3000-SS36
SoftScreen®/GE SNP-X Driver

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SoftScreen/General Electric SNP-X Driver

This *SoftScreen* driver allows the 3000 family of workstations to communicate with General Electric (GE) Fanuc PLCs using the GE SNP-X protocol.

The driver is installed separately from *SoftScreen*. However, once it is installed, it becomes a part of *SoftScreen* and is downloaded, along with an application, to the run-time engine.

Supported Devices

This driver supports the following devices:

90-30	All CPUs firmware revision 4.4 or higher
90-70	All CPUs firmware revision 4.4 or higher

Technical Note

All 90-30s communicate using SNP-X protocol. Consult your GE Fanuc documentation for details on how to support your 90-30 model.

Installing the Driver

Technical Note

You *must* install *SoftScreen* before you install the driver.

Because *SoftScreen* is a Microsoft Windows® 95 Operating System program, you must install the GE SNP-X driver in Windows 95. If you have already installed this driver on your system, this installation will overwrite the current files.

To install the GE SNP-X driver...

1. Start Windows 95.

> **Technical Note**
>
> *SoftScreen* must be closed when you install this driver. We also recommend you close all other Windows applications when you are installing this driver..

2. Insert the GE SNP-X Driver Install disk in your floppy drive (usually drive A).
3. Click the Start button, and then select the Run button.
4. Type A:setup (or B:setup, depending on which floppy drive you use) in the Open text box, and then click OK or press ENTER to begin the installation.
5. Press the Next button to proceed to the next setup screen.
6. Follow the on-screen prompts to complete the installation.

   As files are being copied to your hard drive, three icons display on the left side of your workstation screen to indicate your progress.

   The far left icon indicates how much of an individual file has been transferred. The middle icon indicates how much of a floppy has been transferred. The far right icon represents the amount of space occupied on the system's hard drive before you install the driver.

Technical Note

To end the installation process at any time, select the Cancel button in the setup dialog boxes. A prompt will inform you that setup is not complete. Select the Exit Setup button if you still want to exit the installation program. If you wish to continue the installation, select the Resume button.

Uninstalling the Driver

To uninstall the GE SNP-X driver...

1. From Windows® 95, click the Start button. Select the Settings command, then Control Panel.
2. From the Control Panel, double-click on Add/Remove Programs.
3. Double-click on GE SNPX Driver entry in the list of removable programs on the Install/Uninstall page.
4. Select Yes in the Confirm File Deletion dialog box.

You will be notified once the driver has been successfully uninstalled.

Connecting to the PLC

This section describes the serial port configuration and the pinouts to connect a 3000 engine to a GE Series 90 controller.

Configuring the Port

You can connect a GE Series 90 PLC to a 3000 engine's serial port via an RS-422 or RS-485 connection.

Cabling

Figures 1 and 2 show the pinouts to connect from a 3000 engine to a GE Series 90 PLC via RS-422 and RS-485.

Technical Note

When connecting via RS-422 or RS-485, use a Belden 8302 cable, maximum length 4000 feet. Keep the cable away from high voltage and current-carrying cables. Refer to the EIA RS-485 and RS-422 specification for more details.

Electromagnetic Compatibility Warning

The connection of non-shielded equipment interface cables to the Focal Point workstations will invalidate FCC EMI and European Union EMC compliance and may result in interference and/or susceptibility levels which are in violation of relevant regulations. It is the responsibility of the system integrator and/or user to obtain and use shielded interface cables and equipment. If this equipment has more than one connector, do not leave cables connected to unused interfaces. Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

All interface cables must include braid/foil type shields. Communication cable connectors must be metal, ideally zinc die-cast backsheet types, and provide 360° protection about the interface wires. The cable shield braid must be terminated directly to the metal connector shell; ground drain wires alone are not adequate.

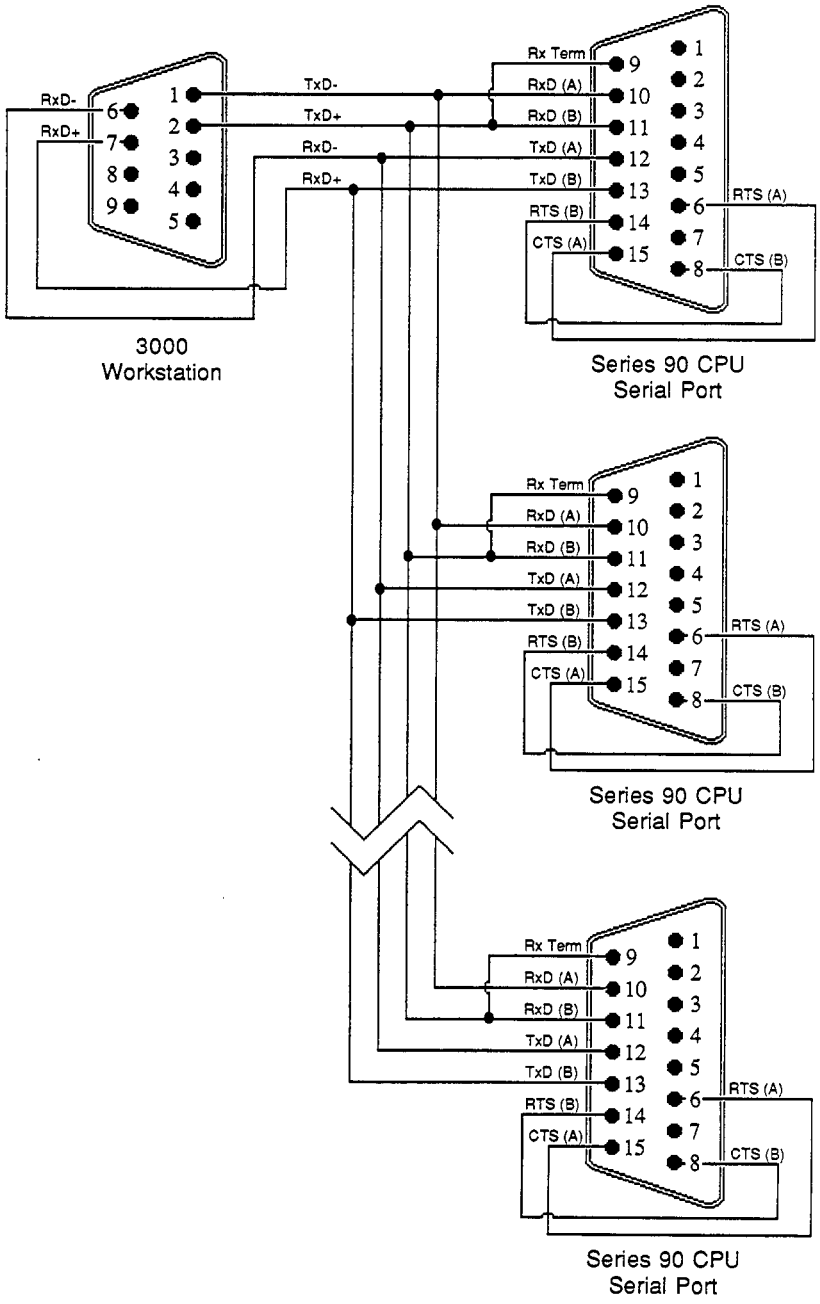

Figure 1. RS-485 Multi-drop Pinouts

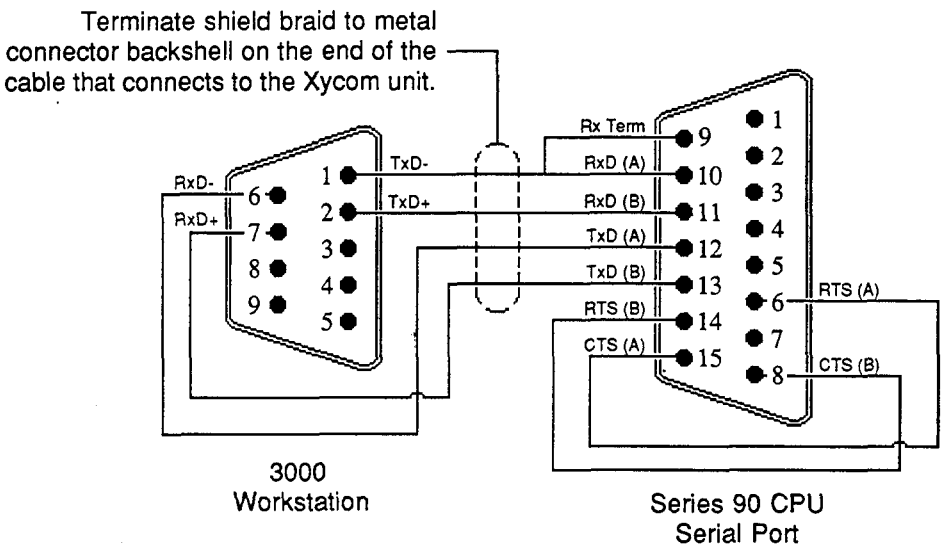

Figure 2. RS-422 Point-to-Point Pinouts

Development System Configuration

Once installation is complete (refer to the *Installing the Driver* section at the beginning of this manual), you must configure the driver in the *SoftScreen* Development System. Once you configure the driver, you can create tags that address GE SNP-X PLC data points.

To configure the driver...

1. Open an application in *SoftScreen*. See the *SoftScreen Development System for Windows User's Guide* for information on creating an application.
2. Select the Drivers command on the Configure menu in the Application Navigator. The Configure Physical Drivers dialog box opens, as shown in Figure 3.

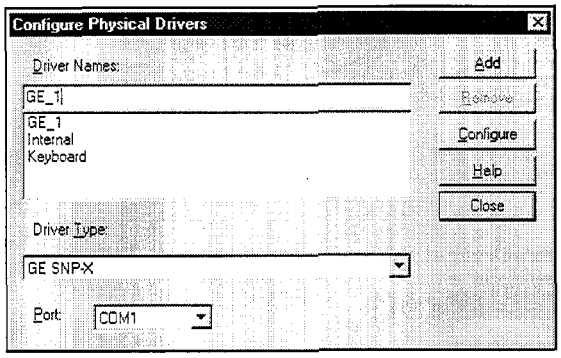

Figure 3. Configure Physical Drivers Dialog Box

3. Select GE SNP-X from the Driver Type drop-down list box. This is the driver type.
4. Type a unique name in the Driver Names text box, to identify this driver and configuration. Tag names can include 32 alphanumeric characters, as well as underscores (_) and colons (:). Tag names cannot begin with a number, a space, or an underscore.
5. Select the port to which you want to connect the PLC. Choices are None, COM1, and COM2. The default is None.
6. Click the Add button. The driver name is added to the Driver Names list box.
7. Highlight the name in the Driver Names list box, and then click on the Configure button.

   The GE SNP-X Configuration dialog box opens, as shown in Figure 4.

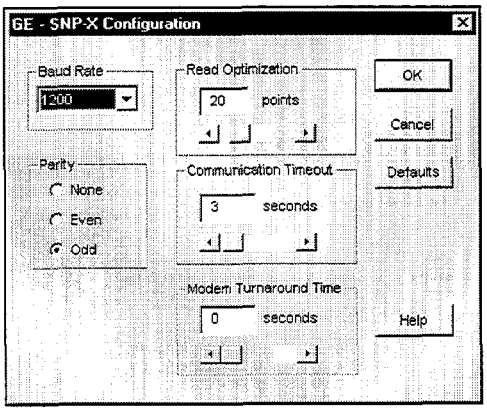

Figure 4. GE SNP-X Configuration Dialog Box

This dialog box reflects the default settings. You can change the settings to conform to your PLC. Table 1 defines each of the fields.

Table 1. Fields in the GE SNP-X Configuration Dialog Box

Field	Definition
Baud Rate	Sets the baud rate at which you will transfer data, from 300 to 19200. The default is 19200.
Parity	Sets error-checking to none, even parity, or odd parity. The default is Odd.
Read Optimization	Optimizes the number of data points read in a single command, from 1 to 100. The default is 20. This number can be changed to affect driver performance.
Communications Timeout	Sets the time period the engine will wait for a response from the PLC before timing out. The range is from 1 to 30 seconds. The default is 3.
Modem Turnaround Time	Sets the number of milliseconds the RTS line will be asserted before any master to slave communications, from 0 to 99 milliseconds. The default is 0.

Click Defaults to revert to the original dialog box settings, as shown in Figure 4. Click Cancel to cancel any changes you have made during the current use of the dialog box. Click OK if you want to accept the changes you have specified.

To change settings once you have configured the driver, double-click on the driver name in the Drivers configured list box on the Application Navigator form.

Technical Note

You cannot change the port setting from the Application Navigator form. You must change this setting in the Configure Physical Drivers dialog box, using the Drivers command on the Configure menu in the Application Navigator.

Addressing the PLC

This section defines how to assign tag names, and identifies the allowable expressions used to address GE SNP-X PLC data points.

SoftScreen uses tag names to address PLC data points. Tag names can include 32 alphanumeric characters, as well as underscores (_) and colons (:). You cannot begin tag names with a number, a space, or an underscore.

Assigning Tag Names

To assign tag names to data points on supported GE devices...

1. Select Drivers from the Data drop-down list box on the Application Navigator form.
2. Double-click on the driver name for which you want to configure tag names. The GE SNP-X data point configuration form opens, as shown in Figure 5.

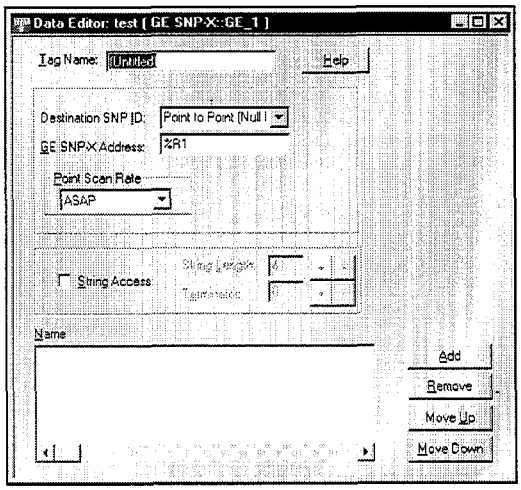

Figure 5. GE SNP-X Data Point Configuration Form

Use the fields in this form to create tags that address GE SNP-X data points. Table 2 defines each of the fields.

Table 2. Fields in the GE SNP-X Data Point Configuration Form

Field	Definition
Tag Name	Defines a unique tag name.
Destination SNP ID	Type in a name (up to seven characters) or choose Point to Point (Null ID) or Broadcast ID from the drop-down list. The default is Point to Point (Null ID). *Note: If the Destination SNP ID is set to Broadcast ID, you can only do a write, not a read.*
GE SNP-X Address	Links the tag name to a valid data point within the PLC specified in the Destination SNP ID. The default is %R1. See the following section, *Creating Valid Addresses*, for more information.
Point Scan Rate	Sets how often the run-time engine will read from the data point, from ASAP (as soon as possible) to once every eight hours. The default is ASAP.

Field	Definition
String Access	When checked, indicates the data address you entered in the GE SNP-X field accesses strings. If this field is checked, you must select a string length, from 1 to 128 characters (the default is 4), and a string terminator character, from 0 to FF (the default is 0). When a string is read from the PLC, the driver will search for the specified terminator, replace it with a null and then store it in the run-time engine. When a string is written to the PLC, the driver will append the specified terminator at the end of the string, and then send it to the PLC. *Note: Refer to Table 3 for information on data types that acess strings.*

Click Add to add the tag to the Name list box. Click Remove to delete the tag. Click Move Up or Move Down if you want to change the order in which the tags are evaluated.

Creating Valid Addresses

All GE PLC memory types are configured decimally. Table 3 defines the valid data types and address ranges for PLCs supporting the GE SNP-X protocol.

Table 3. Valid GE SNP-X Data Types and Address Ranges

Data Type	Address Range	Size	Bit Access	String Support	R/W
Input (%I)	1- 65535	Bit	N/A	No	R/W
Output (%Q)	1 - 65535	Bit	N/A	No	R/W
Temporary (%T)	1 - 65535	Bit	N/A	No	R/W
Internal (%M)	1 - 65535	Bit	N/A	No	R/W
SA Discrete (%SA)	1 - 65535	Bit	N/A	No	R/W
SB Discrete (%SB)	1 - 65535	Bit	N/A	No	R/W
SC Discrete (%SC)	1 - 65535	Bit	N/A	No	R/W
S Discrete (%S)	1 - 65535	Bit	N/A	No	R
*Genius Global Data (%G)	1 - 65535	Bit	N/A	No	R/W
Analog Input (%AI)	1 - 65535	Word	0-15	No	R/W

Data Type	Address Range	Size	Bit Access	String Support	R/W
Analog Output (%AQ)	1 - 65535	Word	0-15	No	R/W
Register (%R)	1 - 65535	Word	0-15	Yes	R/W

*On 90-70 PLCs, you can access Genius global data types GA, GB, GC, GD, and GE using the %G data type and the following address ranges:

1281-2560 (GA)	Accesses GA data points 0001-1280
2561-3840 (GB)	Accesses GB data points 0001-1280
3841-5120 (GC)	Accesses GC data points 0001-1280
5121-6400 (GD)	Accesses GD data points 0001-1280
6401-7680 (GE)	Accesses GE data points 0001-1280

Following are some GE SNP-X addressing examples.

Example_1 addresses input address 655 every 5 seconds. This is a read-only bit address.

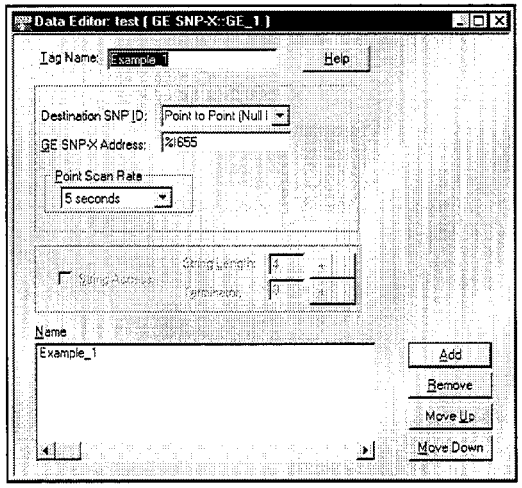

Figure 6. GE SNP-X Addressing, Example 1

Example_2 addresses global data address 1032 every 10 minutes.

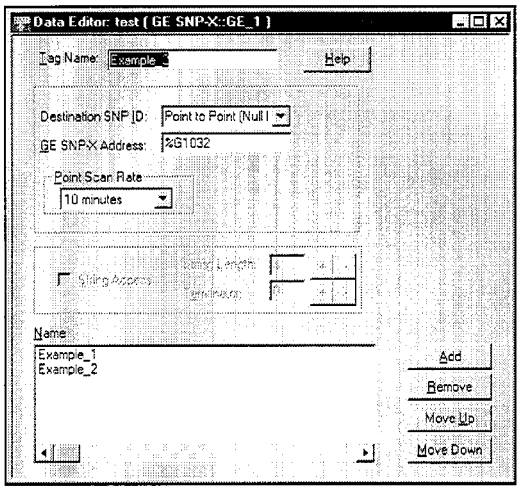

Figure 7. GE SNP-X Addressing, Example 2

Example_3 addresses bit 2 of register 50 every 30 seconds.

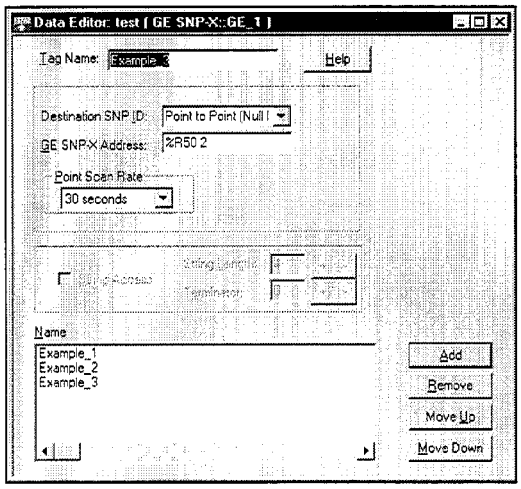

Figure 8. GE SNP-X Addressing, Example 3

Retrieving Status Information

Use the strings described in this section to retrieve status information during run-time.

> **Technical Note**
>
> Status strings are *not* case sensitive.

Driver ID

GeDriverId returns the following null-terminated string identifying the driver running on the 3000 engine: "GE SNP-X driver."

Driver Revision

GeDriverRev returns a string identifying the driver revision level: GE SNP-X Driver Revision: 1.1

Error Handling

GeCommStatus returns a decimal number describing the current communication status of the driver.

Table 4 defines these status bits.

> **Technical Note**
>
> If the entire number is 0, there are no communication errors.

Table 4. GE SNP-X Error Codes

Bit	Description
0	Timeout–The PLC did not respond in the configured amount of time.
1	Transmit error–The initial part of the message (before the response data) had an error.
2	Receive error–The part of the message after the first ACK from the PLC had an error.
3	Checksum error–The message received an invalid checksum.
4-7	Reserved.
8-15	GE SNP-X minor error codes. Refer to your GE documentation for more information.
16-23	GE SNP-X major error codes. Refer to your GE documentation for more information.

Communication Status

GeCommString returns a null-terminated string describing the current communication status of the driver.

Scan Time

GeScanTime returns a number (in msecs) describing how long it takes the driver to read the current data points. For example, if all data points are set to ASAP, the system would track the time between the starting point of the scan and the ending point, and then would display the scan time based on these two numbers. However, if one data point is set to an ASAP scan rate, and another is set to an eight hour scan rate, the system would continue to read the ASAP point until eight hours had passed, then it would read the ASAP point, and the eight-hour point, and then provide you with the time period it took for this scan to read both the points.

Detecting Errors and Generating Alarms

Each of the data points assigned to the driver can have a different update rate, so on any given scan, some points will be scanned and some will not. When the driver detects an error (either read or write), it will post an alarm if it has not previously posted an alarm. The alarm will be posted

at the bottom of the screen for three seconds. During any given scan, only the first error condition in the scan will be posted.

The alarm message that is posted will indicate the data point that caused the error, as shown below:

```
GESNP-X Port:1 "PLCNAME" Addr:(R)%G1032
```

This error occurred while reading address %G1032 from "PLCNAME", port 1.

The number that indicates the type of error that occurred (refer to the previous section on Error Handling) does not appear on screen. However, the number will be logged in the alarm summary along with the date and time of the alarm (refer to the *SoftScreen Development System for Windows User's Guide* for information on the alarm summary).

If the driver is optimizing points, it will read data points in optimized blocks, instead of one at a time. If an error occurs while the driver is reading the block, the alarm message will describe the data point that was at the beginning of the block.

For example, if the driver reads an optimized block of data points (a, b, and c), and an error occurs because data point "c" does not exist in the target device, an alarm message is posted. This message will indicate that there was an error reading data point "a," not data point "c."

Once the driver completes a scan without any errors (after an error has occurred in a previous scan), then the driver will post the following message:

```
"GESNP-X: Communication Restored"
```

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