Date: 2016.12.26

Area Designer
sensor configuration tool
Instruction manual

Approved by	Checked by	Drawn by	Designed by	Title	Area Designer Instruction Manual	
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[Introduction]

Make sure to read this manual before and during operation for the correct operation.

[About Area Designer]

By using this application, it is possible to monitor the sensor and area configuration. Also, it is possible to save measurement data and area data.

[Before use]

Make sure to read the specification and user's manual of the sensor before operation.

[Precautions]

- Make sure to perform operations with a stable power supply listed in the product specifications and the user's manual. Operating under unstable power supply may damage the device.
- The actual product may differ from the illustrations and figures in this document as they are used for explanatory purposes only.
- All information in this user's manual is subject to change without prior notice.
- If you have any inquiry about the product, contact our nearest distributor or sales representative.

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1. System requirement

The minimum system requirement for the operation of Area Designer is as follows.
After reading the operation manual of computer, check the operating environment.

Computer	CPU	Pentium® IV processor of 800MHz or above
	RAM	512MB or above
	Hard disk	150MB minimum free space
Compatible OS	Microsoft® Windows 7 Professional	
	Microsoft® Windows 8.1	
	Microsoft® Windows 10	
Display	High color (16bit color) or above, 800×600 dot or above	

The operation in the below system environment cannot be guaranteed.

- Other OS that is not mentioned above
- NEC PC98 series and its compatible device
- Self made PC
- Multi boot environment
- Multi monitor environment
- Upgraded OS from the standard installed OS

Caution

□ For OS other than Windows 7, operation is not guaranteed even if the minimum system requirements are fulfilled.

2. Installing the application

In this section, it will explain how to install application in Windows.

1. This application can be downloaded from our company website. In order to install this application, double click the installer “Area Designer”.

2. Double click the installer “Area Designer” and the following screen will be displayed. Here the language can be changed at the time of installation.

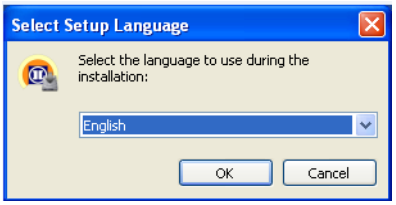


Figure 2-1 Select the language for an installer

3. As shown in figure 2.1 click “ok”, then displays the screen of the installation location of Area Designer. If there is no particular specification then, click “next”.

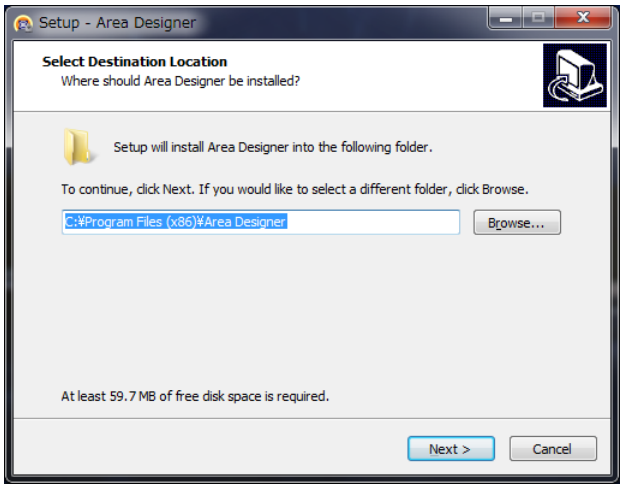


Figure 2-2 Specify the location for an installation

4. As shown in figure 2.2 click “next”, then select the component of “Area Designer”. If there is no particular specification then click “next”.

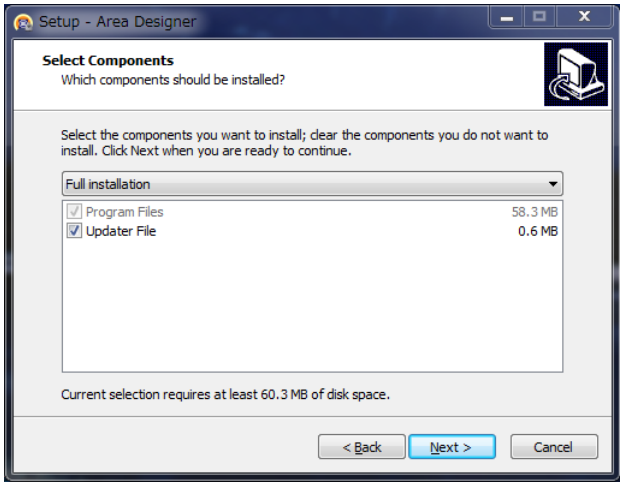


Figure 2-3 Select component

5. As shown in figure 2-3 click “next” then user will be proceed to specify the program group of “Area Designer”. If there is no particular specification then click “next”.

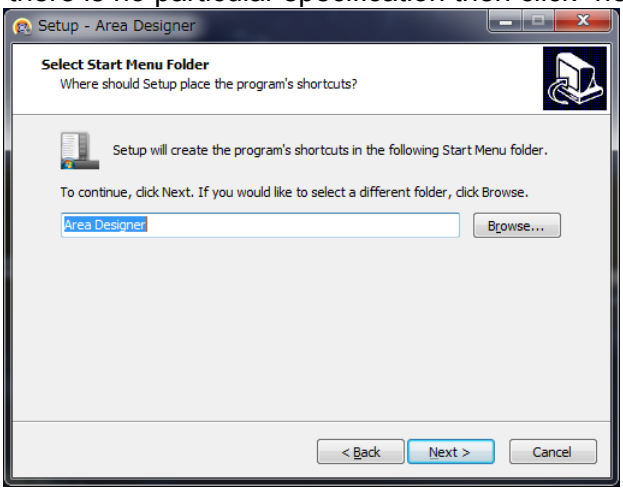


Figure 2-4 Specify the program group

6. Once you click next as shown in figure 2-4 then proceed to additional task select screen. After selecting the additional tasks you would like for this setup to perform while installing, then click next.

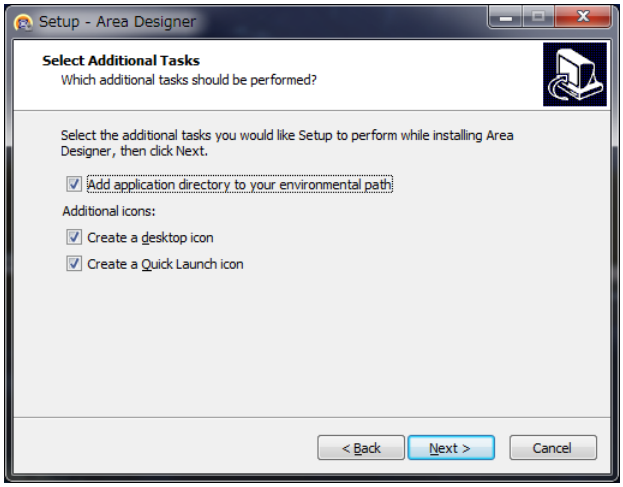


Figure 2-5 Select additional tasks

7. As shown in figure 2-5, click next then installation of “Area Designer” will start.

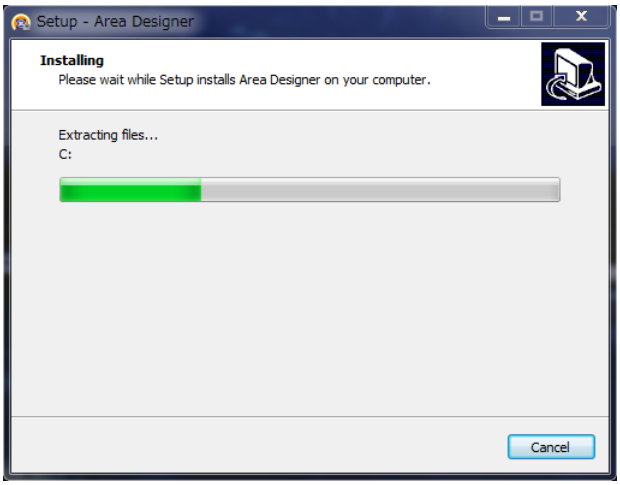


Figure 2-6 Installation in progress

3. Using the application

1. Click Start menu → All programs →Area Designer. Or Double-click Area Designer shortcut icon on the desktop as shown in below figure 3.

Figure 3 Area Designer icon

2. Starts the Area Designer application.

4. Main window screen

When the application is started, this will explain the main window screen displayed.

4.1 Welcome to “Area Designer” screen

If application starts, the following window will be displayed as shown in figure 4.1-1. Table 4.1-1 explains details of three buttons of this window.

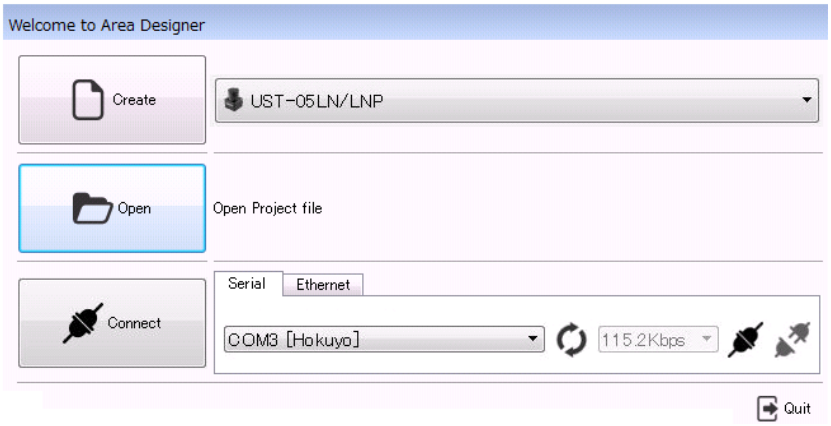


Figure 4.1-1 Welcome to “Area Designer” screen

Table 4.1-1 Button of “Welcome to Area Designer” screen

Button	Description
	Create a new project file of the selected sensor type.
	Open an existing project file.
	Connect with the sensor. Read the settting from the sensor.

As shown in table 4.1-1 “open” button can open the project file. Table 4.1-2 shows the extension of the project file which can be opened. In this application, the project file of UBG, PBS, etc can be also be used. (About the detail operation method, refer to the section 5.1.1)

Table 4.1-2 File extension types of project file 1

Extension	Description
.arax .arx	Project file of Area Designer

As shown in table 4.1-1, the components right of connection button will explain as below.

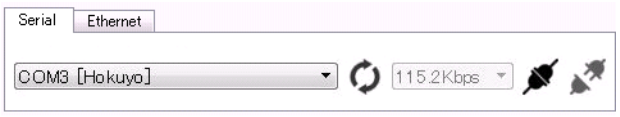


Figure 4.1-2 Serial connection component

Table 4.1-3 Serial connection component

Icon	Name	Description
	Serial COM Port	The connected COM port number will be displayed. When using multiple sensors, select the COM port which you want to connect.
	Rescan	Rescan of serial port will be performed and the number of connected COM port will be displayed again.
	Select Baud rate value	Select the baud rate value which has been connected.
	Connect	Connects with COM port and starts communication.
	Disconnect	Disconnect the communication.

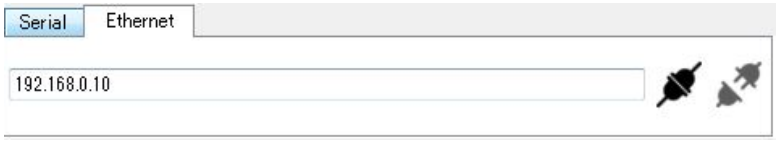


Figure 4.1-3 Ethernet connection component

Table 4.1-4 Ethernet connection component

Icon	Name	Description
	Input IP address	Input IP address which you want to connect. The port number is fixed.
	Connect	Connects with the IP address and starts communication.
	Disconnect	Disconnect the communication.

4.2 Main screen

This is the main window used for area configuration and monitoring. Edit screen and monitor screen can be switched by view →mode [/edit] and [/monitor] of the menu bar. Click the or icon from the toolbar for switching the mode. The main screen window of edit mode and monitor mode will be different.

4.2.1 Edit

In this screen, write area configurations to the sensor. User can also read and display the area configurations from sensor.

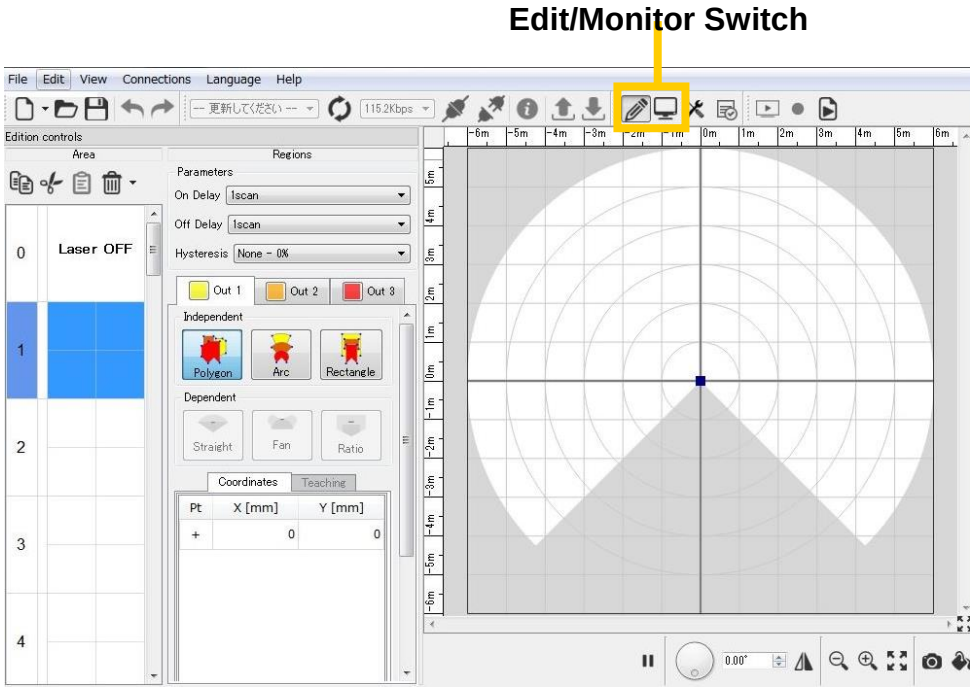


Figure 4.2.1-1 Default status in edit mode

Quick/Useful tips

□ Click on the lower left corner of the main view, deletes the tool bar and increase the area of the main view. Click , to return to the original state.

As shown in figure 4.2.1-2 and icons of no.1 are used for undo or redo operations of the icon no.2 through 6. As shown in the figure 4.2.1-2 icon no.2 through 4 are used for area configurations and operations. “Areas” refers to the regions configured with a maximum of 3 outputs displayed on the main view of no. 6 as shown in figure 4.2.1-2.

The regions displayed in yellow, orange and red on the main view represent each individual output region. As shown in figure 4.2.1-2 No.5 and No.6, these are used for the area configurations and operations of each output region. If you click No.7 as shown in figure 4.2.1-2, it is possible to detach the edit control from the main window. 1

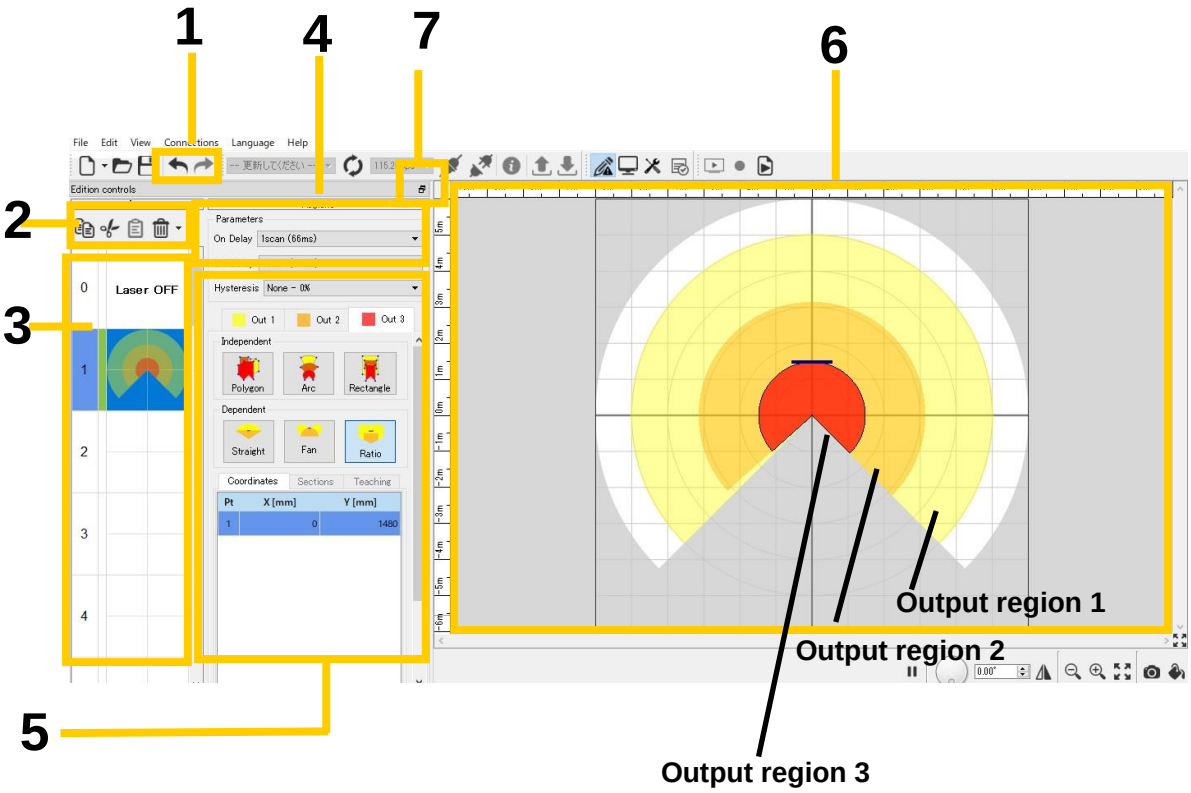


Figure 4.2.1-2 Edit tool of edit screen 1

4.2.1.1 Area

In this the setting and operation of the present configured area is shown.
Copy, paste or read and write of the selected area can be performed.

4.2.1.1.1 Copy, Cut, Paste, Delete

As shown in figure 4.2.1.1.1-1 [Copy], [Cut], [Paste], [Delete].
When you want to paste data of under configuration area to another area, [Copy] and [Cut] are used. [Copy] on the left the data of selected area and paste in another area. [Cut] deletes the data of selected area and pastes it in another area.
[Delete] eliminates the data of the selected area.

When you click ▼right of , as shown in figure 4.2.1.1.1-2, you can select [Reset], [Reset All], [Delete] and [Delete All]. [Reset] is used when you want return back to original state before editing the data of under configuration area. [Delete All] eliminates all data of the area. [Reset All], returns back to original state before editing the data of all area.

Figure 4.2.1.1.1-1 Copy, Cut, Paste, Delete

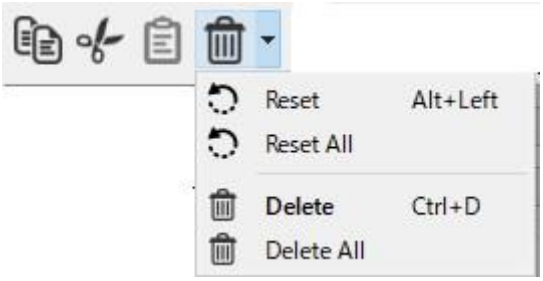


Figure 4.2.1.1.1-2 Reset, Reset All, Delete and Delete All

Caution

□ Copy, Cut, Paste and Delete tools cannot be used for each output region.
Also, these tools can be only used for each individual area; they cannot be used for multiple areas.

4.2.1.1.2 Area preview

In figure 4.2.1-2 the functions of number 2 and 3 are used for the area preview. When the background of the area number selected in the area preview turns blue, that area can be edited. The area that can be edited will be displayed on the main view illustrated in figure 4.2.1-2. The top left number in the area preview is the area number. When changing area configuration, the edit mode of the selected area in the area preview will turn to green. When a region within an area has a very narrow shape which cover less than 2 steps, the writing operation would fail for the defective area and its preview would turn red.

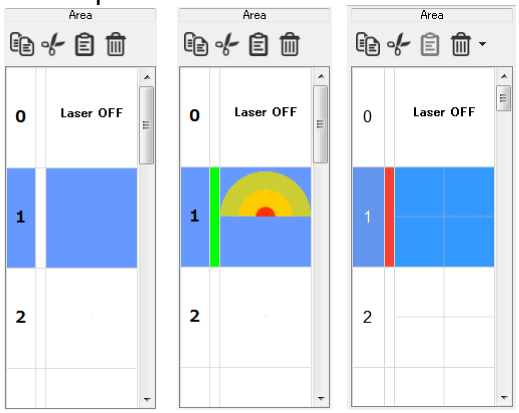


Figure 4.2.1.1.2-1 Left: Area preview of default status,
Middle: Area preview of edit status
Right: Area preview when a write error happen

By right clicking in the area preview, the background of the selected area will change to blue and display the sub menu as illustrated in figure 4.2.1.1.2-2. Functions listed in this sub menu can be used for the area selected. Single write is used to write the setting of current area to the sensor. Single read is used to read the setting of current area from the sensor.

Figure 4.2.1.1.2-2 Menu displayed by the right click of Area preview

Cautions

□ Area 0 is a laser OFF. It is disabled by default and marked as “Laser OFF”.

4.2.1.1.3 ON/ OFF delay, Hysteresis setting

As shown in figure 4.2.1.1.3 ON/OFF delay and Hysteresis can be configured for each area or for each region depending on application settings. The configurable range of ON/OFF delay setting is 1scan to 128scan, actual time differs according to the sensor. Please confirm in the user’s manual.

Hysteresis setting has 3 options: None (0%), Low (3.125%) and High (6.25%). Depending upon the sensor, Hysteresis cannot configured for each area or for each region. Please confirm in the user’s manual.

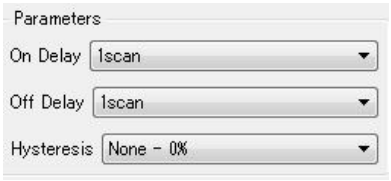


Figure 4.2.1.1.3 ON / OFF delay, Hysteresis setting

4.2.1.2 Regions

As shown in figure 4.2.1.2-1, Outputs 1 to 3 are displayed when selecting the tabs, or click on any of outputs as displayed in yellow, orange, and red on the main view. Then it is possible to edit the selected outputs.

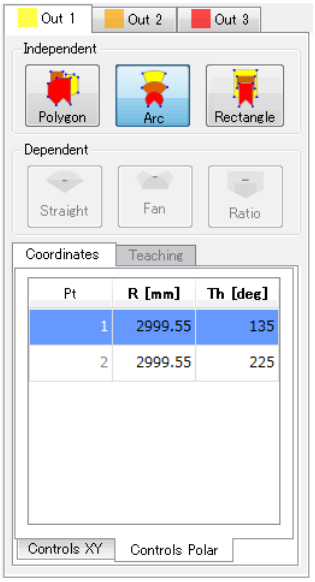


Figure 4.2.1.2-1 Tab of output regions 1 to 3

As shown in figure 4.2.1.2-2, menu will be displayed. Click output 1 to 3 on colored rectangle tab (For example). If you click visibility of main screen, then it displays or hides the region of the main screen. While viewing the region mark will be displayed. Area edit menu is also displayed. Explain the details of menu in table 4.2.1.2.

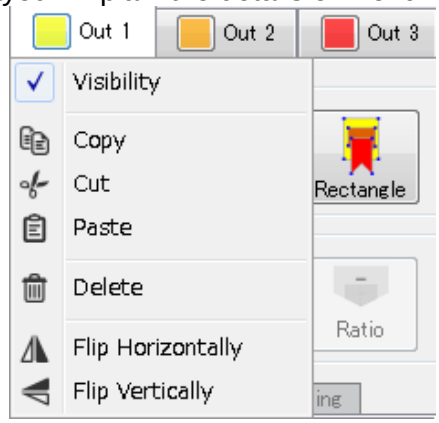


Figure 4.2.1.2-2 Menu

Table 4.2.1.2 Region edit menu

Icon	Name	Description
	Copy	Copy the under-configuration region.
	Cut	Cut the selected region. Delete the original region.
	Paste	Paste the selected region to another region.
	Delete	Delete the selected region.
	Flip Horizontally	Flip horizontally the current region.
	Flip Vertically	Flip vertically the current region.

Quick/Useful tips

- To delete a point from a region, select the point which you want to delete then right click the mouse. The backspace or delete key can be used for deleting the point. Right clicking the mouse while dragging over a set of points would delete them.
- In the case when you want to make an adjustment to point position, hold the Ctrl Key and move the mouse so the point moves in 10(mm) intervals. Also, if you hold the Shift Key and move the mouse, the point then moves in 100(mm) intervals. Also, by holding the Alt key, Ctrl key and Shift Key and moving the mouse will move the point moves in 1000(mm) intervals.

4.2.1.2.1 Independent

In this section, it explains how to configure the output of an independent shape. There are the 3 types: polygon, arc and rectangle. When one of these independent shapes is selected, the point will be added to the center point of the main view (refer to figure 4.2.1.2.1-1). By moving this point, a region of the selected shape can be configured.

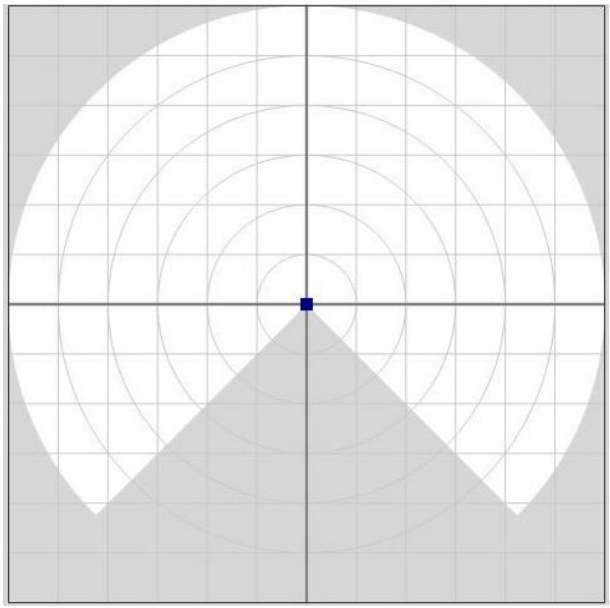


Figure 4.2.1.2.1-1 Default state during independent shape selection

When configuring an independent shape, there is a region where outputs can be configured as well as a region where outputs cannot be configured. The regions where an output can be configured are referred as configurable region. The regions where outputs cannot be configured are referred to as an un-configurable region. As shown in figure 4.2.1.2.1-1 the configurable area region is in **white** while the un-configurable area region is in **gray**.

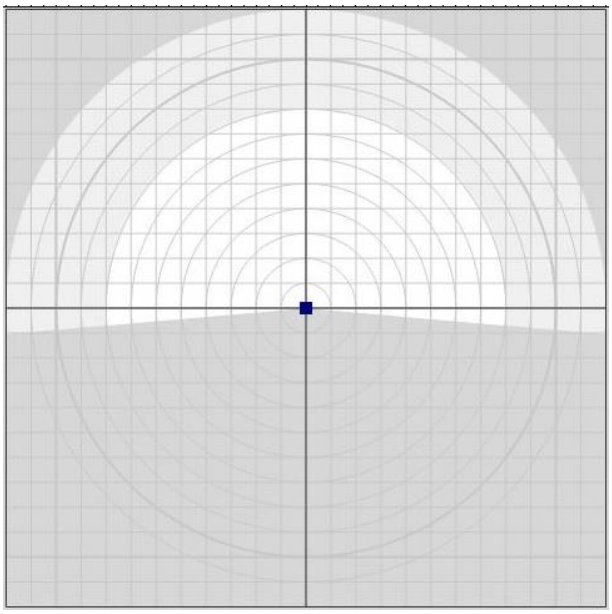


Figure 4.2.1.2.1-2 Default state during independent shape selection

As shown in figure 4.2.1.2.1-2, in some sensors displays in **light gray** between white and gray. Although this is un-configurable area region but it will be measurement area region. For detail, please refer to the user's manual of the sensor.

4.2.1.2.1.1 Polygon

Polygons can be used as a configured area if the intended shape of the output cannot configure as arc or rectangle. The information shown with a polygon configuration will display the number of points configured and X and Y coordinates of each point in the main view window. As shown in figure 4.2.1.2.1.1-1 here is an example of polygon configuration.

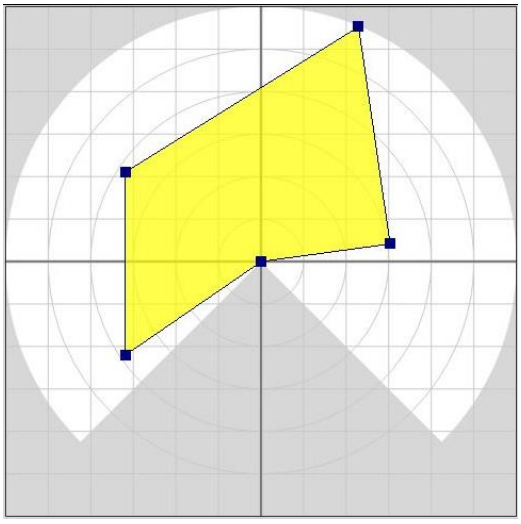


Figure 4.2.1.2.1.1-1 Example of polygon configuration

When a point is deleted, the output area will be configured to form a straight line between one point to another depending on the one removed. If one is the center point, then the output will be configured such that one point it forms a straight line with the center point. When all the points are deleted other than the center point, the entire output region will be deleted.

Caution

- □ Maximum 30 points can be configured with a polygon.
- □ When an area is configured with more than 31 points, first write the area to the sensor and then read the area from the sensor, as shown in figure 4.2.1.2.1.1-3; the points will be displayed in all steps within the configured area. Although, it is possible to write an area with more than 31 points to configure into the sensor, the writing of point information on the area cannot be guaranteed. In the event an area with more than 31 points, the maximum number of points that can be displayed in the main view is the maximum number of steps of the sensor + 1 point.

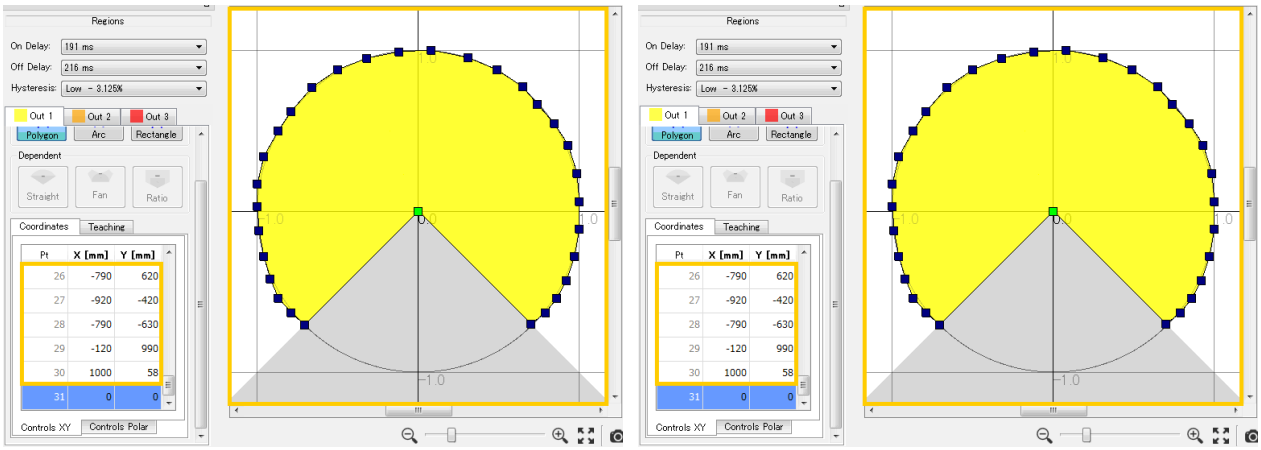


Figure 4.2.1.2.1.1-2 Left: Example of 30 points or less within the area
Right: Display an area of 30 points or less when read from the sensor

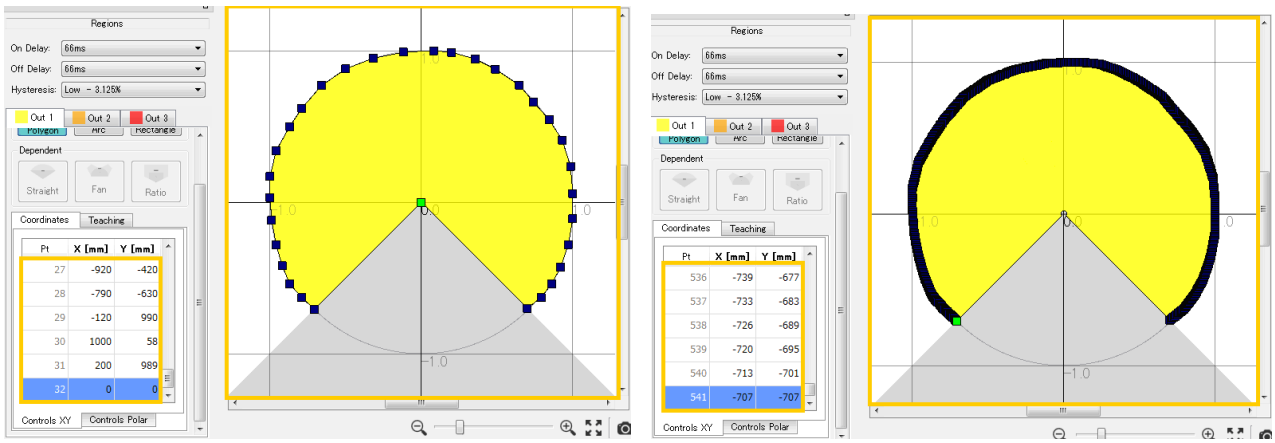


Figure 4.2.1.2.1.1-3 Left: Example of more than 31 points within the area
Right: Display an area of more than 31 points when read from the sensor

4.2.1.2.1.2 Arc

When configuring an arc, the point information is shown below.
Figure 4.2.1.2-1.2.1 consists of 2 output points.

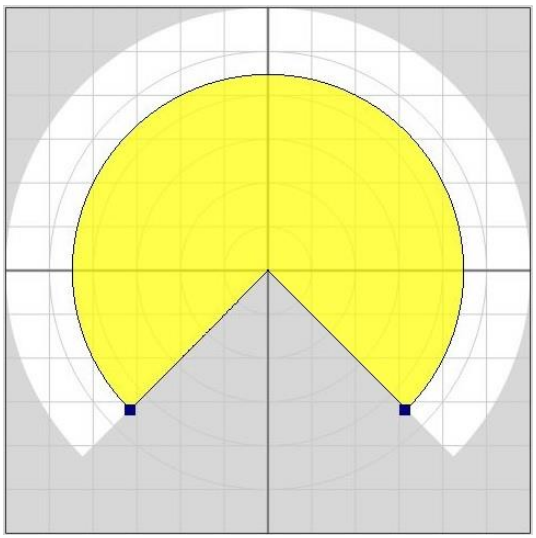


Figure 4.2.1.2.1.2-1 Example of Arc configuration

The point information of an arc shape consists of 2 angles to each point from the starting angle of 0° on the main view and saves the information of the radius of arc. The output area of an arc shape is configured from these 2 angles and the radius of the arc. When the radius of one point is changed, the radius of other point is also changed of same value. As shown in figure 4.2.1.2.1.2-2 arc will be configured, if either of one point is deleted, the value of deleted point will change to same value of other point.

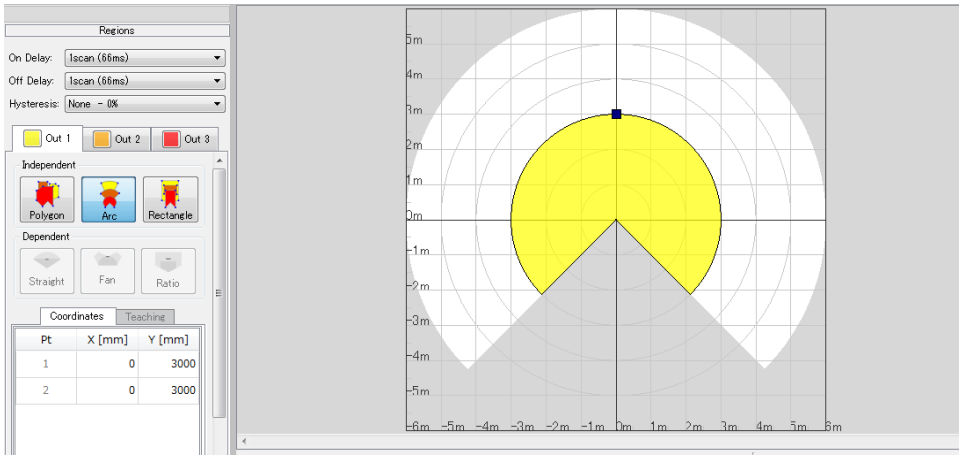


Figure 4.2.1.2.1.2-2 Example of Arc configuration when a point is deleted.

4.2.1.2.1.3 Rectangle

The output of a rectangle is configured of 4 points as illustrated in figure 4.2.1.2.1.3-1.

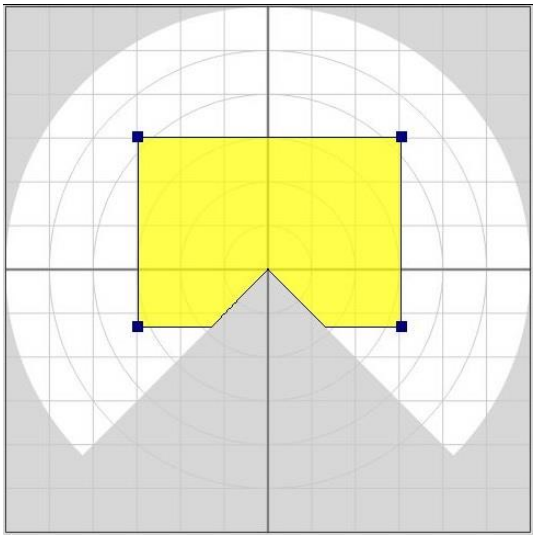


Figure 4.2.1.2.1.3-1 Example of rectangle configuration

The point information of a rectangle consists of last selected point and the opposite 2 points of selected points. Based on the relative values between these 2 points, the horizontal and vertical lengths of the rectangle are calculated. The output of a rectangle is then configured and that does not include the unavailable region.

When any one of the 4 points is moved, the coordinates of other opposite points will be changed. Points will change as drawing the rectangle's 4 points and it doesn't include the unavailable region.

It is only possible to move a point to the unavailable region while configuring a rectangle and polygon (refer to figure 4.2.1.2.1.3-2 for moving point in the unavailable region). The configured output is a region enclosed within the 4 points and that does not include the unavailable region.

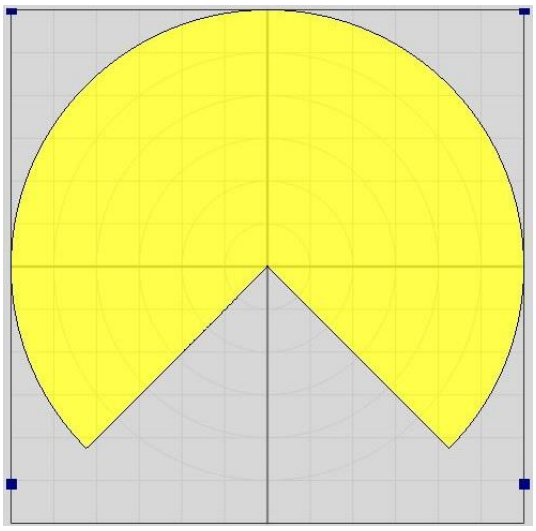


Figure 4.2.1.2.1.3-2 When configuration of rectangle points moves to unavailable region

4.2.1.2.2 Dependent

This section will explain how dependent-shaped outputs of the region are changed within the range of outer most (upper) output. The outer most output refers to Output 1 (yellow) within this area is Output 2 (orange) and lastly Output 3 (red) referenced to Output 2. Since Output 1 is the outer most output, when it is changed, the regions of Output 2 and Output 3 are changed automatically.

Straight line, Fan shape, and Ratio are the types of dependent shapes. As shown in figure 4.2.1.2.2, the blue offset bar can be used for different area configuration. When the offset bar is selected, it will be displayed in a lime green (yellow- green) color.

The configurable range of the offset bar is within the range of 0 – 100%.

When selecting a dependent shape, default offset bar will be displayed as in figure 4.2.1.2.2. The value of offset bar can be set through left-clicking the mouse.

Cautions

□ With Output 1 as the outermost range, is not possible to configure as a dependent shape.

Quick/Useful tips

□ It is possible to delete the offset value of the point by right–clicking of the mouse when the offset bar is selected, or press delete or the backspace key on the keyboard. The offset bar as shown in figure 4.2.1.2.2.will be displayed in the default position of the coordinate origin.

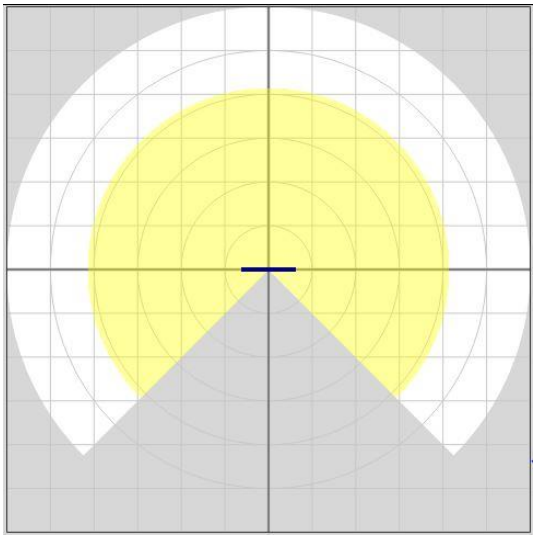


Figure 4.2.1.2.2 Default position of dependent offset bar

4.2.1.2.2.1 Straight Line

Within outer most output, the maximum distance in the positive direction of Y axis coordinate from the center point is considered as 100%. The coordinate origin is at the 0% position. Based on the configured position of the offset bar, calculate the Y-direction and linear distance of the straight line to configure output of a straight line that is dependent of the outer most output.

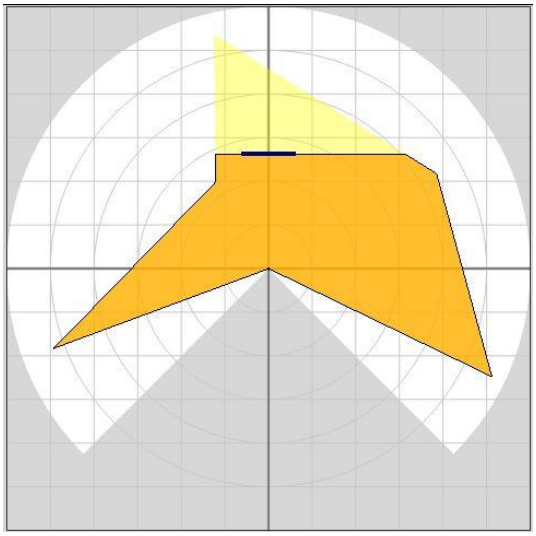


Figure 4.2.1.2.2.1 Example of straight line

Caution

□ When outer most output region is without a point in the positive direction of the Y-axis coordinate, straight line output that is dependent of the outer most regions cannot be configured.

4.2.1.2.2.2 Fan shape

Within outer most output, the maximum distance of a point from the center point is considered as 100% and coordinate origin is considered as 0%. Based on the configured position of the offset bar, calculate the radius of the arc of the fan shape to configure fan-shaped output, that is dependent of the outer most output area.

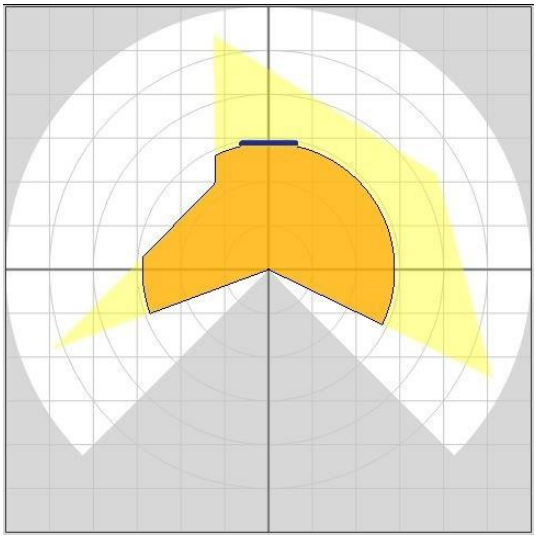


Figure 4.2.1.2.2.2 Example of fan shape

4.2.1.2.2.3 Ratio

Within outer most output, the maximum distance in the positive direction of the Y-axis coordinate from the center point is considered as 100% Calculate the ratio shape to configure ratio-shaped output that is dependent of the outer most output area.

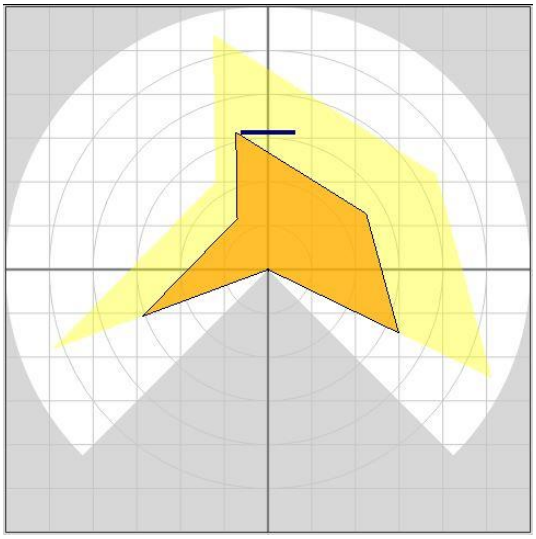


Figure 4.2.1.2.2.3 Example of ratio

Caution

□ When outer most output region is without a point in the positive direction of the Y-axis coordinates, ratio output that is dependent of the outer most regions cannot be configured.

4.2.1.2.3 Numerical input

In this section, it will explain how to configure the area by numerical input of X and Y coordinates, polar coordinates for independent shapes and dependent shapes separately.

When configuring the area, ID position information is assigned to each point coordinate. Point ID is displayed in the Pt column of numerical input. After selecting a point when the mouse is place on the main view, the tool tip of the selected point ID will be displayed as illustrated in figure 4.2.1.2.3-1. Displayed tool tip is the point ID number.

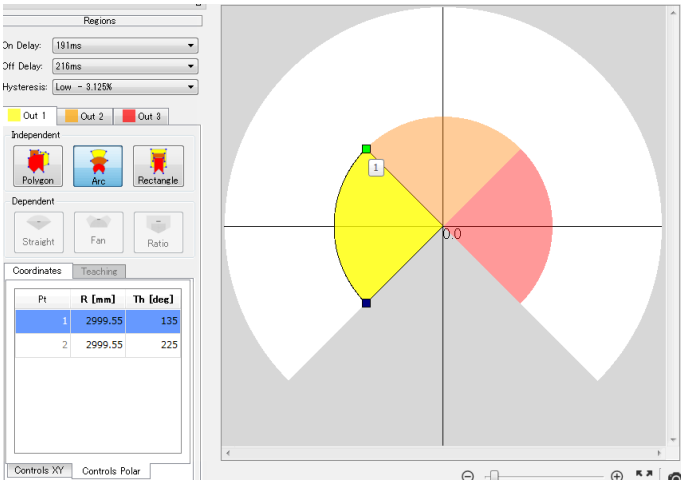


Figure 4.2.1.2.3-1 Point ID assigned to each point

The point ID is assigned in order to identify the coordinate position information of each point (here the coordinate position information of point will be referred to as point information). The point ID starts from 1 up to maximum steps +1. The coordinates X, Y and the radius of arc for numerical input is displayed in [mm] units and the angle is displayed in [deg] units.

In order to correct the positions of the points coordinates, double click on the area which you want to change. After input the changed value, move to other cell or press the enter key. When the change is completed, the changed output will be displayed on the main view.

When you right click on the point coordinate, displays the sub menu as shown in the figure 4.2.1.2.3-2. This menu is used to save and input the coordinate data easily.

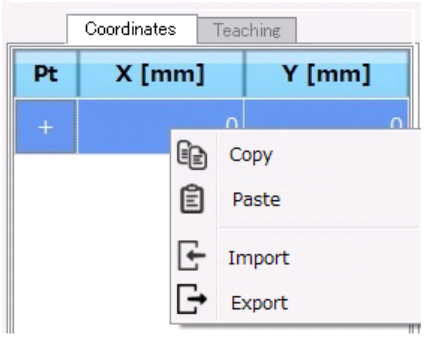


Figure 4.2.1.2.3-2 Sub menu

Explains each menu in table 4.2.1.2.3.

Table 4.2.1.2.3 Numerical input menu

Icon	Name	Description
	Copy	Copy the coordinate data.
	Paste	Paste the copied coordinate data to other region.
	Import	Input the coordinate data from the selected CSV file.
	Export	Displays the coordinate data as CSV file.

Caution

□ Maximum of 30 points is guaranteed while writing a polygon shape into the sensor. Although, 31 or more points can be written into the sensor of polygon shape, it cannot guarantee the point's information.

Quick/Useful tips

□ While the numerical input row is selected with a blue display, delete or backspace key can be pressed and the point information of that row will be deleted.

4.2.1.2.3.1 Numerical input of Independent

Figure 4.2.1.2.3.1-1 illustrates the default state of numerical input screen when selecting the rectangle independent shape. Output on the main view is displayed as illustrated in figure 4.2.1.2.1-1.

As in figure 4.2.1.2.3.1-1, rectangle is configured of four points, therefore four rows will be displayed. With using a polygon, the default state of numerical input value is configured of one point and one row will be displayed. If using an arc shape, it is configured of two points, and then two rows will be displayed.

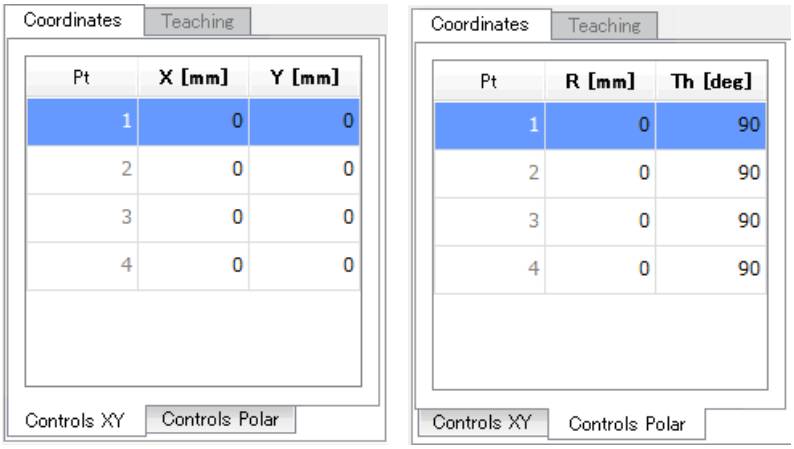


Figure 4.2.1.2.3.1-1 Example of default state of Numerical input screen during independent rectangle selection
(Left: XY Coordinates, Right: Polar Coordinates)

With using a polygon shape, when a point is deleted, the ID of that corresponding point is deleted and ID assigned after the deleted point ID is decreased by one.

By changing the values of the X and Y coordinates or the value of the polar coordinates of each point ID in numerical input screen, the output will be displayed in the main view. In figure 4.2.1.2.3.1-2, it shows an example of arc configuration by numerical input.

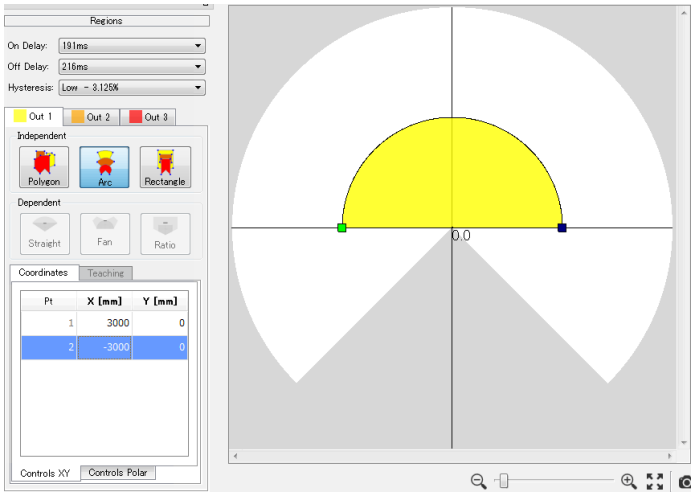


Figure 4.2.1.2.3.1-2 Example of arc configuration by numerical input

4.2.1.2.3.2 Numerical input of dependent

When a dependent shape is selected, a single row of point information ID will be displayed in numerical input screen. Default state of numerical input is illustrated in figure 4.2.1.2.3.2-1. As illustrated in figure 4.2.1.2.2, it shows the default state of numerical input when fan shape, straight line or ratio of dependent is selected.

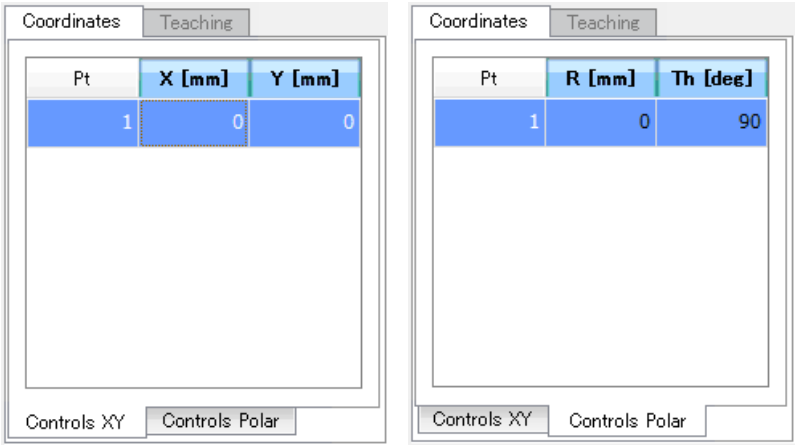


Figure 4.2.1.2.3.2-1 Default state of numerical input screen during selection of a dependent shape

(Left: XY coordinates, Right: Polar coordinates)

In the numerical input of X and Y coordinates, it is possible to change the value of Y coordinate only and in the numerical input of polar coordinates, it is possible to change the value of radius only. In figure 4.2.1.2.3.2-2, it shows an example of fan shape by numerical input.

When selecting the point ID in numerical input screen, if backspace or delete key is pressed, the screen will return to the default state as illustrated in figure 4.2.1.2.2.

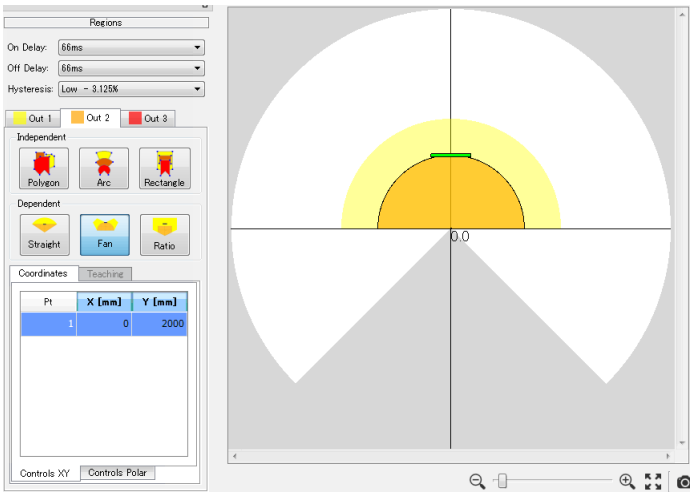


Figure 4.2.1.2.3.2-2 Example of fan shape by numerical input

4.2.1.2.4 Teaching

Only when polygon as an independent shape is selected, then “Teaching” tab next to “Coordinates” tab will become active. When teaching tab is clicked the configurations screen as illustrated in figure 4.2.1.2.4-1 will be displayed. It will be possible to set the teaching function. This teaching function enables an area to be configured based on a background obtained by scanning the sensor.

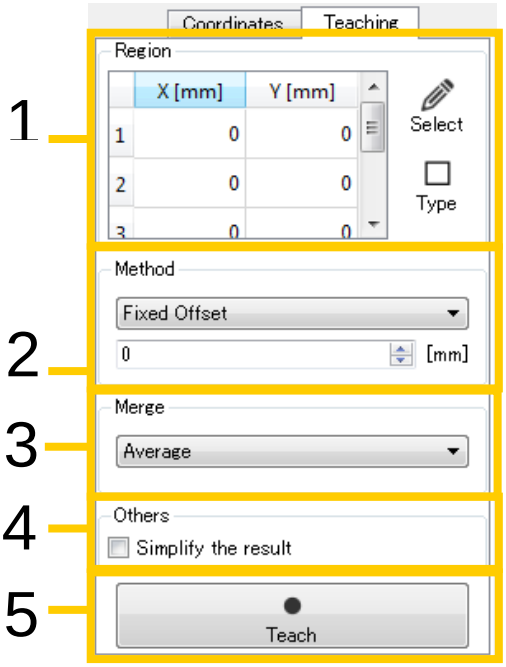


Figure 4.2.1.2.4-1 setting of teaching

Operating method is configured in the order as illustrated in figure 4.2.1.2.4-1.

1. Specify the region to perform teaching. Click Select and the pink dot will be displayed in the center of the main view. Specify the region with this round dot. Also, it is possible to specify the region by numerical input (numerical input value on the X and Y coordinate value.)

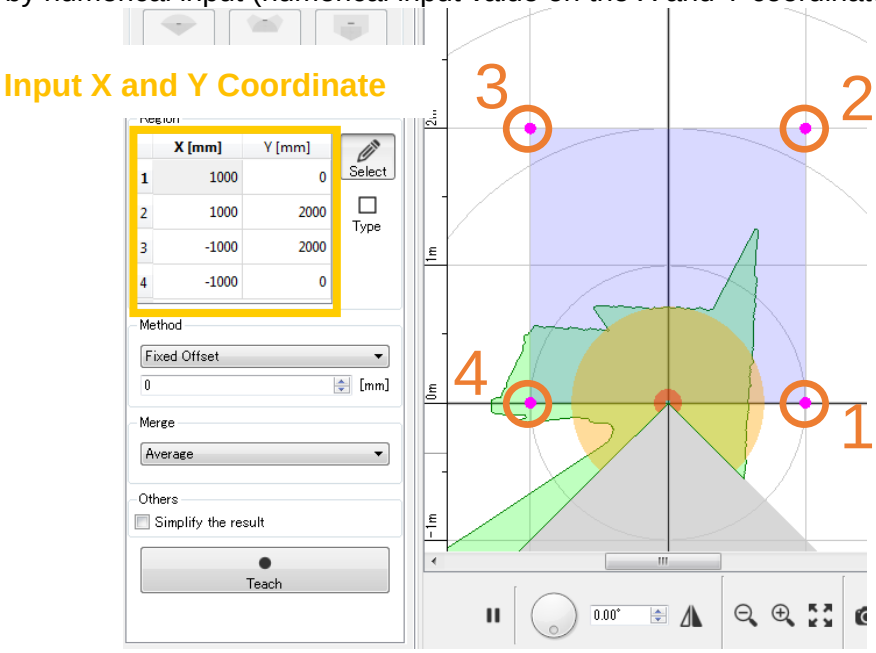


Figure 4.2.1.2.4-2 Specify the region for teaching (Rectangle Type)

There are two teaching region selection types. In region selection panel, Type indicates a rectangular type and Type indicates a polygon type with 4 points each. It is possible to toggle the type by click the icon. Using a rectangle type, when one point is specified, the adjacent points adapt its positions to keep a rectangular shape. Using a polygon type as shown in figure 4.2.1.2.4-3 , points can freely be specified.

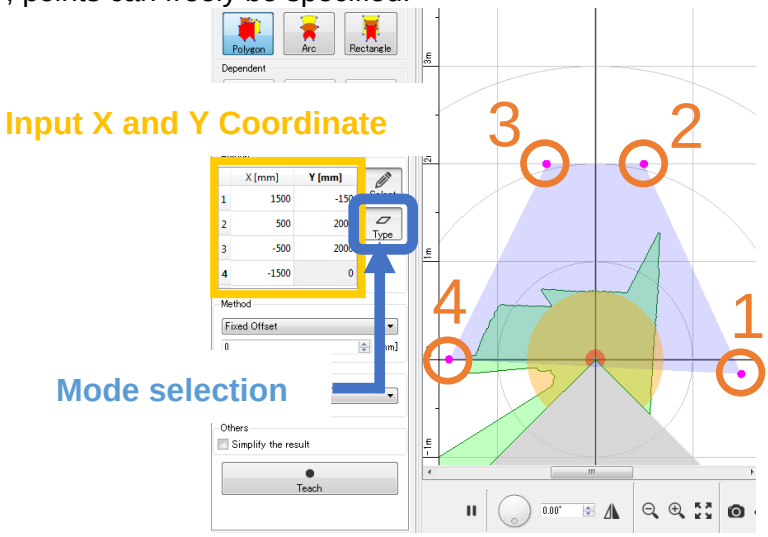


Figure 4.2.1.2.4-3 Specify the region for teaching (Polygon Type)

2. Set the method of teaching. Specify fixed distance offset. During teaching with fixed distance offset of 100 mm, the offset is removed from the range of each step as illustrated in figure 4.2.1.2.4-5. The pink waveform is the configured region and the green waveform indicates the sensor readings.

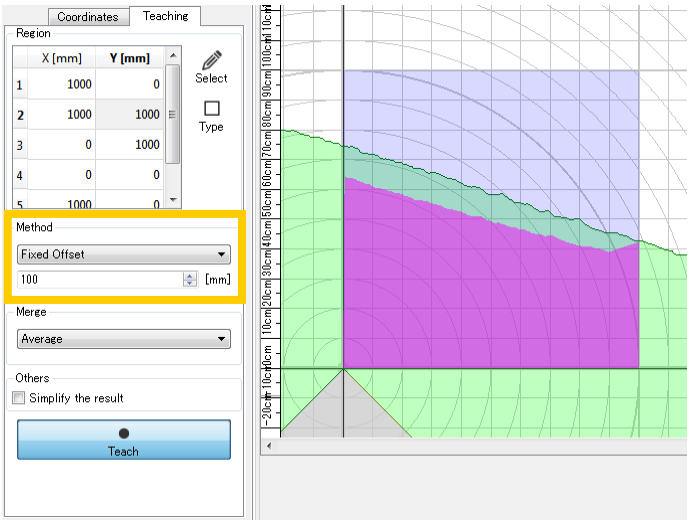


Figure 4.2.1.2.4-4 Display the configured teaching region (pink) and Sensor readings (green) using the Fixed offset method

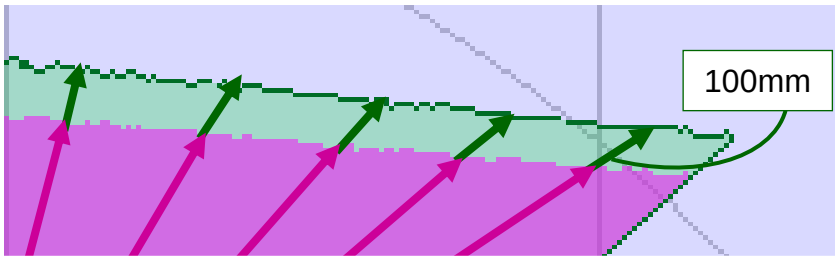


Figure 4.2.1.2.4-5 Distance offset through step method

Set the method to Erosion. During teaching with distance offset of 100mm figure will be as illustrated in figure 4.2.1.2.4-7. This method uses an offset circle to trim the range data within the teaching region. This method advantage is the application of the offset between adjacent steps as shown in figure 4.2.1.2.4-8 (Advantage circle). However, selecting a teaching region which includes very short distance reading may lead to smaller teached region as shown in figure 4.2.1.2.4-8 (Disadvantage circle).

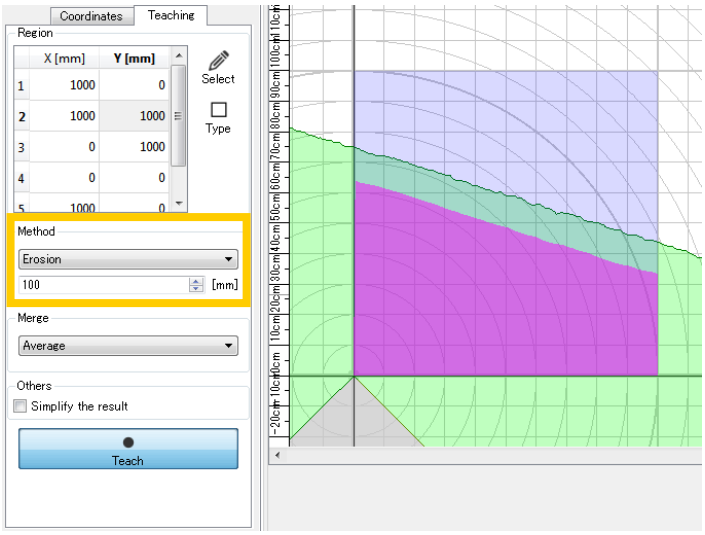


Figure 4.2.1.2.4-6 Display the configured teaching region (pink) and Sensor readings (green) using the Erosion method

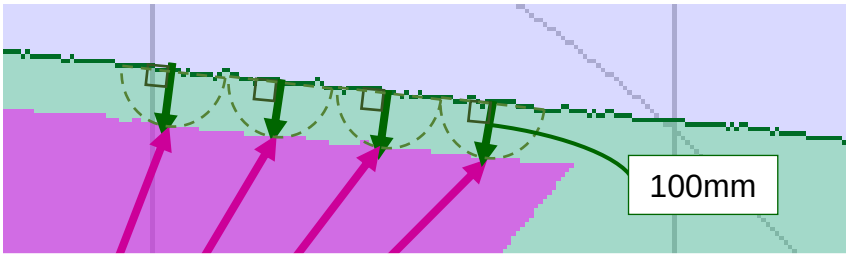


Figure 4.2.1.2.4-7 Distance offset using the Erosion method

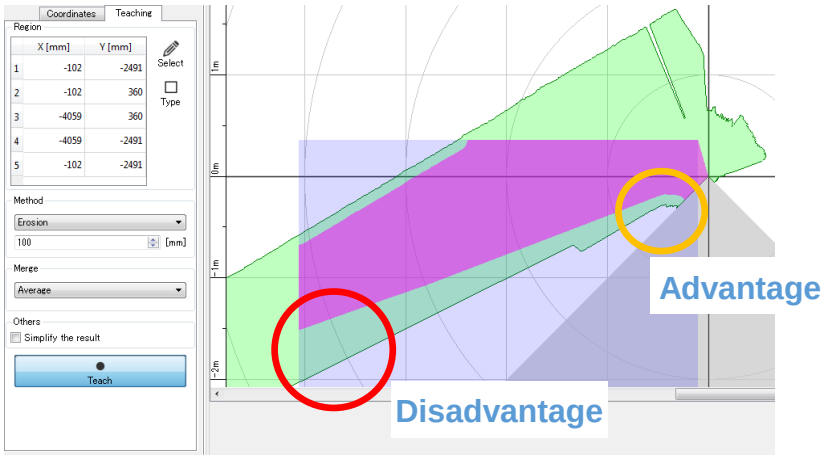


Figure 4.2.1.2.4-8 Erosion method's advantage and disadvantage

Select the Percent Offset method. This method allows specifying a percentage as the offset value. This method has the advantage to keep walls parallel after offsetting. In the example below, the offset is set to 10% which uses the 90% of the sensor readings as the teached region as shown in figure 4.2.1.2.4-10. Since the offset amount is different depending on the distance to the background, parallel surfaces feature is reflected in the teached region as shown in figure 4.2.1.2.4-9. However, the offset is applied along the step not between adjacent steps as shown in figure 4.2.1.2.4-11.

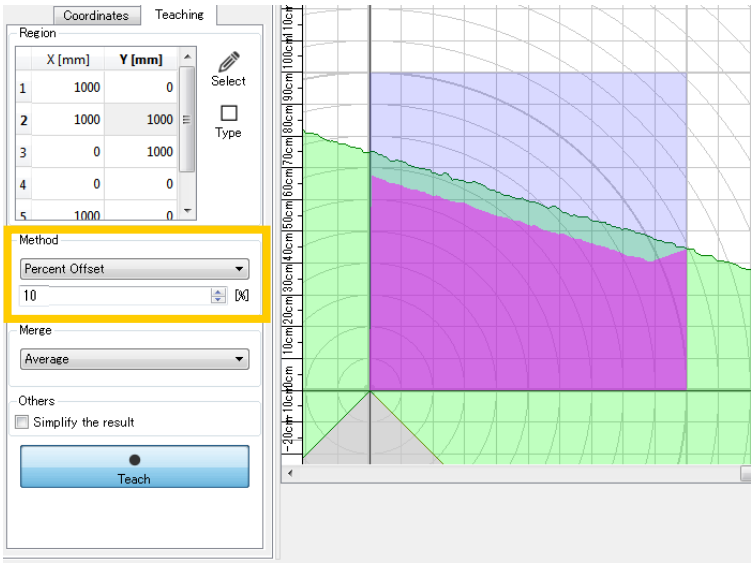


Figure 4.2.1.2.4-9 Display the configured teaching region (pink) and Distance region (green) using the Percent Offset method

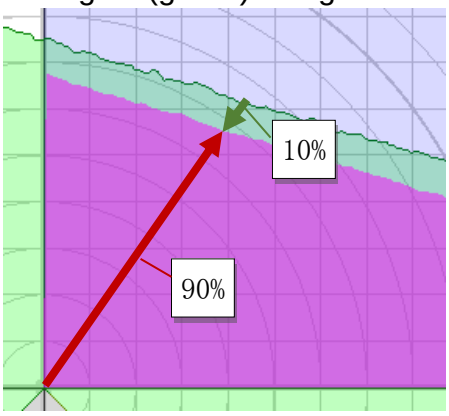


Figure 4.2.1.2.4-10 Distance offset using the Percent Offset method

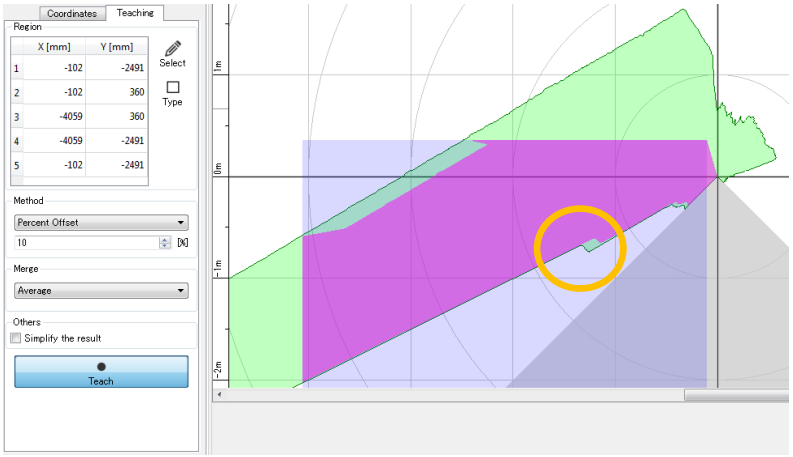


Figure 4.2.1.2.4-11 Distance offset using the Percent Offset method

3. The Merge option defines the method used for scan sampling. “Average Value” calculates the average values of the distance scanned during teaching and selects it as region. “Minimum Value” selects the minimum value scanned during the teaching and selects it as the region. If the “None” merge option is selected, the last range information would be used as a region template.

4. In the event of a minimizing point being displayed during teaching, place a check in “Simplify the result”. When there is no check, it will display the point of each step of the in the region.

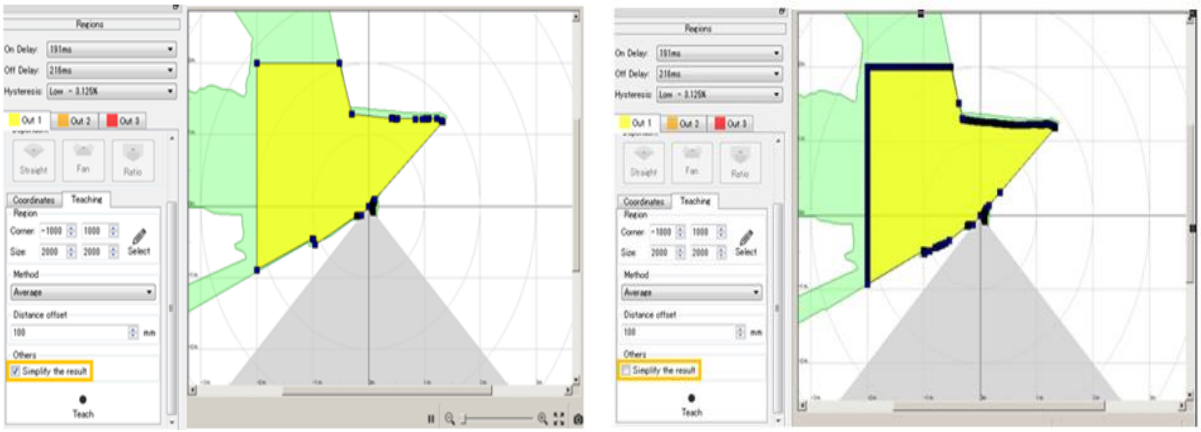


Figure 4.2.1.2.4-12 Left: When a check placed in “Simplify the result”
Right: When not check in “Simplify the result”

5. Teaching will start when “ ● Teach” is clicked. In order to set teaching region to the sensor, it is necessary to write the configuration to the sensor.

Caution

□ While performing teaching within the specified region, if background does not exists, then the boundary of teaching performing region will be set as the region. In this case, difference of offset value will not be applied. (Refer to figure 4.2.1.2.4-13)

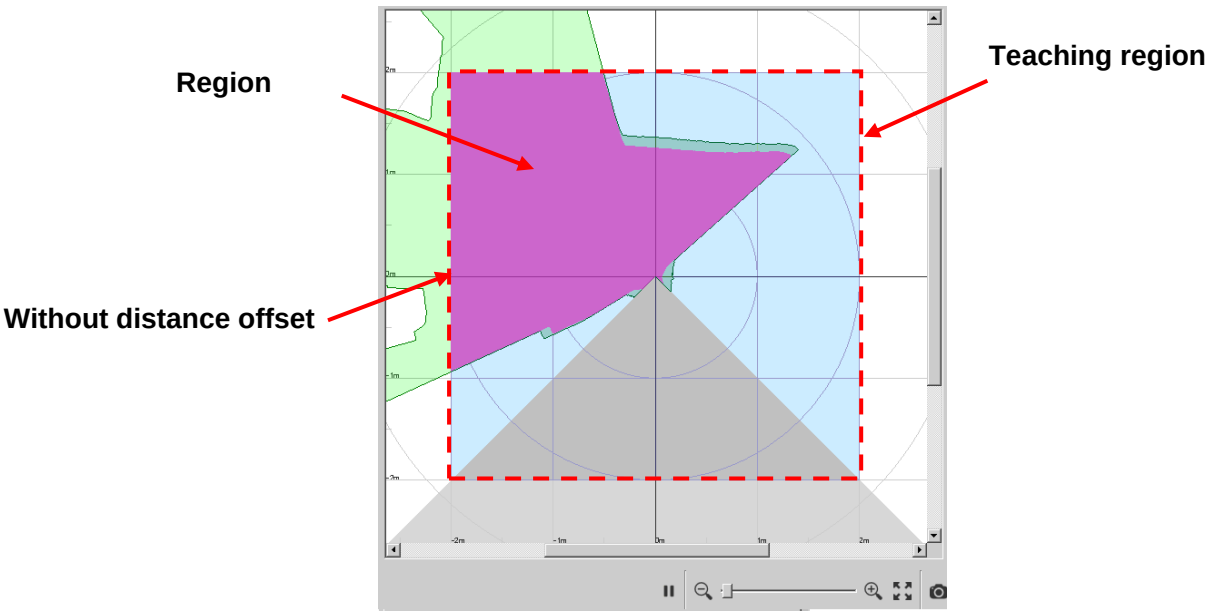


Figure 4.2.1.2.4-13 Display when no background in the configured teaching region

Quick/ Useful tips

□ In the case when deleting multiple points which forms the region, specify the range by clicking upper right part of main screen. Deletes all the specified points within the range.

4.2.1.2.5 Origin offset from the center of scanning beam

Depending on the sensor capabilities, it is possible to configure a region as detached from the sensor origin. This feature allows to monitor an area without considering occlusion. As shown in the left side of figure 4.2.1.2.5, usual output is formed with point dragged from the sensor's origin. To detach a region, move the red point near origin point, as shown in the right side of figure 4.2.1.2.5.

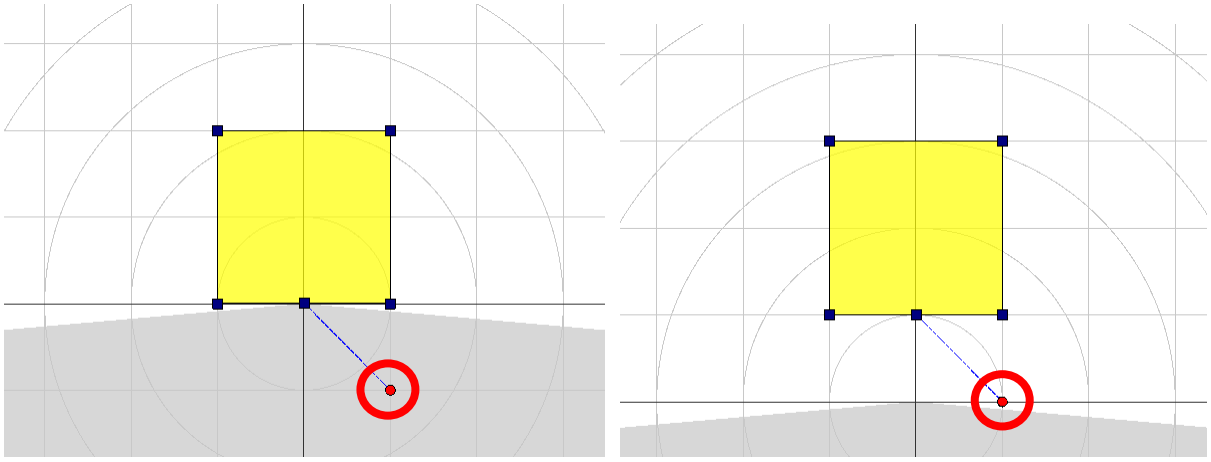


Figure 4.2.1.2.5 Left: Output including point of origin Right: Origin offset from the center of scanning beam

Quick/Useful tips

- □ When returning the center point of origin offset from the center of scanning beam to its point of origin, select the red point then right click the mouse. The Backspace or delete key can also be used for returning to its point of origin.
- □ To make an adjustment to center point of origin offset from the center of scanning beam, hold the Alt key and make the adjustment. To make a slight adjustment to center point of origin offset from the center of scanning beam, hold Ctrl Key and Alt key and move the mouse. The point moves in 10(mm) intervals. Moving the mouse while holding the Alt and Shift Key would move the point in 100(mm) intervals. Also, by holding the Alt key, Ctrl key and Shift Key and moving the mouse will move the point moves in 1000(mm) intervals.

Caution

- □ It is not possible to configure a detached region with more than 30 points.
- □ Please refer to the user's manual for compatible sensor model.

4.2.2 Monitor

In this screen, data measurement, record and play of log data, IO information check and monitoring of a sensor are performed.

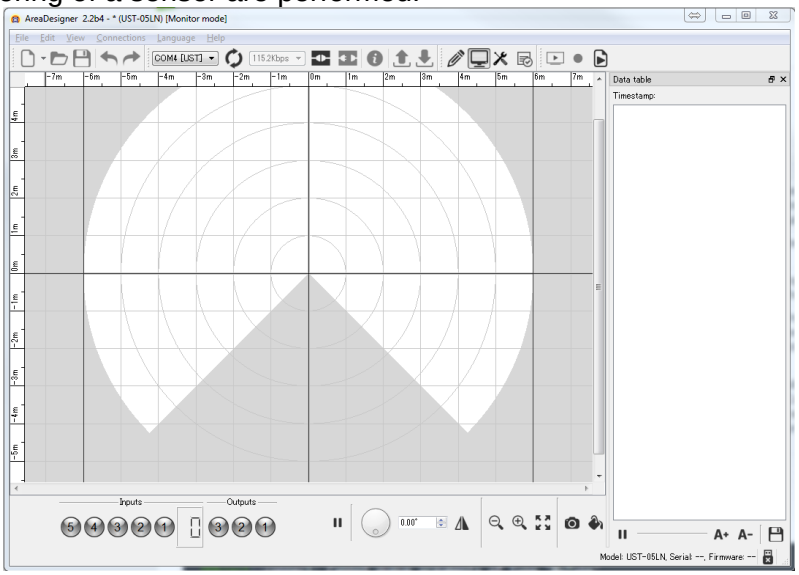


Figure 4.2.2-1 Monitor screen

IO information that is displayed in the monitor screen is configured as in illustrated in figure 4.2.2-2. The input values are binary numbers (0 indicates gray while 1 indicates green) and the area numbers are displayed as decimal values. Status display of the output lamp is explained in Table 4.2.2.

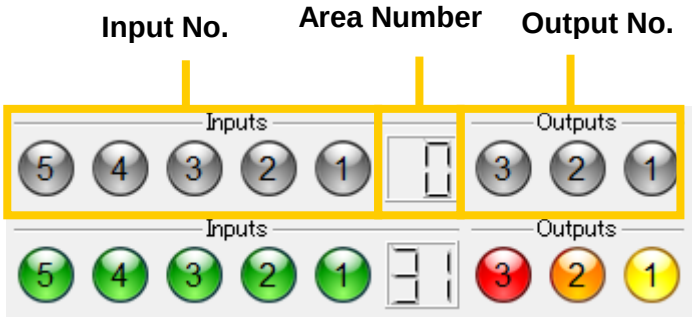


Figure 4.2.2-2 IO lamp display in monitor screen

(Top: Display when disconnected from the sensor, Bottom: Display when connected to the sensor)

Table 4.2.2 Status display of IO lamp

Lamp	Description
	Displays when disconnect from the sensor or IO in the OFF state. Numbers on the each lamp are IO values.
	Display when the input is in ON state. Numbers on the each lamp are IO values.
	Output 1 region lamp ON during object detection.
	Output 2 region lamp ON during object detection.
	Output 3 region lamp ON during object detection.

In application setting monitor mode, if inverse input status is selected. Inverse the logical input signal.

4.3 Data table

Click [View] → [Data table] of the menu, the window illustrated as in figure 4.3-1 will be displayed. Also, it is possible to display this same table by shortcut keys of “Ctrl + T”. This window is used for displaying the measured distance, confirms the information of the output data and saves the displayed numerical values into a CSV file. When the display of the measured data is started, a time stamp [units: us (micro seconds)] is displayed in the top of the data table. Also, the distance and intensity is displayed in the data table.

Explain the details of the display tools in table 4.3-1.

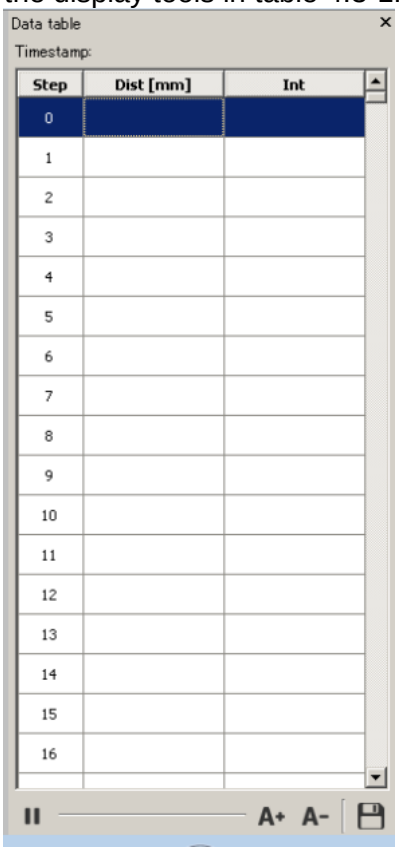


Figure 4.3-1 Data table

Table 4.3-1 Data table

Icon	Name	Description
⏸	Pause	Stops the update of the numerical value information. Refresh starts if clicked again.
▶	Start update	Starts the update of the numerical value information.
A+	Increase the character size	Increase the character size of the table.
A-	Decrease the character size	Decrease the character size of the table.
💾	Save	1 scan of the displayed measured data is saved as CSV file.

When the numerical value information of the output data is checked on the data table, there are cases when a row is displayed in red. This indicates measurement error has occurred during measurement of those steps.

When the row of data table is clicked, it is inverted and displayed in blue. At this time, a blue line will be displayed at the step position corresponding to the clicked row. A blue line will be displayed as illustrated in figure 4.3-2.

Also, when the main view is clicked, a blue line will be displayed on that area. During this, the row of the corresponding step on the data table will be inverted and displayed in blue.

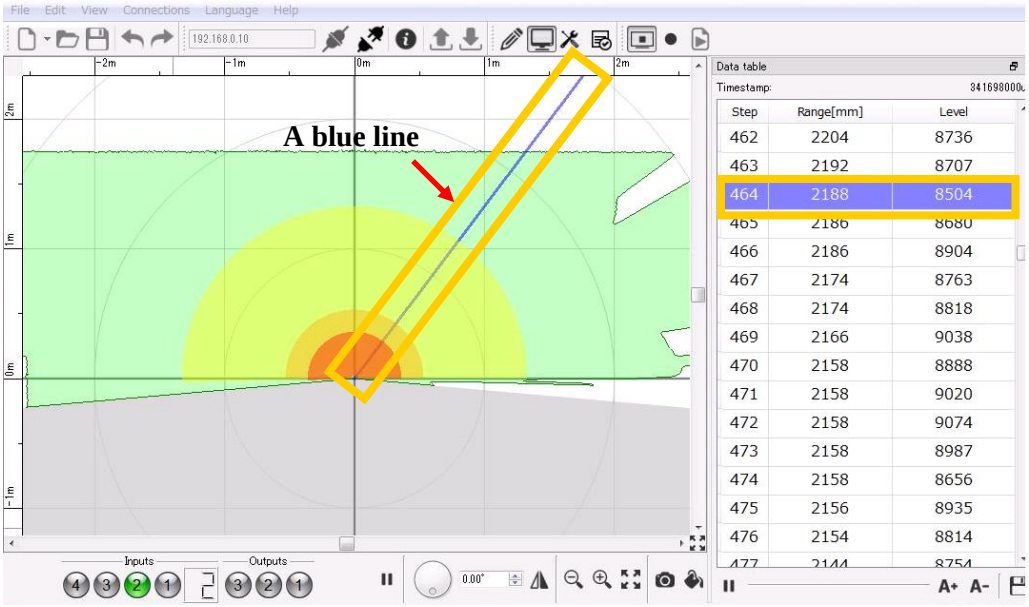


Figure 4.3-2 Display with blue line in the monitor screen

Quick/ Useful tips

□ If you click the lower right corner of main view, deletes the tool bar, I/O lamp and increase the area of main view. Click , returns to original state.

4.4 Application settings

The application settings are used for communications and setting the displays of the application. Click [Edit] of the menu bar → [Application settings], illustrated as in figure 4.4-1 will be displayed.

Figure 4.4-1 Application settings (General tab)

As shown in figure 4.4-1, beside the edit mode tab there is a general tab (refer to figure 4.4-2) and monitor mode tab (refer to figure 4.4-4) for the configuration.

There are two settings in general tab. The first setting is for synchronizing sensor's time during connection or not. Through this setting (only displays in SD card internally equipped type), automatically synchronize the internal clock of the sensor with the computer or not when sensor is connected. Other setting is for acquisition of log data. In default setting (refer to figure 4.4-1), prioritize recording (continuous mode) only will be ON. While comparing with handshake mode, skip of log data acquisition in this mode will be minimized. As acquired distance data only in distance only support mode; therefore minimize the skip of data acquisition.

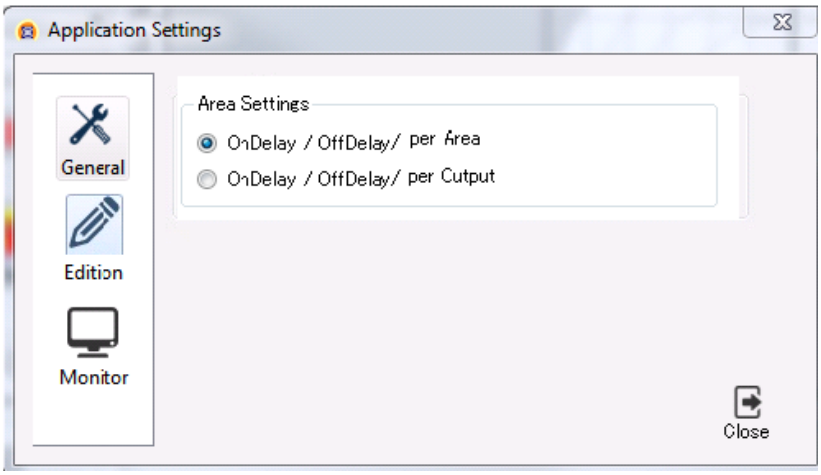


Figure 4.4-2 Edit tab

In edit mode, as shown in figure 4.4-3 can change the setting of region parameter (ON/OFF delay, hysteresis) in edit control panel.

There are some sensors which does not respond to hysteresis for each area and region.
In such case, it will not display hysteresis button. Please refer to user's manual.

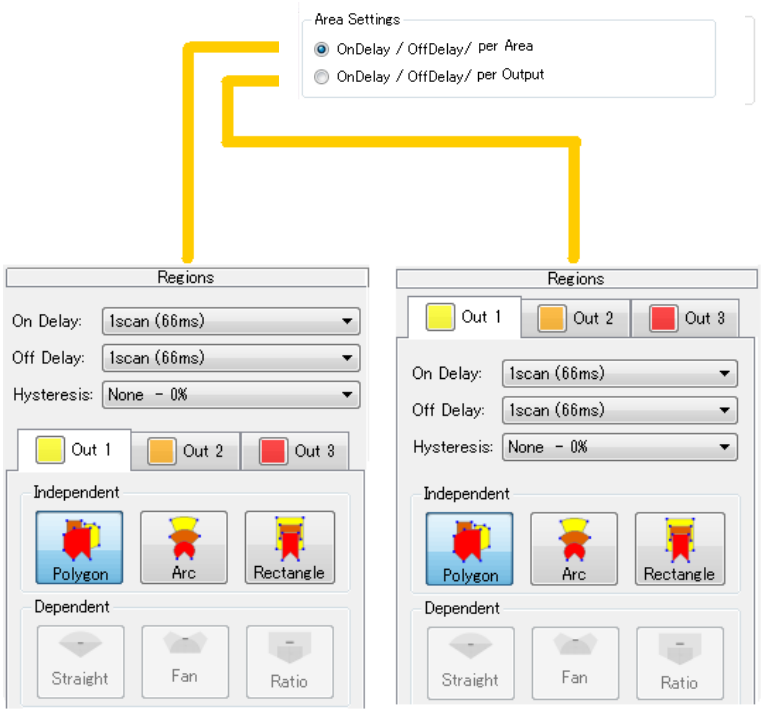


Figure 4.4-3 Changing configuration of the region parameters

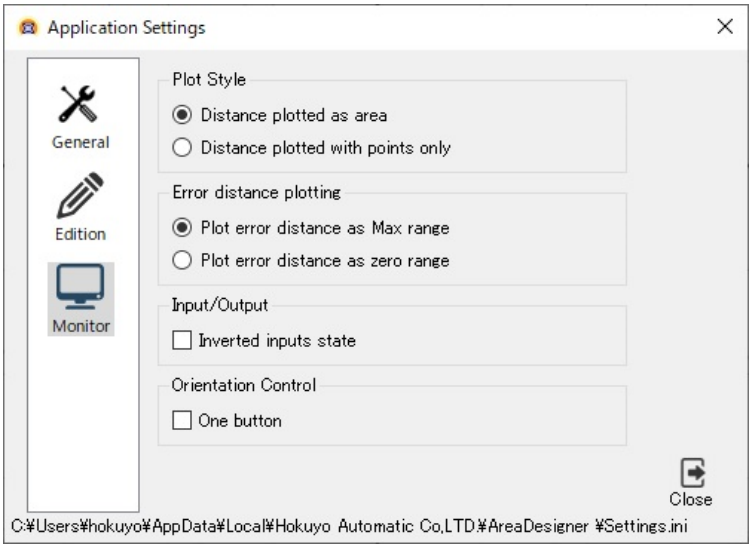


Figure 4.4-4 Monitor mode ⚠1

If you select one button, it is possible for orientation control and change into one button as shown in figure 4.4-5.

Figure 4.4-5 Orientation control one button ⚠1

In the monitor mode tab, as illustrated in figure 4.4-6, when displaying measurement data (distance and intensity) it is possible to change the displaying method of the measurement data.

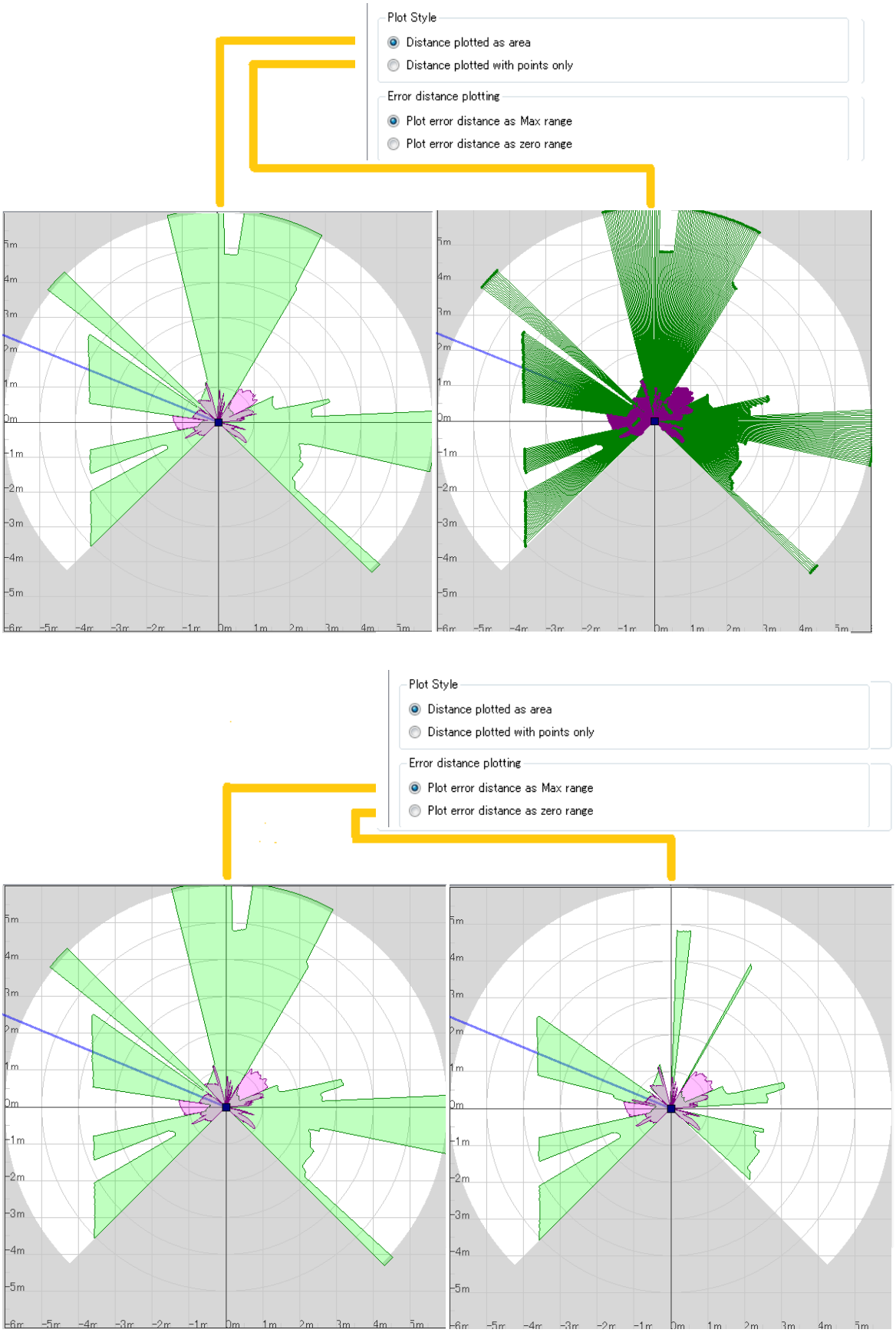


Figure 4.4-6 Changing the display of the output data (top), changing the display of the error data (bottom)

4.5 Sensor settings

This window is used to set parameters of the sensor. Click [View] in the menu bar → [Mode] → [/ Sensor settings] or the icon in the tool bar, and the window illustrated in figure 4.5 will be displayed. By using shortcut keys of “Ctrl + Alt + S” also the below window can be displayed. The details of the tools displayed will be explained in table 4.5. In table 4.5 [Read] and [Write] can only be used when there is connection with the sensor.

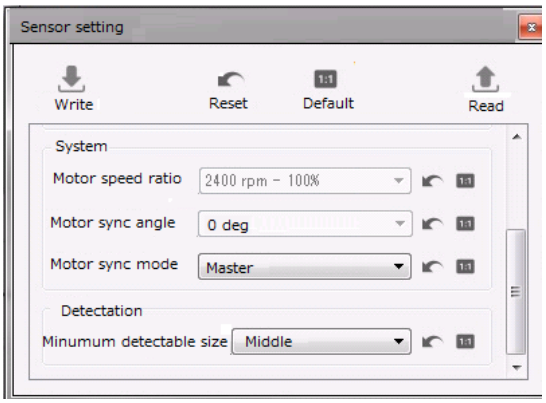


Figure 4.5 Sensor setting

Table 4.5 Display of sensor setting

Icon	Name	Description
	Write	Write the configured parameter in to sensor.
	Reset	Returns the parameter to before edit state
	Default	Returns the parameter to default setting
	Read	Read the parameter from sensor.

In the case of changing the internal parameter of the sensor, from the sensor setting the user need to change the value of parameter then click write to sensor. When you want to return default state of the parameter then click reset.

When you want to return the item independently, click right of the item.

And if you want to set all items to default, click default in the top of the window and in the case of item no. click on right of the item. In the case of reading the internal parameter, click read.

In sensor setting, parameter setting differs according to the sensor

For detail please refer to user’s manual. It is necessary to write setting in the sensor to display the setting.

Cautions

□ When the parameters have changed, the background display will be yellow and inverted because the parameter in the sensor settings is different from the internal settings of the sensor. By clicking read or write if the sensor settings and internal setting of the sensor are same, then it will return to its original color.

4.6 IO Simulation

This simulation is used to tests the IO information of the sensor. While sensor is connected, change into monitor screen, in the menu bar View → Mode→ [/ IO Simulation] and the icon in the toolbar switch will be active. Click the icon or the shortcut keys of “Ctrl + Alt + I” and the window illustrated in figure 4.6-1 will be displayed. The “ / Apply” icon is used to apply the configurations of the simulation to the sensor and starts test.

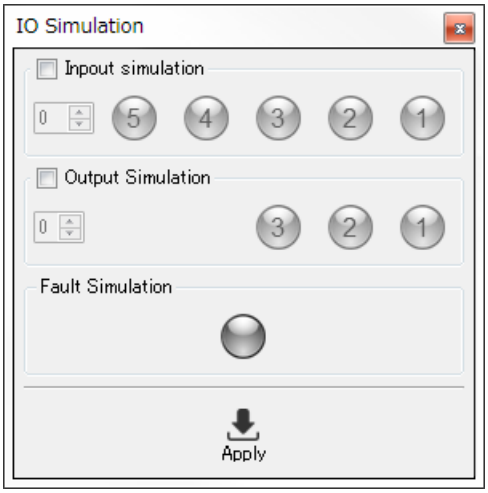


Figure 4.6-1 IO Simulation

[In case of input/output simulation test]

1. This shows when a check mark is placed in the input simulation checkbox or the output simulation for which to perform the test. When check mark is placed, as illustrated in figure 4.6-2, the numerical input checkbox and the buttons will be active.

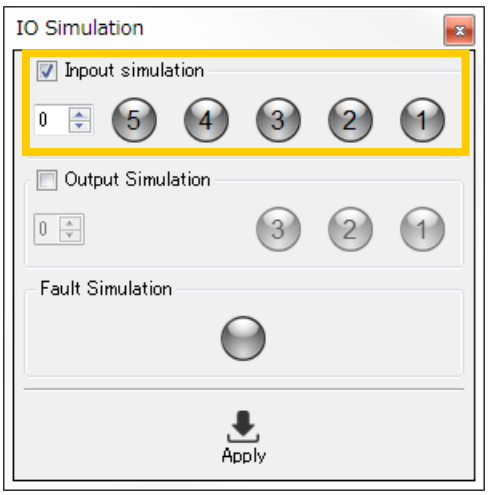


Figure 4.6-2 Display when the check box of input simulation is active

2. Specify the IO value by changing the numerical value on the left or click on the IO lamp on the right to configure the details of specific IO state. When the numerical value of the left is changed, the lamp on the right will automatically switch ON /OFF such that they are in the same IO state. Also, when the IO state of the lamps on the right are changed, the numerical values on the left will also change automatically.

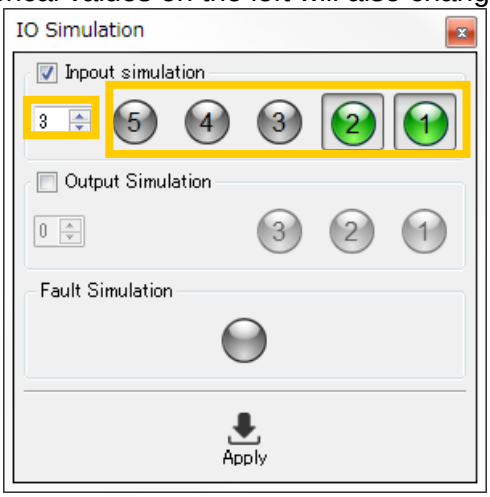


Figure 4.6-3 Input simulation numerical input and lamps

3. If Apply is clicked, and then IO test starts.

[In case of fault simulation test]

1. Click Fault simulation, confirm the lamp turns green.

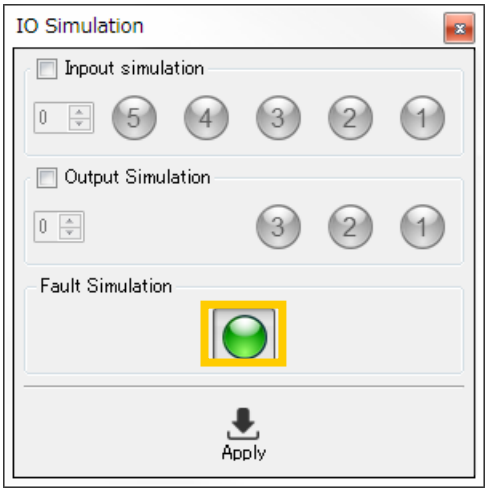


Figure 4.6-4 In the state of fault simulation lamp is led.

2. If Apply is clicked, and then starts test.

Caution

- □ After fault simulation test is done, the sensor will be in fault state temporarily. In order to return to the normal state from the test, restart the sensor and it is necessary to reconnect.
- □ When the input value is 0 and output value is 1, IO Simulation cannot be done. Figure 4.6-5 displays is in such condition because laser is off in Area 0. During laser off state, area configuration cannot be configured and detection determination is not possible either.

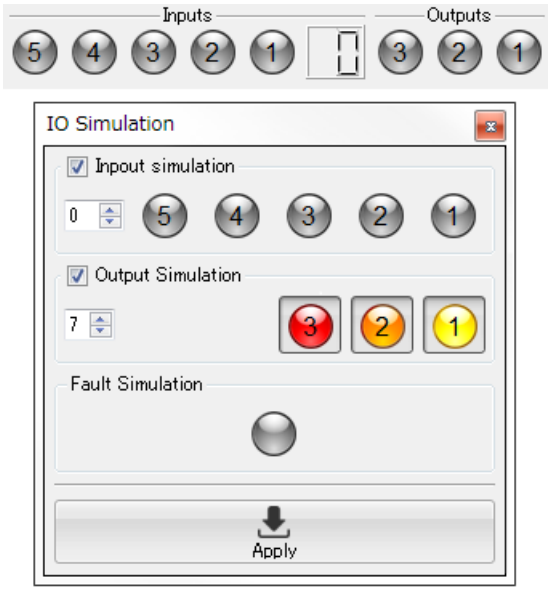


Figure 4.6-5 Display of IO lamps when IO Simulation with the input value is 0

4.7 Synchronize sensor time

This function is used to adjust the internal clock of the sensor. When connecting with SD card internally equipped sensor type, click connections in the menu bar → [/ Synchronization of the Sensor Time] will become active. During this state, click on Synchronization of the Sensor Time or press the shortcut keys of “Ctrl + Shift + T”, the window for synchronization of the sensor time illustrated in figure 4.7 will be displayed. In table 4.7.explain details of the icons displayed.

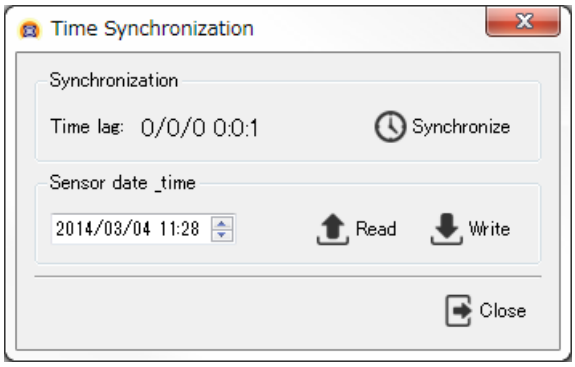


Figure 4.7 Synchronize sensor time

Table 4.7 Synchronize sensor time

Icon	Name	Description
	Synchronize	Synchronize the internal time of the sensor with the computer.
	Read from sensor	Read the internal time of the connected sensor. Display the sensor internal time and time lag.
	Write to sensor	Choose and write the time during the sensor is connected.

There are two methods for synchronizing the sensor’s time. Synchronized automatically and synchronized manually. In order to automatically synchronize the sensor clock, click on Synchronize. After synchronized is clicked, the time lag (year / month / day hour / minute / seconds) between the computer and the sensor to the left will be displayed. In order to manually synchronize the sensor clock, set the time of the input field (year / month / day hour / minute / seconds) below sensor date time and click write.

When connected with the sensor in order to automatically synchronize the sensor time click edit in the menu bar → Applications settings and In general tab check in Synchronize sensor time.

4.8 Sensor information

When the sensor is connected this internal information of the sensor will be displayed. Click connections in the menu bar → [/ sensor information] and the icon in the tool bar will be active. When you click on the icon or press to the shortcut keys of “Ctrl + Shift + I”, the window illustrated in figure 4.8 will be displayed.

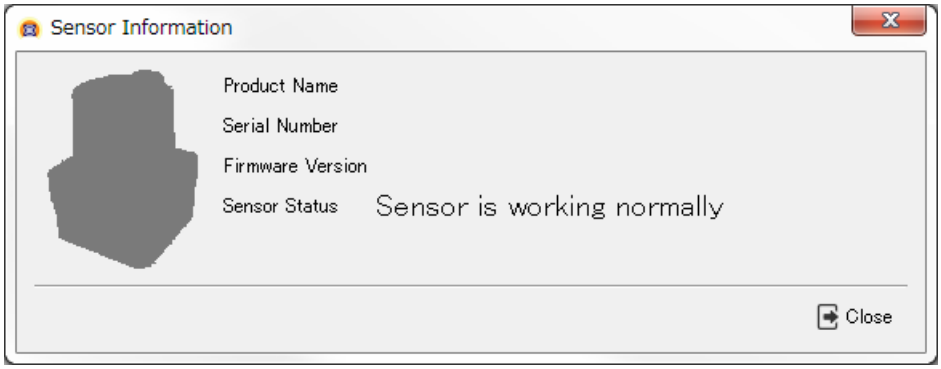


Figure 4.8 Sensor information

The details of the sensor information will be explained in table 4.8-1. In regard to the sensor status explained in table 4.8-1, the sensor status list is in table 4.8-2 while the SD card status list is in table 4.8-3. Sensors without SD card have no SD card status.

Table 4.8-1 Display of sensor information

Name	Description
Sensor model	The product name of sensor model will be displayed.
Serial number	Serial number of the sensor will be displayed.
Firmware version	Firmware version of the sensor will be displayed.
Sensor status	Sensor status will be displayed.
SD card status	SD card status will be displayed.

Table 4.8-2 Sensor status

Status	Description
Sensor is working normally	The sensor is in normal operation.
Sensor is booting	The sensor is in process. Please wait for a while.
Waiting for motor	Wait until the internal motor of the sensor becomes stable.
Sensor is in simulation mode	IO simulation operation is in progress.
Sensor error condition by fault simulation	Displays error state due to fault simulation. After restarting the sensor, it can return to normal operation.
Timeout waiting for master device for motor synchronization	Could not find master sensor. Check synchronize wiring or motor synchronize mode of sensor setting to see if it is suitable or not.
CPU firmware is incorrect	Failure of sensor firmware update. Update the firmware again.
System is being reset	Sensor is restarting. Please wait for a while
FLASH erase/write operation failed	Error is detected while updating firmware. In the event the status is displayed after the sensor is restarted, contact to our nearest distributor.
FPGA is not responding	FPGA of the sensor might have been damaged. In the event the status is displayed after sensor is restarted, contact to our nearest distributor.
Laser is not responding	Laser of the sensor might have been damaged. In the event the status is displayed after sensor is restarted, contact to our nearest distributor.
Motor is not responding or speed is not stable	The inner motor of sensor is in unstable state. In the event the status is displayed after the sensor is restarted, contact to our nearest distributor.
Unhandled CPU exception error	Error is detected in the CPU of the sensor. In the event the status is displayed after sensor is restarted, contact to our nearest distributor.
FLASH memory damaged critical error	ROM of the sensor might have been damaged. In the event the status is displayed after sensor is restarted, contact to our nearest distributor.
Other status	If other status is displayed in addition to the above listed status, contact to our nearest distributor.

Table 4.8-3 SD card status

Status	Description
SD-card is valid and operating normally	SD card is operating normally.
SD-card not detected or not present	Could not find SD card inside the sensor.
SD-card is valid but writing suspended in current sensor state	Writing process has been stopped. Switch application to monitor screen
SD-card read timeout error	Read from sensor is failed. In the event the status is displayed after the sensor is restarted, contact to our nearest distributor.
SD-card write timeout error	Write to sensor is failed. In the event the status is displayed after the sensor is restarted, contact to our nearest distributor.
Other status	If other status is displayed than above listed status, contact to our nearest distributor.

4.9 SD card log

This window is used for log extraction of the SD card equipped inside the sensor. Sensor without SD card does not have this function. While sensor is connected, click [Connect] in the menu bar→ [/ SD card log] icon will become active. Click this icon and the window as illustrated in figure 4.9 will be displayed. The details of this toolbar will be explained in Table 4.9.

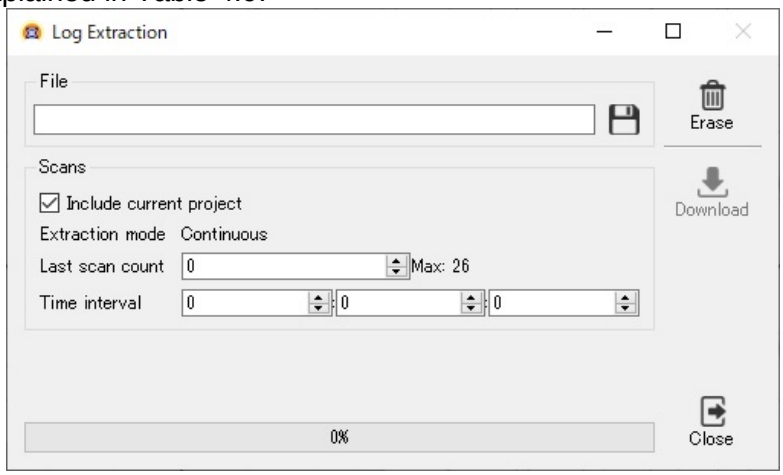


Figure 4.9 SD card log

Table 4.9 SD card log

Icon	Name	Description
	Specify the location	Specify the location of SD card log data. File extension is *.ubh
	Erase	Delete all the log data of SD card.
	Download	Saves the log data of SD card in the specified location.

During monitoring of the sensor, log data will be recorded in SD card. While sensor is connected, switching to edit mode will stop recording log data of SD card. When switching to monitor mode, recording log data will resume. Click log output location is specified, and a file dialog will be displayed. Specify the location where you want to save the log data. Next, decide the number of scan or recording time of the log to save.

Lastly, if you click the icon, the log data will be saved in the specified file. If you check the “include current project” check box, saves the area data also.

Caution

□ In you want to confirm the detection judgment of the area when playing log data, it is necessary to open the original project file used while recording the log data. Please make sure to save the project file.

Quick/Useful tips

□ In the event when the scan limit and time interval is 0, and click the icon. All the log data saved in the SD card can be saved in the specified location.

4.10 Log data

This window is used to save the scanned data of the sensor. File extension is *.ubh. When sensor is connected, the ● icon in the toolbar will be active. Click the icon or press the shortcut keys of “Ctrl + 1”, and the window illustrated in figure 4.10 will be displayed. The details of this window will be explained in table 4.10-1.

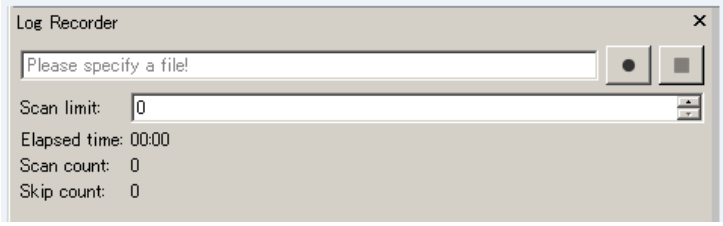


Figure 4.10 Data logging

Table 4.10-1 Display of data logging

Icon	Name	Description
●	Starts recording	Specify the location to record the scanned data and starts recording.
■	Stops recording	Stops recording the log data.

When specifying the number of scans, enter the number of scans you want to record in the scan limit box and click the ● icon start recording to log file. After clicking the ● icon start recording to log file, then select the location. After location is selected, starts recording. If the scan limit is 0, it records until icon ■ is clicked to stop. Explain the content of the log data window in table 4.10-2.

Table 4.10-2 Content

Content	**Description**
Elapsed time	Total played time of log data
Scan count	Scan count of log data
Skip count	Scan count of log data which cannot be saved.

Caution

□ Depending on the computer load and connection quality, measurement data reception speed can get affected. Therefore, real-time log recording is not guaranteed.

Quick /Useful tips

□ When file name is specified during log recording, you can select the file extension. In the case when playing log data in Area Designer, select log file in *.ubh format. When CSV file is *csv format is selected, displays the coordinate data. Also, if scan count is specified when recording, it is possible to display MS Excel in *xls format.

4.11 Playing log data

This window is used for playing log data. (file extension: *.ubh). While sensor is disconnected, or when the measured distance display is stopped while connected to the sensor, play the log data and the icon in the tool bar will be active. Click play using the log data icon or use the shortcut keys of “Ctrl + 2”, and the window illustrated in figure 4.11-1 will be displayed.

The details of the cursor that is displayed within the “progress” of this window will be explained in figure 4.11-2. Also, the details of tool bar will be explained in table 4.11.

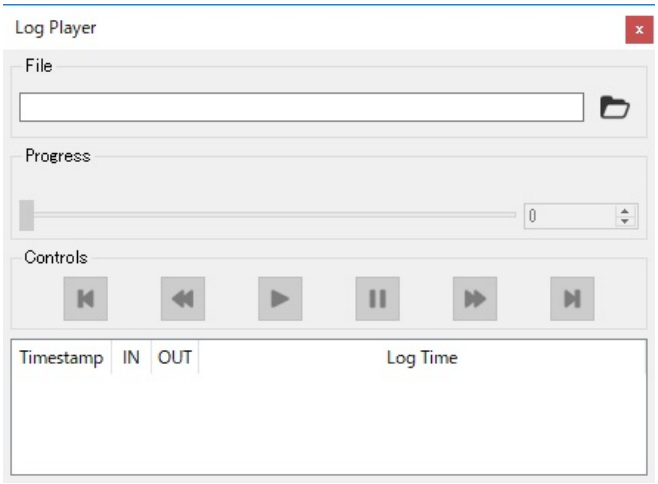


Figure 4.11-1 Log player 1

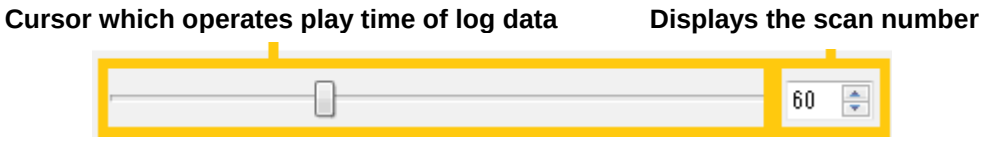


Figure 4.11-2 Cursor which operates play time of the Log data

Table 4.11 Log player 1

Icon	Name	Description
	Open	Open and select the log data which you want to play. (File extension: *.ubh).File path will be displayed on the left when the file is selected.
	First	Moves to the initial position of log data.
	Replay	Moves up to the position where previous output changes.
	Play	Starts playing the log data.
	Pause	Pause/ Stops the log data for a while.
	Fast	Moves up to the position where output changes.
	Last	Moves to the end of log data.

When you start to play log, displays waveform in the main screen as well details of log data as shown figure 4.11-3.

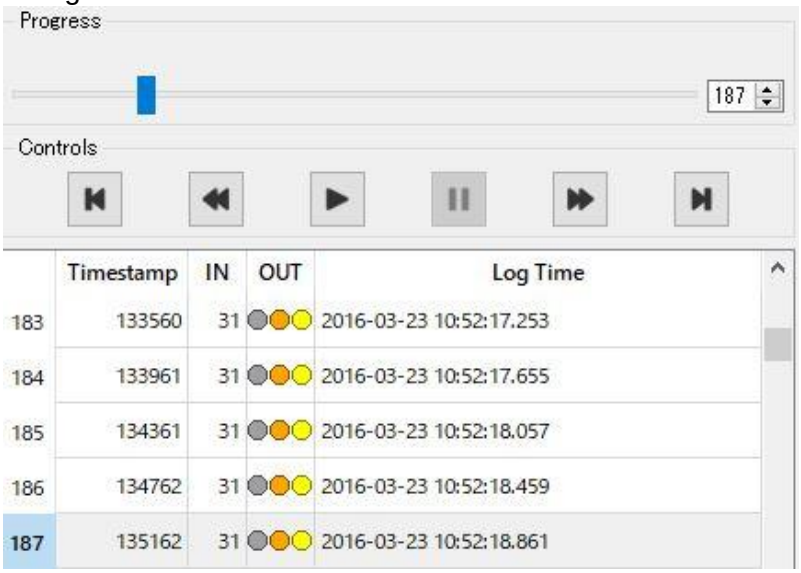


Figure 4.11-3 Displays the details of log data ⚠1

Caution

□ It is not possible to play log data and measurement display at the same time.

□ In case you want to confirm the detection judgment of the area when playing log data, it is necessary to open the original project file used while recording the log data. Make sure to open the saved project file.

4.12 About the application

This is used to confirm release information of the application. Click Help in the menu bar → [/ About this application] or press the shortcut keys of “Ctrl + A”, as illustrated in figure 4.12 will be displayed.

Version indicates time and date when the application was released. Update details in each version of the application are listed in the update history.

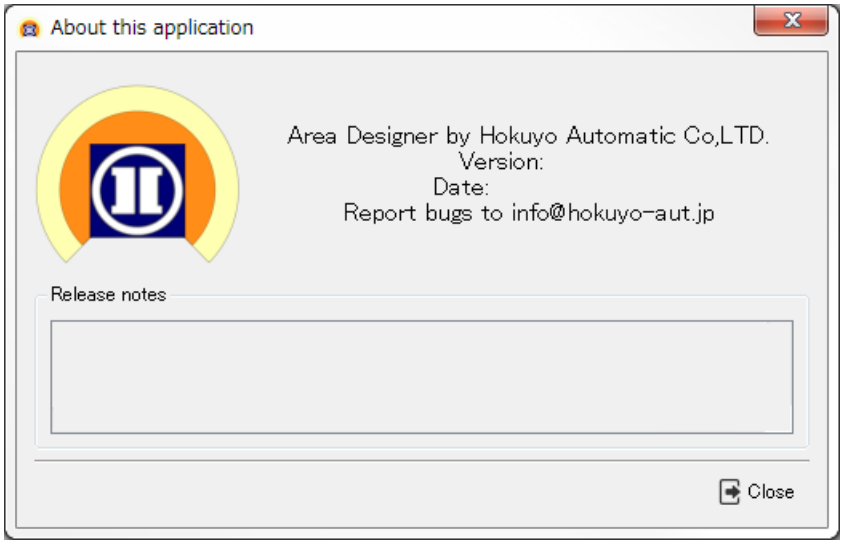


Figure 4.12 About this application

5. Function of main screen window

5.1. Menu bar

The menu of this application is as displayed in figure 5.1. The details of each item of the menu are explained in the following chapters.

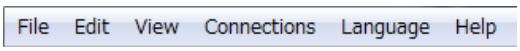


Figure 5.1 Menu bar

5.1.1 File

This menu is used for operating of project files and closing the application. This menu is displayed in figure 5.1.1. Also, the details of this menu are explained in table 5.1.1-1.

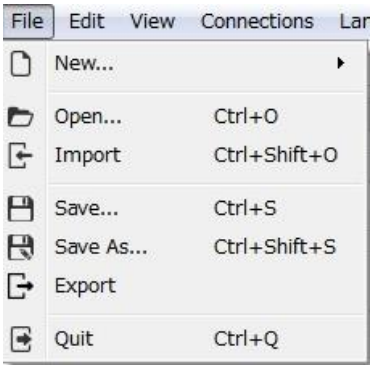


Figure 5.1.1 File

Table 5.1.1-1 File △1

Icon	Name	Shortcut	Description
	New		Create a new project file.
	Open	Ctrl+O	Open an existing file.
	Import	Ctrl+Shift+O	Opens project files created in UBG, PBS or XML.
	Save	Ctrl+S	Saves the project file. When the file exists, it overwrites the file.
	Save As	Ctrl+Shift+S	Save the project file after selecting name.
	Export		Displays the setting in PDF or XML file.
	Quit	Ctrl+Q	Close the application.

Import can open the project file and XML file of extension as shown in table 5.1.1-2. Specify the extension of file type selection and select the file. The information of area settings each area or each output will not be shown. Make sure to confirm the area and settings. (Such as on delay, off delay, hysteresis etc) △1

Table 5.1.1-2 File extension types of project file 1

Extension	Description
.ara	UBG,PBS project files
.arax .arx	Project files of Area Designer

5.1.2 Edit

This menu is used for editing the area and application settings in edit mode. The edit menu is displayed as in figure 5.1.2. Also, the details of edit menu are explained in table 5.1.2.

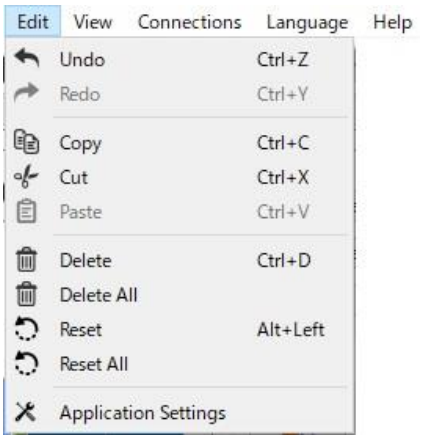


Figure 5.1.2 Edit 1

Table 5.1.2 Edit 1

Icon	Name	Shortcut	Description
	Redo	Ctrl+Z	It will undo the previous operation.
	Undo	Ctrl+Y	It will redo the last operation that was undone.
	Copy	Ctrl+C	Copy the under configuration area.
	Cut	Ctrl+X	Cut the selected area. Delete the original area.
	Paste	Ctrl+V	Paste the selected area in other area
	Delete	Ctrl+D	Deletes the selected area.
	Delete All		Deletes all the area.
	Reset	Alt+Left	The under configuration area will return to original state before editing.
	Reset All		All area will return to original state before editing.
	Application settings		Displays the application settings.

5.1.3 View

This menu is used to switch modes to edit or monitor and to display log data. This menu list is displayed in figure 5.1.3-1. Also, the details of this menu list will be explained in table 5.1.3-1.

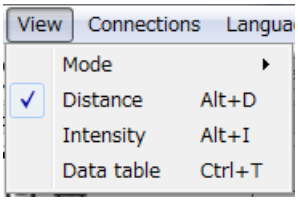


Figure 5.1.3-1 View

Table 5.1.3-1 View

Name	Shortcut	Function
Mode		Change/Switch the mode.
Distance	Alt+D	Displays distance data as the measurement output data.
Intensity	Alt+I	Displays intensity data as the measurement output data.
Data table	Ctrl+T	Displays data table.

In figure 5.1.3-1 displays the mode selection menu. In figure 5.1.3-2, it displays operation menu after the mode selection. Also, the details of this menu list are explained in table 5.1.3-2.

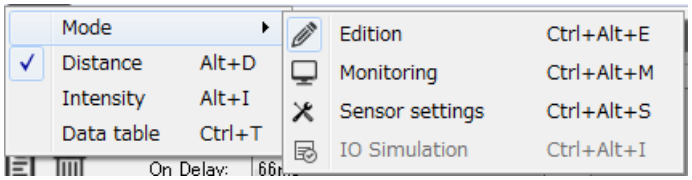


Figure 5.1.3-2 Mode selection

Table 5.1.3-2 Mode selection

Icon	Name	Shortcut	Description
	Edit	Ctrl+Alt+E	Changes to edit mode.
	Monitor	Ctrl+Alt+M	Changes to monitor mode.
	Sensor settings	Ctrl+Alt+S	Opens sensor setting.
	IO Simulation	Ctrl+Alt+I	Displays IO Simulation.

5.1.4 Connections

This menu establishes communication with the connected sensor. The menu is displayed in figure 5.1.4-1. Also, the details of this menu are explained in table 5.1.4-1.

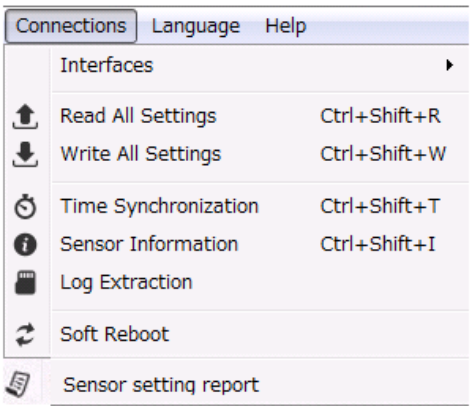


Figure 5.1.4-1 Connections

Table 5.1.4-1Connections

Icon	Name	Shortcut	Description
	Interfaces		Change connection interfaces.
	Read all settings	Ctrl+Shift+R	Read all setting from sensor.
	Write all settings	Ctrl+Shift+W	Write all setting to sensor.
	Time synchronization	Ctrl+Shift+T	Time synchronization of the sensor.
	Sensor information	Ctrl+Shift+I	Displays sensor information.
	SD card log		Displays SD card log window.
	Soft reboot		Sensor restarts.
	Sensor setting report		Displays the sensor setting in PDF file.

The Interface explained in figure 5.1.4-1 is displayed in figure 5.1.4-2. Also, the details of this menu will be explained in table 5.1.4-2.

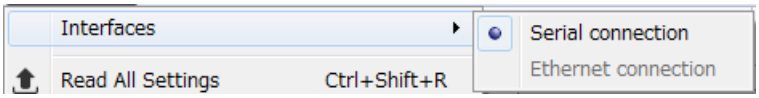


Figure 5.1.4-2 Interfaces

Table 5.1.4-2 Interfaces

Name	Description
Serial connection	Connect to serial connection.
Ethernet connection	Connect to Ethernet connection.

5.1.5 Language

This menu used to change the displayed language of the application to English or Japanese. This menu list is displayed in figure 5.1.5. Also, the details of this menu are explained in table 5.1.5.

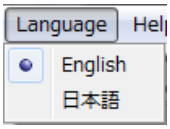


Figure 5.1.5 Language

Table 5.1.5 Language

Name	Description
English	Display in English language
日本語	Display in Japanese language

5.1.6 Help

This menu displays the instruction manual and application information. The Help menu is as shown in figure 5.1.6.In table 5.1.6 explain about this menu.

Figure 5.1.6 Help

Table 5.1.6 Help

Icon	Name	Shortcut	Description
	Manual	Ctrl+M	Displays the application manual.
	About Area Designer	Ctrl+A	Displays about this application.

Quick/ Useful tips

□ When 日本語 or English selected from language menu, displays the manual in Japanese or English respectively.

5.2. Toolbar

In figure 5.2, it displays the toolbar of the application. This toolbar consists of four toolbars sections and the details of each of the toolbars are explained in table 5.2. The details of each individual toolbar section are explained in the following chapters.

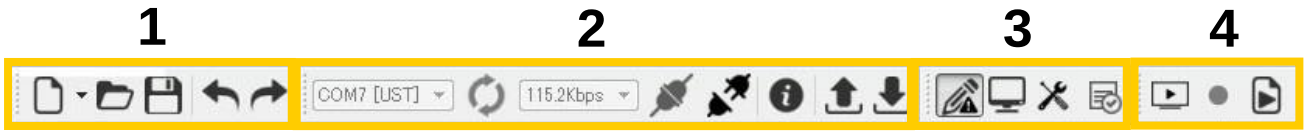


Figure 5.2 Toolbar

Table 5.2 Toolbar

No.	Name of tool bar	Description
1	Basic tool	For the operation of project file and Redo/Undo operation.
2	Connection tool	Establish communication with the connected sensor.
3	Mode selection tool	Display mode selection and setting of each mode.
4	Measurement tool	Measurement display, record and play of log data.

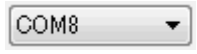
5.2.1 Basic tool

Table 5.2.1 Basic tool

Icon	Name	Shortcut	Description
	New		Create new a project file.
	Open	Ctrl+O	Opens the existing project file.
	Save	Ctrl+S	Saves the edited project file. When a file is already specified, overwrite data and saves.
	Undo	Ctrl+Z	It will undo the previous operation.
	Redo	Ctrl+Y	It will redo the last operation that was done.

5.2.2 Connection tool

Table 5.2.2 Connection tool

Icon	Name	Shortcut	Description
	Serial COM Port		Display the COM port which has been connected.
	Rescan		Rescan the serial COM port and redisplay the connected COM port number.
	Select baud rate		Display the serial baud rate configuration.
	Connect device	Ctrl+Shift+C	Connects to COM port and communication takes place.
	Disconnect device	Ctrl+Shift+D	Disconnect the communication.
	Sensor information	Ctrl+Shift+I	Displays sensor's information.
	Read from sensor	Ctrl+Shift+R	Read the setting from the sensor.
	Write to sensor	Ctrl+Shift+W	Write settings to the sensor.

5.2.3 Mode selection tool

Table 5.2.3 Mode selection tool

Icon	Name	Shortcut	Description
	Edit	Ctrl+Alt+E	Change/Switch to edit mode.
	Monitor	Ctrl+Alt+M	Change/Switch to monitor mode.
	Sensor settings	Ctrl+Alt+S	Displays the sensor's setting.
	IO Simulation	Ctrl+Alt+I	Displays IO Simulation.

5.2.4 Measurement display tool

Table 5.2.4 Measurement display tool

Icon	Name	Shortcut	Description
	Play	Ctrl+0	Displays the measurement data.
	Hide	Ctrl+0	Hide the measurement data.
	Record	Ctrl+1	Record log data.
	Replay	Ctrl+2	Play log data.

Caution

□ In the event you want to confirm the detection judgment order of the area when playing a log, it is necessary to open the original project file used while recording the log data. Make sure to save the project file.

5.3. Main view toolbar

This toolbar is displayed in the bottom right of the main window. This toolbar is used for main view operations. The toolbar is as illustrated in figure 5.3-1. The details displayed in this toolbar are explained in table 5.3.

Figure 5.3-1 Main view toolbar

Table 5.3 Display of Main view toolbar 1

Icon	Name	Description
	Pause	Stops the update of the distance and level plot. Refresh starts if clicked again.
	Start update	Starts the update of the distance and level plot.
	Rotate	Rotates the main view.
0.00°	Angle of rotation	Displays the rotation angle of main view. Main view can be also rotated to desired angle through numeric input
	Flip Horizontally	Flip horizontally the current region.
	Zoom out	Zoom out the main view screen. Same operation can be done by scrolling mouse down.
	Zoom in	Zoom In the main view screen. Same operation can be done by scrolling mouse up.
	Zoom fit	Adjust the zoom so that the entire main view can be seen.
	Screen capture	Capture the main view, saves in PNG file.
	Canvas Settings	Shows the canvas settings windows
	Orientation control	The main screen can be rotate / inverse with one button.*For details, refer to 4.4 Application Settings.

The color of the measurement plot is configurable using the Canvas setting panel. The panel shows up when pushing on the button on the lower right corner of the screen. The setting panel is shown in figure 5.3-2. The color option is split in 2 categories: Color settings for the range and for the level plot. The line color corresponds to the outer line of the plot. The fill color corresponds to the fill of the plot. The area transparency can be set in the range of 0 to 100%, and the main screen area transparency can be set. 1

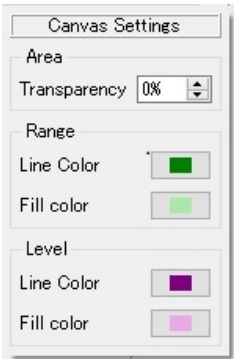


Figure 5.3-2 Canvas settings panel 1

5.4. Status bar

The status bar is displayed at the bottom of the main window. This status bar displays the sensor information and status display. The status bar is as illustrated in figure 5.4-1. Details displayed in this status bar and sensor information is explained in table 5.4-1. Communication status and recording status of display tools are explained in table 5.4-2

Figure 5.4-1 Status bar

Table 5.4-1 Sensor information

Display	Description
Model	Model of the sensor will be displayed.
Serial	Serial number of the sensor is displayed.
Firmware	Firmware version of the sensor is displayed.

Table 5.4-2 Status display

Icon	Name	Description
	Sensor connected	Application displayed is connected with the sensor.
	Sensor disconnected	Application displayed is disconnected with the sensor.
	Protection state	When disconnected from the sensor or when switching to the monitoring screen while connected with the sensor.
	Non protection state	When connected to the sensor, switch to the editing screen
	Error state	Displays during fault simulations as it is not possible for data logging output.
	SD card normal	SD card is operating normally.
	No SD card	No SD card, or under optimization.
	SD card error	SD card might have been damaged. After restarting the sensor if it displays the icon again then contact us.
	Data logging	Displays during data logging.
	During communication	Displays during communication processing.

6. Revision history

Amended No.	Symbol	Revision date	Details
---		Dec 2016	First release
RS-01342	1 × 24	Aug 2019	4. Main window screen 4.1 Project file extension .arx added 4.2.1 Edit control detach function added 4.4 Orientation control function One button added 4.9 Area data storage function added 4.11 Replay function added 5. Function of main screen window 5.1.1 Supports XML file import / export function for project settings, Project file extension .arx added 5.3 Area transparency added Appendix B XML file format added

Appendix A Network address

UXM starts communication when Area Designer is connected with Ethernet. The default setting of sensor's IP address is 192.168.0.10. No need for special instruction as port number is fixed. Also, IP address can be changed by using other address changing tool.

Appendix B XML File

This section explains the XML file output by export. XML stands for Extensible Markup Language and managed by World Wide Web Consortium (W3C). Compatible version is XML1.0 or above. The table below described the tags used for the XML file format. ⚠1

XML file format tag and types ⚠1

Level	Tab	Type	Details
1	AreaDesigner	R	XML file root tag
2	Information	G	Basic information group
3	Info	G*	Basic information entry *The basic information is necessary for the project; therefore do not change the value.
4	Key	E	Basic information name Sensor model App_version: Application version App_revision: Application revision Settings_per_area: Set ON/OFF delay for each area (true) / Set ON/OFF delay for each output (false) Supports detached: Enable detached area setting (true) /disable (false)
4	Value	E	Basic information value
2	Settings	G	Sensor setting group tab
3	Setting	G*	Sensor setting entry *Sensor settings may vary depending on the sensor. For details on sensor settings, refer to the related sensor user manual.
4	Key	E	Sensor setting invert outputs (Output logic) scan_skip_count laser_pulse_skip_on motor_rotation_period_ms motor_speed_percent synchronization_angle synchronization_mode minimum_detect_size
4	Value	E	Sensor setting value
2	Areas	G	Area group tab
3	Area	G	Area entry Attribute: Id (area number)

			Example: If Id is set to 1, it will be shown in the area with are number 1. Specify the ID value 1 to reflect in the area no.1
4	Region	G*	Region entry Attribute: Id (region number) Example: If Id is set to 0, it will be shown in the region with region number 1. Specify the ID value 0 to reflect in the region no.1
5	Type	G*	Region tab Possible settings : - Polygon : 3 - Arc: 2 - Rectangle: 1 - Fan: 18 - Straight: 17 - Ratio: 19
5	OnDelay	E	Regions On Delay Combo box index value
5	OffDelay	E	Regions Off Delay Combo box index value
5	Hysteresis	E	Regions Hysteresis Possible settings : - 0%: 0 - 3.125%: 64 - 6.25%: 128
5	Shift	G	Region center point *Can use only in compatible sensors.
6	X	E	X coordinate center point.(mm)
6	Y	E	Y coordinate center point.(mm)
5	Points	G	Region upper point group tag
6	Point	G*	Region upper point entry
7	X	E	X coordinate upper point.(mm)
7	Y	E	Y coordinate upper point.(mm)
5	Sections	G	Group tag for region section position *Can use only in compatible sensors.
6	Point	G*	Region section position entry
7	X	E	X coordinate section position. (mm)
7	Y	E	Y coordinate section position. (mm)

Classification：

Level：Hierarchy level of the Tag

Type：Tag type

R ：Root tag

G ：Tag when the group is only one

G*：Tag when there are multiple groups

E：Element tag

Appendix C Troubleshooting

While using this application if a problem occurs, refer to the following table.

In case a problem cannot be resolved with any of the following methods listed, please note the situation and issues as well as when the problem occurred and contact our nearest distributor or sales representative.

Situation	Issue	Possible reason	Solution suggestion
When installing the application	Cannot install the application	Non-supported OS is used	Install in the OS supported computer.
		Free space of Hard disk is not sufficient	Free space of Hard disk must be more than 150MB.
		All windows program have not been closed	Close all the windows programs except installer.
	Installation process seems as stopped.	Installation process continuous	Please wait for a while. Depending on the computer, the installation process may require some time.
		A message dialogue is displayed behind the displayed screen	Any hidden messages will be displayed by pressing the “Alt key” + the “Tab key”, operate according to the message.
When Sensor and PC connected	Could not find the sensor	Power supply is OFF	Make sure the power supply is ON.