

Human Machine Interface (HMI) GOT

GT Works3 (GT Designer3) Basics (Elementary Screen Design (GOT))

This online training system (e-learning) is intended for those who operate the GOT2000 series (GT27) and the screen design software GT Designer3 for the first time.

In this course, we will learn how to create a project and configure the GOT's basic function settings using the screen design software GT Designer3.

This course requires the basic knowledge of Human Machine Interface (HMI) Graphic Operation Terminal (GOT) and GT Works3. Complete the following courses in advance.

- FA Equipment for Beginners (HMIs)
- GOT2000 Basics (GOT Introduction)
- GT Works3 (GT Designer3) Basics (Screen Design Introduction)

This course also requires the basic knowledge of MELSEC iQ-R programmable controllers (PLCs). It is recommended to complete the following courses in advance.

- FA Equipment for Beginners (PLCs)
- PLC MELSEC iQ-R Series Basics
- PLC Programming Basic (Ladder)

The contents of this course are as follows.
We recommend that you start from Chapter 1.

Chapter 1 Learning Equipment Preparation

We will prepare equipment and software used for learning.

Chapter 2 Creating Objects and Figures

We will learn how to create and place objects.

Chapter 3 Checking the Display of the Created Objects and Figures

We will check the display of the created objects and figures on the personal computer.



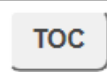

Chapter 4 Checking the Operation of the Created Objects

We will check the operation of the created data with the PLC and the GOT.

Final Test

Passing grade: 60% or higher.

Following is an explanation of how to use the graphical user interface.

Go to the next page		Go to the next page.
Back to the previous page		Back to the previous page.
Move to the desired page		"Table of Contents" will be displayed, enabling you to navigate to the desired page.
Exit the learning		Exit the learning. Window such as "Contents" screen and the learning will be closed.

Safety precautions

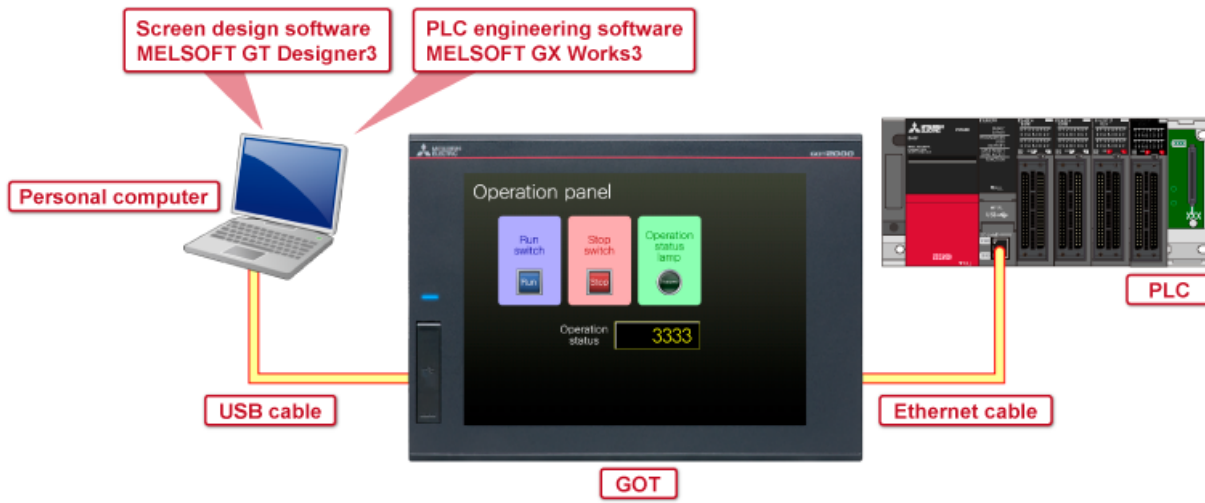
When you learn based on using actual products, please carefully read the safety precautions in the corresponding manuals.








In this chapter, we will prepare equipment and software used for learning.

- 1.1 Configuration of the learning equipment
- 1.2 Learning equipment list
- 1.3 Functions used for learning

In this course, we will learn the procedure from creating project data for the GOT using the GOT2000 series (GT27) and the screen design software GT Designer3 to monitoring/operation check with the GOT.

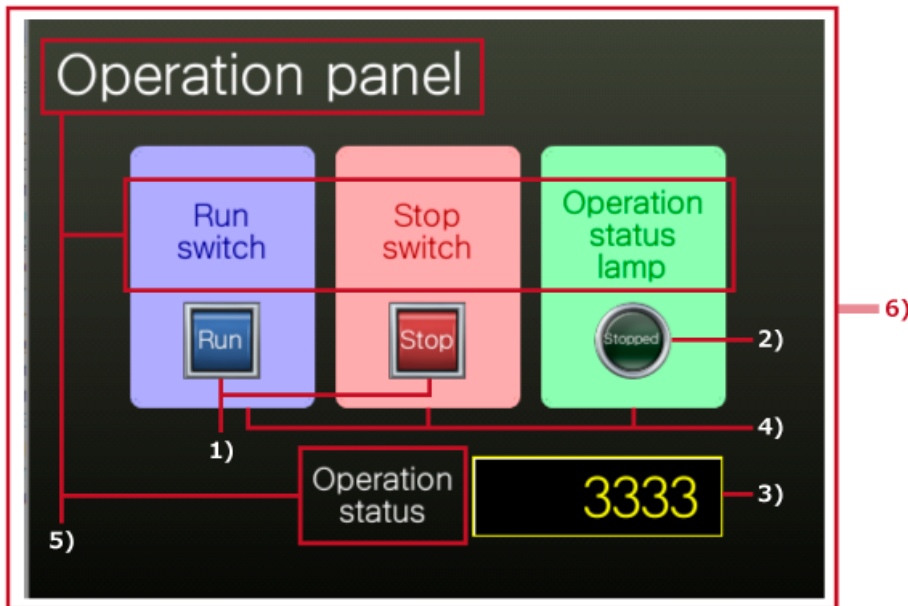
The following diagram shows the configuration of the learning equipment.



Photo/illustration	Name	Application/setting
	Personal computer	Used to create GOT project data and transfer the data to the GOT. Also used to create a sequence program to check the operation of the created GOT project data, and write the program to the PLC.
	GOT Screen Design Software MELSOFT GT Works3	Includes GT Designer3 (software for creating project data), GT Simulator3 (software for simulating the GOT operation). Install GT Designer3 on the personal computer. (Model: SW1DND-GTWK3-E)
	PLC engineering software MELSOFT GX Works3	Engineering tool for setting, programming, debugging, and maintenance for PLCs including MELSEC iQ-R, MELSEC iQ-F series. Install the software on the personal computer.
	GOT	Used to display the created project data on the screen and monitor/operate the PLC. (Model: GT2710-VTBD)
	USB cable	Used to connect the GOT and the personal computer. (Model: GT09-C30USB-5P)
	PLC	Used to run the sequence program. (Model: R04CPU)
	Ethernet cable	Used to connect the GOT and the PLC. * Use a commercially available Ethernet cable that meets the 100BASE-TX standard. (It is recommended to use a Category 5 or higher shielded cable.)

In this course, we will create the following screen.

	Name	Object/figure	Description
1)	Run Switch Stop switch	Switch	Touch to turn on or off the bit device.
2)	Operation status lamp	Lamp	Turns on or off according to the on or off state of the bit device.
3)	Operation status display	Numerical display	Displays the data stored in the PLC CPU device.
4)	Figure (rectangle)	Figure (rectangle)	Place some to highlight the switches and the lamp.
5)	Figure (text)	Figure (text)	Displays the title/text that explains the object such as the screen, switch, or lamp.
6)	–	Base screen	A screen on which objects and figures 1) to 5) are placed.



In this chapter, we will learn how to create and place objects.

(To create an object, you need to create a new project. For how to create and save a project, refer to "GT Works3 (GT Designer3) Basics (Screen Design Introduction)".)

2.1 Creating a bit switch

2.2 Creating a bit lamp

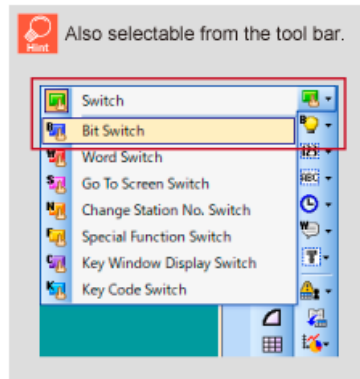
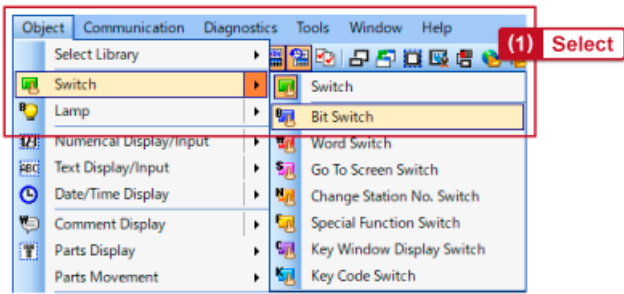
2.3 Creating a numerical display

2.4 Creating a figure (rectangle)

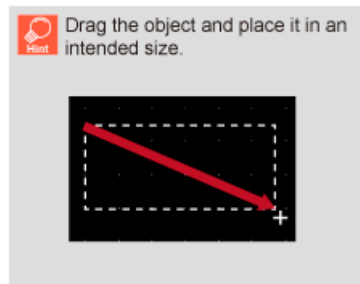
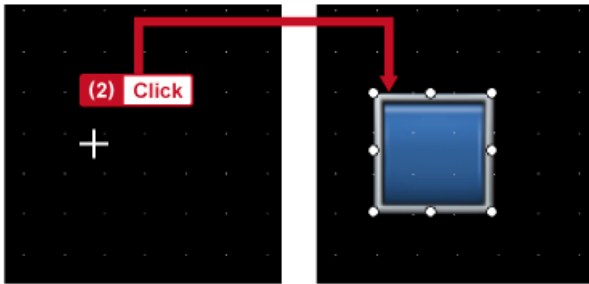
2.5 Creating a figure (text)

Create a run switch.

(1) Select [Object] → [Switch] → [Bit Switch] from the menu.

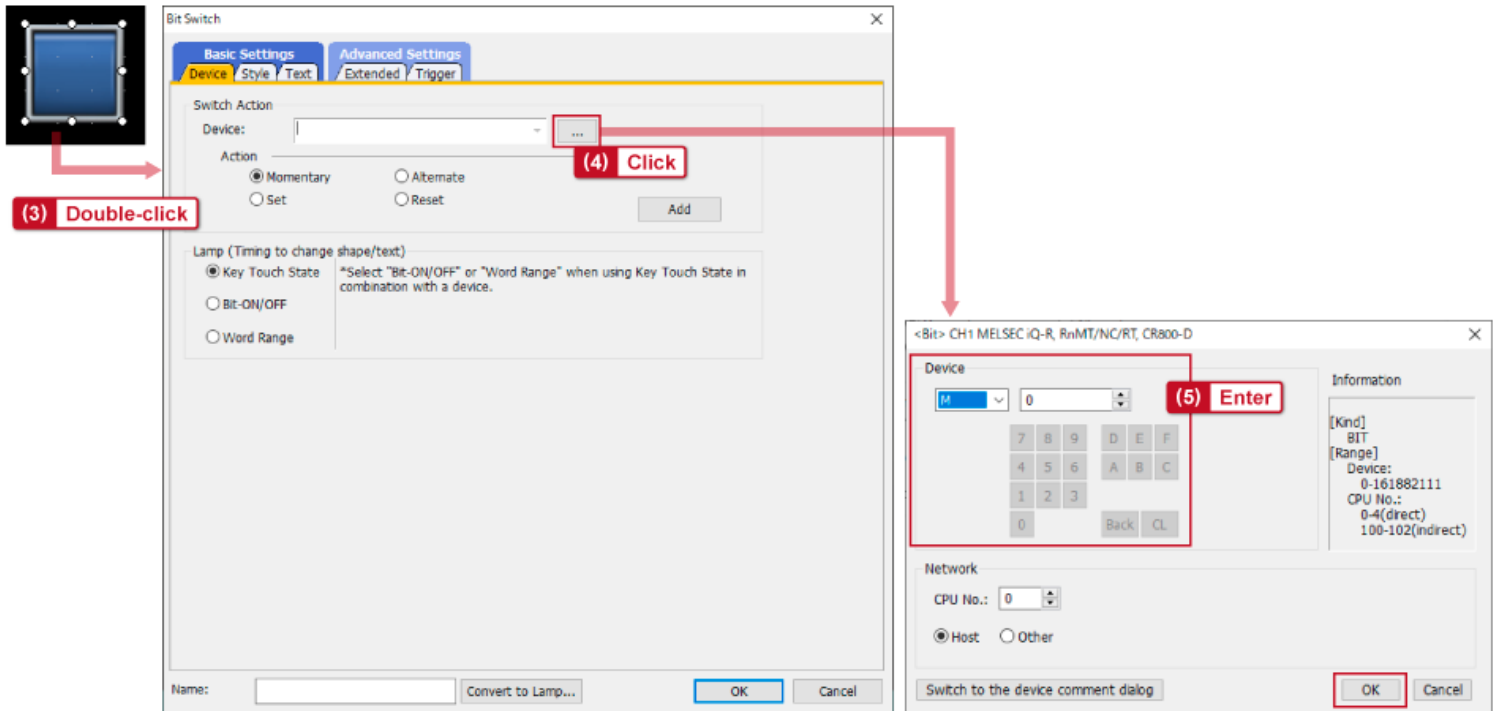


(2) The cursor becomes a crosshair (+). Click an intended point to place the bit switch.

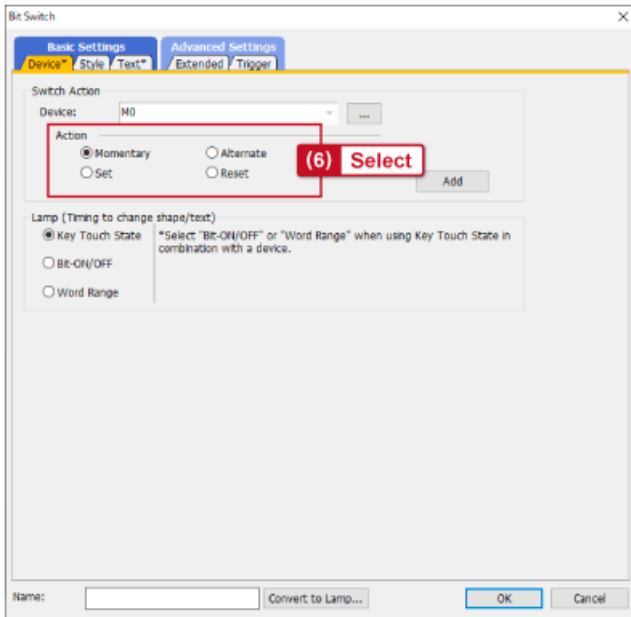


Set a device and an action in the [Device] tab.

- (3) Double-click the placed switch to open the setting dialog.
- (4) Click [...] to open the device setting dialog.
- (5) Enter a device and click [OK]. (Setting example: M0)



(6) Select an action for the bit switch. (Setting example: Momentary)



Point Glossary: "Actions" in the action setting

Momentary

Keeps the specified bit device on only while the switch is being touched.
The device turns off when the touch is released.

Alternate

Reverses the status (ON ⇔ OFF) of the specified bit device when the switch is touched.

Set

Turns on the specified bit device when the switch is touched.

Reset

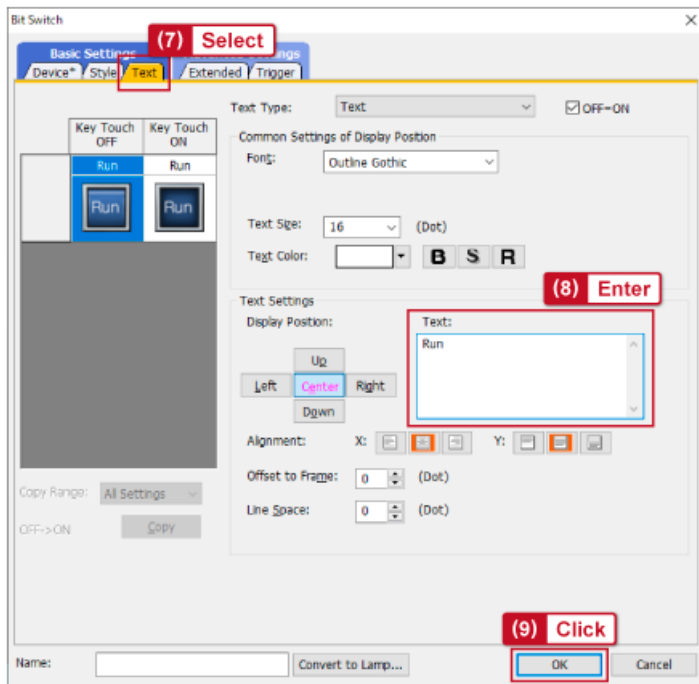
Turns off the specified bit device when the switch is touched.

Set a text to be displayed on the bit switch in the [Text] tab.

(7) Select the [Text] tab.

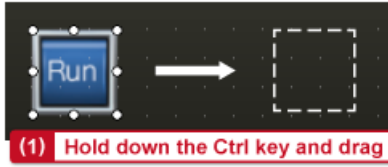
(8) Enter a text to be displayed on the bit switch in [Text]. (Setting example: Run)

(9) Click [OK].

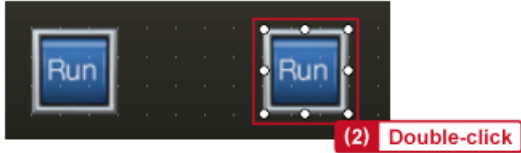


Create a stop switch.

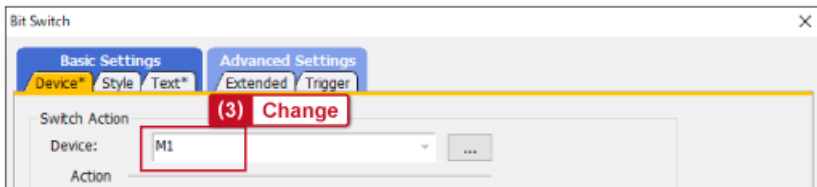
(1) Select the run switch. Hold down "Ctrl" and drag the switch to copy the switch.



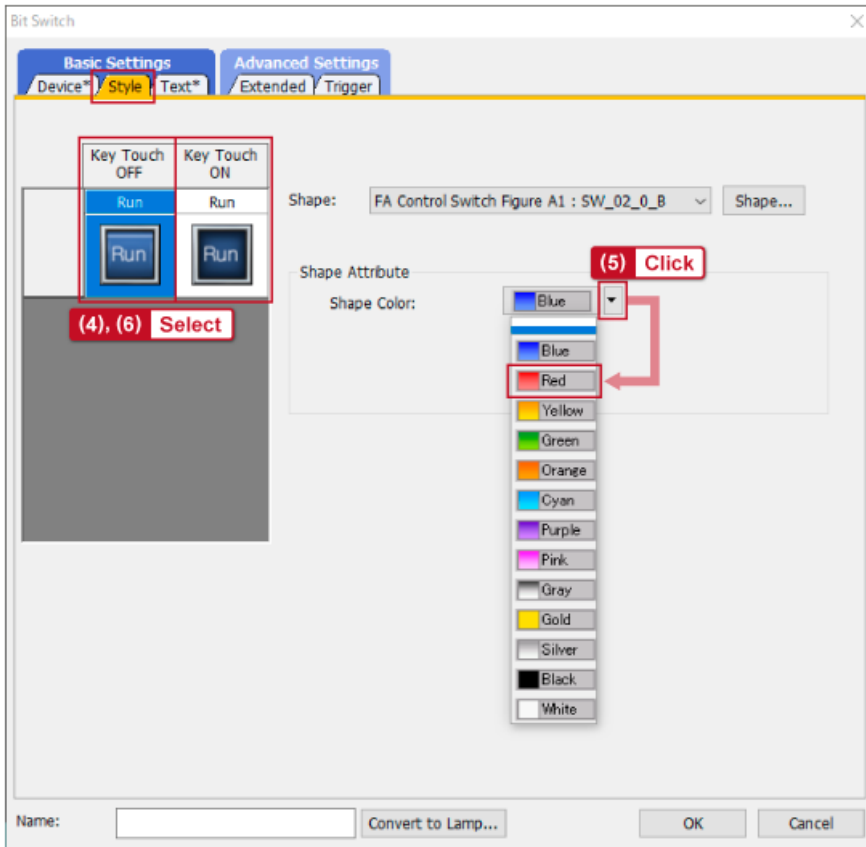
(2) Double-click the copied switch to open the setting dialog.



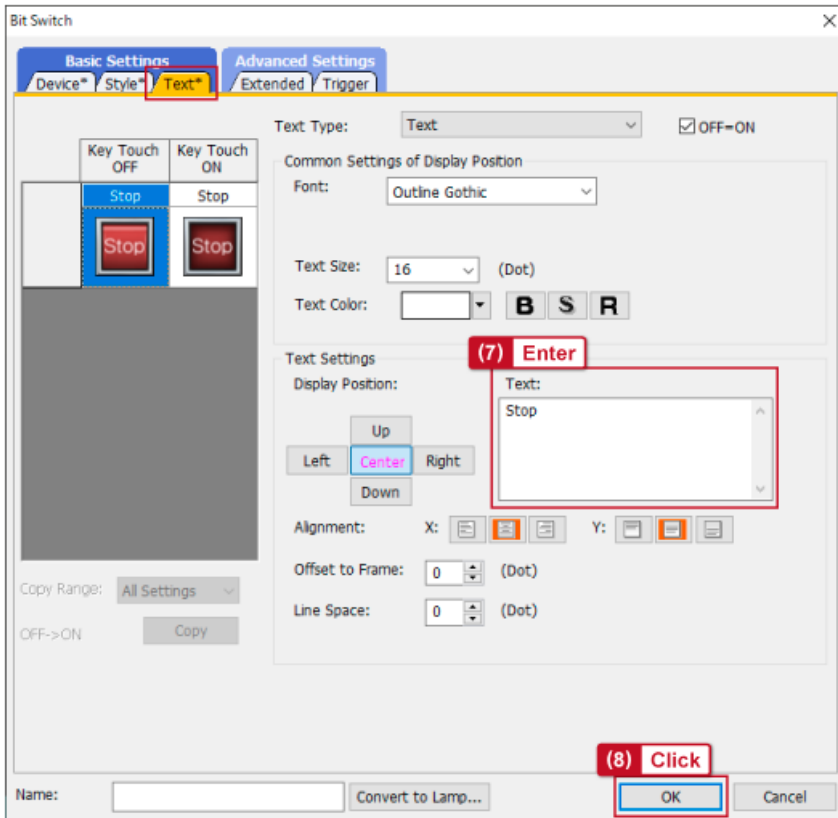
(3) Change the device to another for the stop switch in the [Device] tab. (Setting example: M1)



- (4) Select the [Style] tab and select [Key Touch OFF].
- (5) Set [Shape Color] for [Key Touch OFF]. (Setting example: Red)
- (6) Set [Shape Color] for [Key Touch ON]. (Setting example: Red)

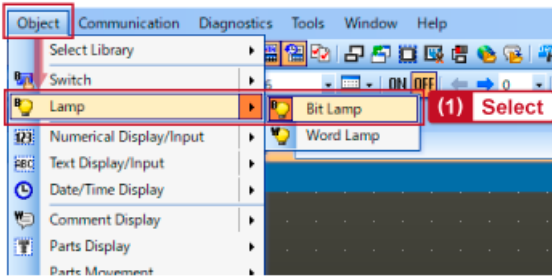


- (7) Select the [Text] tab and enter a text to be displayed on the bit switch in [Text]. (Setting example: Stop)
- (8) Click [OK].

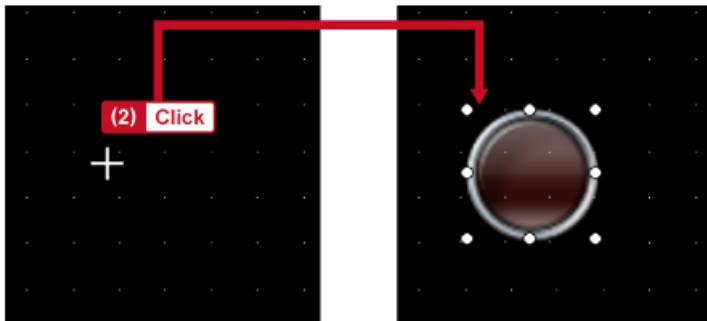


Create an operation status lamp.

(1) Select [Object] → [Lamp] → [Bit Lamp] from the menu.



(2) The cursor becomes a crosshair (+). Click an intended point to place the bit lamp.



Set a device and a shape color in the [Device/Style] tab.

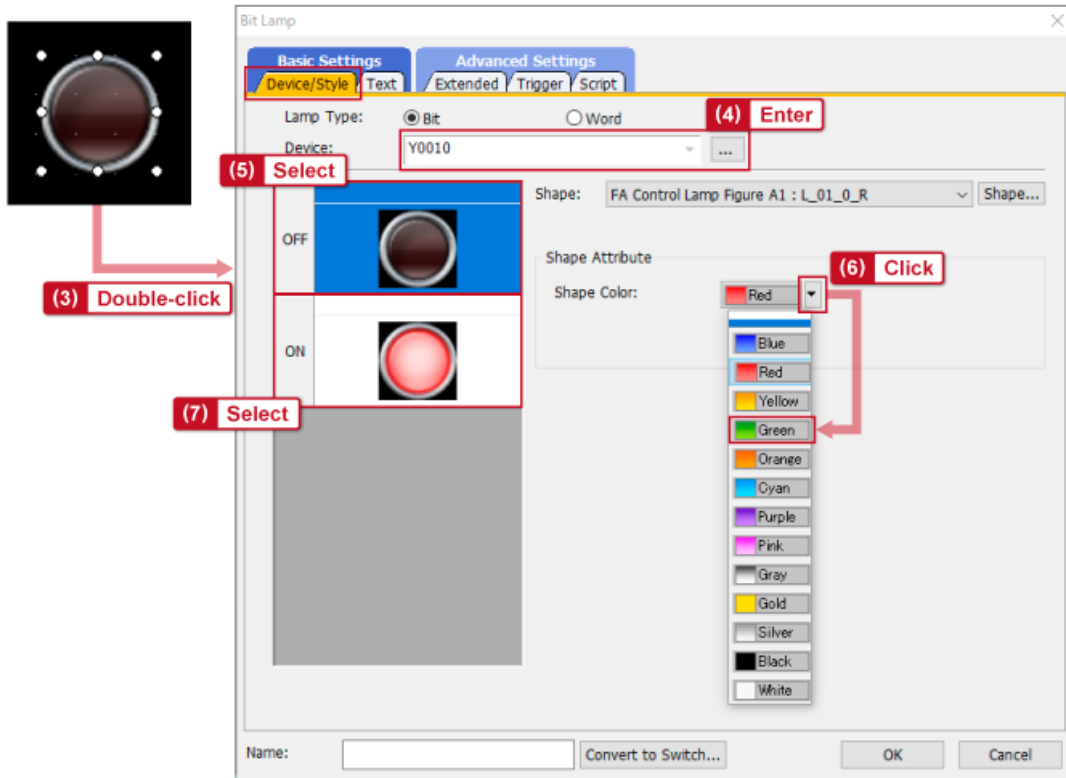
(3) Double-click the placed lamp to open the setting dialog.

(4) Set a device. (Setting example: Y0010)

(5) Select [OFF].

(6) Set [Shape Color] for [OFF]. (Setting example: Green)

(7) Set [Shape Color] for [ON]. (Setting example: Green)

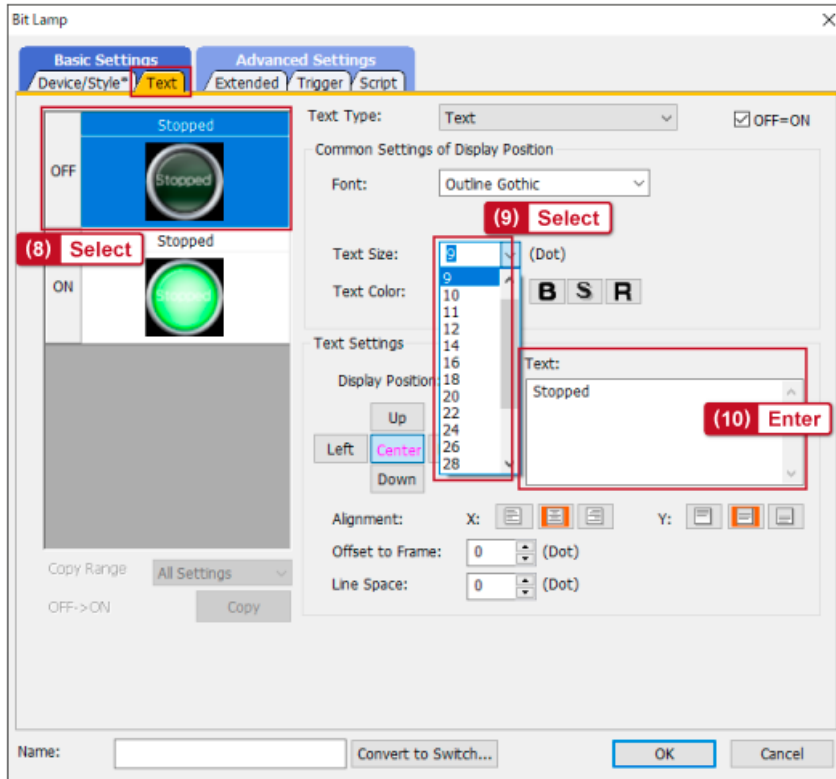


Set a text to be displayed on the bit lamp in the [Text] tab.

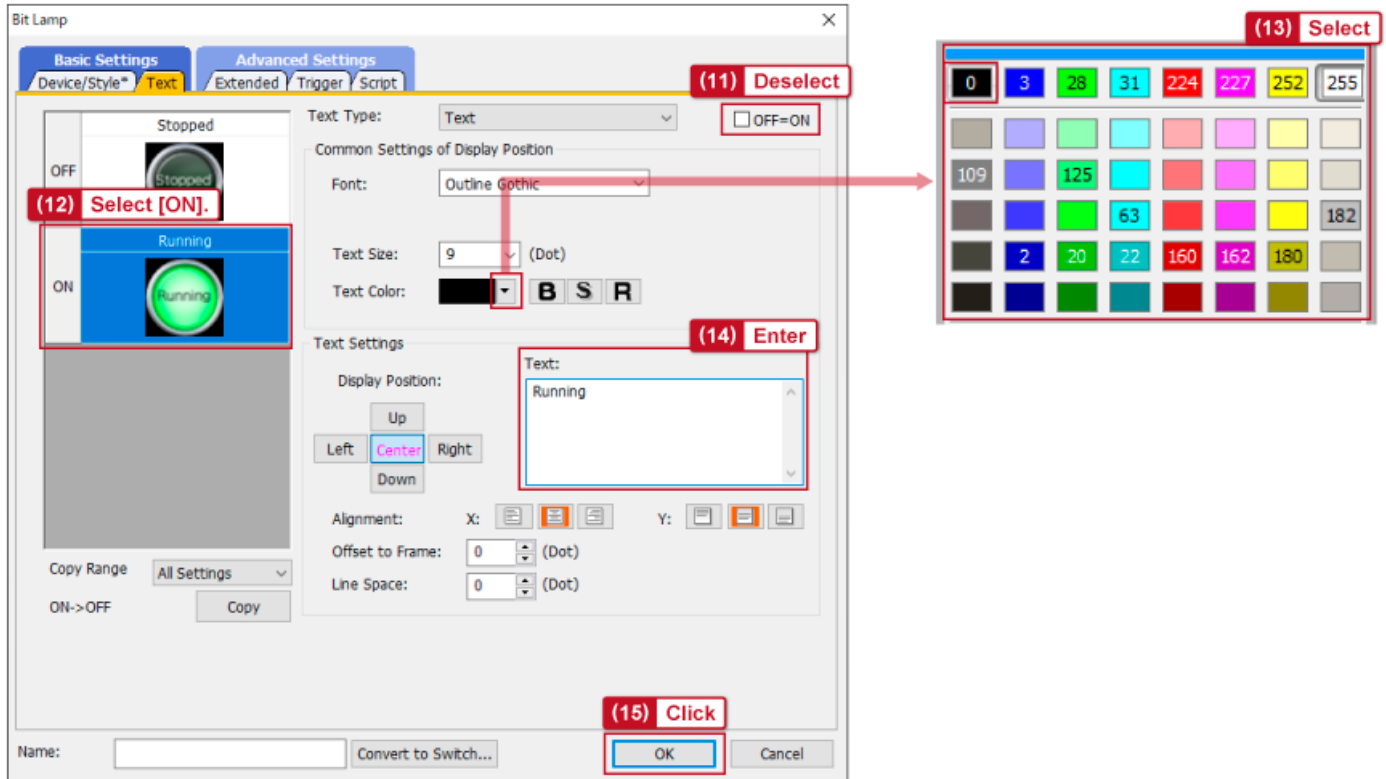
(8) Select [OFF].

(9) Set [Text Size]. (Setting example: 9)

(10) Enter a text to be displayed in [Text]. (Setting example: Stopped)

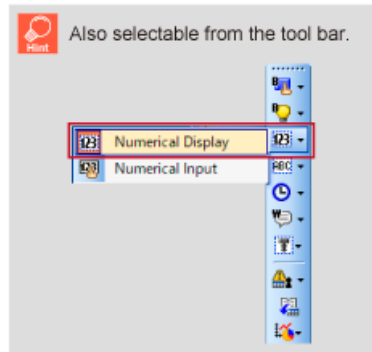
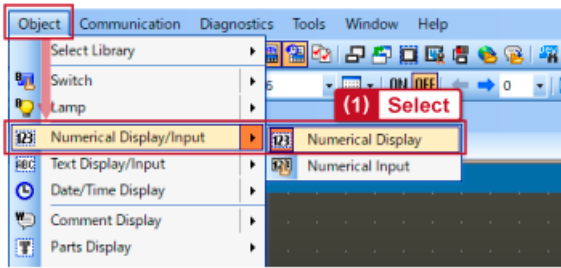


- (11) Deselect [OFF=ON].
- (12) Select [ON].
- (13) Set [Text Color]. (Setting example: Black)
- (14) Enter a text to be displayed in [Text]. (Setting example: Running)
- (15) Click [OK].

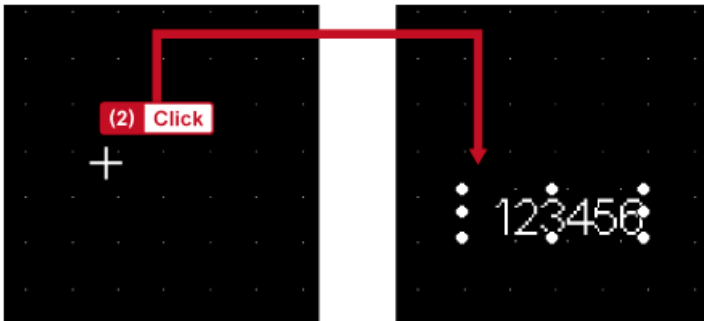


Create an operation status display.

(1) Select [Object] → [Numerical Display/Input] → [Numerical Display] from the menu.



(2) The cursor becomes a crosshair (+). Click an intended point to place the numerical display.

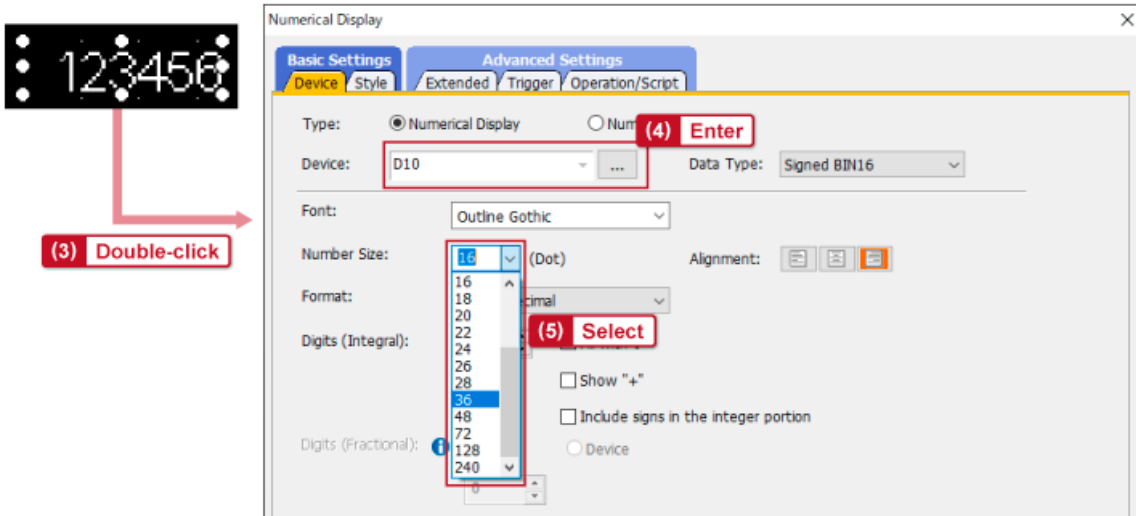


Set a device and a numerical display style in the [Device] tab and [Style] tab.

(3) Double-click the placed numerical display to open the setting dialog.

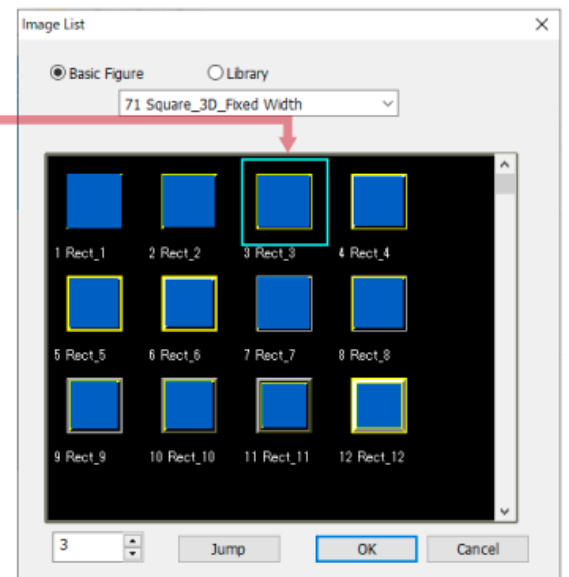
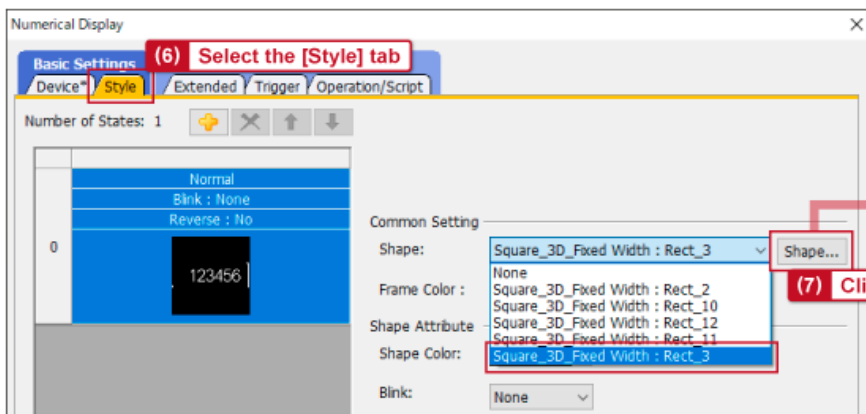
(4) Set a device. (Setting example: D10)

(5) Select a value for [Number Size]. (Setting example: 36)

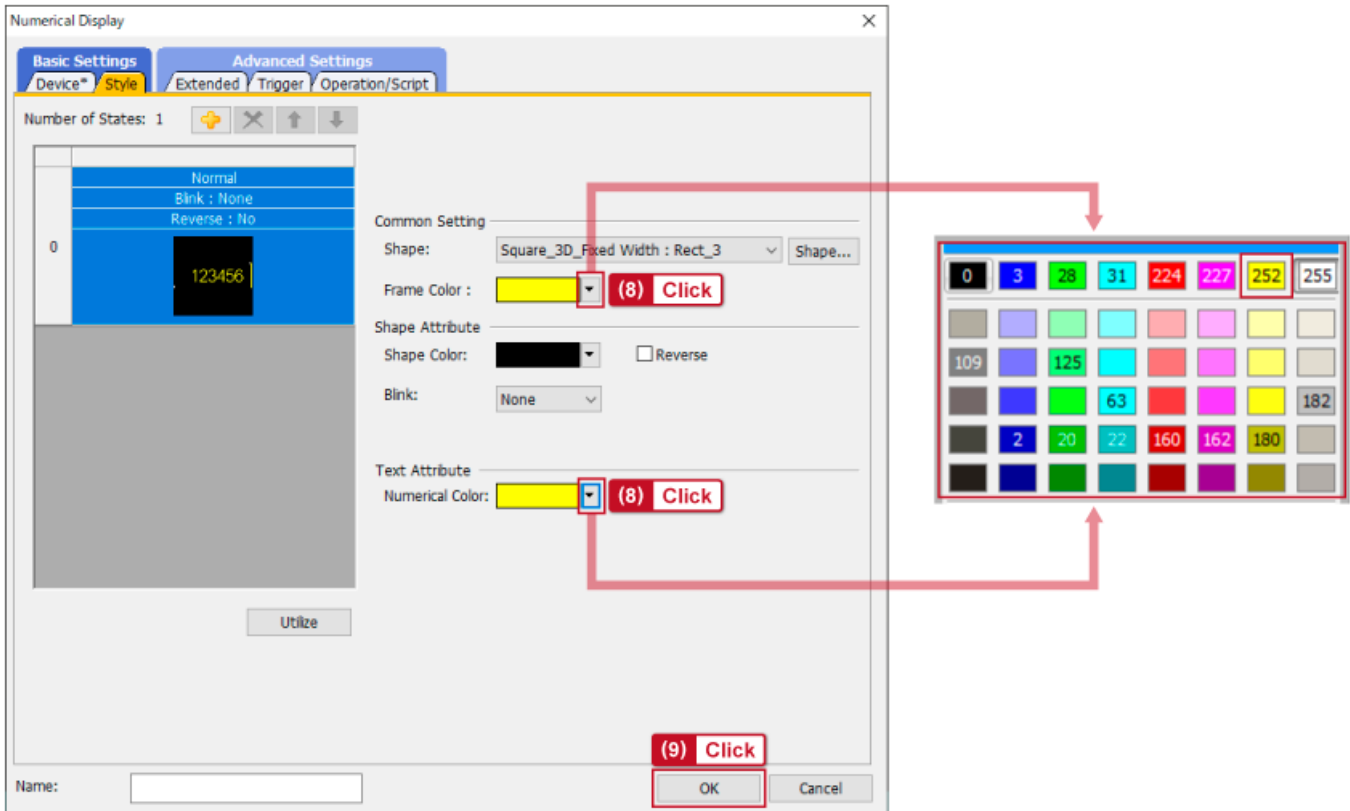


(6) Select the [Style] tab.

(7) Select a frame of the numerical display. (Setting example: Square_3D_Fixed Width: Rect_3)

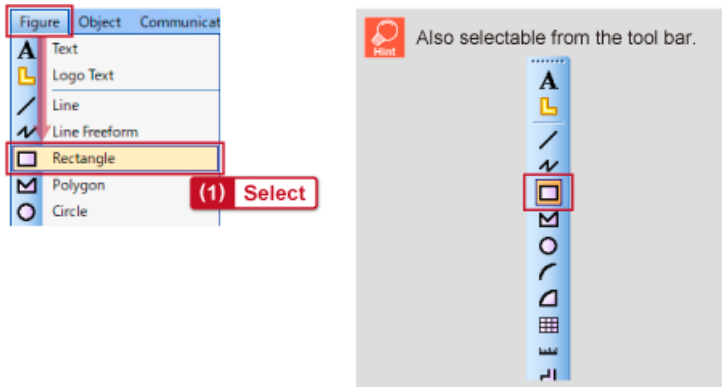


- (8) Set [Frame Color] and [Numerical Color]. (Setting example: Yellow)
- (9) Click [OK].



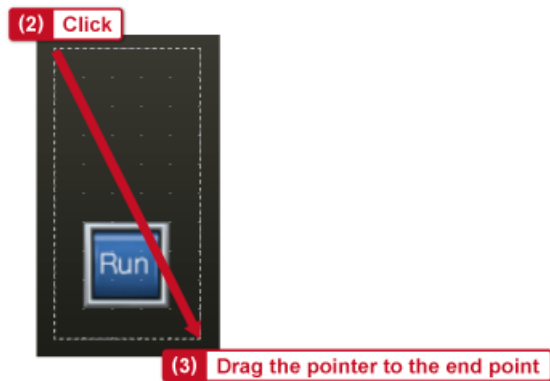
Create a figure (rectangle). Place the created figure behind the run switch.

(1) Select [Figure] → [Rectangle] from the menu.

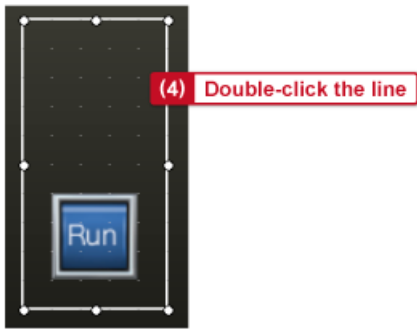


(2) Click and hold the mouse button at the start point.

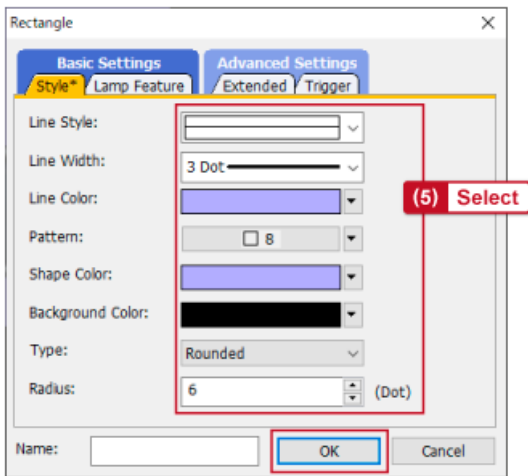
(3) Drag the pointer to the end point.





(4) Double-click the line of the placed figure to open the setting dialog.



(5) Set a style for the figure. Then, click [OK].



Item	Setting example
Line Style	—————
Line Width	3 Dot
Pattern	□ 8
Type	Rounded
Radius	6
Line Color	
Shape Color	

Place rectangles behind the stop switch and operation status lamp.

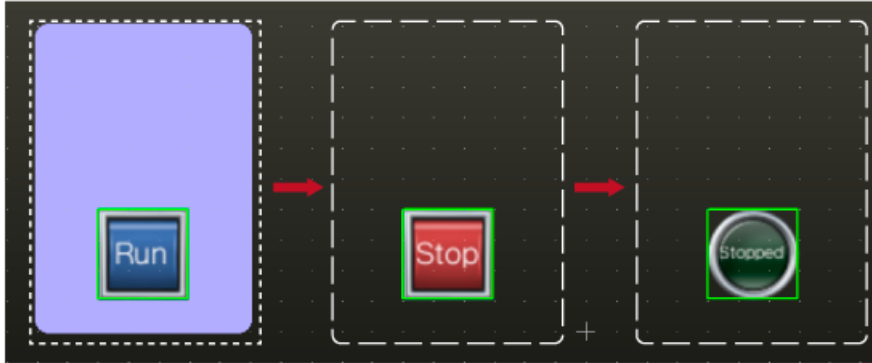
(6) Click and hold the rectangle.

(7) Press the Ctrl key and drag the rectangle to copy the rectangle behind the stop switch.

(8) Copy the rectangle also behind the operation status lamp.

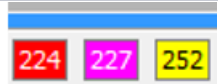

(6) Click

(7), (8) Copy the rectangle (Click and hold the mouse button + Ctrl key and drag)

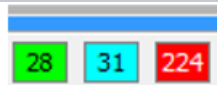



(9) Change the background colors of the stop switch and operation status lamp.

Background color of the stop switch

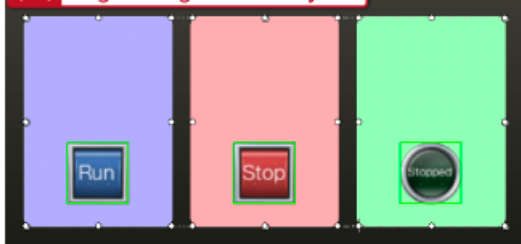
Item	Setting example
Line Color	
Shape Color	


Background color of the operation status lamp


Item	Setting example
Line Color	
Shape Color	

(10) Align the objects.

(10) Align the figures and objects



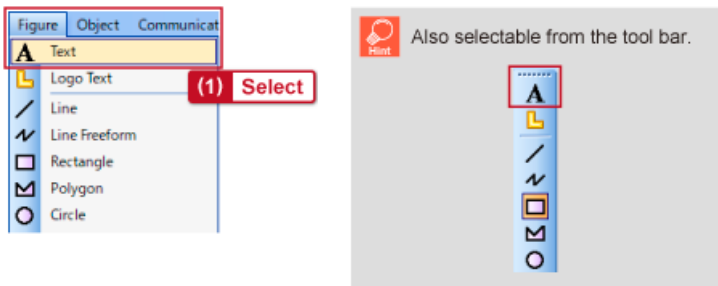
 The [Align] toolbar helps align the objects.



- 1 Left
- 2 Center (Horizontal)
- 3 Right
- 4 Top
- 5 Center (Vertical)
- 6 Bottom
- 7 Align Sideways
- 8 Align Lengthways

Create figures (texts) to identify the individual objects. Place each figure above the corresponding object (run switch, stop switch, operation status lamp, or operation status display).

(1) Select [Figure] → [Text] from the menu.



(2) Click an intended point to enter a text to open the text dialog.

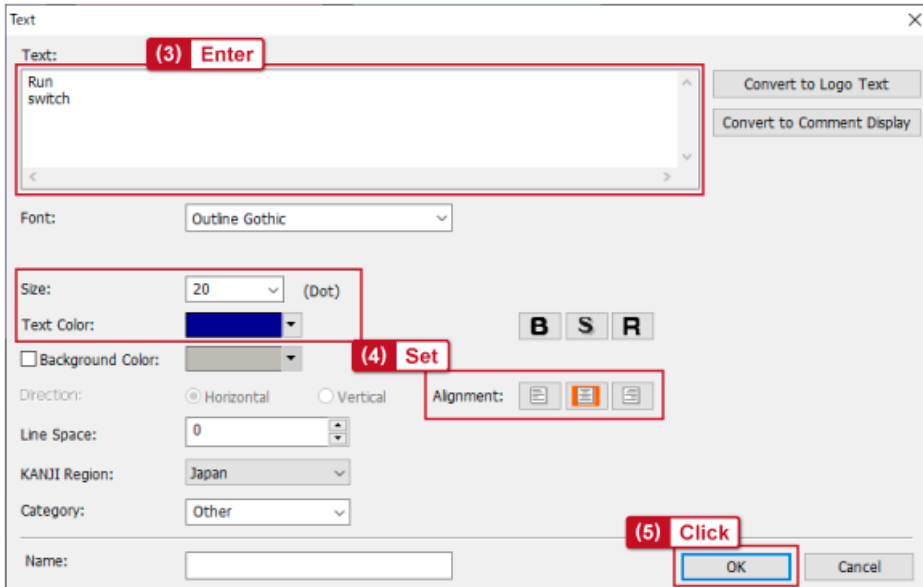



Enter a text to be displayed and set a style in the dialog.

(3) Enter a text to be displayed in [Text]. (Setting example: Run switch)

(4) Set [Size], [Text Color], and [Alignment].

(5) Click [OK].

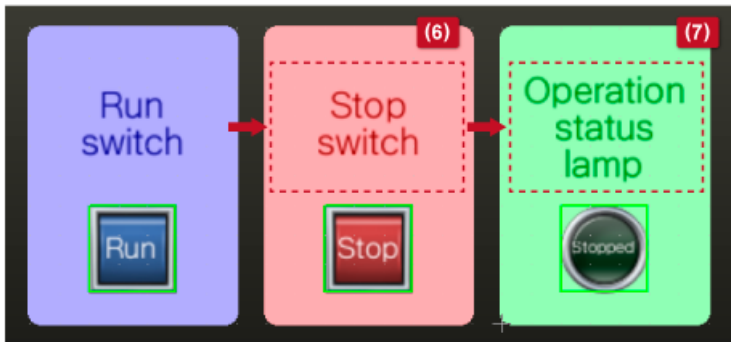


Item	Setting example
Size	20
Text Color	
Alignment	Center

Place a text figure also above the stop switch and operation status lamp as shown below.

(6) Copy the text figure "Run switch", double-click the figure to open the dialog, and enter "Stop switch" in [Text].

(7) Copy the text figure "Stop switch", double-click the figure to open the dialog, and enter "Operation status lamp" in [Text].



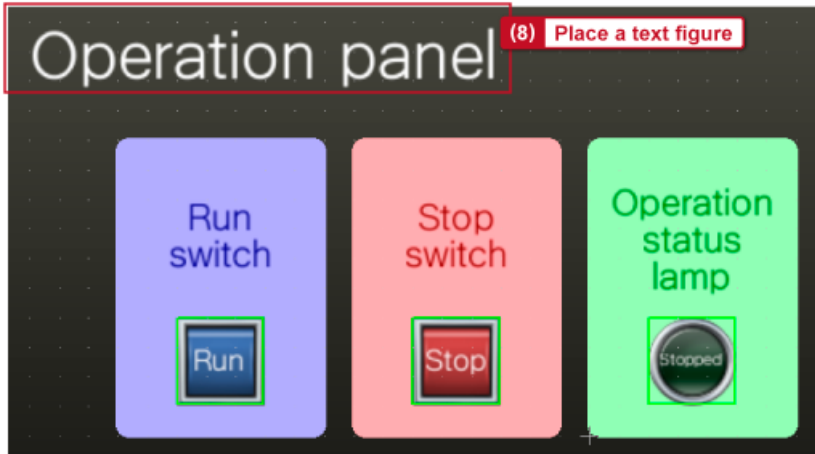
Stop switch

Item	Setting example
Text Color	<div style="display: flex; gap: 5px;"> 160 162 180 </div> <div style="display: flex; gap: 5px; margin-top: 5px;"> </div>

Operation status lamp

Item	Setting example
Text Color	<div style="display: flex; gap: 5px;"> 20 22 160 </div> <div style="display: flex; gap: 5px; margin-top: 5px;"> </div>

(8) Place a text figure "Operation panel" at the upper left of the screen as shown below. If there is insufficient space, select the objects and move them down.



(9) Place a text "Operation status" on the left of the numerical display object as shown below.



In this chapter, we will check the created screen for incorrect settings or errors on the personal computer before transferring the screen data to the GOT. This increases efficiency of creating project data.

3.1 Checking the settings of the created objects and figures

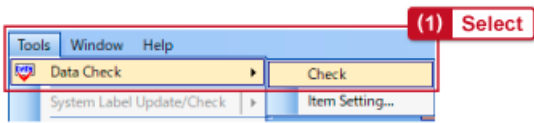
3.2 Using the screen preview

3.2.1 Checking the style

3.2.2 Exiting the preview

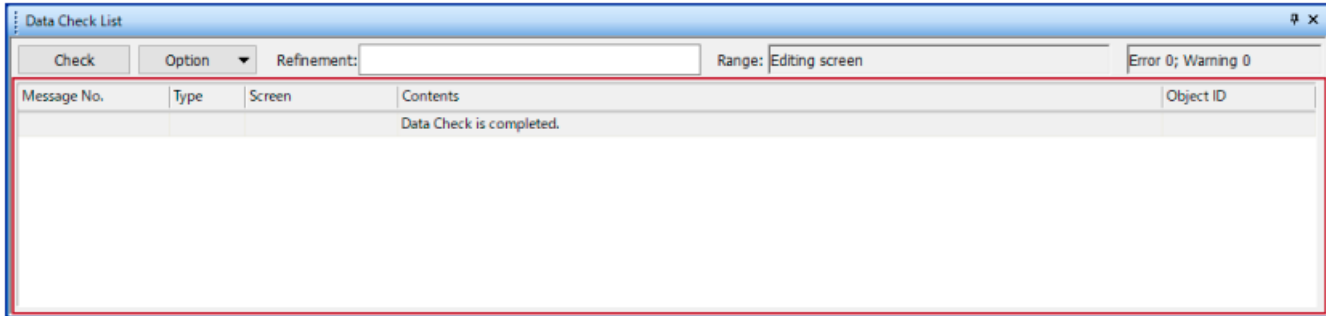
Use [Data Check] to check for errors in the created project data.

(1) Select [Tools] → [Data Check] → [Check] from the menu.

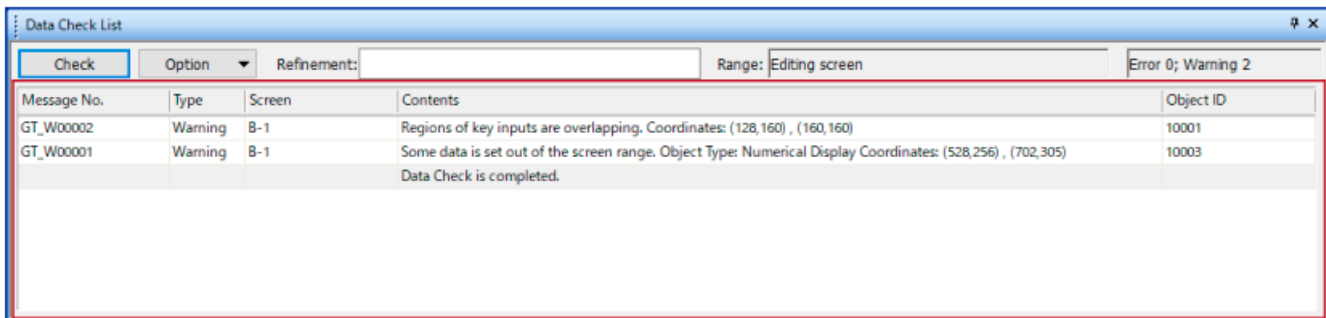


(2) "Data Check is completed." is displayed in the Data Check List window.

(Example) When no error is found

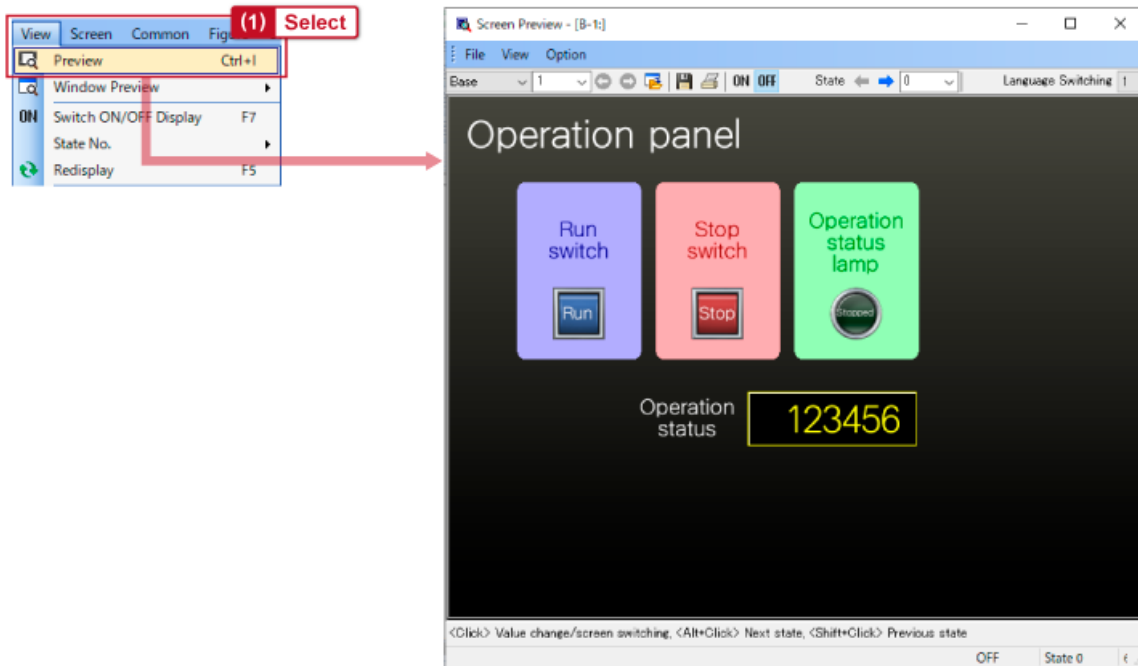


(Example) When errors are found



Use the screen preview to check the ON/OFF display of the bit switches and the bit lamp on the created screen.

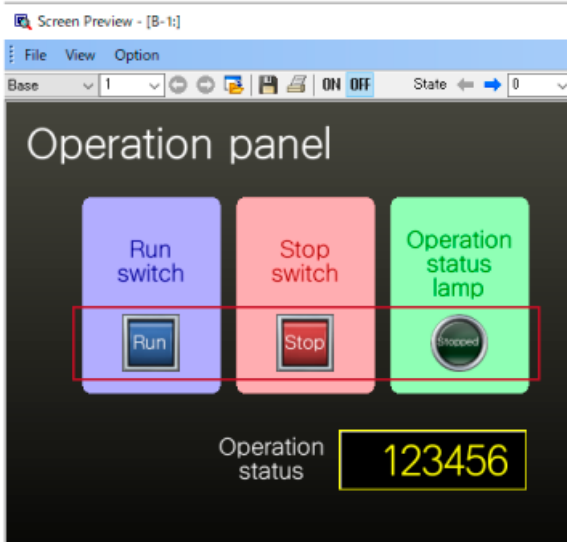
(1) Select [View] → [Preview] from the menu. The screen preview window appears.



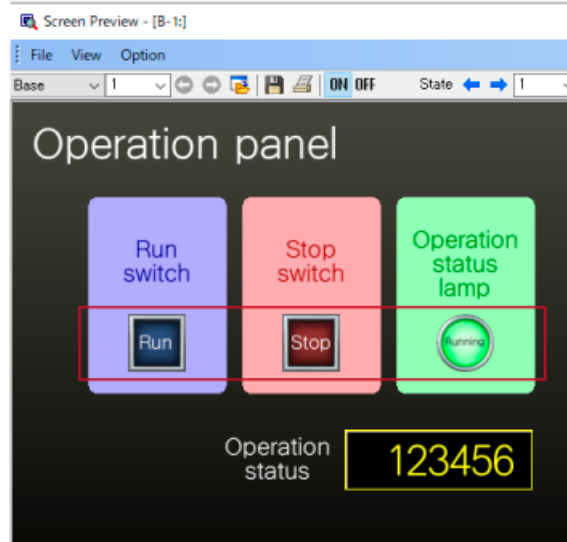
(2) Select [ON] or [OFF] and ensure that the bit switches and the bit lamp are consistent with the set styles.

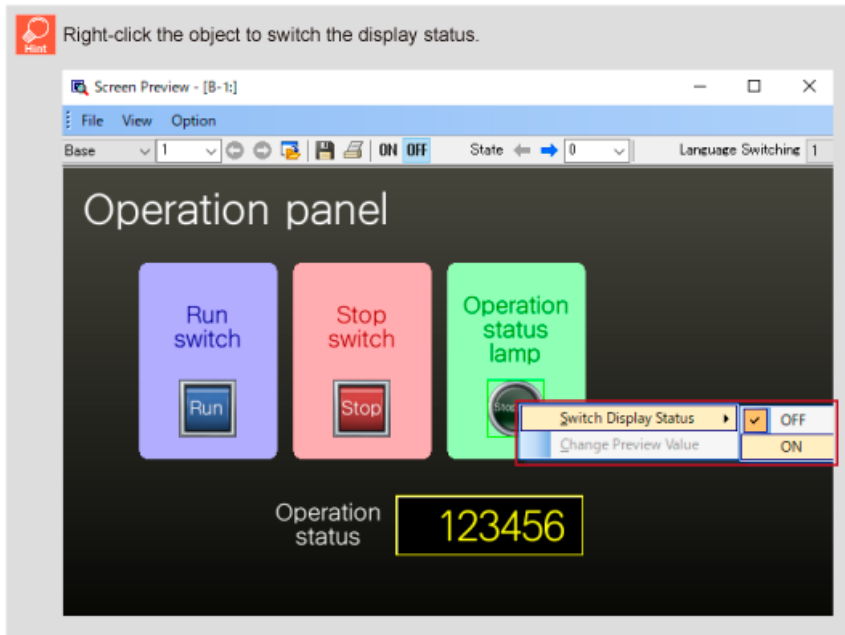


When [OFF] is selected



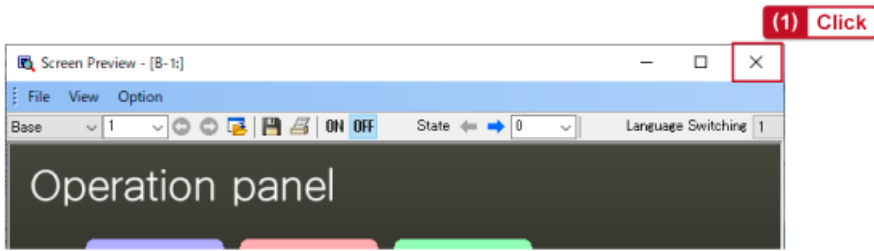
When [ON] is selected





After checking, close the screen preview window.

(1) Click the [×] button.



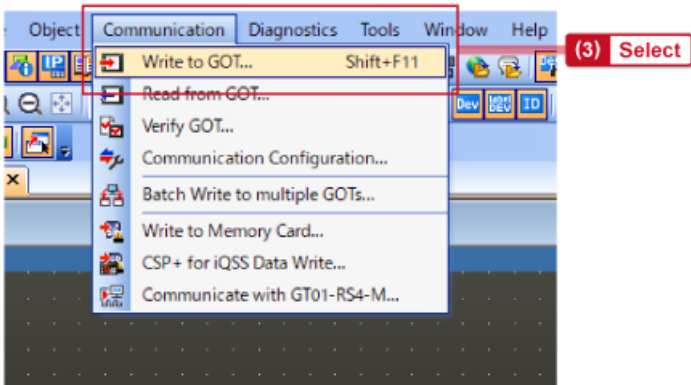
In this chapter, we will combine the data created in Chapters 2 and 3 with a sequence program and check the operation with the GOT and the PLC.

- 4.1 Transferring the data created in Chapters 2 and 3 to the GOT
- 4.2 Preparing a sequence program
- 4.3 Starting communications between the GOT and the PLC
- 4.4 Checking the operation with the GOT

4.1 Transferring the data created in Chapters 2 and 3 to the GOT - 1

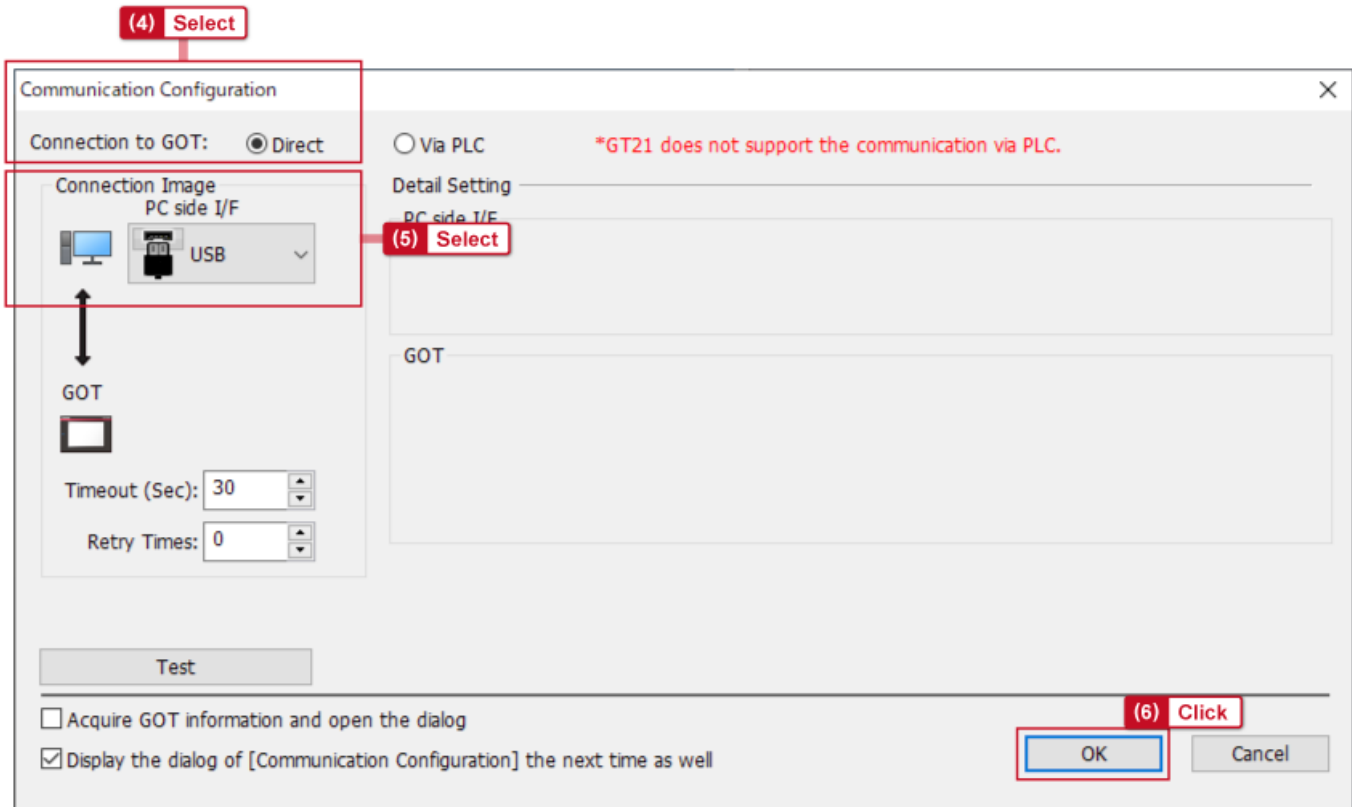
Transfer the data created in Chapters 2 and 3 to the GOT.

- (1) Check that the GOT is powered off, then connect the GOT and the personal computer with the USB cable.
- (2) Power on the GOT.
- (3) Select [Communication] → [Write to GOT] to open the [Communication Configuration] dialog.



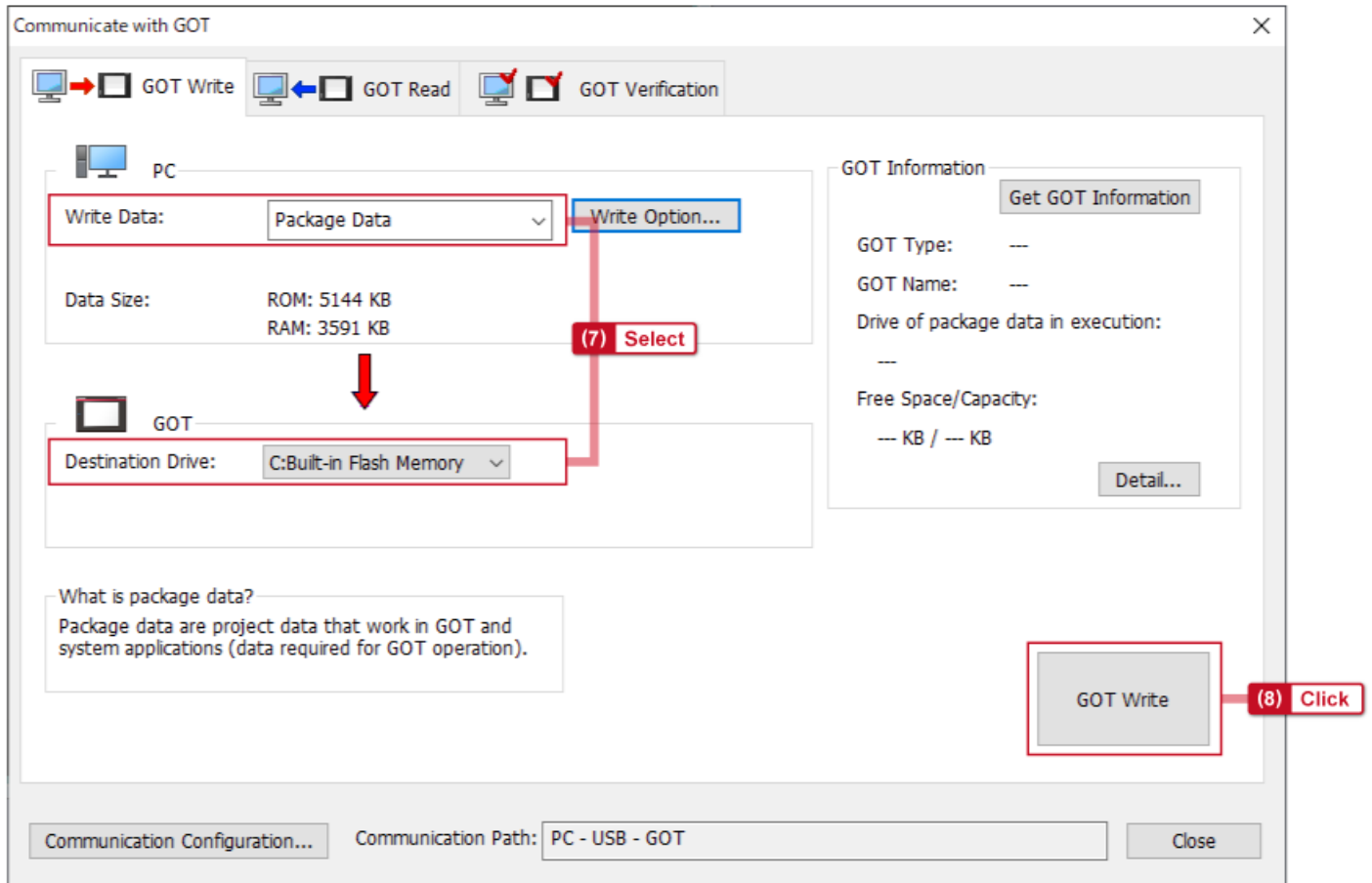
4.1 Transferring the data created in Chapters 2 and 3 to the GOT - 2

- (4) Select your preference for [Connection to GOT] in the [Communication Configuration] dialog.
- (5) Select your preference for [PC side I/F] in the [Communication Configuration] dialog.
- (6) Click [OK] to open the [Communicate with GOT] dialog.

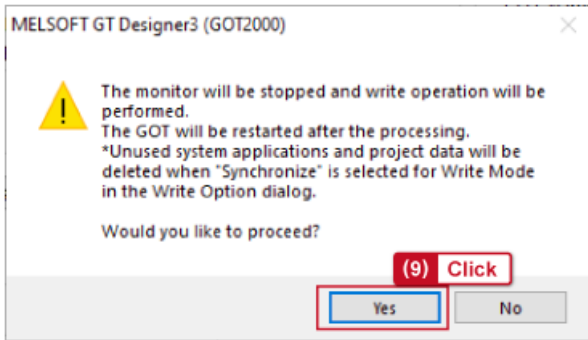


4.1 Transferring the data created in Chapters 2 and 3 to the GOT - 3

- (7) The [Communicate with GOT] dialog appears. Select one of the options for [Write Data] and for [Destination Drive].
- (8) Click the [GOT Write] button.



(9) The confirmation dialog appears. Check the contents and click the [Yes] button to start writing of the screen data.



(10) When the writing is completed, the completion message appears. Click [OK].

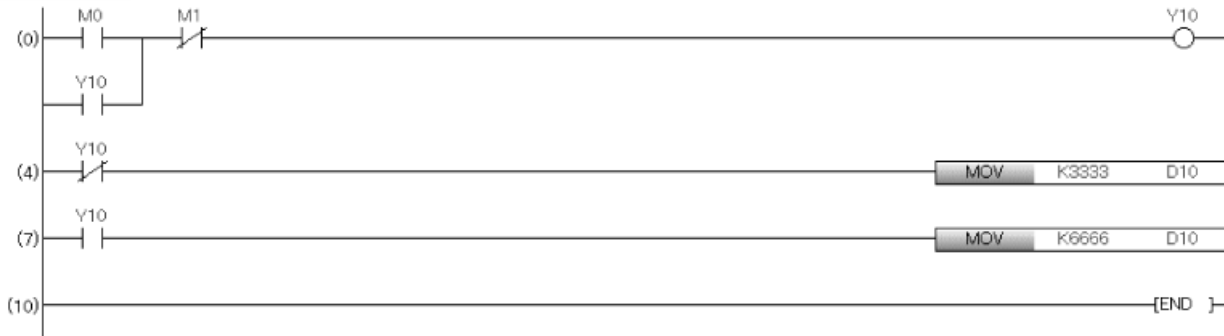
(11) The GOT automatically restarts.

Prepare a sequence program to enable operation check with the GOT.

The following diagram shows the sequence program used in this course. Create the program with GX Works3 and write the program to the PLC.

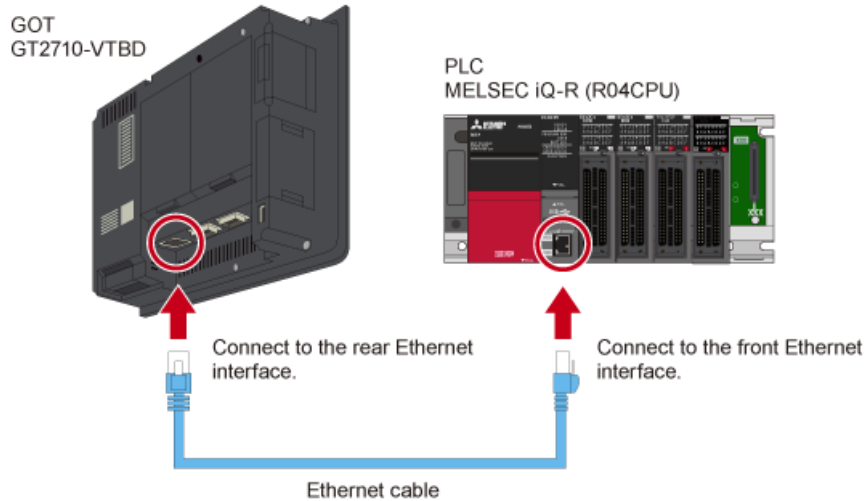
For how to operate GX Works3 and how to create a sequence program and write the program to the PLC, take the "GX Works3 (Ladder Logic)" course.

- Series: MELSEC iQ-R
- Model: R04CPU
- Program language: Ladder

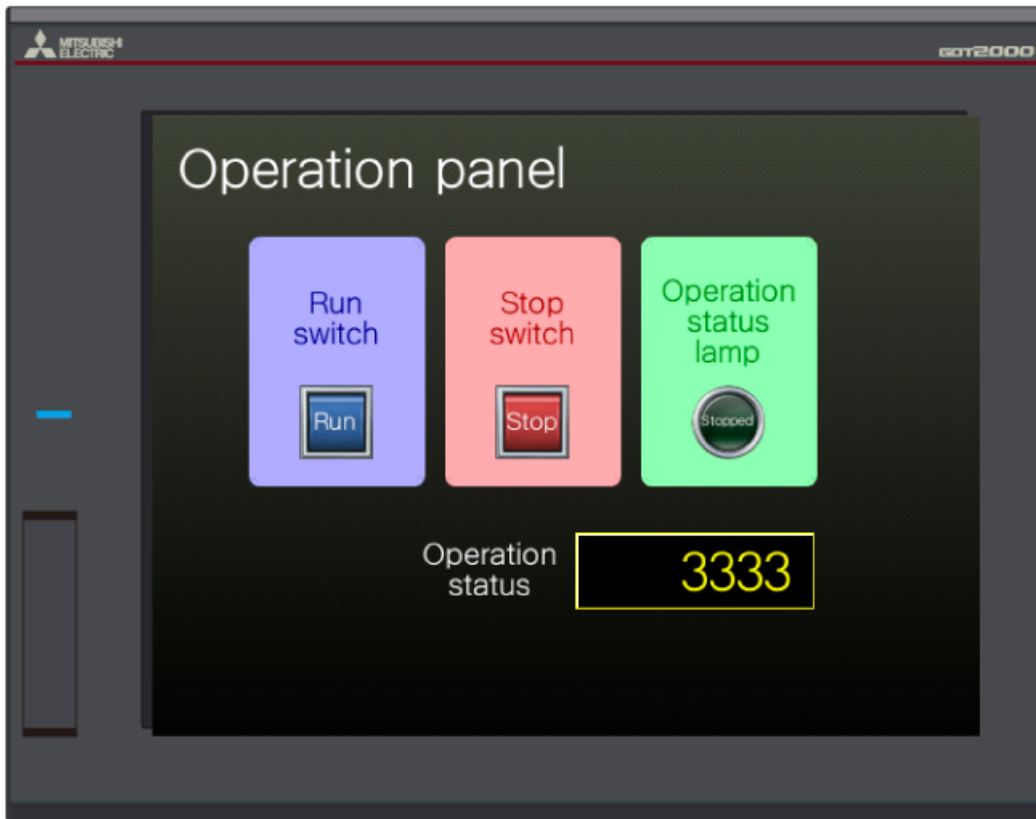
GX Works3

Start communications between the GOT and the PLC.

- (1) Power off the PLC and the GOT.
- (2) Connect the PLC and the GOT with the Ethernet cable.
- (3) Power on the PLC and the GOT.
- (4) The created data is displayed. If the language selection screen appears, select a language.

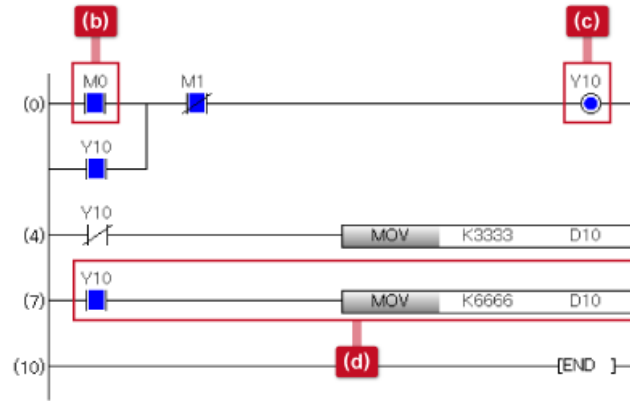
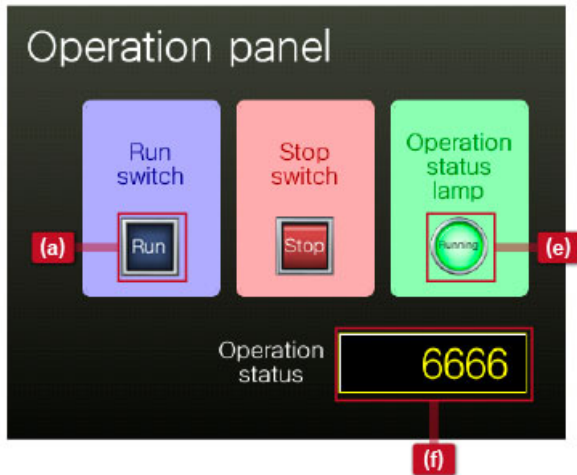


(1) When the GOT starts up and starts communications with the PLC, the GOT displays the data created with GT Designer3.



Touch the run switch, and actions (a) to (f) will occur in the GOT and the PLC.

- (a) GOT: Changes its display to the display of when the run switch is in the ON state.
- (b) PLC: The M0 device turns on.
- (c) PLC: The Y10 device turns on.
- (d) PLC: The D10 device stores a value "6666".
- (e) GOT: Changes its display to the display and text of when the operation status lamp is in the ON state.
- (f) GOT: Displays a value "6666" on the numerical display which indicates the operation status with a numerical value.



(3) Touch the stop switch, and (a) to (f) will occur in the GOT and the PLC.

(a) GOT: Changes its display to the display of when the stop switch is in the ON state.

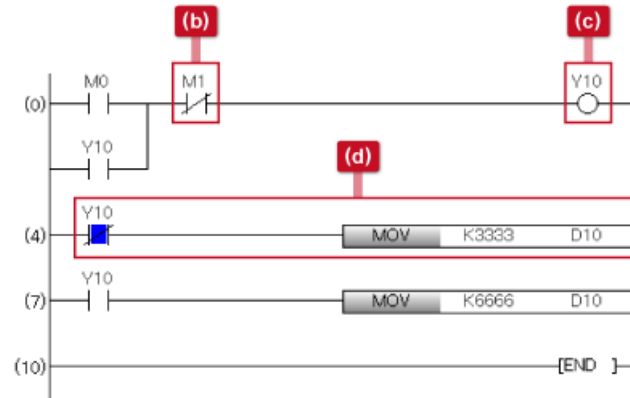
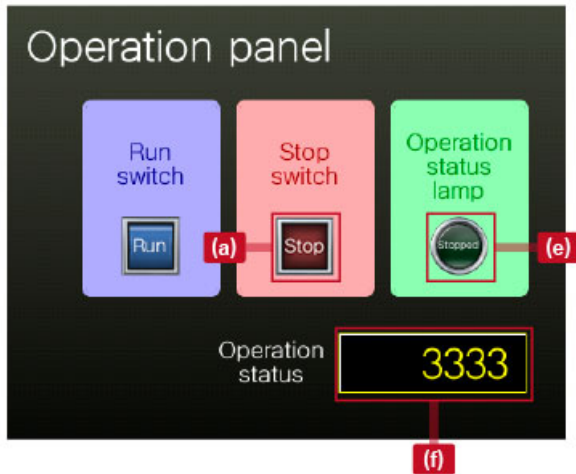
(b) PLC: The M1 device turns on. This indicates a command of the NC contact in the sequence program; therefore, the input condition is unsatisfied.

(c) PLC: The Y10 device turns off.

(d) PLC: The D10 device stores a value "3333".

(e) GOT: Changes its display to the display and text of when the operation status lamp is in the OFF state.

(f) GOT: Displays a value "3333" on the numerical display which indicates the operation status with a numerical value.



[Q1] refers to a software product used to create screens for the Human Machine Interface (HMI) GOT2000 series.

Q1

GT Designer3

GT Simulator3

GX Works3

MT Works3

[Q1] refers to a software product used to create sequence programs for the MELSEC iQ-R series PLCs.

Q1

GT Designer3

GT Simulator3

GX Works3

MT Works3

In this course, [Q1] refers to an object used to turn on or off the bit device of the PLC on the GOT.

Q1

Bit switch

Word switch

Bit lamp

Numerical display

In this course, [Q1] refers to an object used to monitor the device value of the PLC on the GOT.

Q1

Bit switch

Word switch

Bit lamp

Numerical display

There are four touch switch actions as shown below. Select the name of each action.

■[Q1]: Keeps the specified bit device on while the switch is being touched. The device turns off when the touch is released.

■[Q2]: Reverses the status (ON \Leftrightarrow OFF) of the specified bit device when the switch is touched.

Q1

Bit momentary



Q2

Bit alternate



Q3

Bit set



Q4

Bit reset



The following toolbar is useful to neatly align the objects placed on the screen. What is this toolbar called?

Q1

[Display] toolbar

[Object] toolbar

[Align] toolbar

[Figure] toolbar



[+]

[Q1] is a function used to check the display image of the created screen.

[Q1] is available to check the image by switching the ON/OFF display of a switch or lamp.

Q1

Print preview

Screen preview

Display switching

Slide show

You have completed the Final Test. Your results are as follows.
To end the Final Test, proceed to the next page

	1	2	3	4	5	6	7	8	9	10
Final Test 1	✓									
Final Test 2	✓									
Final Test 3	✓									
Final Test 4	✓									
Final Test 5	✓	✓	✓	✓						
Final Test 6	✓									
Final Test 7	✓									

Total questions: **10**

Correct answers: **10**

Percentage: **100 %**

Clear

You have completed the **GT Works3 (GT Designer3) Basics (Elementary Screen Design (GOT)) course.**

Thank you for taking this course.

We hope you enjoyed the lessons and the information you acquired in this course will be useful in the future.

You can review the course as many times as you want.

Review

Close