


32 | Simulation

This chapter provides an overview of the Simulation feature.

First, read “32.1 Settings Menu” (page 32-2) and proceed to the description of the desired section.

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32.1 Settings Menu

Checking the Display Operation on the PC	
 <p>The diagram illustrates the process of checking the display operation on a PC. It shows two computer setups. The first setup shows a monitor displaying a simple interface with a red dot. An arrow points to the second setup, where the monitor displays a more complex interface with various icons and text. A speech bubble points to the second monitor with the text: "You can check the operation on the PC."</p>	<ul style="list-style-type: none">☞ Setup Procedure (page 32-4)☞ Details (page 32-3)

32.2 Checking the Display Operation on the PC

32.2.1 Introduction

Using the simulation feature, you can verify how the project operates before transferring it to the device/PLC. You do not have to save the project before simulating, making it ideal for debugging as you edit and create the project. You can even keep simulation running while you open and edit a different project in GP-Pro EX.



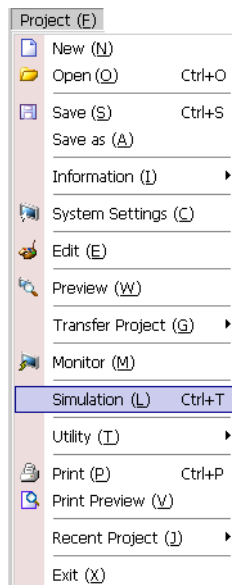
32.2.2 Procedure

NOTE

- Please refer to the settings guide for details.
 - ☞ “32.3.1 [Simulation] Settings Guide” (page 32-8)
 - ☞ “32.3.2 [Device View] Settings Guide” (page 32-10)



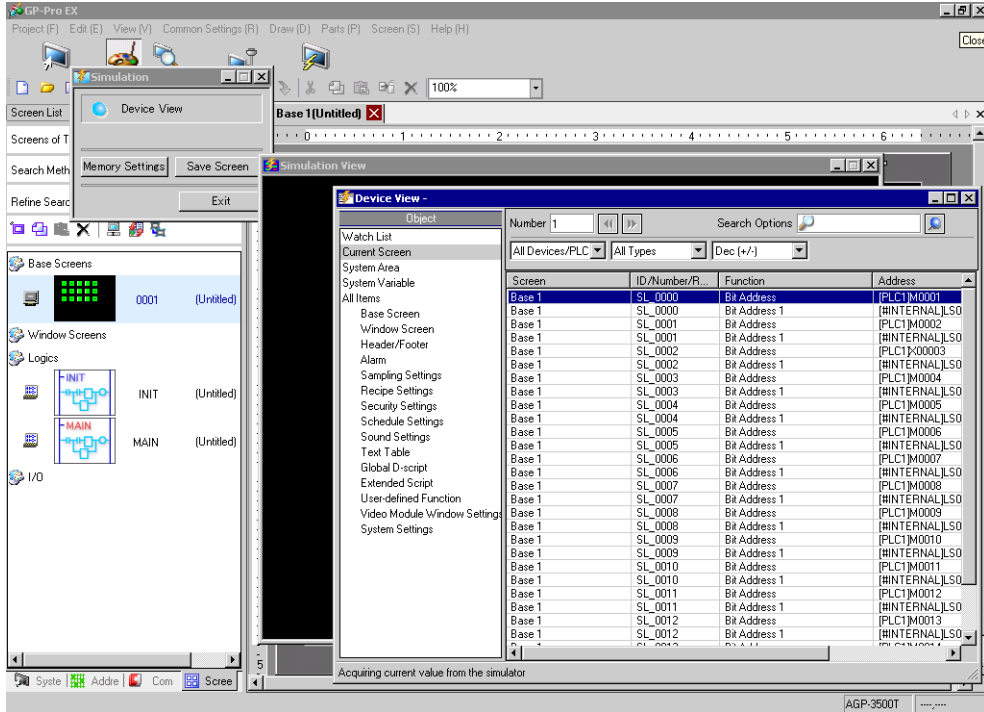
1 Open the project file you want to test. From the [Project (F)] menu, select [Simulation (L)].



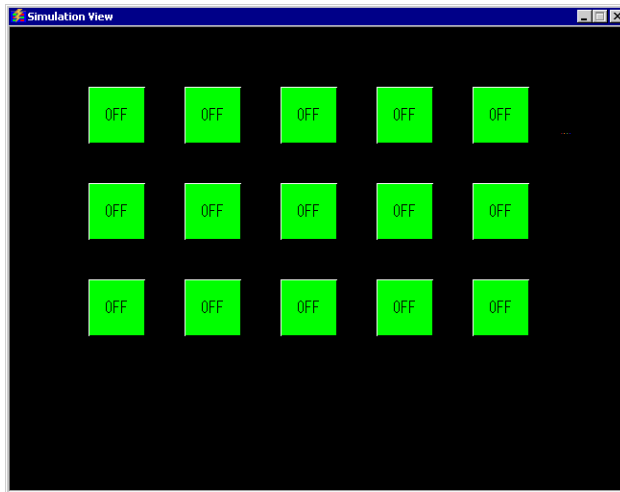
NOTE

- You can also use the keyboard shortcut Ctrl+T to start simulation.

2 [Simulation], [Simulation View], [Device View] are displayed.



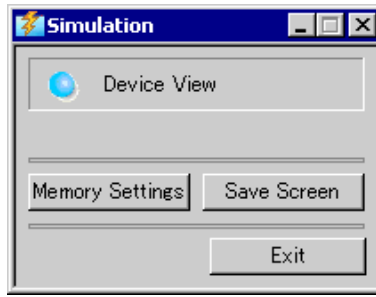
3 [Simulation View] allows you to check the contents of the project file.



NOTE

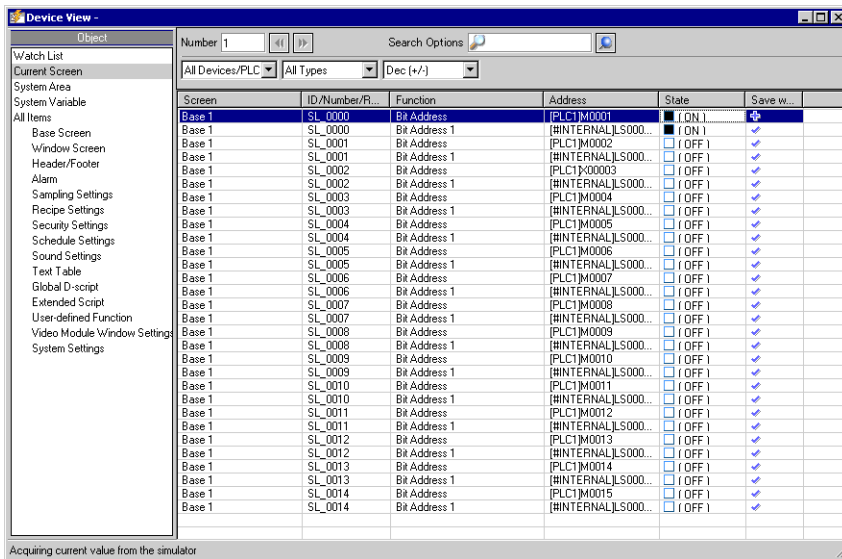
- Select [Simulation (L)] from the [Project (F)] menu again to simulate a different project file or the edited the current project.

4 The [Simulation] dialog box allows you to display a list of the virtual device/PLC address data or backup and save the simulation display as an image.

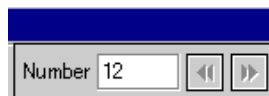


- NOTE**
- When you activate a simulation for the first time, [Device View] is displayed automatically. However, if you close [Device View] then close and re-open [Simulation], [Device View] is not displayed again. You must click the [Device View] button.

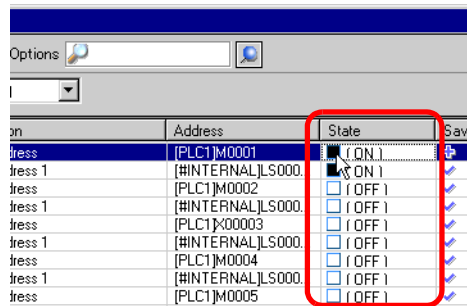
5 [Device View] allows you to display a list and edit the current value of the virtual device/PLC address used for simulation. Select the item you need from [Object].



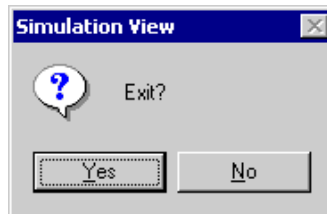
6 In the Device View, set the screen number from [Number] to switch the address display screen.



7 To toggle the bit address ON or OFF, in the [State] field click . To change the value in a word address in [Device View], select the value in the State field and make the change.



8 The following message is displayed when you click [Simulation View] . Click [Yes] to exit simulation and close the simulation.

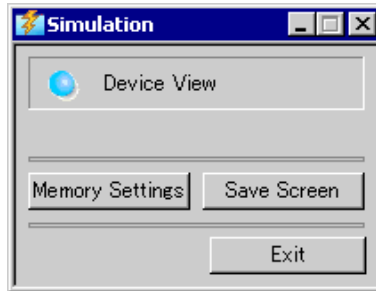


NOTE

- The SRAM backup data generated during simulation is cleared when you exit simulation.
- To exit the simulation, you can also click [Simulation] or, select [Exit] in [Simulation].



32.3 Settings Guide

32.3.1 [Simulation] Settings Guide

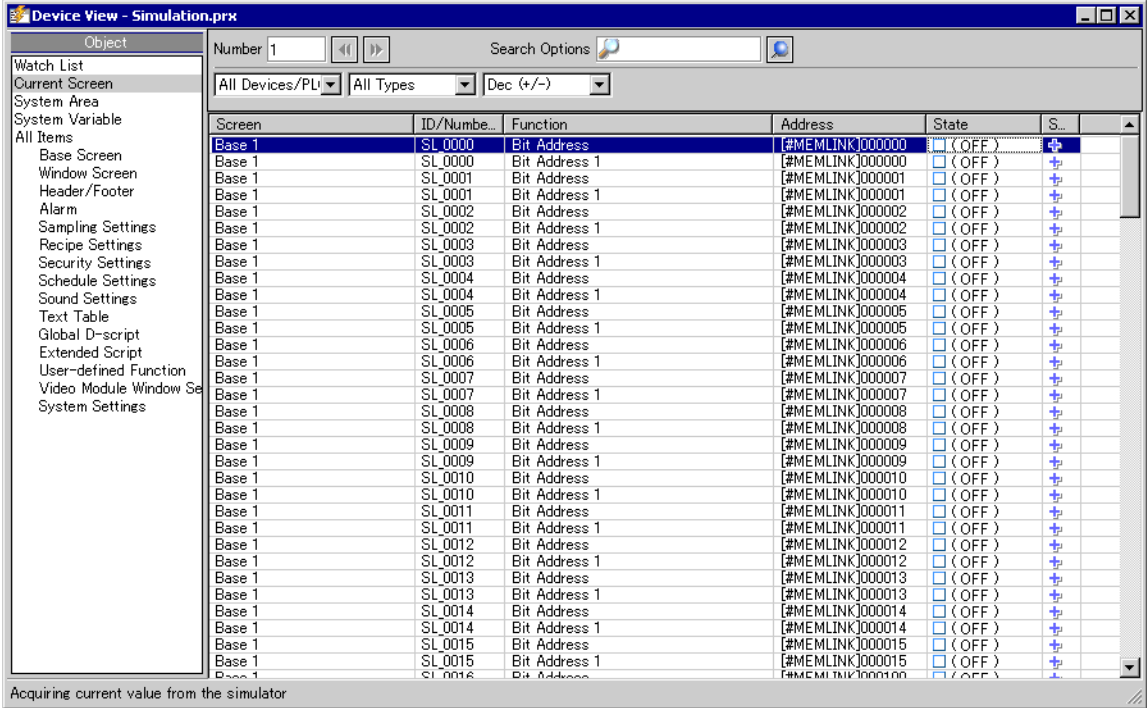






Setting	Description
Device View	Switch between display and hide for [Device View]. [Device View] allows you to display or edit the current value of the virtual device/PLC address for the simulation function. For more information on [Device View], see. "32.3.2 [Device View] Settings Guide" (page 32-10)
Configure Memory	After selecting [Device View], the [Configure Memory] dialog box appears. You can back up or initialize the virtual device/PLC address data. <div style="text-align: center;"> </div>
Back up PLC Device	When you exit the simulation, specify whether to back up the virtual device/PLC address. By backing up, you can retrieve the data from the same address when you open the same file.
Initialize PLC Device	Select [Initialize PLC Device] to clear all of the virtual device/PLC address data to 0.

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Setting	Description
Save Screen	<p>Upon clicking, the screen displayed in [Simulation View] is stored as a JPEG file.</p> <p>NOTE</p> <ul style="list-style-type: none">• When the [Black/White] check box is selected in the [System Settings], [Display Unit], Mode tab's [Screen Capture Settings] area, the screen image is stored in black and white.• You can specify the quality of the screen capture screen to save in the [Screen/Video Capture Settings]'s [Capture Image Quality] field. <p>Save in C:\Program Files\Pro-face\GP-Pro EX ***\CFA00\CAPTURE (***) stores the version number)</p> <p>File Name "CAP" + year, month, date, hours, minutes, seconds, and automatically generated three digit number + ".jpg". You cannot change how this filename is generated.</p>
End	<p>Exit simulation.</p> <p>NOTE</p> <ul style="list-style-type: none">• To exit simulation you can also click the [Simulation] icon , the [Simulation View] icon , or right-click [Simulation View] and in the shortcut menu click Close.

32.3.2 [Device View] Settings Guide



Setting	Description
Target	In [Device View], select the object associated with the address you want to view. NOTE <ul style="list-style-type: none"> Except [Real Variable], the variables not used as components in drawing settings are not displayed in [Device View].
Number	Define the screen number you want to view with 5 digits or less. NOTE <ul style="list-style-type: none"> You can only specify this when selecting [Base], [Window], [VMUnit Window] in [Object]. If you set up a [Screen Number] that cannot be saved, the number will appear in red.
	The address information of the connected device for the screen before or after the screen input in [Screen Number].
Open Screen	Displays the screen input in [Screen Number] on [Simulation View].
	When  is selected and the [Simulation] and [Simulation View] windows overlap, [Device View] appears in the front. Select  again to remove forcing the front display.
Search Options	If you search for a string in [Screen], [ID No./Rung], [Function], and [Address], all address information that includes the string is displayed.
Device/PLC	Select the device/PLC in the project that you want to view: [All Devices/PLCs], [PLC1], [#INTERNAL], or [Symbol Variable].

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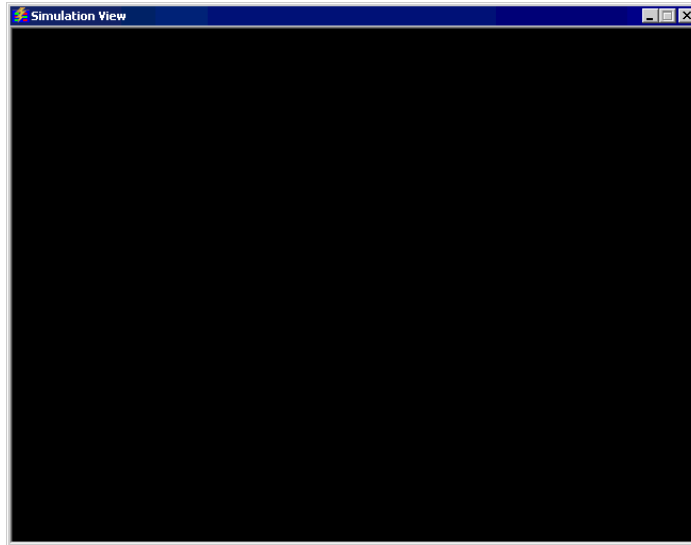
Setting	Description																													
Type	Choose an address type from [All Types], [Bit], [Word]																													
Type	<p data-bbox="353 220 1254 285">For the display [State] and data input formats, select [Oct], [Dec], [Dec (+/-)], [Hex], [BCD] or [Float].</p> <table border="1" data-bbox="399 301 1126 915"> <thead> <tr> <th data-bbox="399 301 518 336">Bit Length</th> <th data-bbox="518 301 655 336">Data Type</th> <th data-bbox="655 301 1126 336">Input/Display Range</th> </tr> </thead> <tbody> <tr> <td data-bbox="399 336 518 606" rowspan="6">16 Bit</td> <td data-bbox="518 336 655 370">Dec</td> <td data-bbox="655 336 1126 370">0 to 65535</td> </tr> <tr> <td data-bbox="518 370 655 405">Dec(+/-)</td> <td data-bbox="655 370 1126 405">-32,768 to 32,767</td> </tr> <tr> <td data-bbox="518 405 655 490" rowspan="2">Hex</td> <td data-bbox="655 405 1126 440">0 to FFFF(h)</td> </tr> <tr> <td data-bbox="655 440 1126 490">0 to FFFF(h)</td> </tr> <tr> <td data-bbox="518 490 655 575" rowspan="2">Oct</td> <td data-bbox="655 490 1126 525">0 to 177777(o)</td> </tr> <tr> <td data-bbox="655 525 1126 575">0 to 177777(o)</td> </tr> <tr> <td data-bbox="518 575 655 606">BCD</td> <td data-bbox="655 575 1126 606">0 to 9999</td> </tr> <tr> <td data-bbox="399 606 518 915" rowspan="8">32 bit</td> <td data-bbox="518 606 655 761" rowspan="4">Dec</td> <td data-bbox="655 606 1126 641">0 to 4294967295</td> </tr> <tr> <td data-bbox="655 641 1126 676">-2147483648 to 2147483647</td> </tr> <tr> <td data-bbox="655 676 1126 710">0 to 4294967295</td> </tr> <tr> <td data-bbox="655 710 1126 761">-2147483648 to 2147483647</td> </tr> <tr> <td data-bbox="518 761 655 846" rowspan="2">Hex</td> <td data-bbox="655 761 1126 795">0 to FFFFFFFF(h)</td> </tr> <tr> <td data-bbox="655 795 1126 846">0 to FFFFFFFF(h)</td> </tr> <tr> <td data-bbox="518 846 655 880">BCD</td> <td data-bbox="655 846 1126 880">0 to 99999999</td> </tr> <tr> <td data-bbox="518 880 655 915">Float</td> <td data-bbox="655 880 1126 915">1.175494351e-38 to 3.402823466e+38</td> </tr> </tbody> </table>	Bit Length	Data Type	Input/Display Range	16 Bit	Dec	0 to 65535	Dec(+/-)	-32,768 to 32,767	Hex	0 to FFFF(h)	0 to FFFF(h)	Oct	0 to 177777(o)	0 to 177777(o)	BCD	0 to 9999	32 bit	Dec	0 to 4294967295	-2147483648 to 2147483647	0 to 4294967295	-2147483648 to 2147483647	Hex	0 to FFFFFFFF(h)	0 to FFFFFFFF(h)	BCD	0 to 99999999	Float	1.175494351e-38 to 3.402823466e+38
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Display Select Area	<p data-bbox="353 946 1254 1012">The address information selected from [Object], [Number], [Device/PLC] and [Type] is displayed. You can select one line at the same time.</p> <ul data-bbox="353 1012 1254 1487" style="list-style-type: none"> <li data-bbox="353 1012 1254 1078">• Screen The active screen number and the settings are displayed. <li data-bbox="353 1078 1254 1178">• Location The ID of components in use, the group of address, the block number and the line number are displayed. <li data-bbox="353 1178 1254 1244">• Feature Displays which address is used by each function. <li data-bbox="353 1244 1254 1309">• Address Displays the device/PLC name and address <li data-bbox="353 1309 1254 1410">• State The current value changed to a [Type] string is displayed. If the current value cannot be displayed, [Retrieving] is displayed. <li data-bbox="353 1410 1254 1487">• Saves the watch list/Delete watch list Saves or deletes the active device/PLC address. <p data-bbox="358 1503 450 1537">NOTE</p> <ul data-bbox="353 1553 1254 1584" style="list-style-type: none"> <li data-bbox="353 1553 1254 1584">• When you select [Watch List] in [Object], you can [Delete]. 																													

Continued

Setting	Description
Save watch list	<p>Saves the active device/PLC address in the watch list. When you save addresses in the watch list, you can confirm all addresses at one time.</p> <p>NOTE</p> <ul style="list-style-type: none">• When you select [Watch List] in [Object], you can only [delete].• The Watch List is common for all projects. Once an address is added to the watch list, that item is not removed unless specified. When a previously added address is not used in the current simulated project, then the address appears in red. Although you cannot display or edit red address values, you can remove them.
Current Value Editing	Change the current value. The assignable value range varies by the selected [Type].
Status Bar	<p>The following message shows the communication status of the simulation.</p> <p>Initialize: Starting communication with the simulator.</p> <p>Communication (Normally): Acquiring current value from the simulator.</p> <p>Communication Error: Unable to connect to the simulator.</p>

32.3.3 [Simulation View] Settings Guide

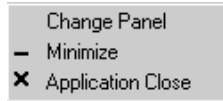
■ Simulation View

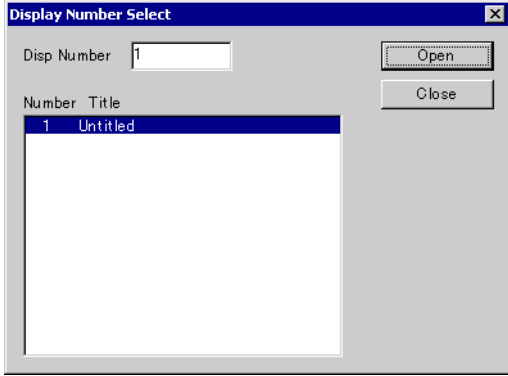


Setting	Description
Minimize Button	Hides the window and displays the icon in the Windows task bar.
Close Button	Exits the simulation function.

■ **Right-click Menu**

The following menu appears when you click the right mouse button on the simulation review screen.



Setting	Description
Screen Change	<p>The [Display Screen Selection] dialog box appears. You can switch the display screen.</p>  <p>The screenshot shows a dialog box titled 'Display Number Select'. It has a 'Disp Number' input field with the value '1'. Below it is a table with two columns: 'Number' and 'Title'. The first row contains '1' and 'Untitled'. To the right of the table are 'Open' and 'Close' buttons.</p>
Screen	Specify the base screen number that you want to switch to in the range of 1 to 9999. Only screens in the project can be opened in the Simulation.
List	Displays the screen number and title.
Open	Open the selected screen.
Close	Close the dialog box.
Minimization	Hides the window and displays the icon in the task bar.
Close	Exit simulation.

32.4 Restrictions

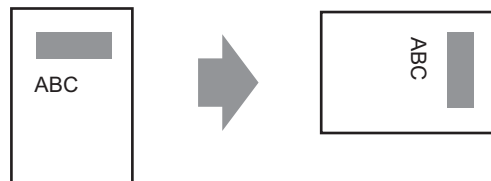
- When you activate a simulation for the first time, [Device View] is displayed automatically. However, if you close [Device View] then close and re-open[Simulation], [Device View] is not displayed again. You must click the [Device View] button.
- To simulate a different project file, select [Simulation] from the [Project (F)] menu again.
- The contents displayed in [Device View] are the same as [Cross Reference (R)]. You cannot display or change an address (including an indirect address) that is not displayed in [Cross Reference (R)].
- The following lists features unsupported in Simulation.

Feature	Details/Menu
System menu	• [Offline], [CF Start], [IP Address], [RGB Settings], [Address Monitor], [Logic Monitor], [Device Monitor], [Ladder Monitor]
Offline	• Cannot display the offline screen.
Print Feature	• Printing alarm banner, alarm history, and sampling data, printing associated with CSV display parts, printing commands in scripts, and printing screen images does not work.
Bar Code Reader	• Cannot read in data from a bar code reader.
AUX Output	• Cannot run AUX Output.
Playing Movies	• The Movie Player does not display. • When using a [File Manager] part set to [Select Movie], the File Manager will not display. • The Save to CF or FTP and the Event Recorder functions do not work.
SRAM Backup	• All data stored in SRAM, such as alarm history, sampling data, recipes, internal device backup, and the Japanese FEP converter, is deleted when existing Simulation.
Brightness/Contrast Settings	• The Brightness and Contrast adjustment bar does not display.
Standby Mode	• The Standby Mode function does not work.
Retentive Variables	• In the [Edit Symbol Variables] dialog box, even though the Symbol is set to Retentive, the data is erased when exiting Simulation.
Detect Backlight	• Detecting if the backlight is burned out does not work.
Remote PC Access	• The Remote PC Access Window Display does not display.
Change Backlight	• Changing the backlight color does not work.
Monitor	• Address Monitor, Logic Monitor, Device Monitor, and Ladder Monitor features do not work.
Cross-hairs Cursor	• The cross-hairs cursor feature does not work.
WinGP	• Device access APIs and handling APIs do not work, and error messages do not save.

Continued

Feature	Details/Menu
Logic	<ul style="list-style-type: none"> • Logic does not run.
I/O Driver	<ul style="list-style-type: none"> • I/O Driver does not work.
Logic System Variables	<ul style="list-style-type: none"> • Logic system variables do not work.
Online Monitor	<ul style="list-style-type: none"> • Online monitor does not work.
Transfer	<ul style="list-style-type: none"> • [Transfer] tool's LAN/USB Transfer • [Memory Loader] tool's CF Card/USB Transfer

- The SRAM backup data during simulation is cleared after you exit the simulation.
- Simulation does not work while WinGP is running.
- Except [Real Variable], the variables not used as components in drawing settings are not displayed in [Device View].
- Some unsupported functions in the model may operate in the simulation because the simulation does not identify the display model (For example, a project file may have sound settings for models with sound output functions (AGP-3550T) and the model changes to another model(AGP-3500T). When the project file is simulated, the sound output function does not run.). See the following description of the support function for each model.
 ☞ “1.3 List of Supported Functions by Device” (page 1-5)
- You cannot directly input the device address to [Watch List] on [Device View].
- You cannot display or edit D-Script temporary addresses.
- You can simulate the read-write function to CF or USB by D script.
- The read only or write only addresses allow you to read or write.
- The virtual device/PLC backup file cannot be read when a simulation of a different project file is running, or when the device/PLC configuration has changed in the same project file. The simulation is activated without the previously stored data.
- When running screen captures, files are stored in the following location:
 C:\Program Files\Pro-face\GP-Pro EX ***\CFA00\CAPTURE (*** stores the version number)
- When running a simulation after changing the [Setting Steps] from [Horizontal] to [Vertical] in the display change, the simulated contents will be displayed rotated 90-degrees.



- When the installation destination of the GP-Pro EX has more than 200 letters and a simulation is activated, the error message "You cannot activate the simulation because the maximum number of letters has been exceeded" appears. The simulation does not run normally. Reinstall the GP-Pro EX to an installation destination with path of less than 200 letters in English one byte characters.
- You cannot exit GP-Pro EX while executing a simulation.
- You can run Simulation on one project at a time.
- During Simulation, if you use the [Display] menu's [Preferences] command to change the language settings, an error message prevents the operation. To change the language, you need to exit Simulation.
- The communication scan value is always set to zero because the simulation does not communicate with the device/PLC. The communication status information is not received correctly in the simulation.
- In the [Display Unit]'s [System Area] tab, if the [System Area Start Address] is not set up, the project cannot display the System Area data.
- If the project does not pass the error check (from the [Project (F)] menu point to [Utility (T)] and select [Error Check (E)]), it will not run in Simulation.
- When using Microsoft Windows XP Service Pack2, starting Simulation may display an error message indicating the Windows firewall is blocking the application. In that case, select to remove the block and continue with the Simulation operation.
- In Simulation, you cannot set up clocks or calendars that use the System Area or system variables.

