



3000-SS08
SoftScreen®/Simatic TI-505 Driver

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SoftScreen/Simatic TI-505 Driver

This *SoftScreen* driver allows 3000 engines to communicate with the Simatic TI-505 family of controllers.

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 Siemens devices:

- 520
- 525
- 530
- 535
- 545
- 555
- 565
- 575
- 505 Remote Base (RBU)

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 Simatic TI-505 driver in Windows® 95. If you have already installed this driver on your system, this installation will overwrite the current files.

To install the Simatic TI-505 PLC 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 install this driver.

2. Insert the Simatic TI Driver Install disk in your floppy drive (usually drive A).
3. Click the Start button, and then select the Run command.
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 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 the Simatic entry in the list of removable programs on the Install/Uninstall page.
4. Select Yes in the Confirm File Deletion dialog box, and Windows will uninstall the driver.

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 for connecting a 3000 engine to a Simatic TI-505 controller.

Configuring the Port

You can connect a Simatic TI-505 and a 3000 engine via RS-422 or RS-232C. You can connect a Simatic TI-555 and a 3000 engine via RS-485.

Cabling

This section provides important information on RS-232C, RS-422, and RS-485 cabling.

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.

RS-232C Connections

Figures 1 and 2 depict the RS-232C pinouts to connect a 3000 engine to a Simatic TI-505 PLC.

Technical Note

When connecting via the RS-232C standard, use a Belden 9925 or equivalent cable, maximum length 50 feet. Keep the cable away from high voltage and current-carrying cables. Refer to the EIA RS-232C specification for more details.

Terminate shield braid to metal connector backshell on the end of the cable that connects to the Xycom unit.

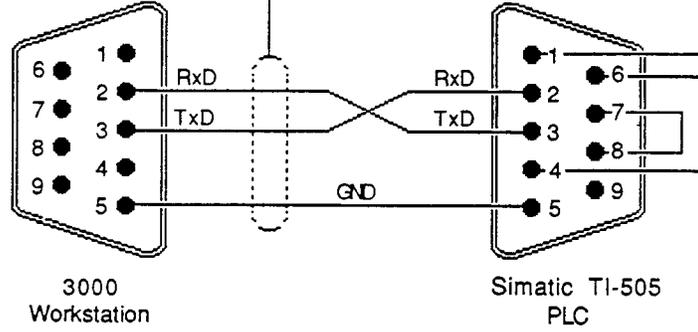


Figure 1. 9-pin RS-232C Pinouts

Terminate shield braid to metal connector backshell on the end of the cable that connects to the Xycom unit.

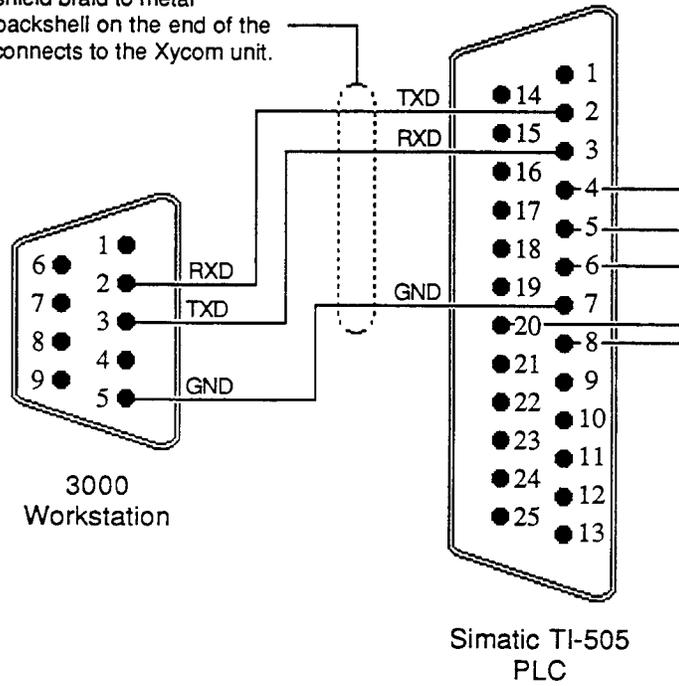


Figure 2. 25-pin RS-232C Pinouts

RS-422 and RS-485 Connections

Figure 3 depicts the pinouts to connect the 3000 engine to a Simatic TI-505 via RS-422. Figure 4 depicts the pinouts to connect the 3000 engine to a Simatic TI-555 via RS-485.

Technical Note

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

Terminate shield braid to metal connector backshell on the end of the cable that connects to the Xycom unit.

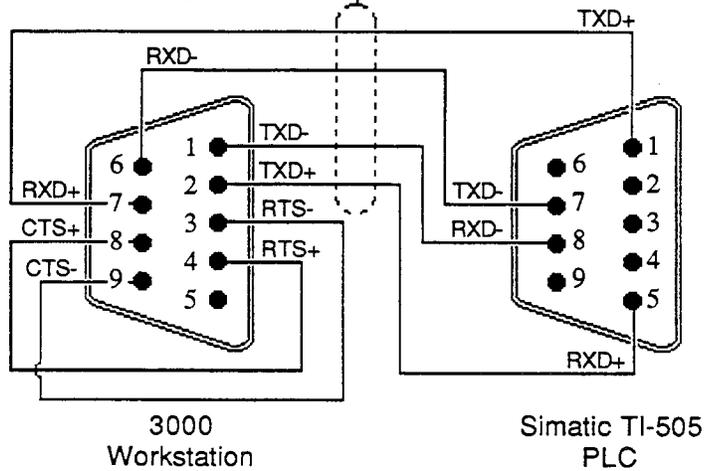


Figure 3. RS-422 Pinouts

Terminate shield braid to metal connector backshell on the end of the cable that connects to the Xycom unit.

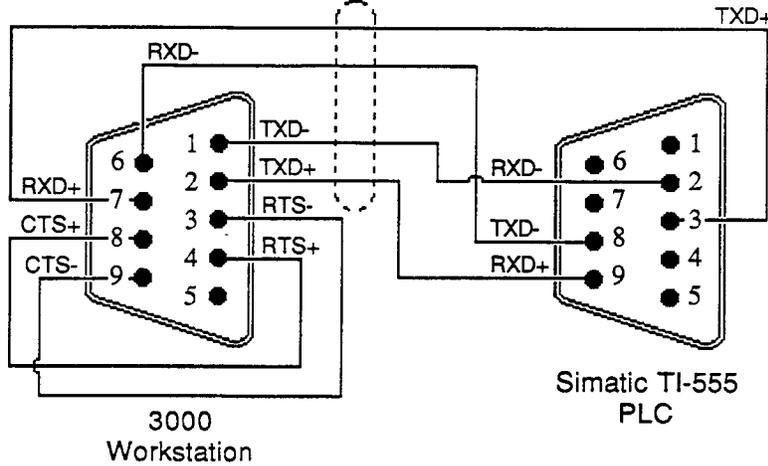


Figure 4. RS-485 Pinouts

Development System Configuration

Once you have installed the driver (refer to the *Installing the Driver* section at the beginning of this manual), you must configure it in the *SoftScreen* Development System. Once it is configured, you can create tags that address data points on support Siemens devices.



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 5.

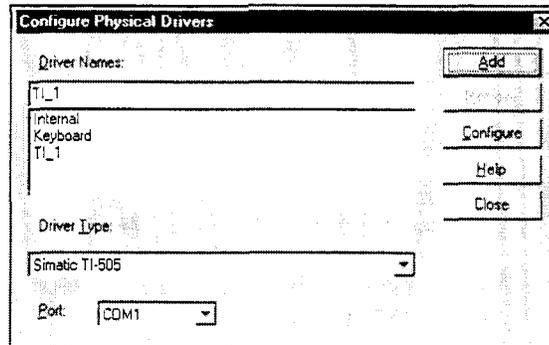


Figure 5. Configure Physical Drivers Dialog Box

3. Select Simatic TI-505 from the Driver Type drop-down list box.
4. Type a unique name in the Driver Names text box, to identify this drivers and its configuration. Names can include 32 alphanumeric characters, as well as underscores () and colons (:). Do not begin a driver name 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 Simatic TI-505 Configuration dialog box opens, as shown in Figure 5.

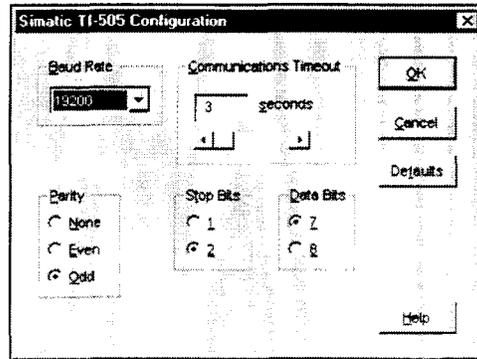


Figure 6. Simatic TI-505 Configuration Dialog Box

This dialog box reflects the default settings. Table 1 defines the fields in this dialog box.

Field	Definition
Baud Rate	Sets the baud rate at which you will transfer data, from 300 to 19200. The default is 19200.
Communications Timeout	Sets the time period the engine will wait for a response from the PLC before timing out, from 3 to 30 seconds. The default is 3.
Parity	Sets error-checking to none, even, or odd parity. The default is odd.
Stop Bits	Sets the end of character stop bit to 1 or 2. The default is 2.
Data Bits	Sets the number of bits used in transmission to 7 or 8. The default is 7.

Table 1. Simatic TI-505 Driver Configuration Settings

8. Once you have finished specifying settings, click OK to accept them. If you want to revert to the default settings at any time, click Defaults. Click Cancel to cancel any changes you have made during the current use of the dialog box.

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 use the Drivers command on the Configure menu in the Application Navigator to change this setting.

Addressing the PLC

This section defines how to assign tag names, and identifies the allowable expressions used to address data points on supported Siemens devices.

SoftScreen uses tag names to address PLC data points on supported devices. Tag names can include 32 alphanumeric characters, as well as underscores (_) and colons (:). Do not start tag names with a number, a space, or an underscore.

Assigning Tag Names

To assign tag names to PLC data points on supported 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 Simatic TI-505 data point configuration form opens, as shown in Figure 7.

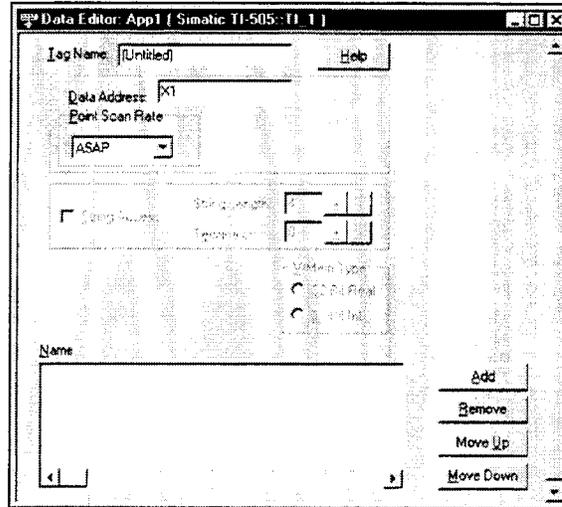


Figure 7. Simatic TI-505 Data Point Configuration Form

Table 2 defines the fields in this form.

Field	Definition
Tag Name	Defines a unique tag name, which addresses a data point.
Data Address	Links the tag to a valid data point. The default is X1. See the <i>Creating Valid Addresses</i> section for more information.
String Access	Allows string access when checked. When selected, you <i>must</i> select a string length, from 1 to 128 characters (the default is 4), and a terminator, from 0 to 255 (the default is 0). When a string is read from the PLC, the driver searches for the specified terminator, replaces it with a null, and then stores it in the run-time engine. When a string is written to the PLC, the driver appends the specified terminator to the string and then sends it to the PLC. <i>Note: String access is available only if you enter an address that can be accessed by a string. Refer to Table 3 for more addressing information.</i>
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
V-Mem Type	Sets the type of value to be returned when specifying a variable address (V): 32-bit real or 16-bit integer. If you do not address a variable, this option is grayed. <i>Note: If you specify 32-bit real, two PLC memory locations are needed to store the value.</i>

Table 2. Simatic TI-505 Addressing Form

3. 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

Table 3 defines the valid data types and address ranges for Simatic TI-505 PLCs.

Technical Note
Word data types can be accessed as words or bits. When accessing them as bits, the allowable range is 1 (MSB) through 16 (LSB).

Table 3. Simatic TI-505 Valid Data Types and Addressing Ranges

Type	Range	Size	R/W
Input (X)	1-65535	Bit	R/W
Output (Y)	1-65535	Bit	R/W
Internal Coil (C)	1-65535	Bit	R/W
Variable (V)	1-65535	Word/String	R/W
Constant (K)	1-65535	Word/String	R/W
Word Input (WX)	1-65535	Word	R/W
Word Output (WY)	1-65535	Word	R/W
Drum Step Current (DSC)	1-32767	Word	R/W
Drum Step Preset (DSP)	1-32767	Word	R/W
Status Word (STW)	1-65535	Word	R
Timer/Counter Preset (TCP)	1-65535	Word	R/W

Type	Range	Size	R/W
Timer/Counter Current (TCC)	1-65535	Word	R/W
Analog Alarm Acknowledge (AACK)	1-255	Word	R/W
Analog Alarm Deadband (AADB)	1-255	Float	R/W
Most Significant Word of Analog Alarm C-flags (ACFH)	1-255	Word	R/W
Least Significant Word of Analog Alarm C-flags (ACFL)	1-255	Word	R/W
Analog Alarm Error (AERR)	1-255	Float	R
Analog Alarm High Alarm Limit (AHA)	1-255	Float	R/W
Analog Alarm High-High Alarm Limit (AHHA)	1-255	Float	R/W
Analog Alarm Low Alarm Limit (ALA)	1-255	Float	R/W
Analog Alarm Low-Low Alarm Limit (ALLA)	1-255	Float	R/W
Analog Alarm Orange Deviation Alarm Limit (AODA)	1-255	Float	R/W
Analog Alarm Process Variable (APV)	1-255	Float	R/W
Analog Alarm Process Variable High Limit (APVH)	1-255	Float	R/W
Analog Alarm Process Variable Low Limit (APVL)	1-255	Float	R/W
Analog Alarm Rate of Change Alarm Limit (ARCA)	1-255	Float	R/W
Analog Alarm Set Point (ASP)	1-255	Float	R/W
Analog Alarm Set Point High Limit (ASPH)	1-255	Float	R/W
Analog Alarm Set Point Low Limit (ASPL)	1-255	Float	R/W
Analog Alarm Sample Rate (ATS)	1-255	Float	R/W
Analog Alarm Flags (AVF)	1-255	Word	R/W
Analog Alarm Yellow Deviation Alarm Limit (AYDA)	1-255	Float	R/W
Loop Alarm Acknowledge (LACK)	1-255	Word	R/W
Loop Alarm Deadband (LADB)	1-255	Float	R/W
Most Significant Word of Loop C-flags (LCFH)	1-255	Word	R/W
Least Significant Word of Loop C-flags (LCFL)	1-255	Word	R/W
Loop Error (LERR)	1-255	Float	R
Loop High Alarm Limit (LHA)	1-255	Float	R/W
Loop High-High Alarm Limit (LHHA)	1-255	Float	R/W
Loop Gain (LKC)	1-255	Float	R/W
Loop Derivative Gain Limiting Coefficient (LKD)	1-255	Float	R/W
Loop Low Alarm Limit (LLA)	1-255	Float	R/W
Loop Low-Low Alarm Limit (LLLA)	1-255	Float	R/W

Type	Range	Size	R/W
Loop Output (LMN)	1-255	Float	R/W
Loop Bias (LMX)	1-255	Float	R/W
Loop Orange Deviation Alarm Limit (LODA)	1-255	Float	R/W
Loop Process Variable (LPV)	1-255	Float	R/W
Loop Process Variable High Limit (LPVH)	1-255	Float	R/W
Loop Process Variable Low Limit (LPVL)	1-255	Float	R/W
Loop Rate of Change Alarm Limit (LRCA)	1-255	Float	R/W
Loop Ramp/Soak Flags (LRSF)	1-255	Word	R/W
Loop Ramp/Soak Step Number (LRSN)	1-255	Word	R/W
Loop Set Point (LSP)	1-255	Float	R/W
Loop Set Point High Limit (LSPH)	1-255	Float	R/W
Loop Set Point Low Limit (LSPL)	1-255	Float	R/W
Loop Rate (LTD)	1-255	Float	R/W
Loop Reset (LTI)	1-255	Float	R/W
Loop Sample Rate (LTS)	1-255	Float	R/W
Loop V-flags (LVF)	1-255	Word	R/W
Loop Yellow Deviation Limit (LYDA)	1-255	Float	R/W

Following are some examples of Simatic TI-505 addressing using *Soft-Screen*.

Example_1 addresses V3000 ASAP in 16-bit integer mode.

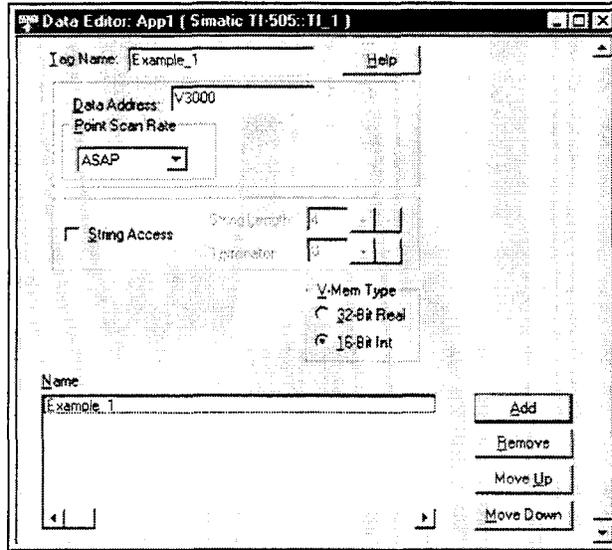


Figure 8. Simatic TI-505 Addressing, Example 1

Example_2 addresses drum step current 100, bit 1 once a second.

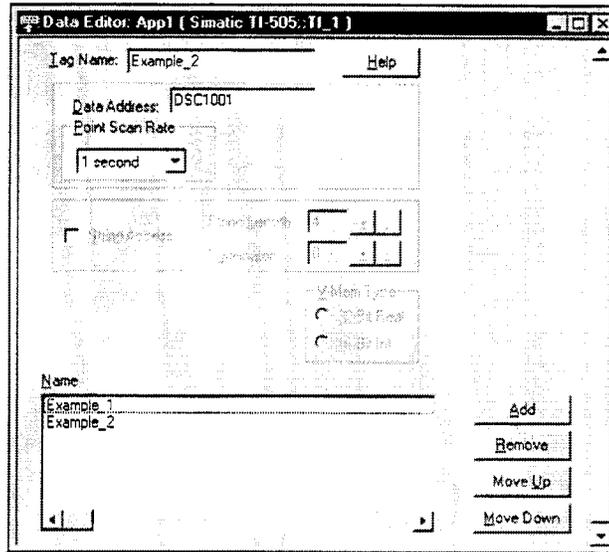


Figure 9. Simatic TI-505 Addressing, Example 2

Example_3 addresses offset 60 of the loop yellow deviation limit data type every five seconds.

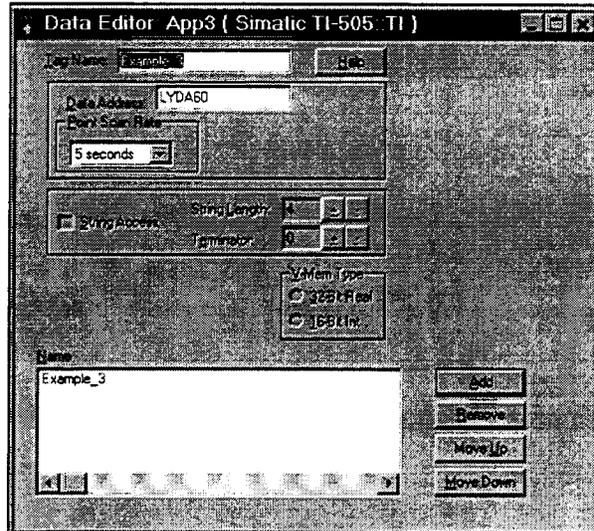


Figure 10. Simatic TI-505 Addressing, Example 3

Retrieving Status Information

Use the strings described in this section to retrieve driver status information

Technical Note

These strings are not case sensitive.

Driver ID

TIDriverID returns the following null-terminated string identifying the driver running on the 3000 engine: "Simatic TI-505 Driver."

Driver Revision

TIDriverRev returns a string identifying the driver revision level, such as "1.1" or "1.2 special."

Error Handling

TICommStatus returns a 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.

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.
4-10	Reserved.
11-15	Unused.
16-23	These bits will contain Simatic TI-505 error task codes. Refer to the Simatic TI-505 documentation for more information.

Table 4. Simatic TI-505 Communication Status Errors

Communication Status

TICommString returns a null-terminated string describing the current communication status of the driver, such as

"Simatic TI-505 on Port x NO Errors"

Scan Time

TIScanTime returns a number (in msec) describing the amount of time 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:

```
Simatic TI-505 Port: 1 Addr: (R) V100
```

This error occurred while reading (R) data point V100 from the Simatic TI-505 connected to port 1.

The number that indicates the type of error that occurred (see the Error Handling section above) 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:

"Simatic TI-505: Communication Restored"

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