page A-4)
A measured value is not displayed.	Is the measurement target placed within the measurement range?	Place the measurement target properly within the measurement range.
	Are the head settings properly set?	Adjust to the proper settings.
	Is the glass cover dirty?	Remove the dust and dirt.
	Does the glass cover have any flaws or cracks?	The glass cover must be replaced. Because this replacement requires KEYENCE repair service, contact your nearest KEYENCE office.
	Is the synchronization control properly set according to the measurement mode?	Set the synchronization control according to the measurement mode.
	Does condensation occur in the unit?	Check the installation environment.

Problem	Possible Cause	Countermeasure
The measured value display fluctuates.	Is the number of averaging measurements properly set?	Set the number of averaging measurements properly.
	Is the glass cover dirty?	Remove the dust and dirt.
	Does the glass cover have any flaws or cracks?	The glass cover must be replaced. Because this replacement requires KEYENCE repair service, contact your nearest KEYENCE office.
	Are there any water or oil splashes in the operating atmosphere?	Use air purge or another method to remove the splashes.
	Does mutual interference occur?	Use the mutual interference prevention function or the laser OFF function. Change the mounting position of the sensor head.
	Is there strong ambient light?	Block the ambient light.
	Does the measurement target or sensor head vibrate?	Take appropriate countermeasures such as vibration isolation.
	Are the head settings properly set?	Adjust to the proper settings.
The measured value display deviates.	Is the measurement target slanted or displaced?	Place the measurement target properly within the measurement range.
	Is the LK-G5000 Series calibrated properly?	Calibrate the unit again.
	Does the temperature in the operating environment change greatly?	Keep the ambient temperature constant.
Program No. cannot be changed.	Is the setting selection properly set?	Set the setting selection according to the method to be used.
	Is the key lock set to ON?	Change the key lock setting to OFF.
	Is the LK-G5000 Series in either the setting mode or the communication mode?	Change the mode to the measuring mode.
The operation key does not work.	Is the display panel properly connected?	Connect the display panel properly.
	Is the panel lock set to ON?	Set the panel lock to OFF.

Error Codes

This section lists the error codes displayed by the LK-G5000 Series and the countermeasures.

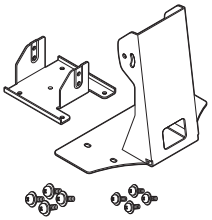
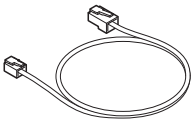
Display	System error	Error description	Countermeasure
Err-00	○	Head connection error	Check the sensor head connection. If there are errors with two or more sensor heads, the smallest error number among Err-01 to 12 is displayed.
Err-01 to 12	○	Head 01 to 12 error	
Err-13	○	Controller error	Turn off the power and turn it on again. If the error continues, contact your nearest KEYENCE office.
Err-15	○	Controller SRAM error	Turn off the power and turn it on again, or initialize the settings. If the error continues, contact your nearest KEYENCE office.
Err-16	○	USB communication error	Turn off the power and turn it on again. If the error continues, contact your nearest KEYENCE office.
Err-17	○	Ethernet communication error	Turn off the power and turn it on again. If the error continues, contact your nearest KEYENCE office.
Err-19	○	Expansion unit error	Turn off the power, disconnect the expansion unit and connect it again, and then turn on the power again. If the error continues, contact your nearest KEYENCE office.
Err-30 to 39	○	Head expansion unit error	Turn off the power, disconnect the head expansion unit and connect it again, and then turn on the power again. If the error continues, contact your nearest KEYENCE office.
Err-50		Command error	The received command is not defined for the RS-232C communication. Check the command you sent.
Err-51		Status error	Operation through the RS-232C communication is not available (e.g., a measurement control command was received in the communication mode). Check the mode and the command you sent.
Err-60		Command length error	The command or parameter received through the RS- 232C communication has an insufficient number of characters. Check the command you sent.
Err-61		Parameter count error	The command received through the RS-232C communication has insufficient parameters. Check the command you sent.

Display	System error	Error description	Countermeasure
Err-62		Parameter range error	The setting value received through the RS-232C communication is out of the possible setting range. Check the command you sent.
Err-63		Parameter range error OUT calculation count limitation)	The repeated use of an OUT value in OUT calculation exceeds the limit. Check the command you sent.
Err-64		Parameter range error (OUT/Head No.)	The number of sensor heads or OUT being used exceeds the active head/OUT count. Check the setting.
Err-65		Parameter range error (Velocity/acceleration calculation method)	The OUT set to the measurement type of "Velocity" or "Acceleration" was set to OUT for another measurement type or to AVE/P-P/MAX or other calculation between OUT. Check the setting.
Err-66		Parameter range error (OUT specification)	The calculation range set for a certain OUT includes the OUT itself, or no target OUT has been set for the AVE/PP/MIN/MAX calculation.
Err-67		Parameter range error (Sampling cycle)	The specified sampling cycle is faster than the fastest sampling cycle available based on the active OUT count, active head count, measurement mode, and calculation method. Select a slower sampling cycle or change other parameters.
Err-68		Parameter range error (Scaling)	The specified scaling parameters do not satisfy the following conditions: • Input value 1 - Input value 2 $\neq$ 0 • |(Displayed value 2 - Displayed value 1) / (Input value 2 - Input value 1) | $\leq$ 2.
Err-69		Parameter range error (Analog output scaling)	The specified analog output scaling parameters do not satisfy the following conditions: • Input value 1 - Input value 2 $\neq$ 0 • |(Output voltage value 2 - Output voltage value 1) / (Displayed value 2 - Displayed value 1) | $\leq$ 2.
Err-70		Parameter range error (Number of data to be stored)	The specified number of data to be stored exceeds the possible setting range.
Err-71		Parameter range error (OUT specified for data storage)	The number of OUT for which data is stored exceeds the active OUT count.
Err-88		Timeout error	The delimiting CR expected after receiving a command via RS-232C communication was not received for 30 or more seconds. Check the command you sent and the communication program.
Err-99		Other error	Contact your nearest KEYENCE office.

* If you cannot resume the LK-G5000 Series after taking the above countermeasures or if you encounter an error which is not listed in the table, contact your nearest KEYENCE office.

List of Optional Accessories

The following table lists the optional accessories compatible with this touch panel.

Name		Model	Appearance	Description
Stand		OP-84428		Used to secure the touch panel on a stand.
Display panel cable	33 cm	OP-84427		A cable used to connect the display panel (LK-HD500/LK-HD1001) and controller (LK-G5001/LK-G5001P).
	3 m	OP-51655		
	10 m	OP-51656		
Protection sheet		OP-42257		Replacement protection sheets (set of 5 sheets).

Maintenance

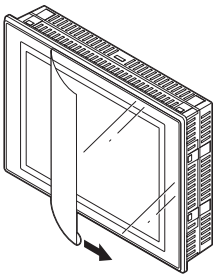
Replacing the Protection Sheet

Follow these procedures to replace the protection sheet.

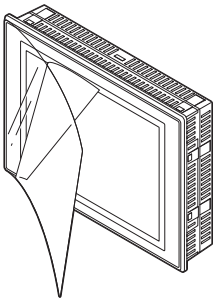
▶NOTE

Use the dedicated protection sheet, OP-42257 for this touch panel.

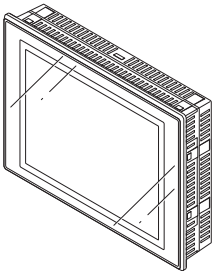
1 **Peel off the protection sheet currently on the touch panel.**



2 **Partially peel back the backing paper from the new protection sheet and align it to the corners of the touch panel.**



3 **Continue peeling the backing paper and apply it to the touch panel while removing any air bubbles that get trapped inside.**



Index

A

ABLE 2-5
ABLE TUNING 2-5
ABLE tuning 2-6
Add bet. OUT 2-10
Alarm level 2-7
Alarm output form 2-16
Amount of Data Stored 2-19, 2-20
Analog output 2-15, 2-20
Analog output scaling 2-15
Auto zero 2-26
Automatic transmission 2-22
AVE bet. OUT 2-10
Averaging Times 2-12

B

Backlight 2-26
Basic point 2-5
Baud rate 2-22

C

Calculation method 2-9
Caution 3
CE marking 4
Common 2-16
Common settings 2-16
Connections 1-12
Controller specifications 3-2
Copying a program 2-23
Copying programs 2-23
Cutoff frequency 2-12

D

Data storage 2-19
Display area 1-6
Display/Analog 2-15

E

Environment settings 2-21
Error Codes A-4
Ethernet settings 2-22
Dimensions 3-3

F

Features 1-4
Filter 2-12
Flow of Operation 2-3

G

Gateway 2-22

H

HEAD A/HEAD B 2-4
Head selection 2-4
Head settings 2-4
Hysteresis 2-13

I

Initializing all 2-25
Initializing programs 2-25
Installation environment 4
IP Address 2-22
IP65f 1-7

L

LASER control group 2-7
List of Optional Accessories A-6

M

Main screen 2-2
Mask boundary 2-8
Mask setting 2-8
MAX bet. OUT 2-10
Measurement 2-11
Measurement data display selector 1-7
Measurement mode 2-4, 2-11
Measurement type 2-11
Measurement Value Display 2-26
Measurement/Filter 2-11

Median....2-7
MIN bet. OUT....2-10
Minimum display unit....2-15
Mounting....1-7
Mutual interference prevention....2-18

N

Names and functions on the main screen....2-2
No. of used heads....2-21
No. of alarm processing....2-7
No. of alarm recovery....2-7
No. of used OUTs....2-21
No. of used analog Ch....2-21

O

Offset....2-13
OP-84428....1-10
OUT selection....2-9
OUT settings....2-9
OUT1/OUT2....2-9

P

P.LOCK....2-27
Package contents....1-2
Panel cutout....1-7
Panel lock....2-21
Parity....2-22
Parts and functions....1-6
P-P bet. OUT....2-10
Program change....2-21
Program settings....2-23

R

Range....2-7
Received Light Waveform Display....2-28
Reflection type....2-5
Reset....2-27
RS-232C....2-22

S

Sampling cycle....2-16
Scaling Setting....2-13
Select head....2-9
Selected OUT....2-19
Set from the measurement data....2-14
Setting 1....2-4
Setting 2....2-7
Setting scaling from measurement data....2-14
Simultaneous auto zero....2-26
Simultaneous reset....2-26
Simultaneous timing....2-26
Specifications....3-2
Stand....1-10
Storage cycle....2-19
Strobe time....2-16
Sub bet. OUT....2-10
Subnet mask....2-22
Synchronization settings....2-17

T

Timing....2-27
TO CONTROLLER port....1-6
Tolerance Comparator....2-13
Tolerance comparator output format....2-16
Tolerance Comparator....2-13
Tolerance/Scaling....2-13
Touch panel....1-6
TRIGGER....2-11
Troubleshooting....A-2
Type (filter)....2-12

W

Waveform display....2-27, 2-28

Z

Zero....2-27

A

Revision History

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