GSLOGIC INTRODUCTION

Purpose of This Chapter

This chapter is intended as an overview and quick-start guide to get your first GS30 GSLogic PLC program quickly up and running.

For More Detailed Information

For further explanation of the GS30 PLC user interface, instruction set, and PLC implementation, please refer to the GSLogic Help File. The Help File can be accessed under the "Help" menu or anywhere you see the "?" symbol. Help on all of the following is located in the GSLogic Help file:

- *Full descriptions of the user interface, menu items, windows, and toolbars*
- *Basics of the GS30 PLC*
- *Special Function registers*
- *All GS30 PLC instructions*
- *Memory addressing and data types*
- *Using the digital and analog I/O*
- *Communication with the PLC and MODBUS addresses*

GSLogic Introduction

GSLogic is the PLC programming software for the built in GSLogic PLCs included on specified AutomationDirect Durapulse series of AC drives. This software can be used on any Durapulse drive series that includes the built-in GSLogic PLC: currently GS4, GS20/20X, and GS30. The software is designed to enable you to perform a variety of PLC programming functions. Windows editing functions like cut, copy, paste, multiple windows, etc., are supported. GSLogic also provides for register editing, settings, file reading, saving, online monitoring settings, and other convenience functions, such as:

- *Upload/download of PLC program files to the on board PLC*
- *Editing of PLC programs*
- *Archive/store multiple PLC programs on your PC or on the GS4-KPD drive keypad*
- *Control PLC PID loops (FPID instructions)*
- *View in real time all PLC registers*
- *Print PLC program files*

GSLogic includes an integral help file that includes software instructions, how to use GSLogic, and how to use the GS30 PLC.

GS30 PLC Summary

Introduction

The GS30 drive includes a built-in PLC. Programmed in ladder logic, the GS30 PLC provides a comprehensive set of basic and application-specific instructions. This chapter is intended to provide an overview of the GS30 PLC, and to help you get started using it. For those unfamiliar with the onboard PLC, the Help File included with GSLogic includes all the detailed information needed to use the PLC.

The PLC functionality can be accessed over communications by external PLCs (over serial Modbus) or the drive (using built-in PLC instructions). The purpose and scope of the onboard PLC is to provide the user with solutions that a simple PLC can provide. The GS30 PLC is perfectly suited for simple PLC applications, where digital and analog I/O requirements are small. For applications with complex PLC programming or large I/O requirements, please consider Click, Productivity, or Do-More/BRX. All of these PLCs can be easily integrated with the GS30 drive or the internal PLC. The optional GS4-KPD keypad of the GS30 is capable of storing multiple PLC programs (PLC must be disabled to perform a keypad copy).

There are *two methods* for communicating with the GS30 PLC. The *first method* is to use the *WPR* (write to parameters) *and RPR* (read parameters) *instructions* available in the PLC's library. These two instructions can read from or write to any GS30 AC drive parameter in the same physical drive, but not to other GS30 drives. The *second method* is to use *Modbus RTU*. The PLC is a Serial Modbus slave only. A Modbus RTU master can communicate with the PLC via serial only; the GS30 Modbus TCP/EtherNet/IP communication card cannot address the PLC. If the Modbus TCP/EtherNet/IP card is the desired method of communication, then parameters P09.11~P09.26 (PLC Buffers) can be used. Simply write the needed information from the PLC into the drive's PLC buffer parameters using the WPR instruction. The Modbus TCP/EtherNet/IP card can then read the VFD parameters.

For more detailed serial communication parameter information, refer to Chapter 5: Serial Communications. For more detailed Modbus TCP/EtherNet/IP communication card parameter information, refer to Appendix B.
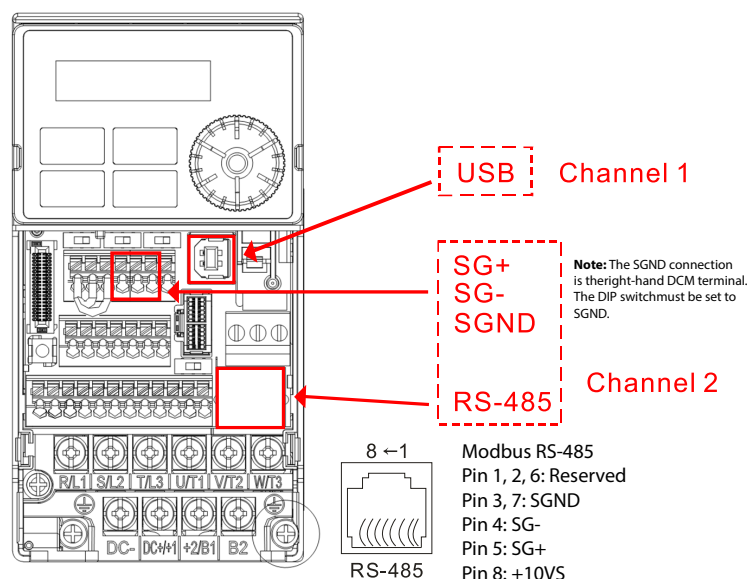
CAUTION: IF THE PLC IS IN CONTROL OF SPECIFIC INPUTS AND OUTPUTS, ONCE THE PLC IS DISABLED THE BEHAVIOR OF THE INPUTS AND OUTPUTS ARE NOW CONTROLLED BY P02.01–P02.07 / P02.13–P02.17. IT IS GOOD PRACTICE TO SET THE I/O THAT IS USED IN THE PLC TO "NO FUNCTION," SO WHEN THE PLC IS DISABLED THERE IS NOT SUDDEN OR UNEXPECTED MOTION.

Notes on Using GSLogic, the GS30 PLC, and the GS30 Drive

1) The GS30 PLC default node address is 2. The PLC node address can be changed in parameter P09.35, but this address cannot be the same as the GS30 drive node address of P09.00, which has a default node of 1. If multiple GS30 drives and PLCs will be connected to a third-party Modbus Master, *be sure to avoid duplicate node numbers*.

2) The GS30 drive provides one RJ45 port and one set of terminals (SG+ & SG-) for serial RS-485 communications, internally wired in parallel, that can either be used to connect to RS485 networks. The GS30 drive provides one Type B Serial port that can be used to connect to a PC and download PLC programs using GSLogic (see figure below).

   Channel 1 (Type B USB Serial for PC communication only) has a fixed communications format, and can only be used to connect the drive with GSlogic software on a PC. Ensure GSlogic Communication serial RTU/ASCII setting match the Drive Parameter P09.04 setting. All other settings are hard coded for this channel.

   Channel 2 is the serial interface to Modbus-capable PLCs, HMIs, and PCs for programming and reading/writing data. Channel 2 can be accessed via the built-in RJ45 connector (ideal for connecting multiple drives together with standard RJ45 cables) or via the SG+, SG-, and SGND terminals. The SGND terminal is the right-hand DCM terminal and the DIP switch above it must be set to SGND. Channel 2 has a default communications setting of 9600, 8, O, 1 Modbus RTU (one RJ45 port and one set of terminals for RS-485). If communication settings in P09.01 and P09.04 are changed, this also changes the PLC comm settings. The Drive node and PLC node will always have the same serial baud rate and protocol. The communication settings are the same for the PLC and Drive communications, programming, and configurations. P09.01 and P09.04 are used to set up the serial communication rate and protocol.

USB — Channel 1

SG+ SG- SGND — Channel 2

Note: The SGND connection is the right-hand DCM terminal. The DIP switch must be set to SGND.

RS-485

8 ←1

RS-485

Modbus RS-485
Pin 1, 2, 6: Reserved
Pin 3, 7: SGND
Pin 4: SG-
Pin 5: SG+
Pin 8: +10VS

Note: If using both Modbus connection points (Terminal block and RS-485 Port), ensure you have the same ground reference. Non-equivalent grounding, or grounding from different references, can introduce noise issues that interfere with communications.

4) A client can simultaneously access data from the GS30 drive and the internal PLC. This is performed by using the two node numbers. For instance, if the GS30 drive node is 1 and the internal PLC node is 2, then the client command will be: 01 (node) 03 (read) 0400 (address) 0001 (1 data item), indicating that it must read the data from the GS30 drive parameter P04.00. Or the client will select the PLC: 02 (node) 02 (read) 0800 (address) 0001 (1 data item), indicating that it must read the data from the internal PLC which is the address to internal bit M0.

5) The PLC program will be disabled from running when uploading/downloading programs.

6) Please note when using WPR (Write to Drive Parameters) commands, values may be modified up to a maximum of 10^6 times. More than this number of writes will result in a memory write error. The calculation of modifications is based on whether the entered value has been changed. If the entered value is left unchanged, the modification count will not increase. But if the entered value is different from before, the modification count will increase by one.

The parameters in the following table are exceptions, and can be written to an unlimited number of times. The FREQ instruction is also an exception to this.

Parameter	Description
P00.10	Control Mode (Speed or Torque)
P00.11	(Speed) Control Mode
P00.27	User-defined value
P01.12~P1.19	1st~4th Acc/Dec Time
P02.12	Multi-Function Input Contact Selection
P02.18	Multi-Function Output Contact Selection
P04.50–P04.69	PLC buffer 1~20
P08.04	Upper Limit for Integral Time
P08.05	PID Output Frequency Limit
P10.17	Electronic gear A
P10.18	Electronic gear B
P11.34	Torque command

7) When parameter P00.04 is set to 28 (User Display = PLC D1043 Value), the GS30 keypad displayed value will be the value of PLC register D1043.

Optional Digital Keypad GS4-KPD Can Display 0~FFFF (hex). (See the 3rd line in the figure below)
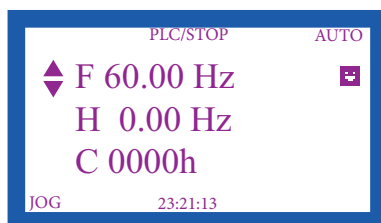
8) In the PLC Run and PLC Stop modes, the parameter P00.02 cannot be set to 9 or 10 (cannot be reset to factory defaults). PLC must be in Disable mode (PLC0) for this. A power cycle is needed after resetting to defaults.

9) The PLC memory will be cleared and the program erased from the PLC when parameter P00.02 is set to 6. The PLC must be in Disable mode before resetting the PLC.

10) When the PLC controls the GS30 drive operation, control commands will be entirely controlled by the PLC, and will <u>not</u> be affected by the setting of parameter P00.21 or P00.31.

11) When the PLC controls the GS30 drive frequency commands, the commanded frequency will <u>not</u> be affected by parameter P00.20, P00.30, or the P00.29 Hand ON/OFF configuration.

12) The use of certain registers will disable the drive's control of the drive output frequency. The instructions and registers that transfer control of the drive output to the PLC are: FREQ, M1040, M1025, M1026, and M1027. See P00.19 or P09.33 for details about what the PLC controls.

13) GS30 PLC is limited to 5,000 Steps. Steps in the PLC program are not directly proportional to rungs. See GSLogic Help inside the GSLogic software for additional information.

14) When the PLC controls the drive operation, if the keypad STOP (P00.32) setting is valid, this triggers an FStP error and causes the drive to stop.

15) The corresponding drive parameter Multi-Function Inputs and Outputs will be disabled when the PLC ladder program contains external terminal usage X and Y registers. (*See GS30 AC Drive to PLC Input/Output Cross Reference tables,* page 8–9).

16) Several parameters in the GS30 drive are directly related to the GS30 PLC operation, monitoring, or control.

GS30 AC Drive Parameters Related to GS30 PLC	
Parameter/Setting Number	**Parameter/Setting Description**
P02.01~P02.07 = 51	Multi-Function Inputs = PLC Mode Select bit 0
P02.01~P02.07 = 52	Multi-Function Inputs = PLC Mode Select bit 1
P02.52	PLC Digital Input Mask
P02.53	PLC Digital Output Mask
P03.30	PLC Analog Output Mask
P00.04 = 28	User Display = PLC D1043 Value (displayed only in hexadecimal)
P09.11~P09.26	PLC Buffers
P09.01 = 9.6	Modbus Baud Rate = 9.6k
P09.04 = 13	Modbus Protocol = 8,N,2 (RTU)
P00.02 = 6	Parameter Reset = Reset PLC (clear PLC)
P00.19	PLC Command Mask
P09.35 = 2	PLC Address = 2 (Cannot be the same as the address of the drive (P9.00))
P09.33	PLC Frequency Command Force to 0

GETTING STARTED

The GS30 automatically switches to PLC mode when the external multi-function input terminals (DI1–DI7) are in PLC Mode selection bit 0 (51) or PLC Mode selection bit1 (52), and the terminal contact is closed or open. In this case, keypad switching is invalid. The corresponding actions are listed below:

PLC mode		PLC Mode selection bit1 (52)	PLC Mode selection bit0 (51)
Using GS4-KPD (optional)	Using GS30 Keypad		
Disable	PLC 0	OFF	OFF
PLC Run	PLC 1	OFF	ON
PLC Stop	PLC 2	ON	OFF
Maintain previous state	Maintain previous state	ON	ON

- When the PLC screen from the keypad is set to PLC0 (or "Disable" on GS4-KPD), the built-in PLC is disabled and you cannot use GSLogic to connect to it.
- When the PLC screen from the keypad is set to PLC1 (or "PLC Run" on GS4-KPD), the built-in PLC is enabled and you can use GSLogic to connect to it through Modbus.
- When the PLC screen from the keypad is set to PLC2 (or "PLC Stop" on GS4-KPD), the built-in PLC is enabled and you can use GSLogic to connect to it. However, the programs in the built-in PLC do not work.
- When the built-in PLC is enabled (PLC1 or PLC2), you can switch between PLC Run or PLC Stop through GSLogic.
- The external terminal control method is the same as shown in the table above.

NOTE: When the input/output terminals (DI1-DI7, R1, and DO) are included in the PLC program, these input/output terminals are used only by the PLC. For example, when the PLC program controls Y0 during PLC operation (PLC1 or PLC2), the corresponding output terminal relay (R1) operates according to the program. At this time, the multifunctional input/output terminal setting has no effect. Because these terminal functions are already being used by the PLC, you can determine the DI/DO/AO in use by the PLC by looking at P02.52, P02.53, and P03.30.

NOTE: When the PLC program uses special register D1040, the corresponding AO contact AO1 is occupied.

NOTE: P03.30 monitors the action state of the PLC function analog output terminals; bit 0 corresponds to the AO1 action state.

CONNECT TO PLC

Start operation of PLC functions in accordance with the following steps from the GS30 drive keypad.

1) Press the MENU button on the keypad until PLC0 appears.
2) Press the UP arrow key to navigate to PLC1 or PLC2 as desired.
3) Press ENTER to start the selected PLC mode.

Enters into PLC2 mode

Enters into PLC1 mode
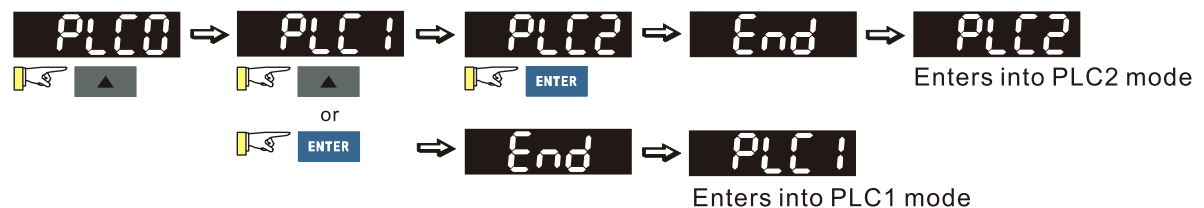
If using the optional GS4-KPD, follow the four steps below instead:

1) Using the Menu key on the GS30 digital keypad, select 5: PLC, press Enter key (see figure below).
The PLC can be connected to only when in Run or Stop modes. When it is in Disable mode the communications to the PLC will be terminated.
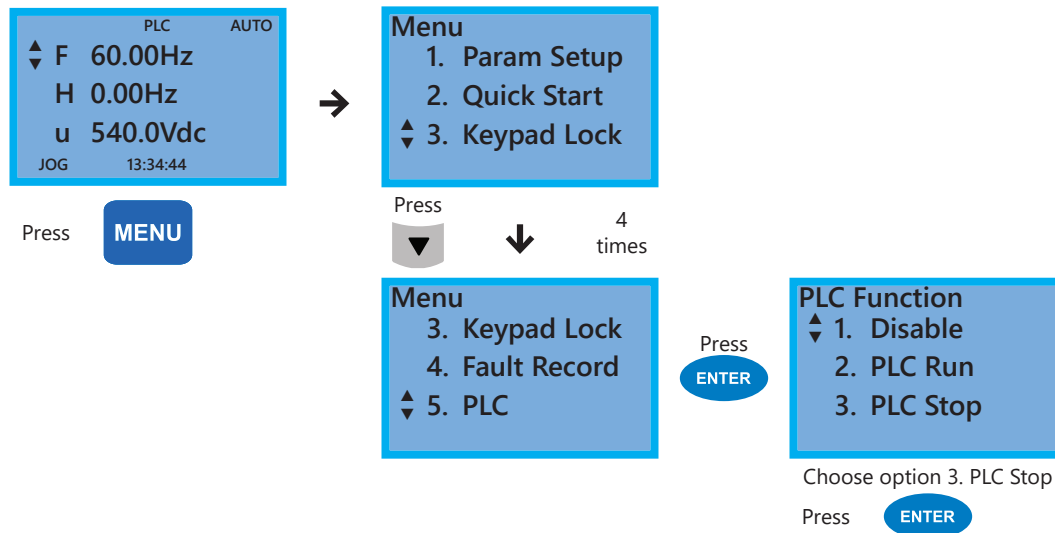
PLC functions are as shown in the lower right menu of the figure above; options 2 or 3 will enable the PLC communication connection. Choose 3 (stop) for now, or if you do not know what the PLC might do if placed into Run mode.

       1: PLC0 - Disable: No function

       2: PLC1 - PLC Run: Enable PLC functions

       3: PLC2 - PLC Stop: Stop PLC functions

Important: When the PLC is Disabled, the PLC Modbus RTU node does not exist, and no communications to the PLC can occur. The PLC must be in Run or Stop for GSLogic or a Modbus device to be able to connect.

2) Wiring: Connect the GS30 drive USB serial communication interface port to a PC USB port. Then you are ready to install and connect to GSLogic software.

To USB B port

ADC Part # USB-CBL-AB3

To USB A port

CONTROLLING DRIVE IO WITH THE PLC

When the external Multi-Functional Input terminals (DI1 to DI7, P02.01 to P02.07) are set to function 51 or 52 (PLC Mode select bit0 or bit1), the digital inputs have priority and the keypad will not be able to change PLC modes.

PLC Mode	Select Bit1 (52)	Select Bit0 (51)
PLC0 - Disable	OFF	OFF
PLC1 - PLC Run	OFF	ON
PLC2 - PLC Stop	ON	OFF
Maintain Previous State	ON	ON

GS30 AC Drive to PLC *Input* Cross Reference			
GS30 Digital Input	PLC Address	GS30 Analog Input	PLC Address
FWD (DI1)	X0	AI1	D1028
REV (DI2)	X1	AI2	D1029
DI3	X2	AI10	D1031
DI4	X3	AI11	D1032
DI5	X4		
DI6	X5		
DI7	X6	–	
DI10	X12		
DI11	X13		
DI12	X14		

GS30 AC Drive to PLC *Output* Cross Reference			
GS30 Digital Output	PLC Address	GS30 Analog Output	PLC Address
R1-R1C-R1O	Y0	AO1	D1040
DO1	Y3	AO10	D1041
DO2	Y4	AO11	D1042

NOTE 1: When X and Y addresses for the input and output terminals are included in the PLC program, these input/output terminals will only be used by the PLC. The DI and DO multifunction assignments are configured by parameters P02.01~P02.07 and will be overridden. As an example, when the PLC program controls Y0 during PLC operation, the corresponding output terminal relay (R1) will operate in accordance with the program. At this time, the Multi-Function Output terminal setting P02.13 will be ineffective because these terminal functions are already being used by the PLC.

NOTE 2: When the PLC uses the special registers D1040, the corresponding Analog Output AO1 will only be used by the PLC overriding the multifunction configuration. The AO multifunction assignments, when they are drive controlled, are configured by parameter P03.20.

Installation of GSLogic Programming Software
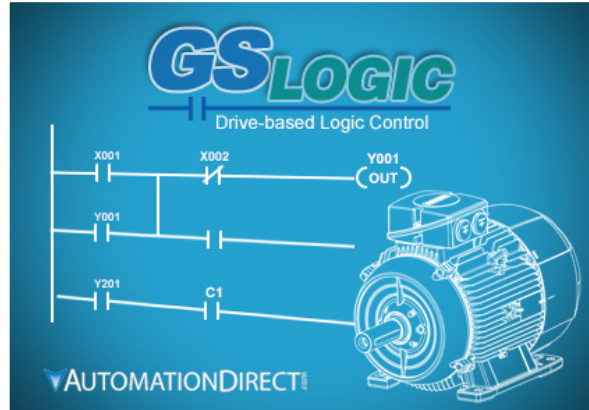
System Requirements

GSLogic Windows-based programming software environment. Please check the following requirements when choosing your PC configuration:
- *Windows OS: 7: 32 & 64 bit, 8: 32 & 64 bit, 8.1: 32 & 64 bit, 10: 64 bit*
- *300MB free hard-disk space*
- *RAM: Windows 7 or higher*
  - *with GUI version 2.0.0.x or higher, RAM = 2GB memory (4GB recommended)*
  - *with GUI version 1.10 or lower, RAM = 512MB free RAM (1GB recommended)*
- *USB Port for project transfer to GS30*

About Getting Started

If you are familiar with Programmable Logic Controllers in general, then following the simple steps in this chapter may be all you require to start being productive using a GS30 PLC system. After you have completed the steps, your GS30 controller will be running the ladder logic project that you programmed.

Technical Support

We strive to make our manuals the best in the industry. We rely on your feedback to let us know if we are reaching our goal. The feedback section of the Help File can be used to send a comment to Technical Support. If you cannot find the solution to your particular application, or if for any reason you need technical assistance, please call us at:

1–770–844–4200

Our technical support group will work with you to answer your questions. They are available Monday through Friday from 9:00 A.M. to 6:00 P.M. Eastern Time. We also encourage you to visit our web site where you can find information about our company and specific technical information about a wide array of our products.

https://www.automationdirect.com

## Installing GSLogic Programming Software

1) Download the latest version of the GSLogic Software, (See ADC's website for GSLogic editing software: www.automationdirect.com/pn/gslogic). Or, if the GSLogic USB drive is available, insert it into your PC USB port. Open the GSLogic setup.exe file.

2) The "InstallShield Wizard" popup (shown below) will appear briefly while the software is checking for previous installs.
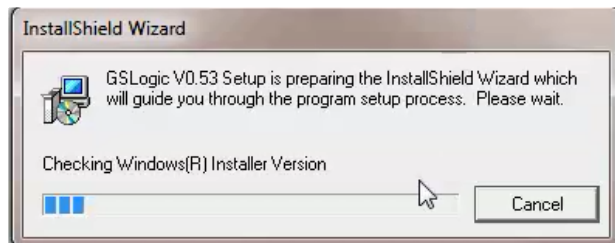

3) The Welcome popup will appear, allowing you to choose to proceed or not. Click the "Next" button to install.
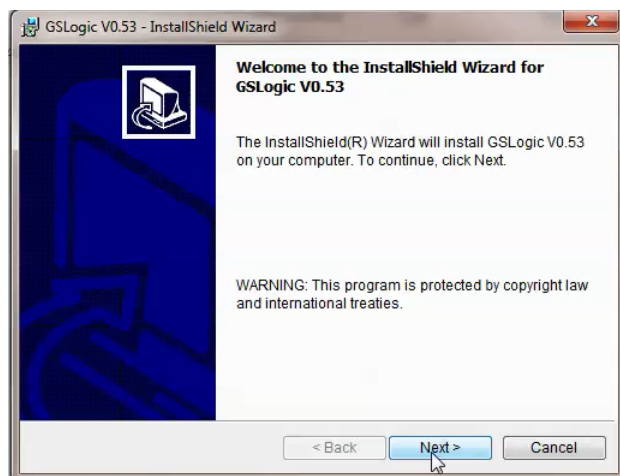
4) The "Customer Information" window will open next. Enter a User Name and Organization name, then click "Next."
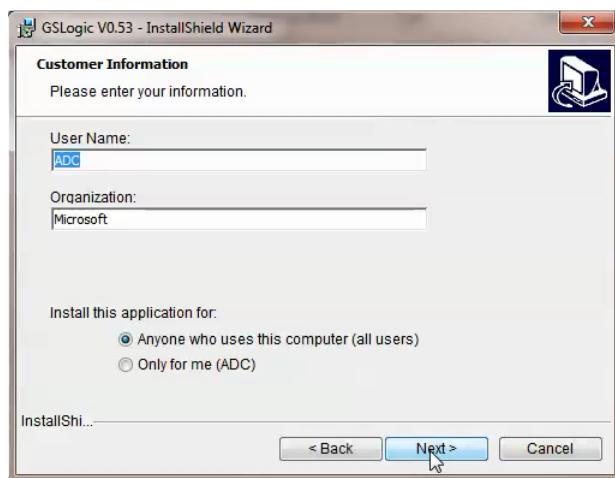
5) The Destination Folder popup will appear, showing the default path to the destination file; click "Next" to continue. Should you want to change to another destination, Click "Change" and another dialog box will appear, allowing entry of a new file path.
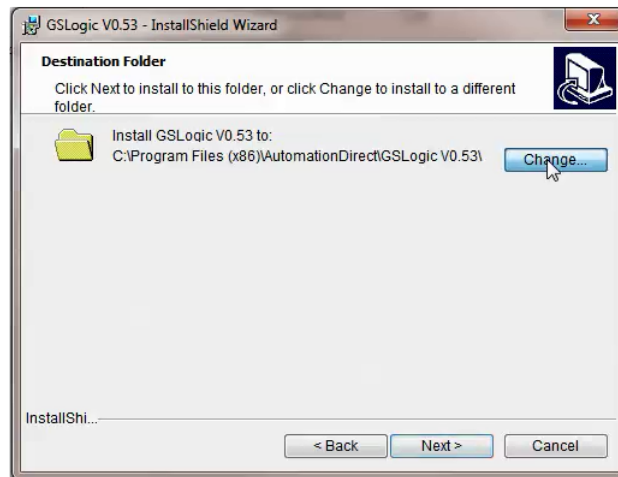
The default installation folder is: C:\Program Files (x86)\ AutomationDirect\GSLogic Vx.xx

6) Once you have selected the install folder (default or new path), the "Destination Folder" window will appear. Click "Next" to continue the installation process. Click "Install" when ready to install the software.
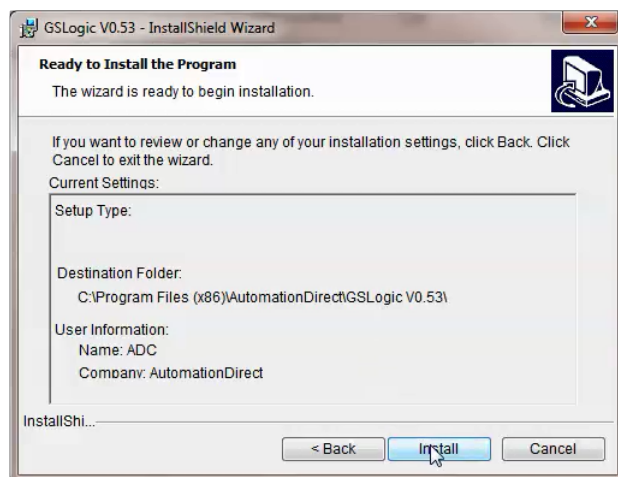
7) The Installation is now complete. Click "Finish." Double-click on the GSLogic icon or navigate to the AutomationDirect folder in the start menu to open the GSLogic programming environment.
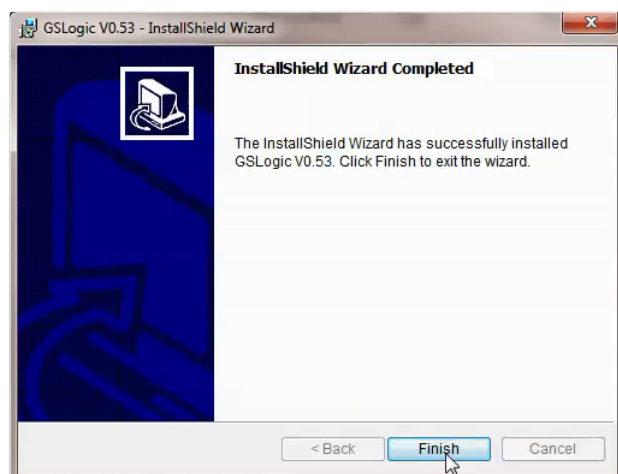
PROGRAM WRITING

CONNECTING GSLOGIC PC TO GS30 PLC

In order to connect to the PLC with GSLogic, the PLC must be enabled by either selecting PLC1 or PLC2 on the GS30 keypad, or PLC Run or PLC Stop in the optional GS4-KPD keypad. Also, no other Modbus master can be connected to the GS30 drive; *this includes GSOFT2.*
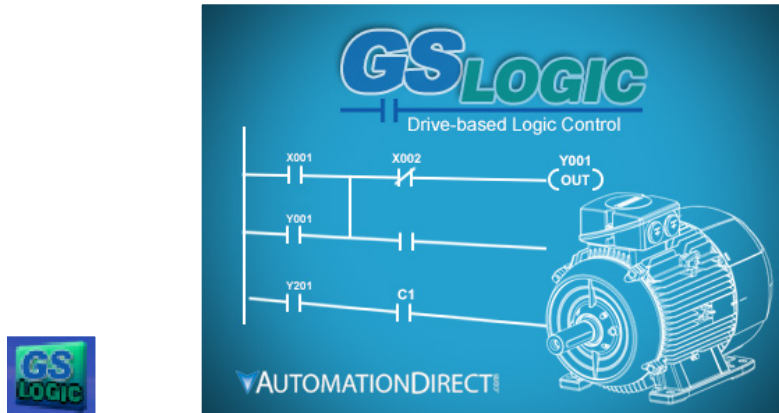
When running GSLogic for the first time, before a "New file" has been used, only the "File (F)," View (V)," "Communications (C)," "Options (O)," and "Help (H)" functions will appear on the function toolbar.
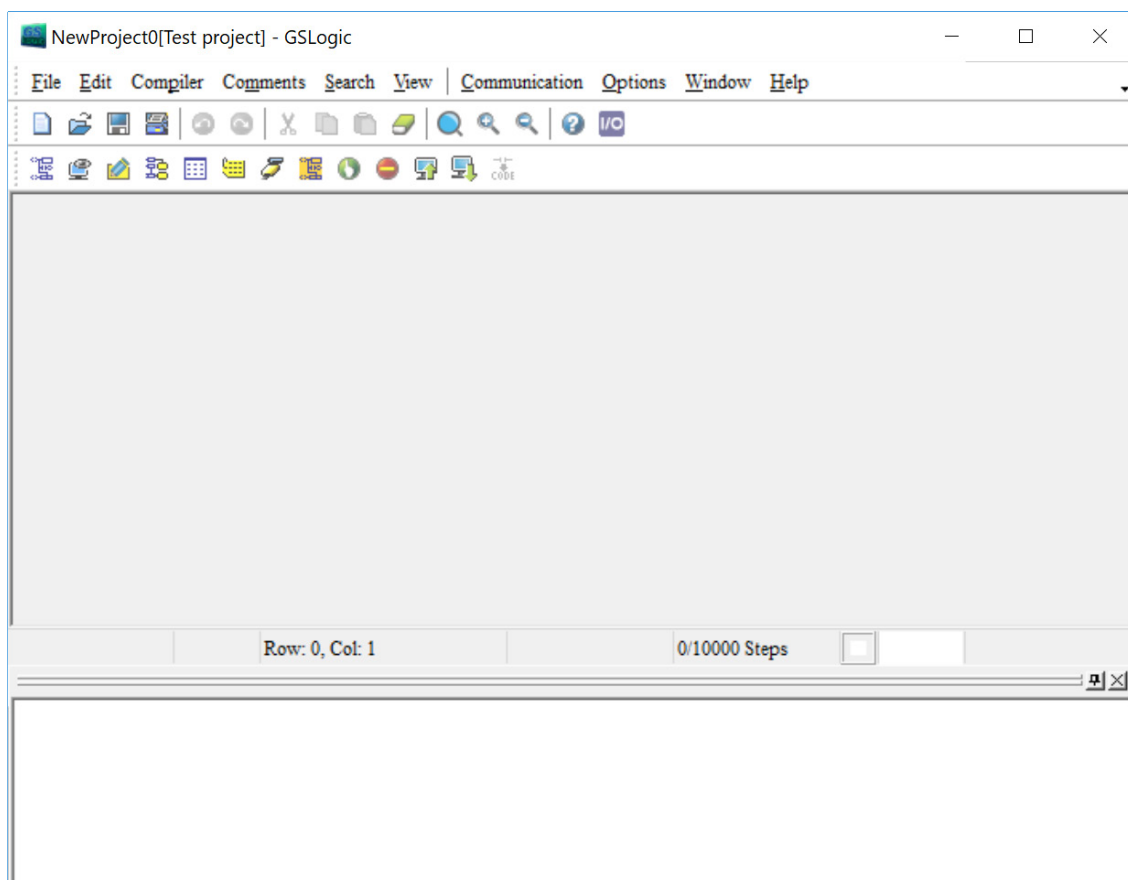
After running GSLogic for the second time, the last file edited will open and be displayed in the editing window.
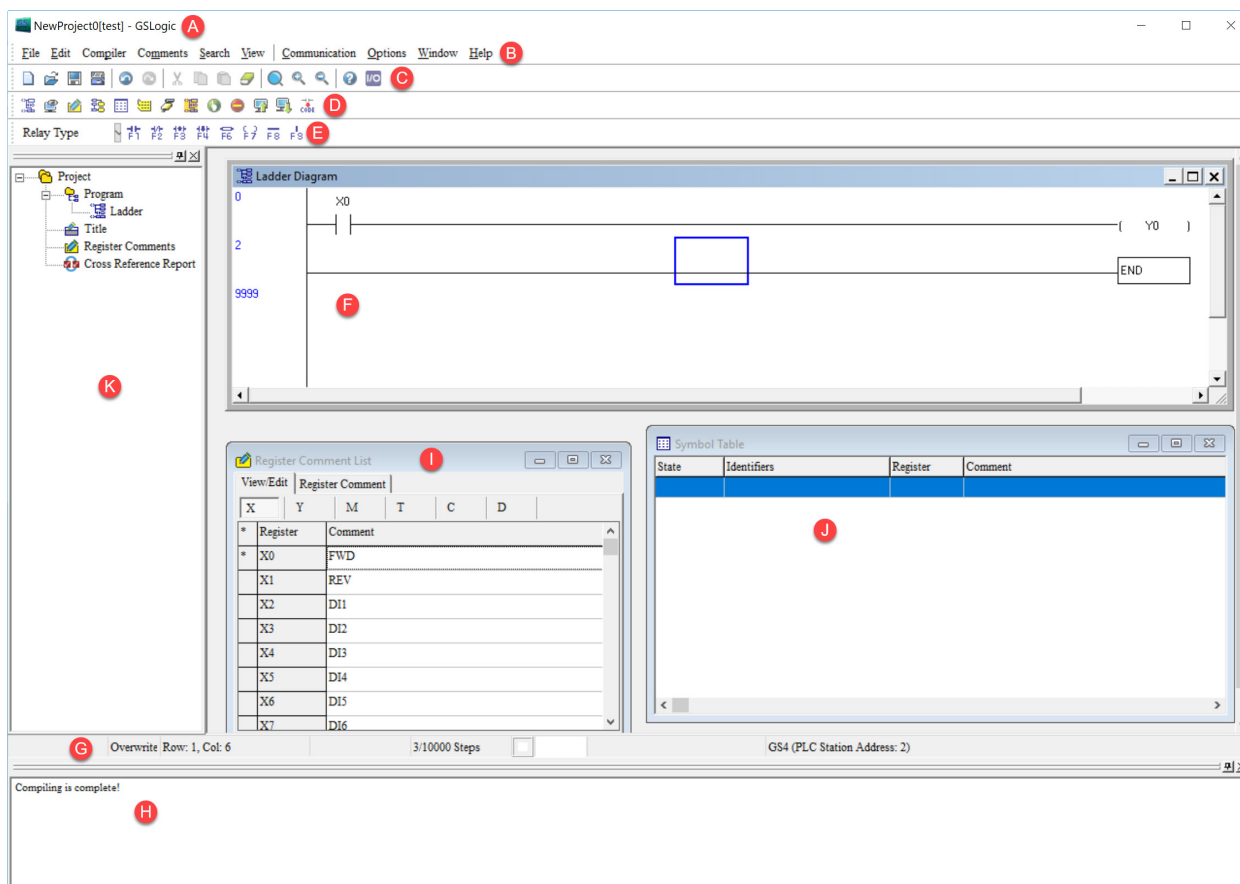
Following is a brief description of the various areas in the GSLogic editing software window shown above.

| Symbol	Name	Description
A	Project Title Toolbar	Project File Name and Project Title shown here (File Name [Project Title])
B	Menu Toolbar	Individual drop-down menu options
C	Standard Editing Toolbar	Contains standard Windows application features
D	PLC Quick Access Toolbar	Allows easy access to the most commonly used GSLogic tasks
E	Ladder Editing Toolbar	Provides quick access to the most common devices used in creating ladder code
F	Ladder Diagram Window	Where the program ladder code is entered and edited
G	Status Toolbar	Displays messages regarding PLC and program status
H	Output Window	Shows compiling status and error messages
I & J	Auxiliary Window	The Symbol Table and Register Comment List Window are shown in order to demonstrate how multiple windows can be placed in the workspace.
K	Reveals or hides the Project Workspace Window	From here, you can open the Ladder Diagram window, change the project title and description, Register Comments, and view the Cross Reference table.

Click the "NEW FILE" icon on the toolbar to open a new file (Ctrl+N).
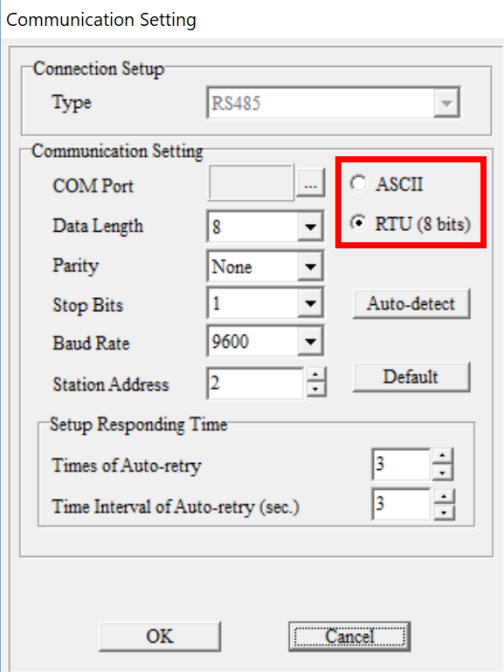You can also use "File (F)"=>New file (N) (Ctrl+N).

The "Program Information" window will appear after opening a new file.
Enter the Program Title and File Name. These will appear at the top of the project window.
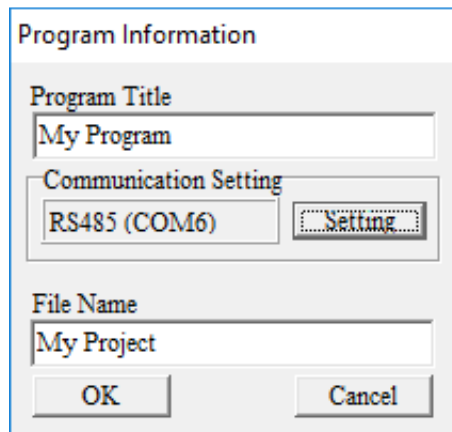
Select "Setting" to choose the communication settings to be used. To adjust communication settings on an existing project, go to the Communication menu and select "Communication Settings." Choose the correct COM Port and ASCII/RTU setting. Only the GSLogic communication settings selection for ASCII or RTU must be the same as the Drive's ASCII/RTU setting found in P09.04. All other settings on this window can be left at default. These values are hard coded in the GS30 drive to communicate with GSLogic.

Communication Setting: Perform settings in accordance with the desired communications method. The Default Station Address for the PLC is 2. (The Modbus station address must be different from the GS30 Drive's station address. The Drive's default address =1.)

Click "OK" after completing settings to return to program editing in ladder diagram mode.

In ladder diagram mode, you can perform program editing using the buttons on the Ladder Diagram Toolbar.
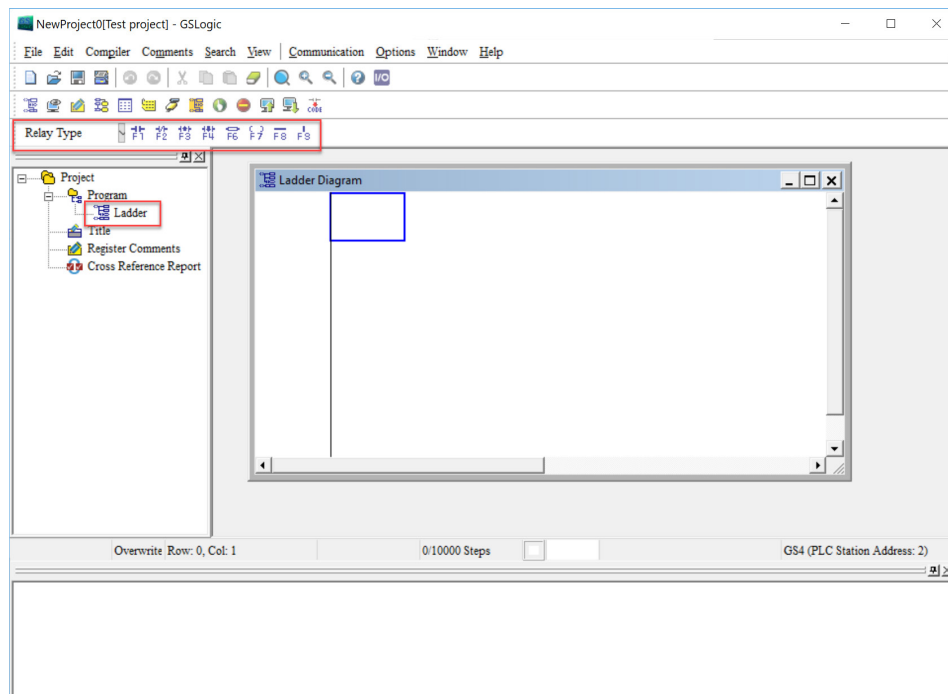
BASIC LADDER PROGRAM EXAMPLE

1) With the cursor in the ladder diagram editor window, select a "Normally Open" contact icon from the Ladder Editing Tool Bar, or use keyboard function key (F1) operation.
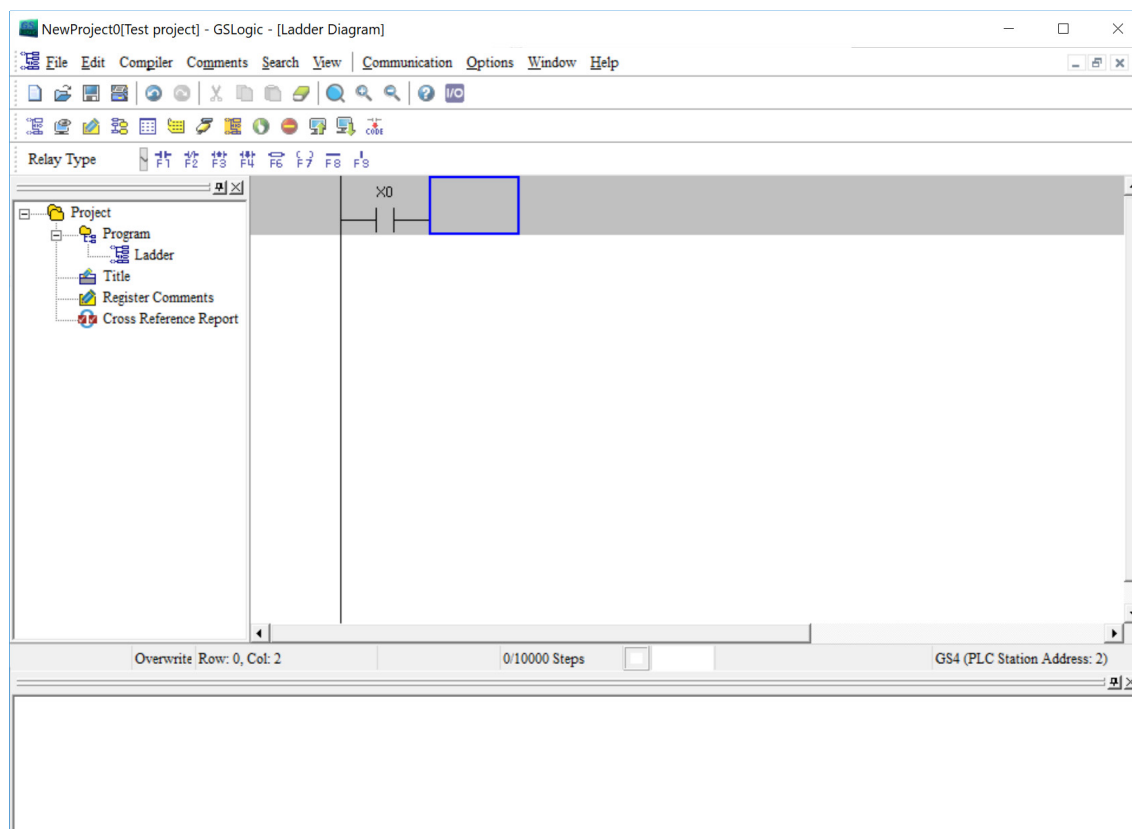

2) The Input Device Instruction dialog box will appear. Select the device name (such as "M" or "X"), the device number (such as "10" or "0"), and input comments (such as "Enable Pushbutton") can be selected; click the OK button when finished. X0 is a digital input which is tied to the FWD terminal of the drive. Any preconfigured behavior of the terminal is void now that the input is being used in the PLC code. Once the PLC is in Disable Mode, the control of the digital input terminal will belong to the drive again.
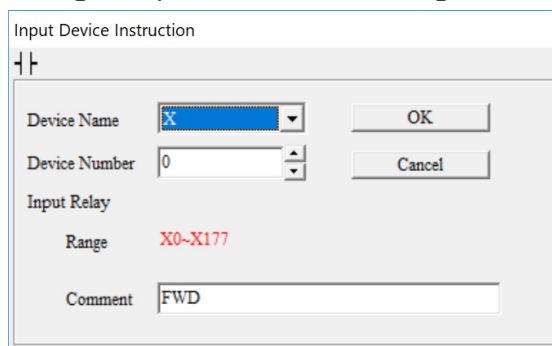
3) Click on the output coil icon (a) or press function key F7. In the Input Device Instruction dialog box choose device name (such as "M"), device number (such as "0"), and input comments (such as "Enable Light"). Click the OK button when finished.
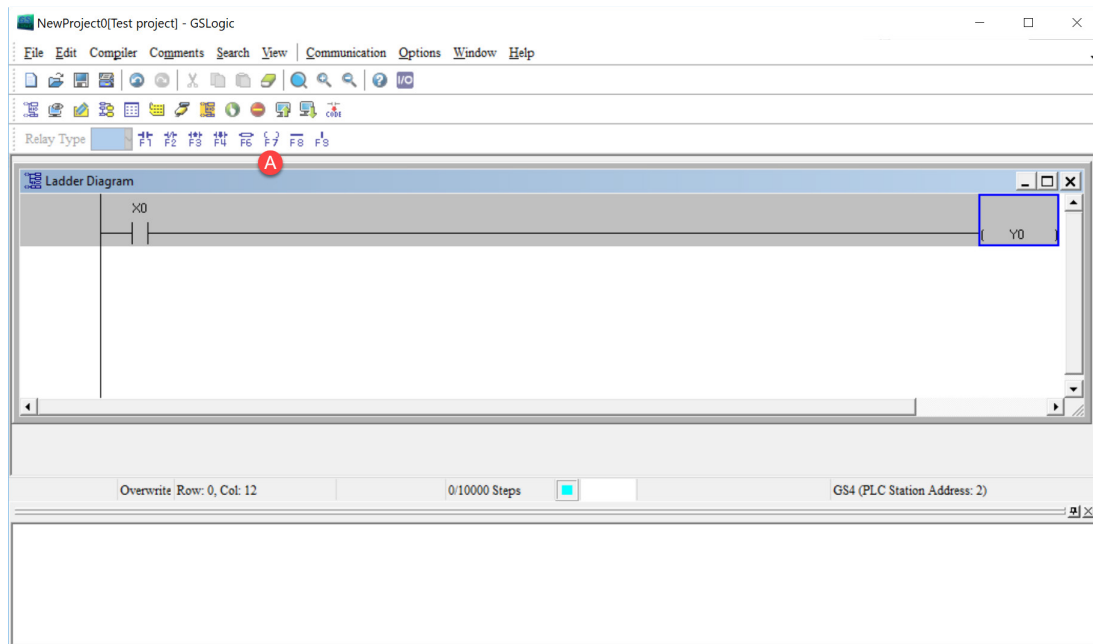
4) While the cursor edit box is on the next row, double-click in the cursor box to bring up the Input Instruction text box (or press F6 to invoke the Instruction List dialogue box). Type in "End" and click OK to add the end instruction rung to the ladder program. This signals the end of the ladder program.
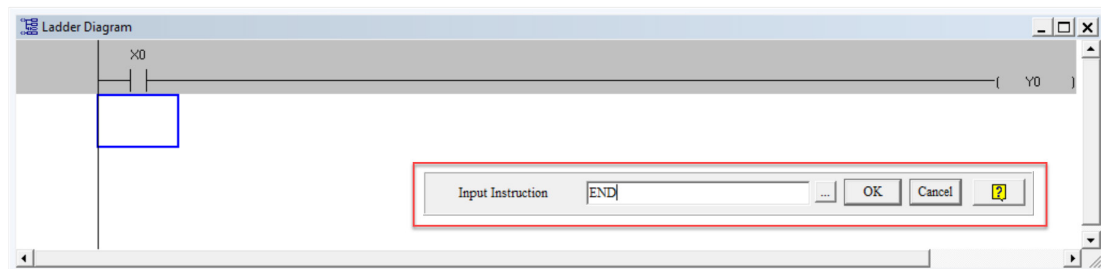

5) Click on the compile (CODE) icon on the tools ribbon. After compiling, the number of steps will appear on the left side of the editor window. The PLC can only accept 2,000 steps.
   *Note*:
   Steps in the PLC program are not proportionally related to rungs. One rung of code with a single contact and a single coil would have two steps for that one rung. A rung with one contact and the FREQ instruction would have eight steps.

PROGRAM DOWNLOAD

Be sure the PLC is NOT in Disabled mode (PLC0) on the GS30 keypad. After creating and compiling a program using GSLogic, select the Write to PLC icon on the tool ribbon () . When the Transfer Setup window appears, make sure that the Communication Mode is set to "Write to PLC," which will download the program to the PLC. GSLogic will perform program download with the GS30 drive PLC in the communications format specified in previously set up communications settings dialog box.
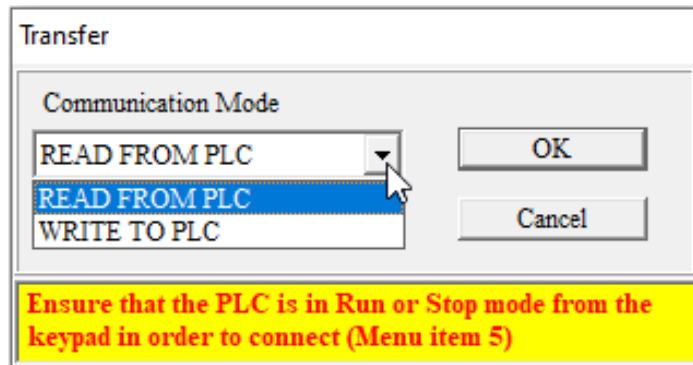
If the PLC is in Run mode, a warning will appear asking if you want to continue. Press Yes if you want to proceed with the download.
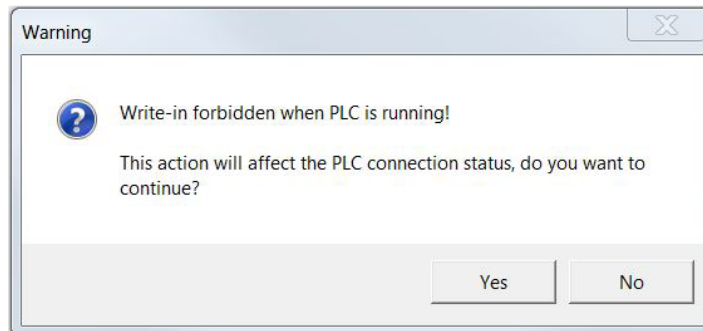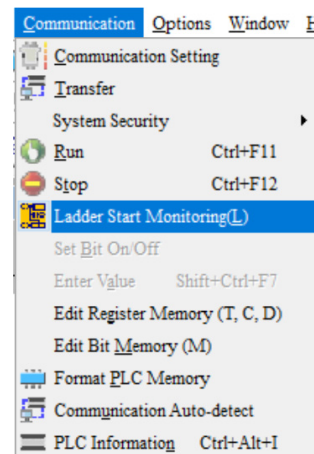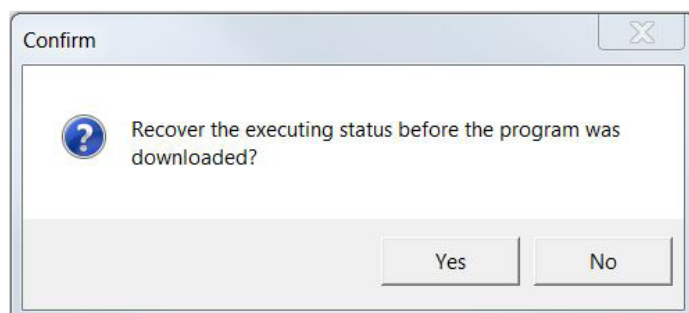

After the program has downloaded, GSLogic will ask you to confirm that you want to put the PLC back in the previous run/stop state it was in before the download. Click Yes if you would like to recover this state.
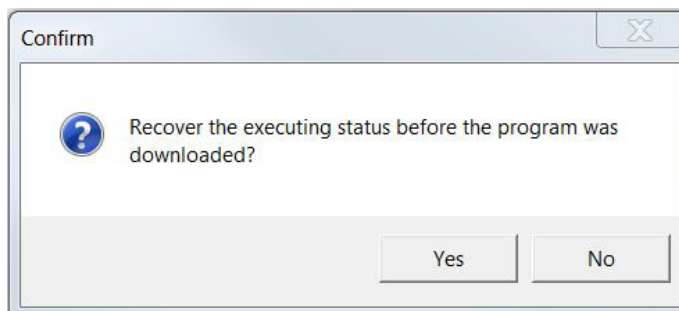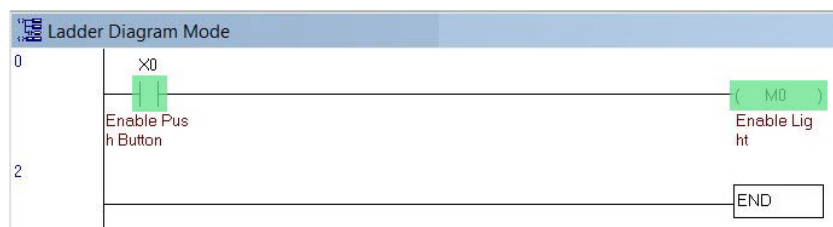

If the PLC is in Run mode, then the ladder code is now running on the GS30 PLC.

PROGRAM MONITORING

Press the Online Mode icon ( ) to go online with the PLC and the current ladder code, and confirm the PLC is in Run Mode at the bottom of the screen. While confirming that the PLC is in the Run Mode after downloading a program, click on the Ladder Start Monitoring icon ( ) in the Communication menu drop-down, or on the tools ribbon (see figures below).

Confirm

? Recover the executing status before the program was downloaded?

Yes   No

Communication Options Window H

- Communication Setting
- Transfer
- System Security ▶
- Run   Ctrl+F11
- Stop   Ctrl+F12
- Ladder Start Monitoring(L)
- Set Bit On/Off
- Enter Value   Shift+Ctrl+F7
- Edit Register Memory (T, C, D)
- Edit Bit Memory (M)
- Format PLC Memory
- Communication Auto-detect
- PLC Information   Ctrl+Alt+I

If you select the Ladder Start Monitoring icon, a live view of the ladder diagram can be viewed similar to the image below. A contact, coil, or instruction highlighted in *green* indicates that it is *conducting* if it is a *contact*, and it is *activated* if it is a *coil or instruction*.

Ladder Diagram Mode

```
0        X0                                                    (  M0  )
       | | |
       Enable Pus                                          Enable Lig
       h Button                                            ht
2                                                              END
```

Press the Edit Monitored Registers icon ( ) to monitor and edit values live in the PLC code. In order to monitor a specific register either double click or right click on a row in the window and type in the register you wish to monitor. To change the value of the register right click on the row and enter the desired value.

Monitor Registers

Register Name	Comment	Status	T/C Set Value	Present Value (16 bits)	Present Value (32 bits)	Floating Point	Format	T/C Set Value Reference
M1006	Output frequency is 0 M1006=On	○						
M1025	RUN (ON) / STOP (OFF) the AC motor drive	●						
M1044	Halt	○						
D1020	AC motor drive Output frequency			K6000	K6000	F0.000	Signed Decimal	
D50				K6000	K6000	F0.000	Signed Decimal	
T2		○		K0	K0	F0.000	Signed Decimal	None

This chapter is designed to be an overview and quick-start guide to get you quickly up and running your first PLC program. For more details and further explanation of the user interface, instruction set, and implementing the PLC, please refer to the GSLogic Help File. This Help File can be accessed under the "Help" menu or anywhere you see the "?" symbol.
*Help on all of the following is located in the GSLogic Help file: Full description of the user interface, menu items, windows, and tool bars; Basics of the PLC; Special Function registers; Full set of PLC Instructions; Memory locations and data types; Using the digital and analog I/O; Communication with the PLC and MODBUS addresses.*

GS30 GSLogic Program Examples

Ex 1: GS30 Drive Control from GS30 PLC

Below is an example in which the drive PLC has control of the drive run, stop, direction, reset, and speed controls. Example GSlogic programs can be downloaded here:

https://cdn.automationdirect.com/static/support/sampleprg/drv/
GSLogic%20Sample%20Programs.zip

- Rung 1: When bit M1 is on the FREQ instruction will write the values in D50, D52, and D53 to the drive. This instruction will not cause the drive to run on its own. M1 can be turned on either via Modbus or through GSLogic. The values of D50, D52, and D53 are populated using GSLogic by modifying the register.
- Rung 2: X0 (Digital input FWD) will turn on the output relay and allow power to the output of the drive.
- Rung 3: X1 (Digital input REV) will tell the drive to run at profile assigned in the FREQ command in rung 1.
- Rung 4: X2 (Digital input 3) will change the direction of rotation of the motor.
- Rung 5: X3 (Digital input 4) will reset any resettable faults in the drive, if they occur.
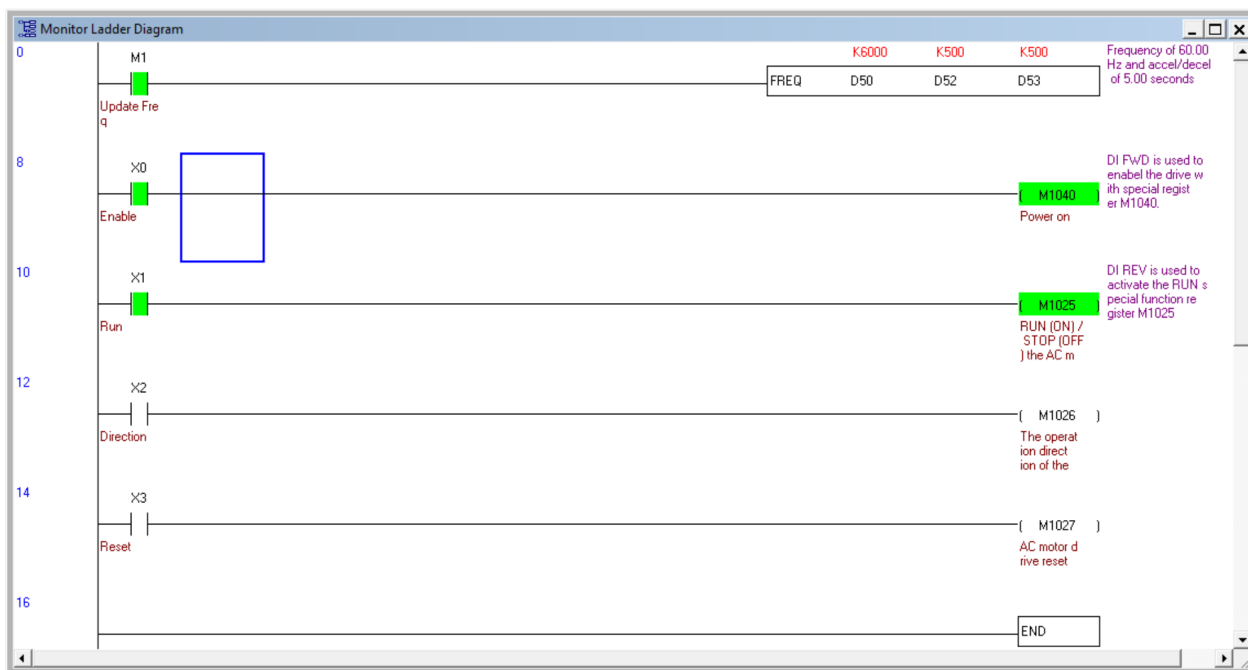
Ex 2: Drive Intercommunications

Below is an example of using the PLC to read and write to the VFD parameters using the RPR and WPR instructions. The WPR (Write Parameter) follows the same rules as when entering new values through the keypad. Even when using the WPR instruction, a Stop-Mode-Only writable parameter can still be written to only when the drive output is stopped.

The comments on the right side of each rung describes what each RPR and WPR does in the following example.