3000-SS38
SoftScreen® Profibus-DP Driver

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SoftScreen/Profibus-DP Driver

This *SoftScreen* driver allows the Focal Point™ family of 3000 engines to communicate with a Siemens PLC network using the SMS CIF 104-DPS-XY Profibus DP slave communications interface card (CIF card).

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 any device that supports Profibus-DP slave Protocol.

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 Profibus-DP driver in Windows 95. If you have already installed this driver on your system, this installation will overwrite the current files.

To install the Profibus-DP 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 before you install this driver.

2. Insert the Profibus-DP Driver Install disk in your local 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 local 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 one of 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 Profibus-DP driver...

1. From Windows 95, click the Start button.
2. Select the Settings command, then Control Panel.

3. From the Control Panel, double-click on Add/Remove Programs.
4. Double-click on the ProfibusDPDriver entry in the list of removable programs on the Install/Uninstall page.
5. Select Yes in the Confirm File Deletion dialog box.

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

Installing and Configuring the CIF Card

You must have a CIF card installed in your system to connect to a supported device using the Profibus-DP driver. Use the ComPro* configuration software to configure the settings for this card.

Figure 1 depicts the layout of the card.

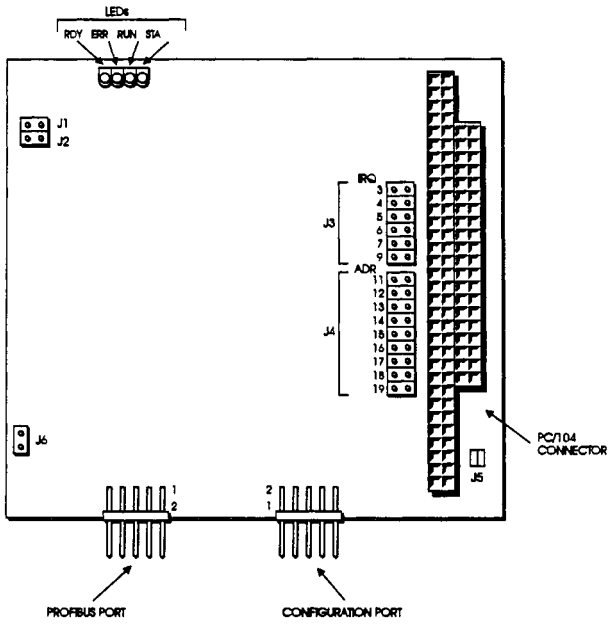

Figure 1. CIF Card Layout

*Configuration program provided by CIF card manufacturer

Configuring the Memory Address

The CIF card occupies 2 Kbytes in the 3000 engine's address range. Jumper J4 sets the memory address. The valid address range is C0000h-FF000h. This setting must match what is specified in the CIF 104 Memory address field in the Profibus-DP Configuration dialog box (refer to Table 2). The default setting in the driver is CA000h.

Figure 2 provides an example of how to configure the jumpers for the CA000h default setting.

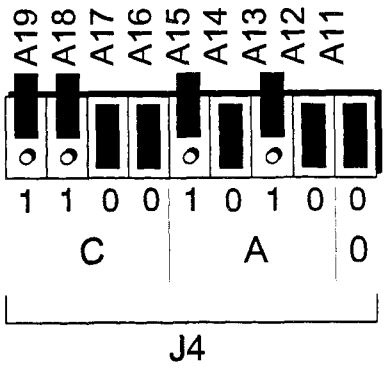

Figure 2. Memory Address Configuration Example

Understanding the LEDs

The CIF card provides four status LEDS.

Table 1. Status LEDs

Status LED	Color	State
RDY	Yellow	On = CIF ready Flashing cyclically = the bootstrap loader is active Flashing non-cyclically = hardware or system error Off = Hardware error
RUN	Green	On = Communication running Flashing cyclically = ready for communication Flashing non-cyclically = parameter error Off = no communication
ERR	Red	Off
STA	Yellow	State depends on firmware

The CIF card performs a self-test when turned on. If it performs satisfactorily, the yellow RDY LED turns on. If the self-test fails, the RDY LED starts to flash, and the program is aborted. If the LED stays off, the card is defective. If no firmware has been loaded on the CIF card, the RDY LED flashes at one-second intervals.

If a parameter error is detected by a protocol task, the RUN LED displays the task. If no error occurs and communication has started, the RUN LED turns on. If this LED is blinking cyclically, no parameter error has been detected, but communication on the bus has not been established. If communication is blocked (for example, by the system start parameter), the RUN LED stays off.

The red ERR LED displays the data transfer errors at the communications interface.

The yellow status LED STA is activated when the CIF card is communicating.

Connecting to Supported Devices

The 3000 workstation connects to a supported device through the CIF card via a network cable. Refer to the your CIF card manual for information on cabling between the CIF card and a supported device.

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.

To configure the Profibus-DP driver...

1. Open an application in *SoftScreen*. Refer to 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.

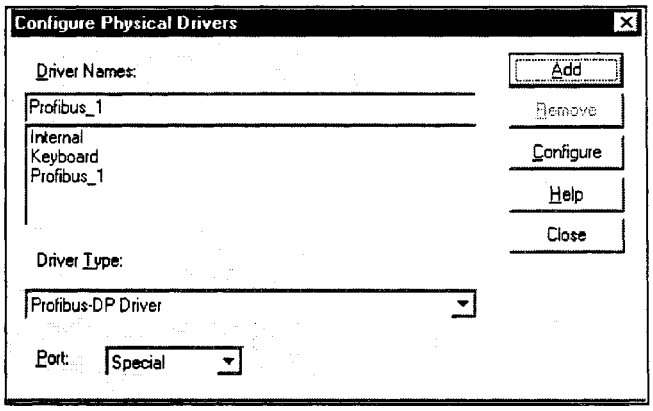

Figure 3. Configure Physical Drivers Dialog Box

3. Select Profibus-DP Driver from the Driver Type drop-down list box.

4. Type a unique name in the Driver Names text box, using up to 32 characters. This name can begin with a character or a colon, and can contain alphanumeric characters, underscores, and colons. Tag names cannot begin with, or contain, a space.
5. Select Special as the Port, since the Profibus-DP driver does not communicate to the PLC through a COM port.
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 Profibus-DP Configuration dialog box opens, as shown in Figure 4.

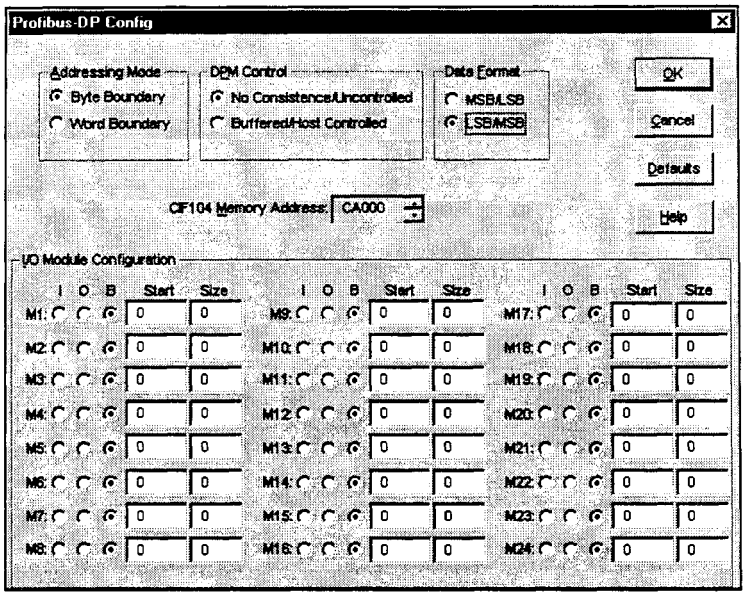

Figure 4. Profibus-DP Configuration dialog box

This dialog box reflects the default settings. Table 2 defines the fields in this dialog box.

Table 2. Fields in the Profibus-DP Driver Configuration Dialog Box

Field	Definition
Addressing Mode	Sets the addressing mode to Byte or Word. The default is Byte.
Dual Port Memory (DPM) Control	Selects the method of data exchange between the driver and the CIF card (this setting has no impact on the method of data exchange between the CIF and the PLC). If "No Consistence/Uncontrolled" is selected, data will immediately be read from/written to the CIF card byte by byte without waiting for a scan of the card to be complete. If "Buffered/Host Controlled" is selected, data will be read from/written to the CIF card as a group after a scan of the card is complete. This setting must match the value configured for the CIF card in SMS's ComPro configuration software.
Data Format	If you select "MSB/LSB" the driver will assume that the data will be transmitted with its most significant byte preceding its least significant byte. If "LSB/MSB" is selected, the driver will assume that the data will be transmitted least significant byte first. Default is LSB/MSB.
CIF 104 Memory Address	Sets the address of the dual-port memory occupied by the CIF card. The valid range is C0000h to FF000h in 1000 hex increments. The default is CA000 and must match the address set on the CIF card using jumpers A11-A19. Refer to the previous section, *Configuring the Memory Address*, for more information.

Field	Definition
I/O Module Configuration	Each CIF card can be configured to emulate form 1 to 24 modules. Each module must be configured as follows: **I**, **O**, or **B**. This is the module type. "I" is for "input", "O" is for "Output" and "B" is for "Blank". This should match the "Moduletype" for the corresponding module configured in Compro. **Start:** The byte number of the first byte of the image table that this module will occupy. There is no corresponding configuration for this in Compro. **Size:** The size (in bytes) of the module. This should match the "Modulelength" for the corresponding modoule configured in Compro.

8. Click OK to accept the changes you have made to these settings. If you want to revert to the default settings, 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.

Once the driver is configured, you can create tag names that address data points on supported devices.

Addressing Data Points on Supported Devices

SoftScreen uses tag names to address data points on supported devices. Tag names can be up to 32 alphanumeric characters. Do not start tag names with a number, a space, or an underscore.

This section describes how to assign these tag names to data points on supported devices, and defines valid Profibus-DP expressions.

Assigning Tag Names

To assign a tag name to a data point on a supported device...

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 Profibus-DP data point configuration form opens, as shown in Figure 5.

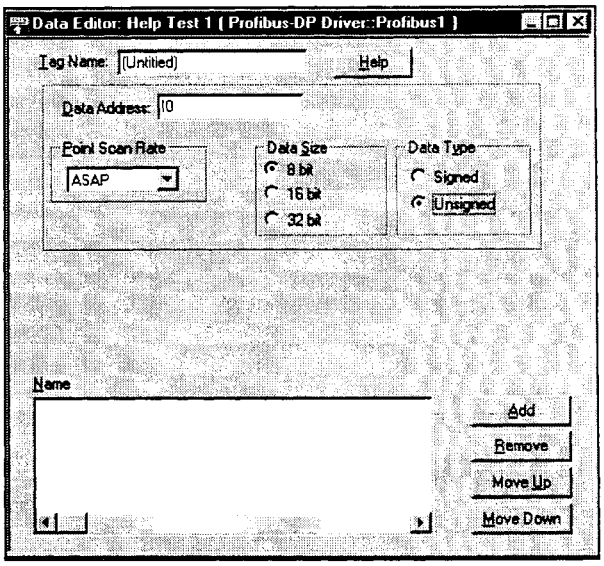

Figure 5. Profibus-DP Data Point Configuration Form

Table 3 defines the fields in this form.

Table 3. Fields in the Profibus-DP Data Point Configuration Form

Field	Definition
Tag Name	Defines a unique tag name.
Data Address	Links the tag to a valid data point. The default is I0. Refer to the *Creating Valid Addresses* section for more information.

Field	Definition
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.
Data Size	This selects between 8 bit (byte), 16 bit (word) and 32 bit (double word) data. Any I/O address can be configured to be any of these three data sizes.
Data Type	This selects between signed and unsigned data. Table 4 below shows the data ranges that are supported by different data types. Default is unsigned.

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 arranged in the list box.

Table 4. Data Ranges

	8 bit	16 bit	32 bit
Signed	(-128)v -127	(-32,768) -32,767	(-2,147,483,648) -2,147,483,647
Unsigned	0-255	0-65,535	0 -4,294,967,295

Creating Valid Addresses

Table 5 defines the valid data types and address ranges for Profibus-DP PLCs. Because the Profibus-DP is a slave device, an input refers to writing to the master and an output refers to reading from the master.

Table 5. Profibus-DP Valid Data Types and Addressing Ranges

	Byte Boundry			Word Boundry		
Type	**Byte**	**Word**	**DWord**	**Byte**	**Word**	**DWord**
Input (I)	0-65535	0-65534	0-65532	0-65535	0-32767	0-16383
Output (Q)	0-65535	0-65534	0-65532	0-65535	0-32767	0-16383
	Bit Range					
Type	**Byte**	**Word**	**DWord**	**Access**	**Strings**	
Input (I)	0-7	0-15	0-31	R/W	No	
Output (O)	0-7	0-15	0-31	R	No	

Following are examples of tags that address data points on supported devices.

Example_1 addresses the least significant bit (0) of input byte 0 ASAP.

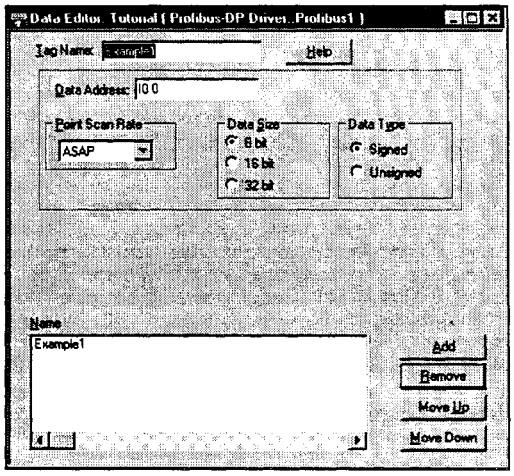

Figure 6. Profibus-DP Addressing, Example 1

Example_2 addresses the most significant bit (7) of output byte 5 every 30 seconds.

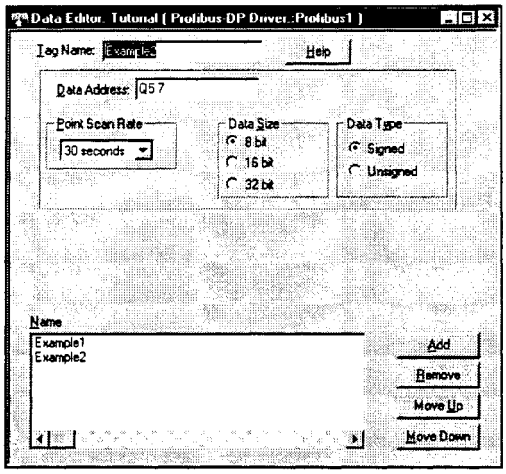

Figure 7. Profibus-DP Addressing, Example 2

Example_3 addresses the most significant bit (7) of input byte 241 every 30 minutes.

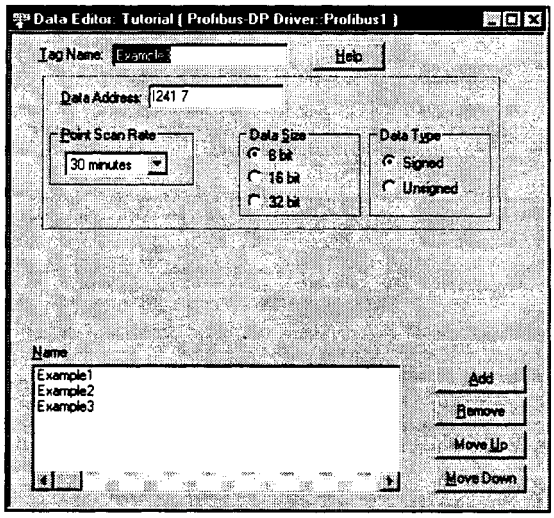

Figure 8. Profibus-DP Addressing, Example 3

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

DPDriverId returns the following null-terminated string identifying the driver running on the 3000 engine:

```
"Profibus-DP Driver"
```

Driver Revision

DPDriverRev returns a string identifying the driver revision level, (such as `1.4)`.

Error Handling

DPCommStatus returns a number describing the current communication status of the driver. Table 6 defines these status bits.

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

Table 6. Profibus-DP Communication Status Errors

Bit	Error	Description
0	Timeout	A timeout occurred while waiting to exchange I/O data with the CIF card.
1-7	Not used	N/A
8	Write error	An attempt was made to write to an output, which is an illegal operation
9	Initialization error	The CIF card failed to initialize properly

Bit	Error	Description
10	Internal error	Occurs if there is a defect in the L2-DP driver. Contact Xycom for help.
11	Addressing error	An attempt was made to address an I/O point outside of the configured address range
12	Not Used	N/A
13	Communication lost error	Communication with the PLC has been lost. This usually means that the communications cable between the PLC and the CIF card is disconnected
14-21	CIF card errors	Bits set by the CIF card during initialization
22	Not used	N/A
23-31	Reserved	N/A

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:

```
"Profibus-DP Addr:(R) Q3 0"
```

This error shows an error when reading from address Q3 0.

The number that indicates the type of error that occurred 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).

When 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:

```
"Profibus-DP: Communication Restored"
```

Communication Status

DPCommString returns a null-terminated string describing the current communication status of the driver. For example, if there are no errors, it would return the following string:

```
"Profibus-DP: No Errors"
```

Scan Time

DPScanTime returns a number (in msecs) 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.

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