

3000-SS17
SoftScreen®/Omron Host Link Driver

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SoftScreen/Omron Host Link Driver

This *SoftScreen* driver allows the Focal Point™ 3000 family of engines to communicate with Omron Host Link programmable logic controllers. Both single link and multi-link communication configurations are supported. The single link configuration supports a single PLC connected to a 3000 engine. The multi-link configuration supports up to 32 PLCs connected to a 3000 engine. Both configurations support multiplex handshaking.

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:

- C**K
- CQM1-CPU2
- CQM1-CPU4
- C200H
- C200HS
- C120
- C500
- C1000H
- C2000H
- CV500: CVM1-CPU01
- CV500: CVM1-CPU11
- CV1000, CV2000: CVM1-CPU21-EV2

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

To install the Omron 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 Omron Host Link Setup 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 a setup dialog box. 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 Omron 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 Omron 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 cabling pinouts for connecting a 3000 engine to an Omron PLC.

Configuring the Port

A 3000 engine can communicate with an Omron PLC in both RS-232C and RS-422 modes.

Cabling

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

Electromagnetic Compatibility Warning

The connection of non-shielded equipment interface cables to 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 Pinout

Figure 1 depicts the RS-232C pinout to connect a 3000 engine to an Omron PLC.

Technical Note

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

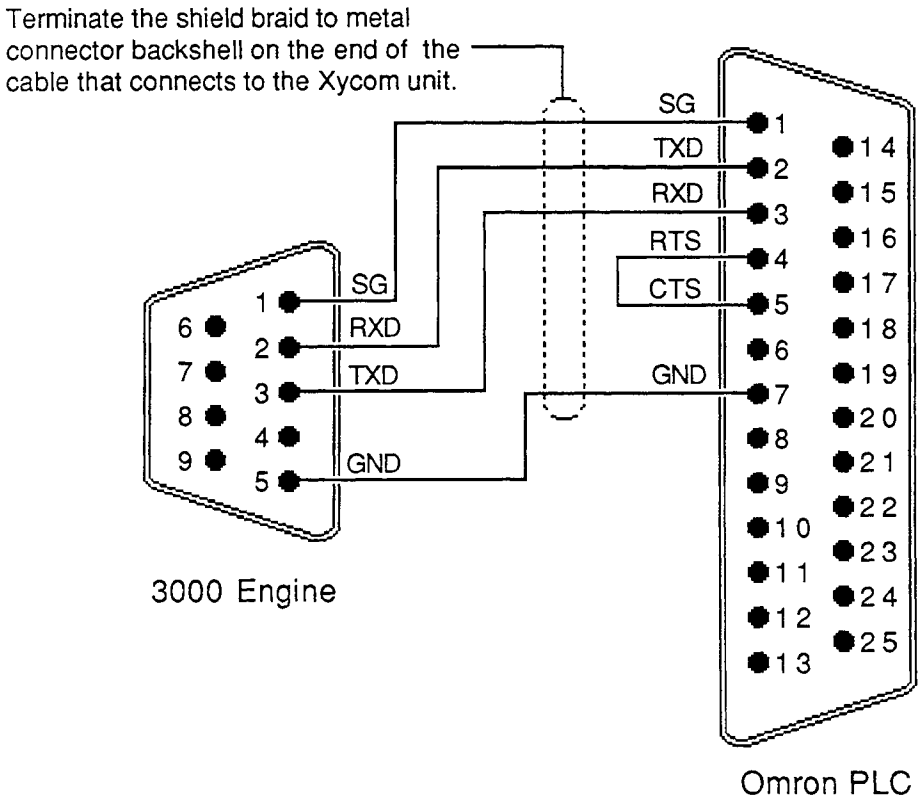


Figure 1. Omron RS-232C Pinout

RS-422 Pinout

Figure 2 depicts the RS-422 pinout to connect a 3000 engine to an Omron PLC.

Technical Note

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

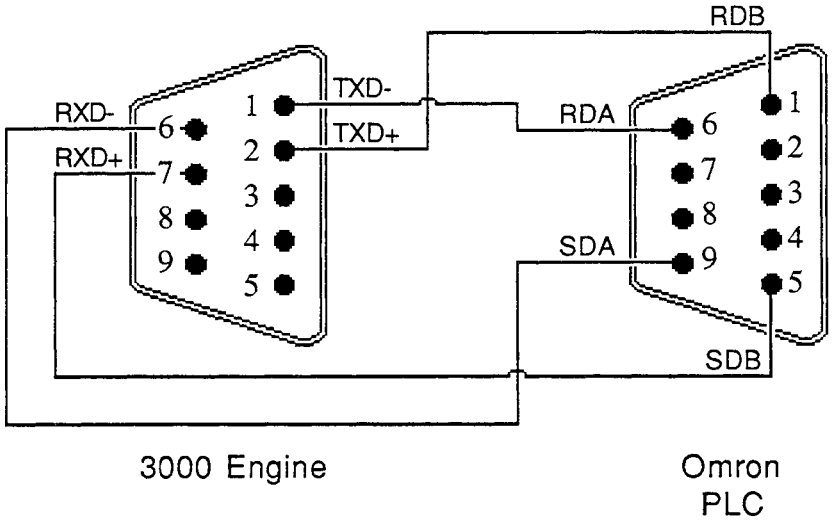


Figure 2. Omron RS-422 Pinout

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 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.

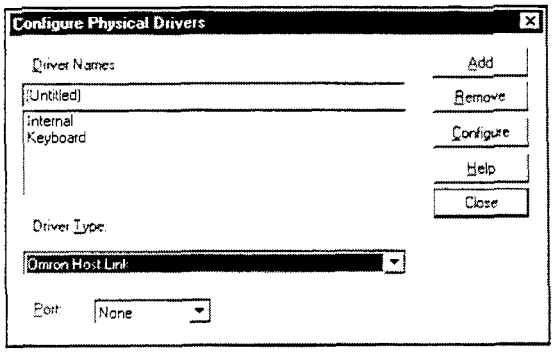


Figure 3. Configure Physical Drivers Dialog Box

3. Select Omron Host Link from the Driver Type drop-down list box.
4. Type a unique name in the Driver Names text box, using up to 32 characters. Tag names 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 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 Omron Configuration dialog box opens, as shown in Figure 4.

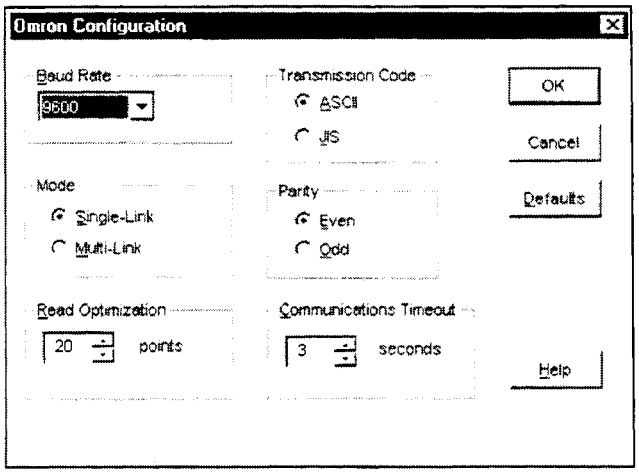


Figure 4. Omron Configuration Dialog Box

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

Table 1. Fields in the Omron Driver Configuration Dialog Box

Field	Definition
Baud Rate	Sets the baud rate at which you will transfer data, from 300 to 19200. The default is 9600.
Mode	Sets the mode to Single link or Multi link. The default is Single link.
Read Optimization	Optimizes the number of data points read in a single command, from 1 to 28. The default is 20. This number can be changed to affect driver performance.
Transmission Code	Sets the format of the data blocks sent/received from the 3000 engine with the format of the data blocks sent/received from the PLCs. Choices are ASCII (7 data bits, 2 stop bits) and JIS (8 data bits, 1 stop bit). The default is ASCII.
Parity	Sets error-checking to even or odd parity. The default is even.
Communications Timeout	Sets the time period the engine will wait for a response from the PLC before timing out, from 1 to 30 seconds. The default is 3.

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 Omron data points.

Addressing the PLC

SoftScreen uses tag names to address PLC data points. Tag names can be up to 32 alphanumeric characters; they cannot begin with a number or space.

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

Assigning Tag Names

To assign a tag name to a data point on a Omron 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 Omron data point configuration form opens, as shown in Figure 5.

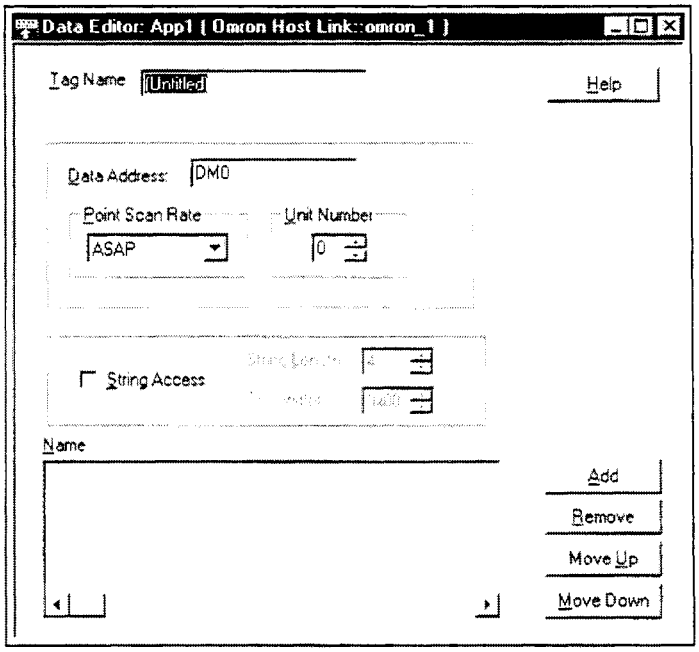


Figure 5. Omron Data Point Configuration Form

Table 2 defines the fields in this form.

Table 2. Fields in the Omron 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 DM0. Refer to the *Creating Valid Addresses* section 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.
Unit Number	Allows you to address a particular PLC on a multi-link network. Choices are 0-31. The default is 0.

Field	Definition
String Access	When checked, indicates the data address you entered in the Data address field accesses strings. If this field is checked, you must select a string length, from 1 to 57 characters (the default is 4), and a string terminator character, from 0x00 to 0xFF (the default is 0x00). 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 access strings.*

3. Click Add to add the tag. Click Remove to delete the tag. Click Move Up or Move Down to change the order in which the tags are arranged in the list box, which changes the order in which they are written to or read from.

Creating Valid Addresses

Table 3 defines the valid data types and file ranges for Omron PLCs.

Table 3. Omron Valid Data Types and Addressing Ranges

Data Type	File Range	Size	Bit Addressing	String Support	Word Access	Bit Access*
Internal Relay (IR)	0-9999	Word	0-15	No	R/W	R/W
Link Relay (LR)	0-9999	Word	0-15	No	R/W	R/W
Holding Relay (HR)	0-9999	Word	0-15	No	R/W	R/W
Auxiliary Relay (AR)	0-9999	Word	0-15	No	R/W	R/W
Data Memory (DM)	0-9999	Word	0-15	Yes	R/W	N/A
Core I/O** (CIO)	0-9999	Word	0-15	No	R/W	R/W
Timer/Counter (TC)	0-9999	Bit	No	No	N/A	N/A
Present Value (PV)	0-9999	Word	No	No	R/W	N/A

**The format for accessing a bit is* `<address> <bit>`. *For example,* `LR10 5` *addresses link relay 10, bit 5.*

***CV-Series PLCs only*

Technical Note

You can only perform writes when the PLC is in Monitor mode.

Technical Note

The CIO memory area contains IR, LR, and HR address types.

Following are examples of tags that address Omron data points.

Example_1 addresses auxiliary relay 123 ASAP from unit number 10.

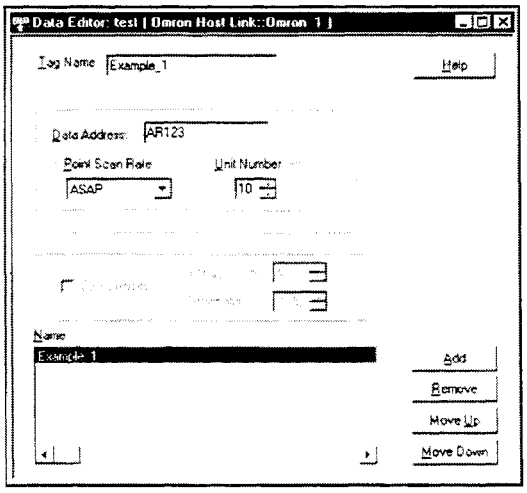


Figure 6. Omron Addressing, Example 1

Example_2 addresses Core I/O data point 9999, bit 15 every five seconds from unit number 31.

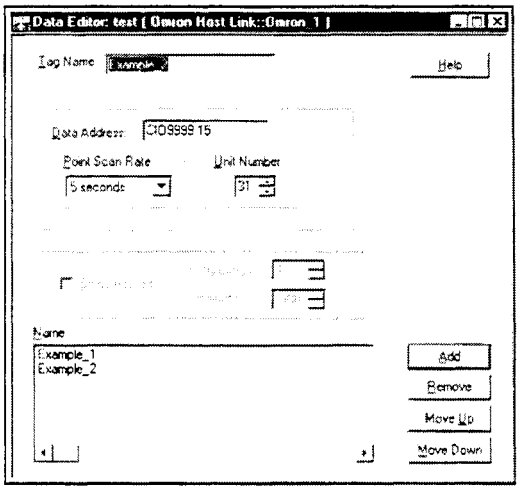


Figure 7. Omron Addressing, Example 2

Example_3 addresses data memory data point 4321 every two minutes from unit 11. String length is 21.

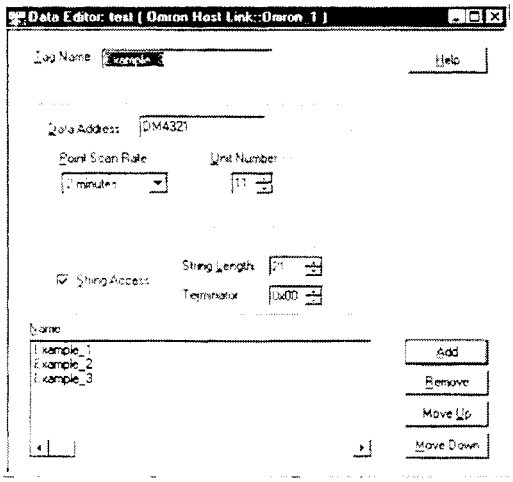


Figure 8. Omron Addressing, Example 3

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

OmronDriverID returns the following null-terminated string identifying the driver running on the 3000 engine: "Omron Host Link Driver."

Driver Revision

OmronDriverRev returns a string identifying the driver revision level, such as "1.3."

Error Handling

OmronCommStatus returns a number describing the current communication status of the driver. Table 4 defines these status values.

Technical Note

There are no communication errors if the number is 0.

Table 4. Omron Communication Status Errors

Number	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 response block contained invalid information (unit number, header, or data)
3	FCS error–The message received had an invalid frame checksum
4-7	Reserved

Number	Description
8	Not executable in RUN mode
9	Not executable in MONITOR mode
10	Not executable with PROM mounted
11	Address over (data overflow)
16	I/O Register capacity exceeded (not registration made), I/O read not executable
18	Not executable in PROGRAM mode
19	Not executable in Debug mode
20	Not executable in LOCAL mode
23	Parity error
24	Framing error
25	Overrun
26	FCS error
27	Format error (parameter length error)
28	Entry number data error (parameter error, data code error, data length error)
29	Instruction not found
31	Frame length error
32	Not executable (due to unexecutable error clear, non-registration of I/O table, etc.)
39	I/O table generation impossible (unrecognized Remote I/O unit, word over, duplication of Optical Transmitting I/O unit)
167	Aborted due to parity error in transmit data
168	Aborted due to framing error in transmit data
169	Aborted due to overrun in transmit data
171	Aborted due to format error in transmit data
172	Aborted due to entry number data error in transmit data
175	Aborted due to frame length error in transmit data
183	Not executable because the program area is not 16 Kbytes

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:

```
"Omron HL Port:2 #:31 Addr:(R) CIO9999 15"
```

This error occurred while reading (R) CIO9999 bit 15 from destination PLC unit number 31 on port 2.

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).

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), the driver posts the following message:

```
"Omron HL: Communication Restored"
```

Communication Status

OmronCommString returns a null-terminated string describing the current communication status of the driver. If no errors are found, the following string displays:

```
"Omron Host Link: Port(x) NO Errors"
```

Scan Time

OmronScanTime 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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