8320-SoftScreen™

Industrial Workstation

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WARNING

Dangerous voltages are present within the 8320-SoftScreen Terminal. These voltages will remain after all electrical power is turned off. Use caution whenever the front panel is opened. Avoid touching high-voltage areas within the SoftScreen Workstation. Do not work alone.

WARNING

The fragile Cathode Ray Tube (CRT) is exposed when the front panel is opened. Wear safety glasses to protect eyes in case of accidental breakage. The internal coating of the CRT is extremely TOXIC. If exposed, RINSE IMMEDIATELY and consult a physician.

CAUTION

This equipment contains parts sensitive to damage by electrostatic discharge (ESD). Use ESD precautionary procedures when touching, removing or inserting parts or assemblies.

1.1 USING THIS MANUAL

This manual provides both in-depth information and a quick start-up section. Use the outline below to help you locate information (see the table of contents and index for page numbers).

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1.2 PRODUCT OVERVIEW

The 8320-SoftScreen™ Workstation consists of two parts: an operator interface workstation and a software program for offline development. This manual discusses only the 8230-SoftScreen Workstation (also referred to as engine and target device). See your SoftScreen Development System manual for information specific to the software.

The Xycom 8320-SoftScreen Workstation is an operator interface for PLCs which incorporates a rugged enclosure, a 14-inch VGA color CRT (with impact-resistant shield), built-in sealed-membrane keypads, and an external keyboard port. The 8320 front panel is sealed to both NEMA 4 and NEMA 12 specifications, and can be mounted in a standard 19" rack or in an equipment enclosure panel.

Like all of Xycom's terminals, the 8320-SoftScreen Workstation is specifically designed for reliability under the extreme conditions of shock, vibration, temperature, and humidity found on a plant floor. (See Appendix A for specifications.)

The ruggedness and flexibility make the 8320-SoftScreen Workstation an ideal industrial interface in such applications as machine and process control, on-site data entry, and system diagnosis. It will provide an interactive window into any industrial system.

The 8320-SoftScreen Workstation runs the applications created on the development system. The applications are downloaded to the 8320-SoftScreen engine over a single RS-232C line or over an RS-485 multidrop network. The 8320-SoftScreen Workstation is user-configurable to provide simultaneous communication with multiple PLC networks for most interfaces. This communication link allows the 8320-SoftScreen Workstation to directly access the PLC's data table to write and retrieve information for plant floor personnel without adding any additional ladder logic.

The 8320-SoftScreen Workstation is an open, versatile system. Some of its features include:

- Two optically isolated serial ports
- Printer port
- Time-of-day clock/calendar (battery-backed)
- Battery-backed memory
- Self-diagnostics
- Password protection
- Front and rear-mounted keyboard ports

1.3 UNPACKING THE SYSTEM

When you remove the 8320-SoftScreen Workstation from its box, verify that you have the parts listed below. (It is a good idea to save the box and inner wrapper in case you need to re-ship the unit.)

- 8320-SoftScreen Workstation
- Documentation kit, which includes:
  - Power cable
  - 8320-SoftScreen Workstation user manual
  - Business reply card
- Any options such as the SoftScreen development system, keyboards, manuals, etc. (shipped in separate boxes)

1.4 SYSTEM COMPONENTS

1.4.1 Front Panel

The 8320-SoftScreen Workstation is equipped with a NEMA 4/NEMA 12 sealed front panel. The panel protects the interior of the system from harsh environmental conditions whenever the system is properly panel-mounted. Features visible on the front panel include:

Monitor — Protected from breakage by a high-impact shield, the 14" VGA monitor displays graphics in high resolution color.

Function Keys — These twenty fully-operable sealed keys are located directly below the monitor. They are user-configurable.

PC/AT Keyboard Port — This enclosed port allows a PC/AT compatible keyboard to be attached to the front of the system.

Data Entry Pad — This sealed 3x11 keypad includes: 0 through 9, DEL, ESC, *, +, -, cursor arrows, Enter, Ctrl, Alt, /, =, Space, BKSPC, Home, Pause, Tab, Insert, PgUp, PgDn, End, and Shift.

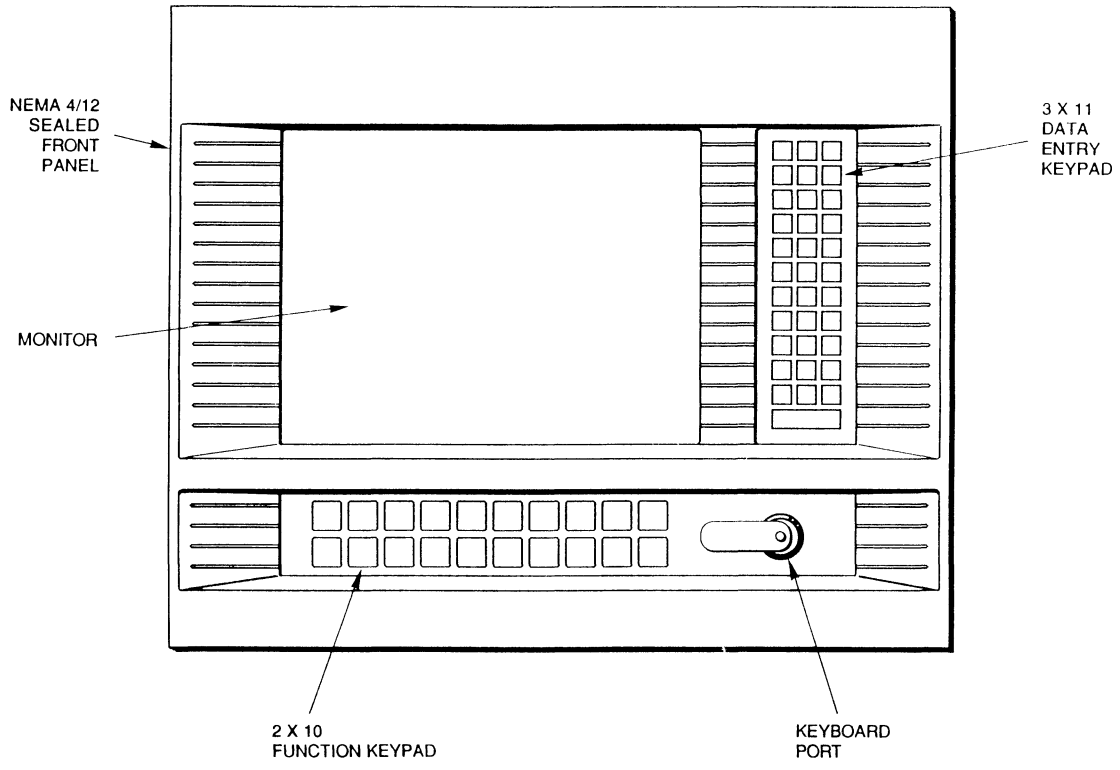


Figure 1-1. 8320-SoftScreen Front Panel

1.4.2 **Back Panel**

The 8320-SoftScreen Workstation's back panel offers access to the various ports, the power assembly, contrast and brightness controls, and optional expansion modules. Figure 1-2 shows the features visible on the back panel:

Power Switch	This switch controls the power flow to the terminal.
Power Receptacle	Located under the power switch, it is the attachment point for the power cord.
Fuse Receptacle	The fuse for the terminal is held behind the black plastic access door.
Adjustment Knobs/Holes	Used to control the brightness and contrast of the monitor. The text knob places the terminal in text mode, and controls the intensity of the text.
Voltage Select	Selects either 115 VAC or 230 VAC input.
Battery	Keyed cover for RAM backup battery.

The options of the back panel are discussed in detail in Chapter 2 and Appendix A.

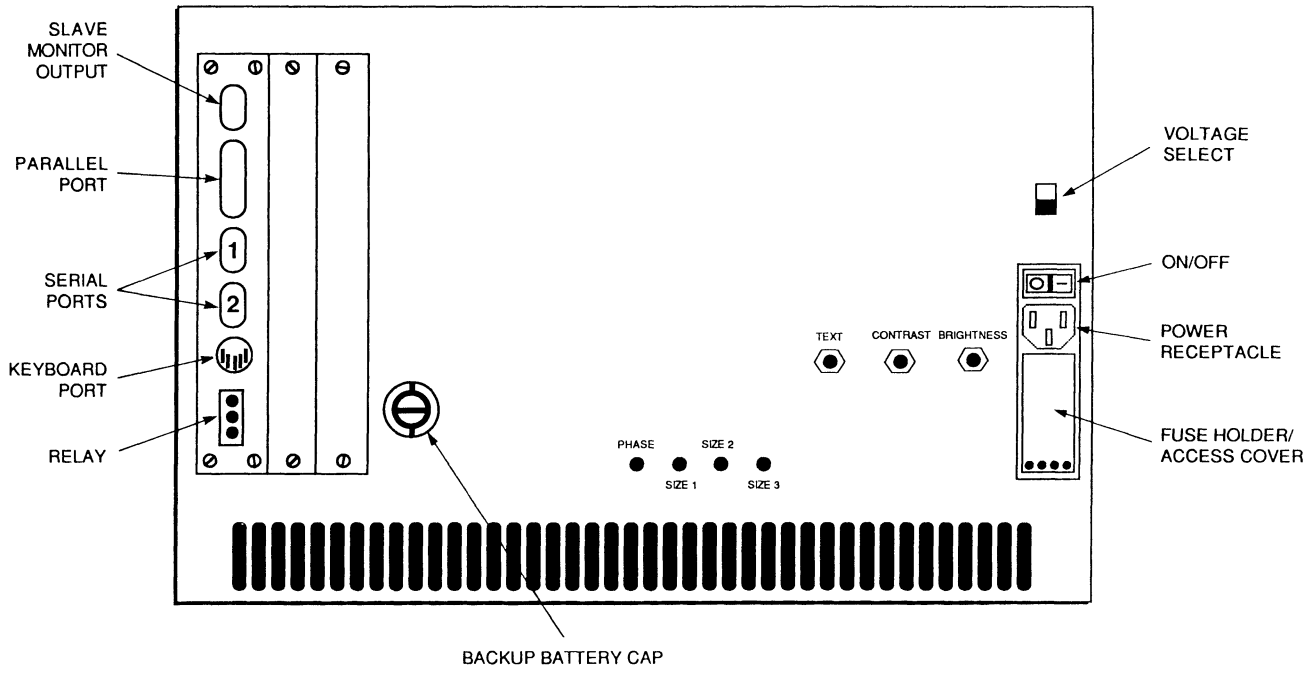


Figure 1-2. 8320-SoftScreen Back Panel

1.5 QUICK START-UP

> **NOTE**
> This section gets your system up and running without explaining options or capabilities of the system. The appendix provides specifications, pinouts, jumper configurations, etc.

To prepare the system for use, perform the steps listed below:

> **WARNING**
> Before connecting electrical power to the terminal, turn the power switch OFF.
>
> The power cable must be connected to a properly grounded outlet. Do NOT use an adapter plug that prevents the terminal from being properly grounded through the power cable.

1. **Install any expansion modules or other circuit boards in the 8320-SoftScreen Workstation.** Instructions are provided with all Xycom optional equipment.

2. **Secure the 8320-SoftScreen Workstation in a suitable mounting location** (refer to Appendix A or Chapter 2 for cutout dimensions).

3. **Connect the female end of the power cable to the terminal electrical power receptacle.** Attach the other end to an appropriate power source.

4. **Attach any optional keyboards** to the keyboard connector on the front or back panels of the 8320-SoftScreen Workstation. Both connectors are keyed to prevent incorrect alignment.

   For both applications, the keyboard must be an AT type (i.e. either an AT keyboard or an XT/AT keyboard with the switch positioned to AT).

5. **Connect the SoftScreen network cables from any serial port other than 1 to the appropriate port on the PLC.** Make sure the port you choose is jumpered appropriately for either RS-232C or RS-422/485. See Section 2.5 for the settings.

6. **If using the SoftScreen offline development software, connect the 8320-SoftScreen Workstation to the offline development system** from port 1 of the 8320 to port 1 or 2 of the development system. Make sure the port you choose is jumpered appropriately for either RS-232C or RS-422/485. See Section 2.5 for the settings.

7. **Connect any other peripherals to the appropriate ports.**

8. **Set power switch to ON.**

9. **Adjust the contrast and brightness knobs.**

Once the power-up diagnostics are complete, the SoftScreen engine screen will appear. The 8320-SoftScreen terminal is ready for use. Type the following to enter the terminal setup menus:

<CTRL><BREAK> (on keyboard) or **<backspace><down arrow>** (on keypad)

The terminal menus are described fully in Chapter 4.

Appendix A provides wiring descriptions of the various ports and connectors, while chapter 3 provides cabling information for the various PLCs supported.

2.1 INTRODUCTION

This chapter describes how to prepare the 8320-SoftScreen Workstation for use including installing the keyboards, mounting the unit, configuring the serial ports, and connecting the 8320-SoftScreen Workstation to the PC/AT development system.

The 8320-SoftScreen Workstation supports communication with multiple PLC networks. The cabling necessary for each connection is detailed beginning in Chapter 3.

2.2 PREPARING THE 8320-SOFTSCREEN WORKSTATION FOR USE

To prepare the system for use, perform the steps listed below:

> **WARNING**
> Before connecting electrical power to the terminal, ensure that the power switch is set to OFF.
>
> The power cable must be connected to a properly grounded outlet. Do NOT use an adapter plug that prevents the terminal from being properly grounded through the power cable.

1. **Install any expansion modules or other circuit boards in the 8320-SoftScreen Workstation.** Instructions are provided with all Xycom optional equipment.

2. **Secure the 8320-SoftScreen Workstation in a suitable mounting location** (refer to page 2-8 for cutout dimensions).

3. **Connect the female end of the power cable to the terminal electrical power receptacle.** Attach the other end to an appropriate power source.

4. **Attach any optional keyboards** to the keyboard connector on the front or back panels of the 8320-SoftScreen Workstation. Both connectors are keyed to prevent incorrect alignment.

   For both applications, the keyboard must be an AT type (i.e. either an AT keyboard or an XT/AT keyboard with the switch positioned to AT).

5. **Connect the SoftScreen network cables from any serial port other than 1 to the appropriate port on the PLC.** Make sure the port you choose is jumpered appropriately for either RS-232C or RS-422/485. See Section 2.5 for the settings.

6. **If using the SoftScreen offline development software, connect the 8320-SoftScreen Workstation to the offline development system** from port 1 of the 8320 to port 1 or 2 of the development system. Make sure the port you choose is jumpered appropriately for either RS-232C or RS-422/485. See Section 2.5 for the settings.

7. **Connect any other peripherals to the appropriate ports.**

8. **Set power switch to ON.**

9. **Adjust the contrast and brightness knobs.**

Once the power-up diagnostics are complete, the SoftScreen engine screen will appear. The 8320-SoftScreen terminal is ready for use. Type the following to enter the terminal setup menus:

<CTRL><BREAK> (on keyboard) or **<backspace><down arrow>** (on keypad)

The terminal menus are described fully in Chapter 4.

Appendix A provides wiring descriptions of the various ports and connectors, while Chapter 3 provides cabling information for the various PLCs supported.

2.3 INSTALLING OPTIONS

2.3.1 Connecting the Optional Keyboard

There are keyboard connectors on both the front and back panels of the 8320-SoftScreen Workstation. Both connectors are keyed to prevent incorrect alignment.

For both applications, the keyboard must be an AT type (i.e. either an AT keyboard or an XT/AT keyboard with the switch positioned to AT).

> **CAUTION**
> The cap should be installed on the front panel when the optional keyboard is not attached.

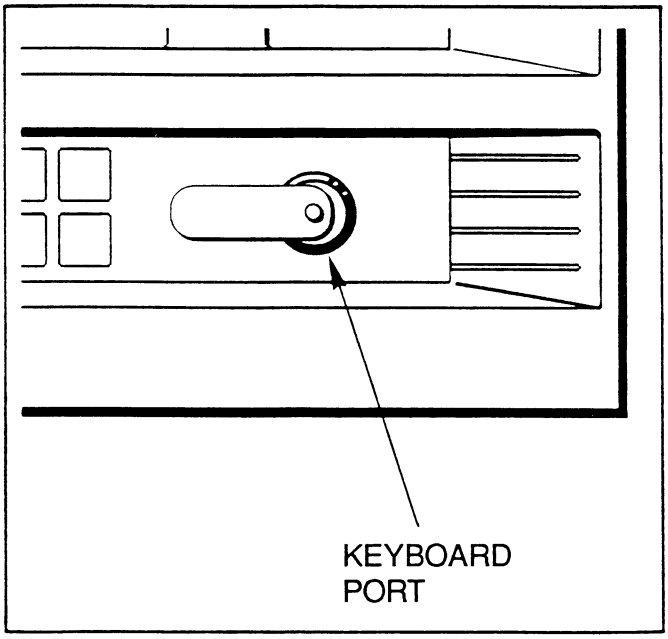


Figure 2-1. Keyboard Connection

2.3.2 Setting the Memory Unit Jumpers on the 8111 and 8112 Option Board

If you are using either Xycom's optional 8111 Memory Expansion Card or 8112 Expansion Module, set the jumpers as shown in Table 2-1 below:

Table 2-1. 8111 and 8112 Memory Unit Jumpers

8111		
Jumper	**First Expansion Card**	**Second Expansion Card**
J43 J47	A* B*	B A
8112		
Jumper	**First Expansion Card**	**Second Expansion Card**
J1	A*	B

*Factory shipped setting

For more information about the optional 8111 or 8112 module, consult the 8111 or 8112 Manual.

2.4 INSTALLING THE UNIT IN A RACK OR PANEL

The 8320-SoftScreen Workstation's rugged design allows for installation in most industrial environments. The 8320-SoftScreen Workstation is generally placed in a NEMA 4/12 enclosure to protect against contaminants such as dust, moisture, etc. Metal enclosures also help minimize the effects of electromagnetic radiation that may be generated by nearby equipment. Follow these guidelines when selecting a location for your unit:

- Account for the unit's depth as well as cabling when choosing the depth of the enclosure
- Select an enclosure that will allow access to the 8320-SoftScreen Workstation ports
- Consider locations of AC power outlets and lighting (interior lighting and windows)
- If condensation is expected, install a thermostat-controlled heater or air conditioner in or near the enclosure that holds the 8320-SoftScreen Workstation
- Wherever possible, do not select a location near equipment that generates excessive electromagnetic interference (EMI) or radio frequency interface (RFI) (equipment such as high power welding machines, induction heating equipment, and large motor starters)
- Make sure the location does not exceed the 8320-SoftScreen Workstation's shock, vibration, and temperature specifications (provided in Appendix A)

2.4.1 Mounting Considerations

Once you have found a location for the 8320-SoftScreen Workstation, install it in the enclosure according to the manufacturer's instructions. Consider the following points and precautions before placing the 8320-SoftScreen Workstation inside an enclosure:

- **To allow for maximum cooling, avoid obstructing the air flow.** Allow about two to four inches of space around the unit.
- **Place the 8320-SoftScreen Workstation at a comfortable working and viewing level.**
- **Locate incoming power lines (such as isolation or constant voltage transformers, local power disconnects, and surge suppressors) alongside the power supply and away from the 8320-SoftScreen Workstation.** The proper location of incoming line devices keeps power wire runs as short as possible, and minimizes electrical noise transmitted to the 8320-SoftScreen Workstation.
- **Locate any fans or blowers close to the heat generating devices.** If using a fan, make sure that outside air is not brought inside the enclosure unless a fabric or other reliable filter is also used. This filtration prevents conductive particles or other harmful contaminants from entering the enclosure.

2.4.2 **Excessive Heat**

The 8320-SoftScreen Workstation is designed to withstand temperatures from 0° to 50° C and is cooled by convection, in which a vertical column of air is drawn in an upward direction over the surface of the components. To keep the temperature in the range, the cooling air at the base of the system must not exceed 50° C. Proper spacing must also be allocated between internal components installed in the enclosure.

When the air temperature is higher than 50° C in the enclosure, use a fan or air conditioner.

2.4.3 **System Power**

It is always a good idea to use a common AC source to the system power supply and the I/O devices. This practice minimizes line interference and prevents the possibility of reading faulty input signals if the AC source to the power supply and workstation is stable while the AC source to the serial I/O devices is unstable. By keeping both on the same power source, you take advantage of the power supply's own line monitoring feature.

Another good practice is to use isolation transformers on the incoming AC power line to the 8320-SoftScreen Workstation. An isolation transformer is especially desirable in cases where heavy equipment is likely to introduce noise onto the AC line. The isolation transformer can also serve as a step-down transformer to reduce the incoming line voltage to a desired level. The transformer should have a sufficient power rating (units of volt-amperes) to supply the load adequately.

Proper grounding is essential to all safe electrical installations. Refer to the National Electric Code (NEC), article 250, which provides data such as the size and types of conductors, color codes, and connections necessary for safe grounding of electrical components. The code specifies that a grounding path must be permanent (no solder), continuous, and able to safely conduct the ground-fault current in the system with minimal impedance. The following practices should be observed:

- **Separate ground wires from power wires at the point of entry to the enclosure.** To minimize the ground wire length within the enclosure, locate the ground reference point near the point of entry for the plant power supply.

- **All electrical racks or chassis and machine elements should be grounded to a central ground bus**, normally located in the magnetic area of the enclosure. Paint and other non-conductive materials should be scraped away from the area where a chassis makes contact with the enclosure. In addition to the ground connection made through the mounting bolt or stud, a one-inch metal braid or size #8 AWG wire can be used to connect between each chassis and the enclosure at the mounting bolt or stud.

- **The enclosure should be properly grounded to the ground bus.** Make sure a good electrical connection is made at the point of contact with the enclosure.

- **The machine ground should be connected to the enclosure and to earth ground.**

2.4.4 Excessive Noise

Electrical noise is seldom responsible for damaging components, unless extremely high energy or high voltage levels are present. However, noise can cause temporary malfunctions due to operating errors, which can result in hazardous machine operation in certain applications. Noise may be present only at certain times, may appear at widely-spread intervals, or in some cases may exist continuously.

Noise usually enters through input, output, and power supply lines and may be coupled into lines electrostatically through the capacitance between these lines and the noise signal carrier lines. This usually results from the presence of high voltage or long, closed-spaced conductors. When control lines are closely spaced with lines carrying large currents, the coupling of magnetic fields can also occur. Use shielded cables to help minimize noise. Potential noise generators include relays, solenoids, motors, and motor starters, especially when operated by hand contacts like push buttons or selector switches.

2.4.5 Excessive Line Voltage

The power supply section of the 8320-SoftScreen Workstation is built to sustain line fluctuations of 90 - 131 VAC or 182-226 VAC and still allow the system to function within its operating margin. As long as the incoming voltage is adequate, the power supply provides all the logic voltages necessary to support the processor, memory, and I/O.

In cases where the installation is subject to unstable AC lines and unusual line variations, a constant voltage transformer can be used to prevent the system from shutting down too often. However, a first step toward the solution of the line variations is to correct any possible feed problem in the distribution system. If this correction does not solve the problem, a constant voltage transformer must be used.

The constant voltage transformer stabilizes the input voltage to the power supply and input field devices by compensating for voltage changes at the primary in order to maintain a steady voltage at the secondary. When using a constant voltage transformer, check that the power rating is sufficient to supply the input devices and the power supply. The output devices are generally connected to the line in front of the constant voltage transformer, instead of providing power to the outputs from the transformer. This arrangement lessens the load supported by the transformer and allows a smaller rating.

2.4.6 Mounting the 8320-SoftScreen Workstation

Once the conditions in the preceding sections have been met, mount the 8320-SoftScreen Workstation by following the instructions below.

1. Locate a position for your 8320-SoftScreen Workstation that meets the specifications listed earlier, and the specifications of the Workstation as listed in Appendix A.

2. Add the cutout (as shown in Figure 2-2) to the enclosure.

3. Make sure the area around the cutout is clean and free from metal burns.

4. Make sure the 8320-SoftScreen Workstation enclosure is grounded to the enclosure.

5. Install the unit into the cutout.

6. Tighten the 14 #10 nuts.

> **NOTE**
> The depth listed does not account for any cabling that may extend beyond the unit.

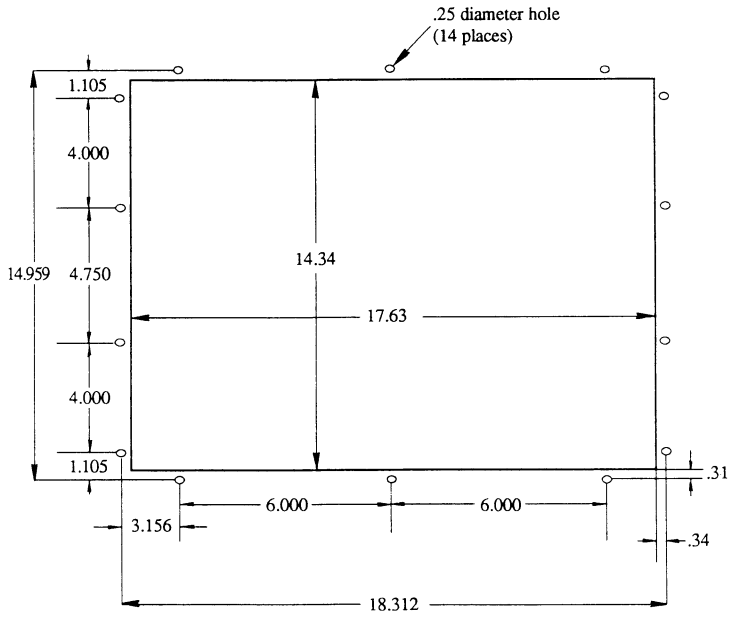


Figure 2-2. Cutout Dimensions

2.5 PORTS

This section describes how to configure the serial ports.

2.5.1 Configuring the Serial Ports

The 8320-SoftScreen Workstation has two serial ports, which can be jumper configured to either RS-232C or RS-485 as shown in Table 2-2 below. (The shipping configuration is RS-232C.) These ports are located below the printer port, and are both 9 pin DIN male connectors. The pinouts for both ports are provided in Appendix A.

Table 2-2. 8320-SoftScreen Serial Port Jumpers

Port 1			Port 2		
Jumper	**RS-232C**	**RS-422**	**Jumper**	**RS-232C**	**RS-422**
J10	out	in	J48	out	in
J11	B	A	J32	B	A
J18	B	A	J34	B	A
J19	B	A	J35	B	A
J20	B	A	J36	B	A
J21	B	A	J37	B	A
J23	B	A	J39	B	A
J24	B	A	J40	B	A
J26	B	A	J43	B	A

If ports 1 or 2 are configured for RS-485, the inputs CTS and RXD may be terminated. Each signal for each port is independently enabled by a pair of jumpers. Installing the jumpers as indicated below will terminate a specific signal.

Port 1:	RXD: J14 and J15	Port 2:	RXD: J54 and J55
	CTS: J12 and J13		CTS: J52 and J53

Xycom's optional 8111 Memory Expansion Card provides two additional serial ports; ports 3 and 4. Port 4 is a dedicated RS-232C port, whereas port 3 can be jumper configured to RS-232C or RS-485 as shown in Table 2-3 below:

Table 2-3. Optional 8111 Expansion Card Serial Port 3 Jumpers

Port 3		
Jumper	**RS-232C**	**RS-485**
J2	B	A
J3	A	B
J4	A	B
J5	B	A
J6	B	A
J7	A	B
J9	B	A
J10	B	A
J11	out	in
J12	out	in

The jumper locations for the 8320-SoftScreen Workstation are given in Figure 2-3 below. (See your 8111 Manual for locations of jumpers on the 8111 Card.)

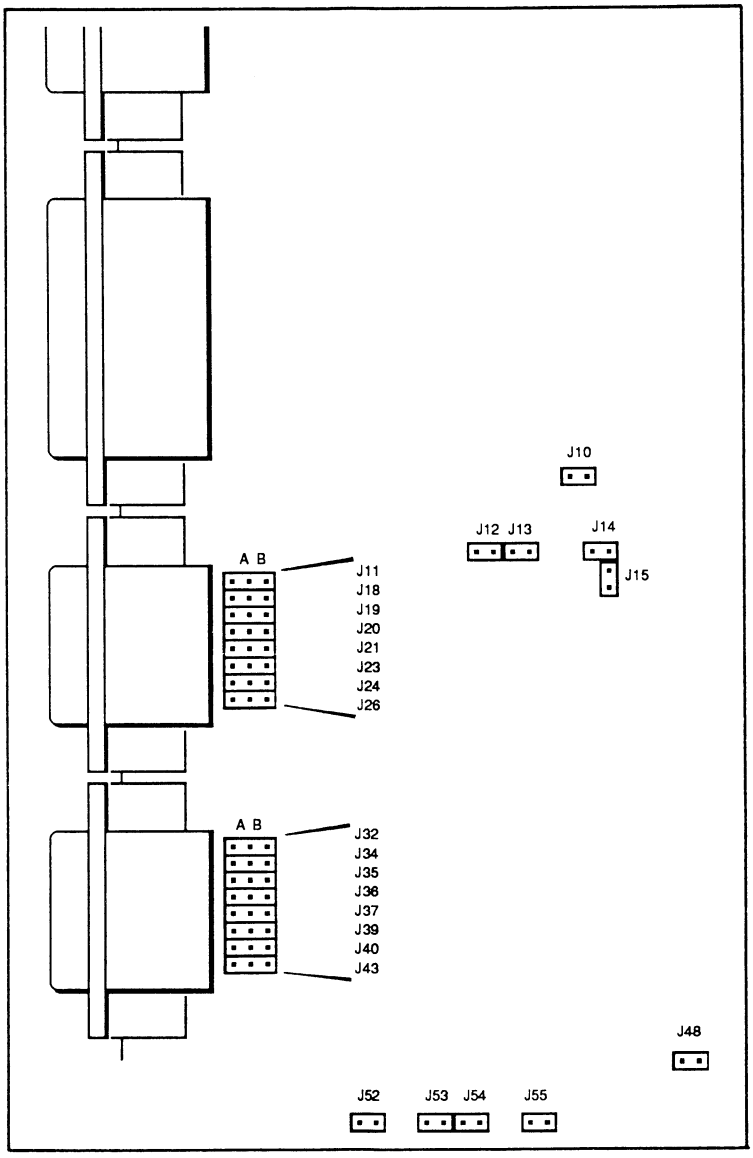


Figure 2-3. Jumper Locations

2.5.2 **Keyboard Port**

This is a standard 5 pin keyboard connector, keyed to permit only one connection alignment.

Table 2-4. Keyboard Connector

Pin	Signal
1	Clock
2	Data
3	N.C
4	Ground (SG)
5	+5 VDC
Shell	Ground (FG)

2.5.3 **Relay Output Port**

This connector consists of three small screws to attach up to three wires, surrounded by a black plastic casing. This is a double pole, single throw (DPST) relay. The relay is activated when a SoftScreen alarm, which is configured to turn the relay "On" occurs. The relay is turned "Off" when the (Alarm Display Time * 20ms) has elapsed. The relay may be used to turn on/off sirens, lights, etc. Refer to your SoftScreen Development Manual for more details.

Relay Specifications: Maximum Contact Current = 0.3A AC, 1.0A DC

Table 2-5. Relay Port

Pin	Signal
1	Normally Closed
2	Common
3	Normally Open

2.5.4 Video Connector

This is a 15 pin D-type female connector with the standard VGA signals.

Table 2-6. Video Connector

Pin	Signal	Pin	Signal
1	RED	9	N/C
2	GREEN	10	GND
3	BLUE	11	N/C
4	N/C	12	N/C
5	GND	13	HSYNC
6	RGND	14	VSYNC
7	GGND	15	N/C
8	BGND		

2.5.5 Slave Monitor

The slave monitor should be no more than 6 feet from the workstation.

2.6 CONNECTING THE 8320-SOFTSCREEN WORKSTATION TO THE OFFLINE DEVELOPMENT SYSTEM

The 8320-Workstation will connect to the PC/AT development system via port 1, which can be jumper configured to RS-232C or RS-485.

For RS-232C, use the 9-pin to 25-pin SMART cable supplied with the development system. First, attach the female 25-pin side of the connector adapter to the 25-pin male end of the cable. Now your cable has two female 9-pin connectors, which can attach from port 1 of the 8320-Workstation to port 1 or 2 of your computer. The pinouts for the connection are shown in Figure 2-4 below. The switch on the cable should be positioned in the middle (connector side up). Both amber lights should be on during normal operation. For more information, see the sticker on the cable or the manual that comes with the cable.

For RS-485, use a standard RS-485 cable to connect from port 1 of the 8320-SoftScreen Workstation to port 1 or 2 of your IBM PC/AT. The pinouts are shown on the next page. Make sure the jumpers are set for either RS-232C or RS-485 as shown in Table 2-2 (on page 2-9).

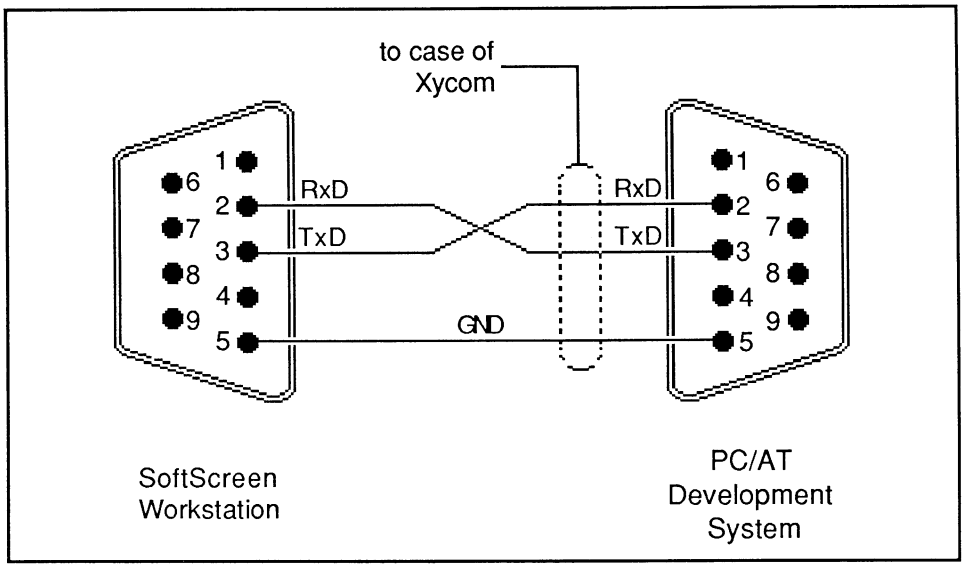


Figure 2-4. PC/AT Development System to 8320-SoftScreen Electrical Interface via RS-232C

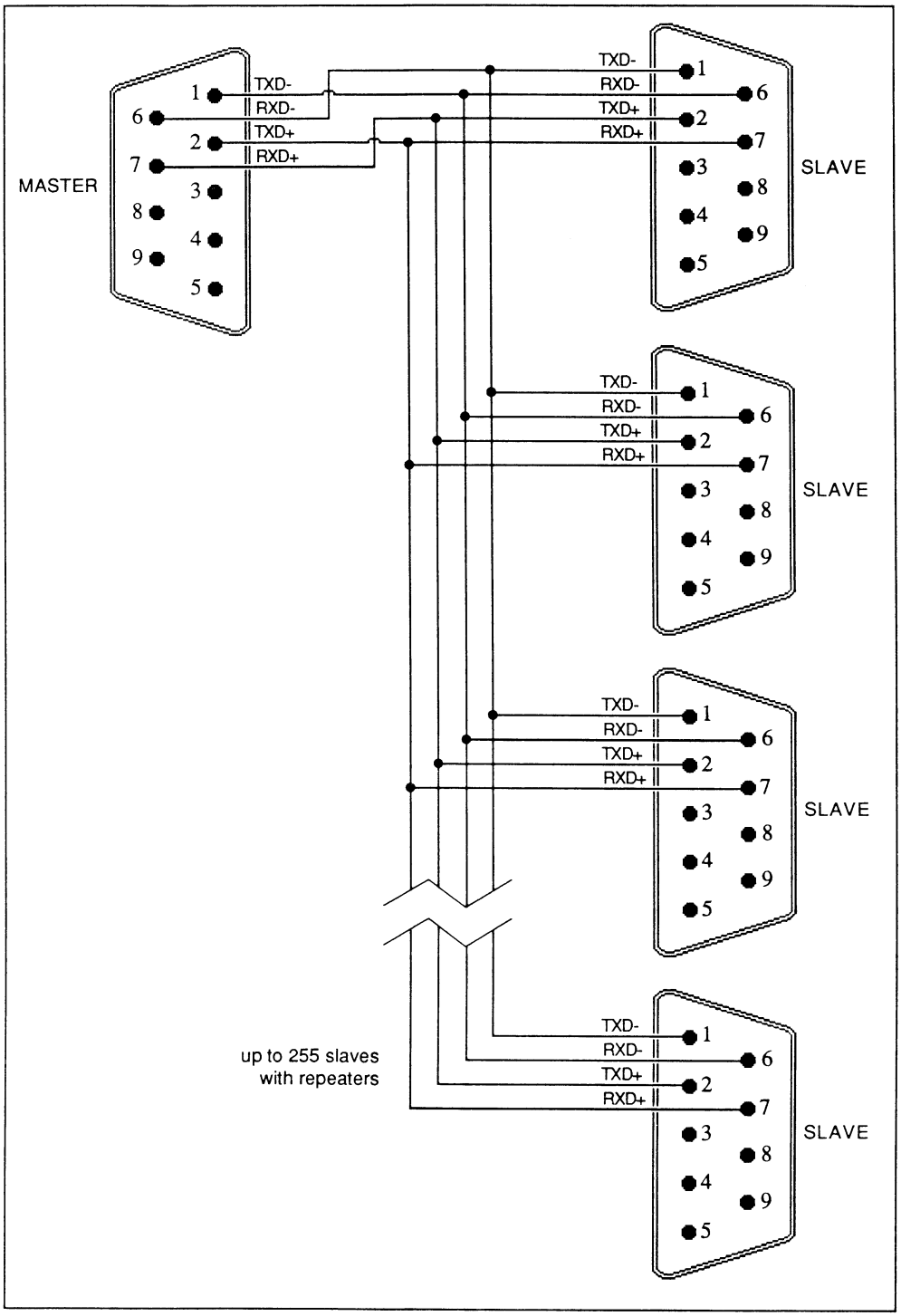


Figure 2-5. PC/AT Development System Multidrop Electrical Interface via RS-485

Up to 255 SoftScreen Workstations can be multidropped from the PC/AT development system. A sample multidrop configuration is shown in Figure 2-6 below.

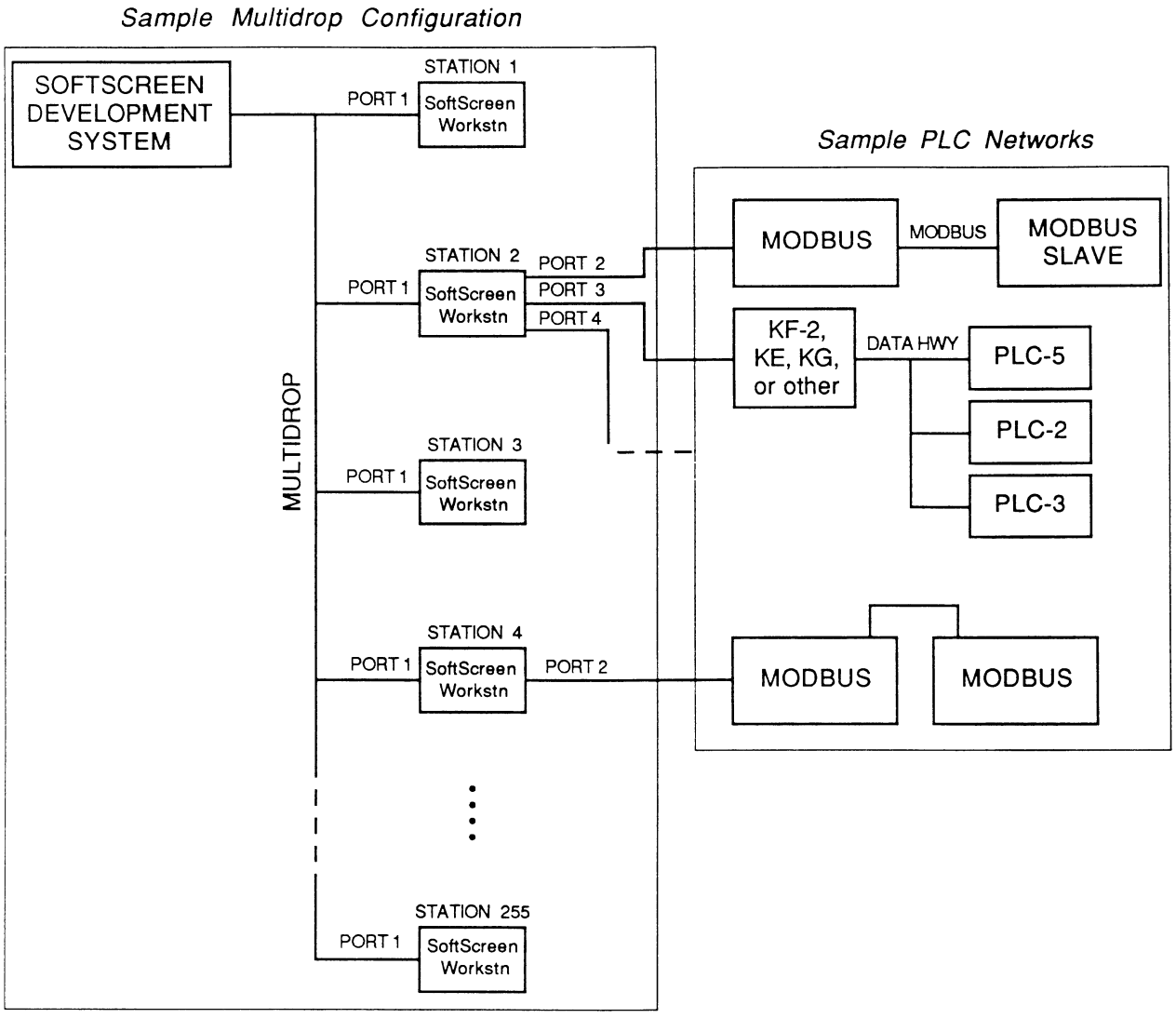


Figure 2-6. Sample Multidrop Configuration

> **NOTE**
> All RS-232 should have shielded cabling with shield ground to engine frame for noise protection.

3.1 CONNECTING THE 8320-SOFTSCREEN WORKSTATION TO ALLEN-BRADLEY DATA HIGHWAY

This section describes the functional definition of the SoftScreen to Allen-Bradley Data Highway interface. The interface to Data Highway is through a 1770-KF2, 1771-KG, or 1785-KE communication controller module (see Figures 3-1 through 3-3).

The specific communications commands (transparent to the user) required to allow the terminal to sit on the Highway and read and write data are listed below:

- Unprotected Write
- Unprotected Bit Write
- Unprotected Read

The user interface allows the user to monitor or change the areas of the PLC data table via the SoftScreen software menus. The user accesses the data table by specifying an address in the table. The data table area contains the values of timer/counter actual and preset values, and an image of the I/O tables. The target PLC device can be PLC2 series, PLC3, or PLC5.

To access PLC3 and PLC5 devices you must first allocate an integer (N) file in the PLC with a number that corresponds to the station number of the 1770-KF2 module. This is the only file in the PLC3 or PLC5 that can be read by the terminal.

3.1.1 Serial Port Configuration

Data Highway connects to SoftScreen via RS-232C. It can be connected to any serial port *except* port 1 which is used for uploading or downloading from the development system or multidrop network. If using port 2 or 3, make sure the jumpers on the 8320-SoftScreen controller board are set to RS-232C as shown in Tables 2-2 and 2-3 and pages 2-9 and 2-10.

> **NOTE**
> Make sure the port you use is the same one specified in your SoftScreen software under Configuration-Ports.

3.1.2 **Electrical Interface**

There are two distinct ways to connect to the PLCs. The first is network configuration, in which all PLCs are networked on Data Highway. The second is stand alone, which is a one-to-one link between the PLC and SoftScreen via RS-232C. A direct connect via a network configuration requires the 8320-SoftScreen Workstation's serial port to be wired serially to a 1770-KF2 Communication Controller Module (see Figure 3-1 below). A direct connect via stand alone requires the SoftScreen Workstation's serial port to be wired serially to a 1771-KA, 1771-KG, or 1785-KE Communication Controller Module (see Figure 3-2 on the following page).

On the next pages, Figure 3-3 shows the stand-alone configurations, while Figure 3-4 shows the network configuration.

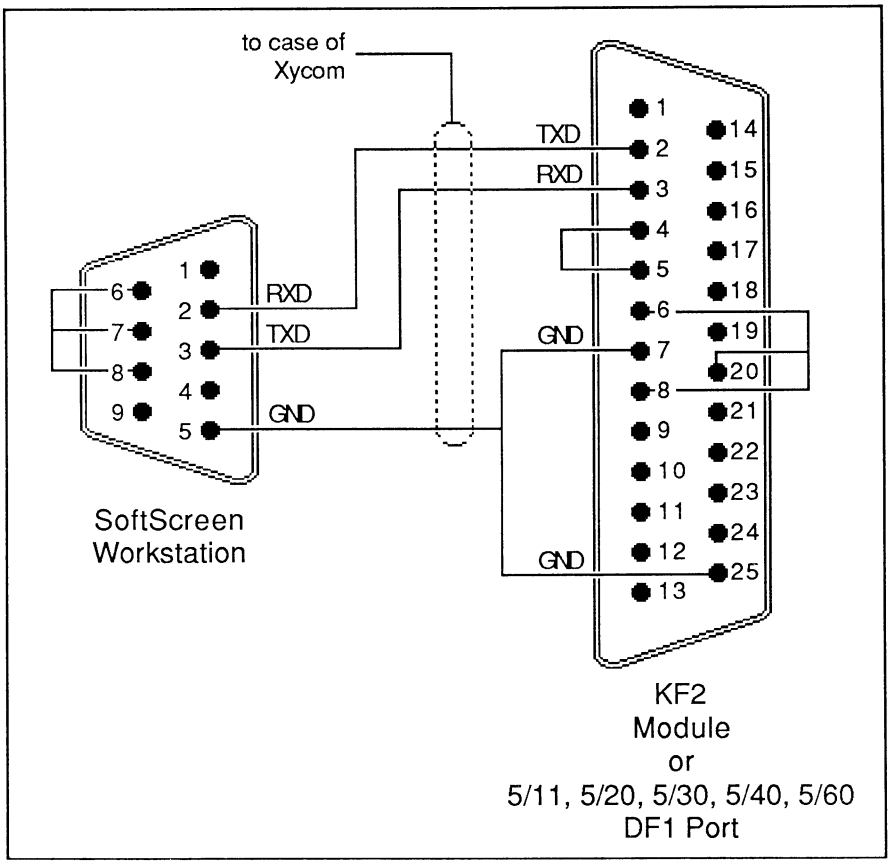


Figure 3-1. Cabling to the 1770-KF2

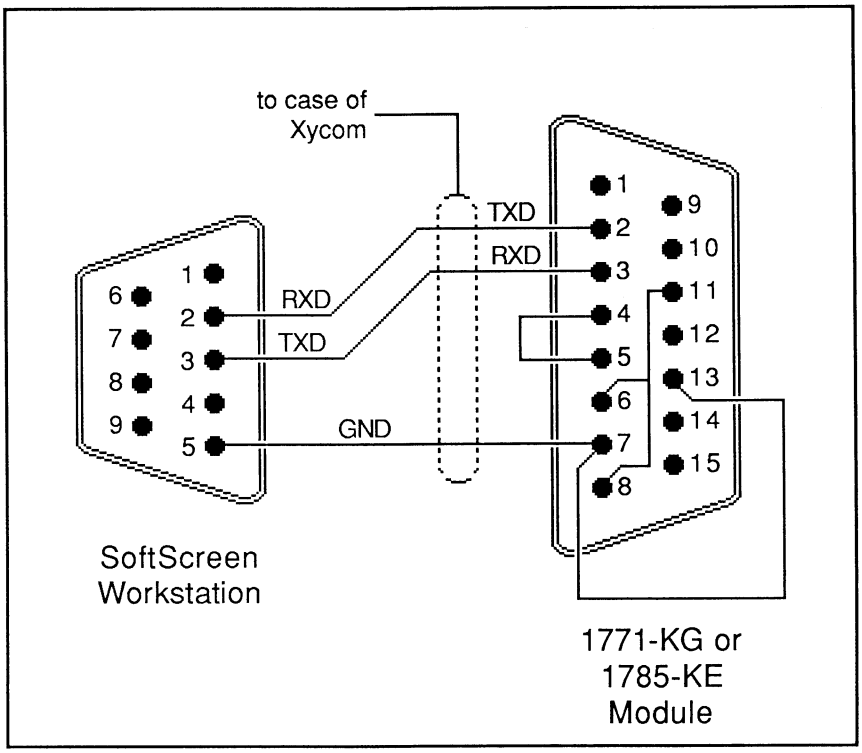


Figure 3-2. Cabling to the 1771-KG or 1785-KE

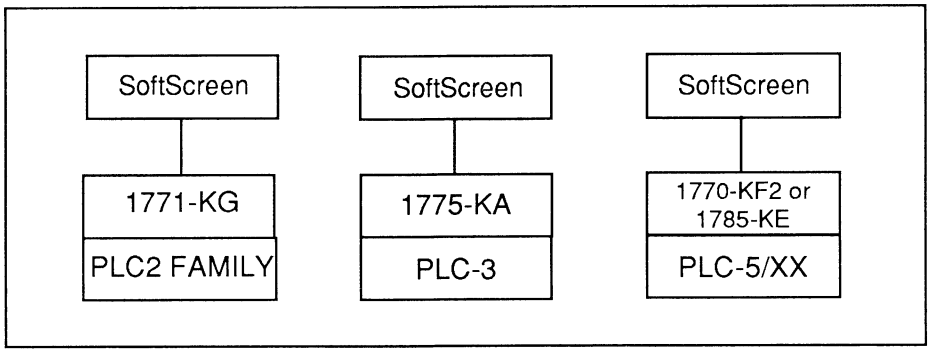


Figure 3-3. Allen-Bradley Stand Alone Configuration
(Data Highway, RS-232C Only)

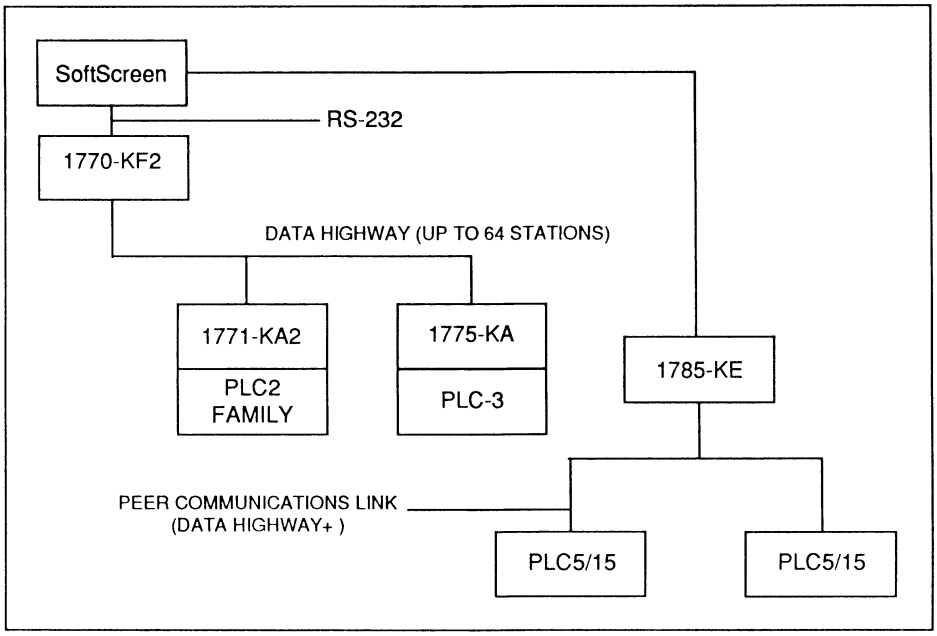


Figure 3-4. Allen-Bradley Network Configurations

3.1.3 **Allen-Bradley Data Highway Addressing**

The address expressions specific to the Allen-Bradley Data Highway interface are shown below:

Table 3-1. Allen-Bradley Data Highway Addressing

Device	PLC Address	Number Type	Size	R/W
All	10-77, 110-177777	Octal	Word	R/W
All	0-7, 100-107	Octal	Word	R

For example, if the expression **[PLC1:70 3]** is entered in the development system software for a data display object, the 8320 engine will read and display the value in PLC1, word 70, bit 3.

Valid bit addresses are octal 0 to 7 and 10 to 17.

For more information on expression value formats, see Appendix C of your SoftScreen Development System Manual.

3.1.4 Allen Bradley Data Highway Communication Status Register

The communication status registers contain information about the communication between the Data Highway module, and the SoftScreen Workstation engine. The following is a list of the communication status registers, one for each COM port:

#8	Communication status for port 2
#9	Communication status for port 3
#10	Communication status for port 4

The communication status registers are 32-bit fixed point registers with the following bit assignments:

Upper 16 Bits

Bit 0	Transmit Error
Bit 1	Receive Error
Bit 2	Timeout Error
Bit 3	Checksum Error
Bit 4	"NAK" Error
Bit 5	"TNS" Error
Bit 6	Unused
Bits 8 - 15	Message Status from Data Highway Module

Lower 16 Bits

unused

By testing specific bits in the communication status registers, the appropriate text, alarm or message can be generated to indicate the current status of communication. For example, the expression #8&4 could be used to test for a timeout error. A timeout error is indicated if the expression evaluated to 4, while no timeout error is indicated with a 0 value.

3.2 CONNECTING THE SOFTSCREEN WORKSTATION TO ALLEN-BRADLEY REMOTE I/O

The direct connect to Allen-Bradley's I/O network is accomplished through a high-speed serial expansion card. The remote I/O direct connect is capable of both monitoring and simulating remote I/O on the network. It can report the status of any I/O point on the network and it can simulate a remote I/O rack.

*The direct connect can also monitor block transfer reads (BTRs) and block transfer writes (BTWs) between the PLC and remote I/O racks. When simulating a remote I/O rack, it can also simulate block transfer modules. The direct connect can supply data for BTRs from the PLC and accept data from BTWs from the PLC.

The remote I/O connection uses two double buffering capabilities of the direct connect adapter card. This ensures that the values of groups of data are kept together, and also that changes will be read from or sent to the PLC at the same time.

3.2.1 Electrical Interface

The Allen-Bradley Remote I/O connection is made through a daisy chain configuration, using a Belden 9463 twin-axial cable (or "blue hose"). Table 3-2 shows the cabling.

Table 3-2. Allen-Bradley Remote I/O Cabling

PLC	Blue Hose	Direct Connect Adapter
1	Blue	1 (or 4)
Shield	Shield	2 (or 5)
2	Clear	3 (or 6)

Pin 1, the top pin of the connector, is the furthest from the LED's. (The edge connector is on the bottom of the card.)

The alternate connectors on the board are used for wiring the Remote I/O in a daisy chain configuration.

The direct connect adapter card should be connected to the PLC the same way as any other remote rack. The adapter card does not have on-board termination. If a terminator is required, it should consist of a 150 ohm resistor between the blue and clear wires (1 and 3 or 4 and 6). In environments with high noise, two 75 ohm resistors may be used; one between blue and shield (1 and 2 or 4 and 5), the other between clear and shield (2 and 3 or 5 and 6). Table 3-3 on the following page shows the Allen-Bradley Remote I/O Addressing.

3.2.2 Allen-Bradley Remote I/O Addressing

The address expressions specific to the Allen-Bradley interface are shown in the table below:

Table 3-3. Allen-Bradley Remote I/O Addressing

Device	PLC Addressing	Number Type	Size	R/W
Output (O)	Orrg	Octal	Word	R
Input (I)	Irrg	Octal	Word	R/W
Rack Information (RINF)	RINF rr q	Octal	Word	R
Block Transfer Read (BTR)	BTRrrg m off	Octal/Decimal	Word	R/W
Block Transfer Write (BTW)	BTWrrg m off	Octal/Decimal	Word	R
Block Transfer Read Status (BRS)	BRSrrg m	Octal	Word	R
Block Transfer Write Status (BWS)	BWSrrg m	Octal	Word	R
Communication Status (CS)	CS	-	Byte	R

Valid bit addresses for all devices, except CS, are 0-17 octal and are read only, except for inputs.

rr - rack, 0-37 octal
g - group, 0-7
q - starting quarter, 1-4
m - module, 0 or 1
off - word offset into the Block Transfer Module, 0-63 decimal

3.2.3 Allen-Bradley Remote I/O Communication Status Register

The communication status registers contain information about the communication between the Allen-Bradley Remote I/O and the SoftScreen Workstation engine. There are three communication status registers, one for each COM port:

#8 Communication status for port 2
#9 Communication status for port 3
#10 Communication status for port 4

> **NOTE**
> For Allen-Bradley Remote I/O use COM ports 3 and 4 *only*.

The communication status registers are 32-bit, fixed point registers with the following bit assignments:

Upper 16 Bits
Equal to 1: Error in initializing the S & S card
Equal to 2: Communication lost with the network
Equal to 3: Error cannot write to real input
Equal to 5: File error. Binary file problem

Lower 16 Bits
Unused

By testing specific bits in the communication status registers, the appropriate text, alarm or message can be generated to indicate the current status of communication. For example, the expression #9 == 2 could be used to test for a network error. A network error would be indicated if the expression evaluated to 2 while a 0 value would indicate no network error.

3.3 CONNECTING THE 8320-SOFTSCREEN WORKSTATION TO GE SERIES 90

This section describes the 8320-SoftScreen to General Electric (GE) Series 90 interface.

3.3.1 Serial Port Configuration

The GE Series 90 PLC connects to SoftScreen via RS-422, and can connect to serial ports 2 or 3. (Port 1 is used for uploading or downloading from the development system or multidrop network, and port 4 is a dedicated RS-232C port.)

Make sure the jumpers are set to RS-422 as shown in Tables 2-2 and 2-3 on pages 2-9 and 2-10.

> **NOTE**
> Make sure the port you select is the same one specified in the SoftScreen software under Configuration-Ports.

3.3.2 Electrical Interface

The electrical interface for the GE Series 90 PLC interface is asynchronous RS-422. Figure 3-5 shows the cabling between the 8320-SoftScreen Workstation and the GE Series 90 PLC.

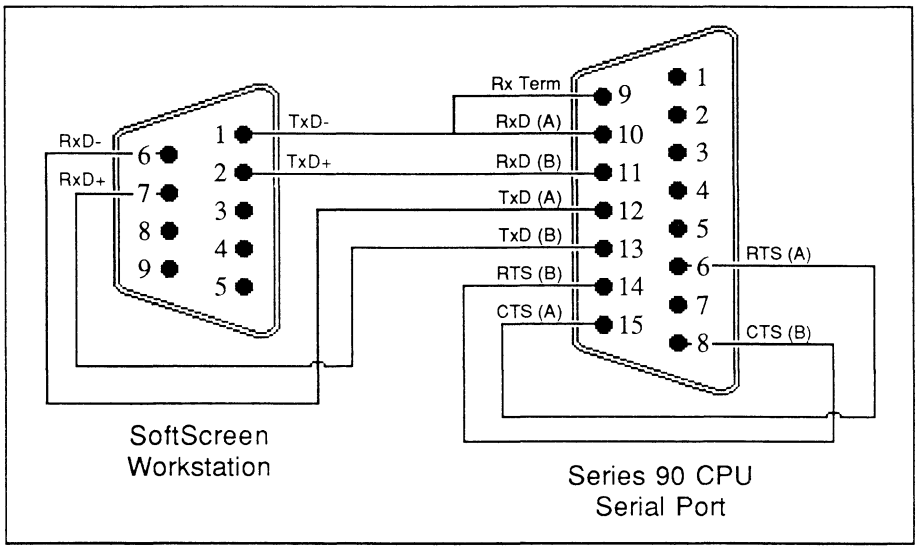


Figure 3-5. Cabling to the GE Series 90

3.3.3 GE Series 90 Addressing

The address expressions specific to the GE Series 90 PLC interface are shown below:

Table 3-4. GE Series 90 Addressing

Device	Range	Dec/Hex	Size	R/W
Input	I0001-I65535	Decimal	Bit	R
Output	Q0001-Q65535	Decimal	Bit	R
Temporary coil	T0001-T65535	Decimal	Bit	R/W
Internal coil	M0001-M65535	Decimal	Bit	R/W
SA discrete	SA001-SA65535	Decimal	Bit	R/W
SB discrete	SB001-SB65535	Decimal	Bit	R/W
SC discrete	SC001-SC65535	Decimal	Bit	R/W
S discrete	S0001-S65535	Decimal	Bit	R
Genius global data	G0001-G65535	Decimal	Bit	R/W
Analog input	AI001-AI65535	Decimal	Word	R
Analog output	AQ001-AQ65535	Decimal	Word	R
Register	R0001-R65535	Decimal	Word	R/W

For example, if the expression **[PLC1:AI100 3]** is entered in the development system software for a data display object, the 8320 engine will read and display the value in PLC1, analog input 100, bit 3.

For more information on expression value formats, see Appendix C of your SoftScreen Development System Manual.

3.3.4 GE Series 90 Communication Status Register

The communication status registers contain information about the communication between the GE Series 90 PLC and the SoftScreen Workstation engine. The communication status registers for the available COMM ports are:

#8	Communication status for port 2
#9	Communication status for port 3

The communication status registers are 32-bit, fixed point registers with the following bit assignments:

Upper 16 Bits

Bit 0	Receive Error
Bit 1	Transmit Error
Bit 2	Attach Error
Bit 3	Address Error
Bit 4	Timeout Error
Bit 5	Checksum Error
Bit 6	Parity Error
Bit 7	Protocol Error (Engine)
Bit 8	Bad Command Error
Bit 9	Framing Error
Bit 10	Protocol Error (PLC)
Bit 11	PLC Privilege Violation
Bits 12-15	Unused

Lower 16 Bits

Unused

By testing specific bits in the communication status registers, the appropriate text, alarm or message can be generated to indicate the current status of communication.

For example, the expression #8&4 could be used to test for an attach error. An attach error would be indicated if the expression evaluated to 4, while a value of 0 would indicate no attach error.

3.4 CONNECTING THE 8320-SOFTSCREEN WORKSTATION TO MITSUBISHI MELSEC-A

This section describes the functional definition of the 8320-SoftScreen to Mitsubishi MELSEC-A interface.

> **NOTE**
> The SoftScreen Mitsubishi A driver uses a checksum, so set the SUM CHECK dipswitch on your PLC to the YES position. See your PLC manual for more information.

3.4.1 Serial Port Configuration

The Mitsubishi PLC can connect to SoftScreen via RS-232C or RS-422.

If using RS-232C, you can use any serial port *except* port 1 which is used for uploading or downloading from the development system or multidrop network. If using ports 2 or 3, make sure the jumpers on the 8320-SoftScreen controller board are set to RS-232C as shown in Tables 2-2 and 2-3 on pages 2-9 and 2-10.

If using RS-422, you can connect to serial ports 2 or 3. Make sure the jumpers are set to RS-422 as shown in Tables 2-2 and 2-3 on pages 2-9 and 2-10.

> **NOTE**
> Make sure the port you use is the same one specified in the SoftScreen software under Configuration-Ports.

3.4.2 **Electrical Interface**

The electrical interface for the Mitsubishi interface is either asynchronous RS-232C or RS-422. Figure 3-6 shows the cabling for RS-232C, Figure 3-7 shows the cabling for RS-232, Figure 3-8 shows the cabling for RS-422.

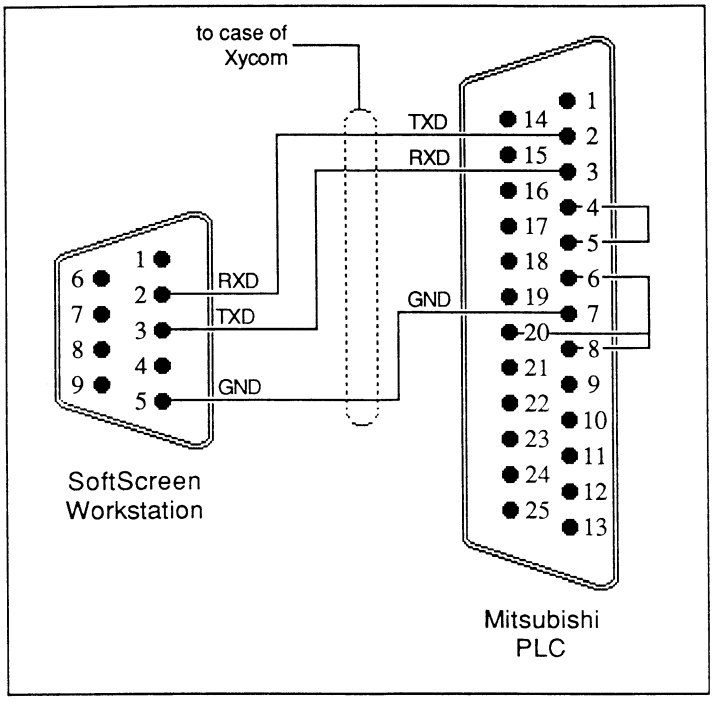


Figure 3-6. Cabling to the Mitsubishi PLC via RS-232C

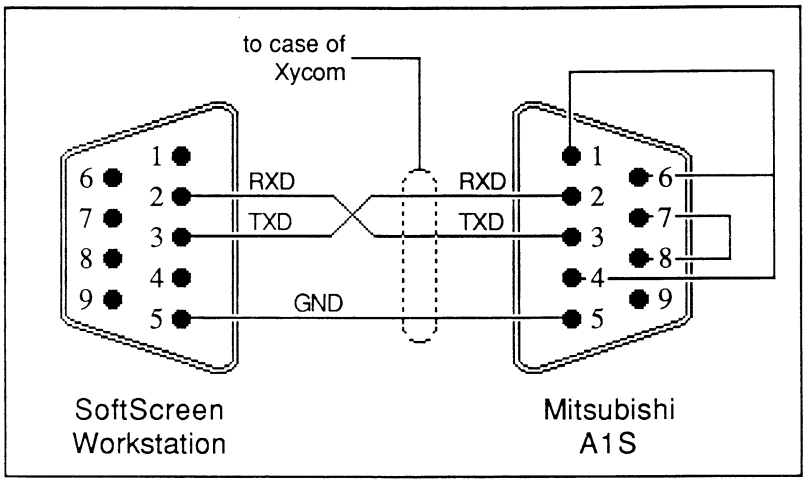


Figure 3-7. Cabling to the Mitsubishi A1S via RS-232

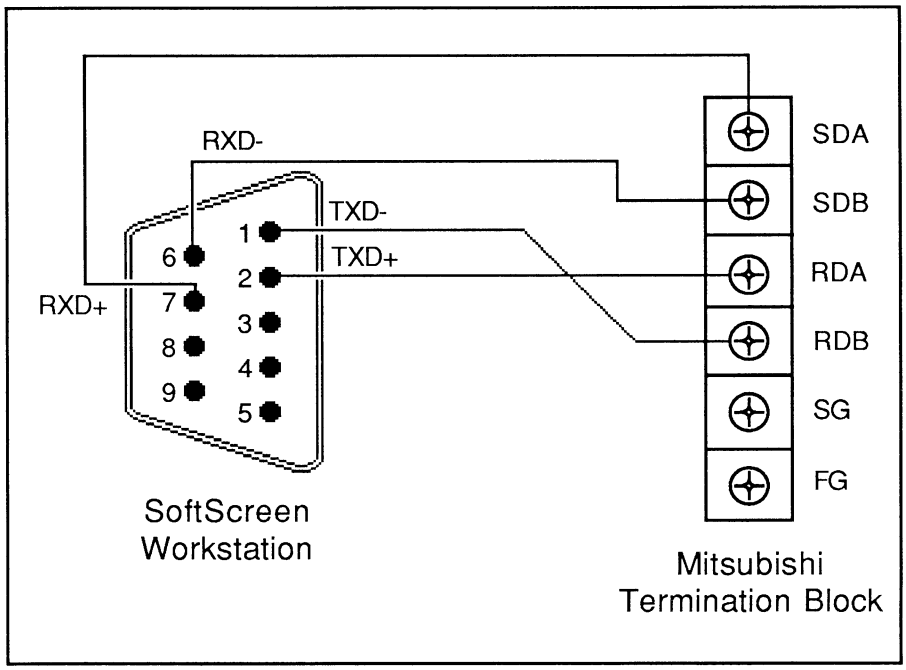


Figure 3-8. Cabling to the Mitsubishi PLC via RS-422

3.4.3 Mitsubishi Addressing

The address expressions specific to the Mitsubishi PLC interface are shown in the table below:

Table 3-5. Mitsubishi Addressing

Device	PLC Address	Number Type	Size	R/W
Input X	X0000-X07FF	Hex	Bit	R/W
Output Y	Y0000-Y07FF	Hex	Bit	R
Internal relay M	M0000-M2047	Decimal	Bit	R/W
Latch relay L	L0000-L2047	Decimal	Bit	R/W
Link relay B	B0000-B03FF	Hex	Bit	R/W
Annunciator F	F0000-F0255	Decimal	Bit	R/W
Special relay M	M9000-M9255	Decimal	Bit	R
Timer contact TS	TS000-TS255	Decimal	Bit	R/W
Timer coil TC	TC000-TC255	Decimal	Bit	R/W
Counter contact CS	CS000-CS255	Decimal	Bit	R/W
Counter coil CC	CC000-CC255	Decimal	Bit	R/W
Timer value TN	TN000-TN255	Decimal	Word	R/W
Counter value CN	CN000-CN255	Decimal	Word	R/W
Data register D	D0000-D1023	Decimal	Word	R/W
Link register W	W0000-W03FF	Hex	Word	R/W
File register R	R0000-R8191	Decimal	Word	R/W
Special register D	D9000-D9255	Decimal	Word	R
Buffer direct BU	BU100-BU7FF	Hex	Word	R/W
Buffer indirect BI	BI1200-BI1FFF	Hex	Word	R/W
Special function SF	SFXX-AAAA*	Hex	Word	R/W

*Where:
XX is special function unit number, 0x00-0x27
AAAA is the address in SFU, 0x0000-0xFFFF
for example: [SF1E-15CD]

Table continues on the following page

For example, if the expression **[PLC1:TN123 3]** is entered in the development system software for a data display object, the 8320 engine will read and display the value in PLC1, word TN123, bit 3. For TN, CN, D, W, R and BU, the bit addresses are 0-15. For B1 and SF, the bit addresses are 0-7.

For more information on expression value formats, see Appendix C of your SoftScreen Development System Manual.

Table 3-5 Mitsubishi Addressing - Continued

Device	PLC Address	Number Type	Size	R/W
Input word XW	XW000-XW07F	Hex	Word	R/W
Output word YW	YW000-YW07F	Hex	Word	R
Internal relay word MW	MW000-MW127	Decimal	Word	R/W
Latch relay word LW	LW000-LW127	Decimal	Word	R/W
Link relay word BW	BW000-BW03F	Hex	Word	R/W
Annunciator word FW	FW00-FW15	Decimal	Word	R/W
Timer contact word TSW	TSW00-TSW15	Decimal	Word	R/W
Timer coil word TCW	TCW00-TCW15	Decimal	Word	R/W
Counter contact word CSW	CSW00-CSW15	Decimal	Word	R/W
Counter coil word CCW	CCW00-CCW15	Decimal	Word	R/W
Special relay word MW	MW9000-MW9015	Decimal	Word	R

For more information on expression value formats, see Appendix C of your SoftScreen Development System Manual.

3.4.4 Mitsubishi Communication Status Register

The communication status registers contain information about the communication between the Mitsubishi PLC and the SoftScreen Workstation engine. There are three communication status registers, one for each available COM port:

#8 Communication status for port 2
#9 Communication status for port 3
#10 Communication status for port 4

The communication status registers are 32-bit, fixed point registers with the following bit assignments:

Upper 16 Bits
Bit 0 Receive Error
Bit 1 Timeout Error
Bit 2 Checksum Error
Bit 3 Bad Response Error
Bits 4-7 Unused
Bits 8-15 PLC error Codes
(See AJ1C24 Users Manual for details)
00h Invalid Access
01h Parity
02h Sum Check
03h Protocol Error
04h Framing Error
05h Overrun Error

06h	Character Area
07h	Character Error
08h	PC access Error

(Generated by AJ1C24 to PC CPU access)

10h	PC Number Error
11h	Mode Error
12h	SFU spec. Error
18h	Remote Error
21h	Memory Access to SFU
80h	PLC returned Error Code

Lower 16 Bits
Unused

By testing specific bits in the communication status registers, the appropriate text, alarm or message can be generated to indicate the current status of communication. For example, the expression #8&4 could be used to test for a checksum error. A checksum error would be indicated if the expression evaluated to 4, while a value of 0 would indicate no checksum error.

3.5 CONNECTING THE SOFTSCREEN WORKSTATION TO MODBUS PLUS

This section describes the functional definition of the SoftScreen to MODBUS PLUS interface. The interface to MODBUS PLUS is through any MODBUS port on a MODICON programmable controller. The purpose of the MODBUS PLUS interface is to access and/or modify registers and coils of the target programmable controller from a Xycom SoftScreen Workstation engine. Thus, the user is able to monitor registers, output coils, and discrete inputs and to change registers via the SoftScreen software menus.

3.5.1 Serial Port Configuration

Modicon MODBUS PLUS connects to the SoftScreen Workstation's SA85 port via a network cable. The SA85 network card attaches to the 8112 expansion card and can only be configured as Port 3 or Port 4.

3.5.2 Cabling to the MODBUS PLUS Network

The network bus consists of a twisted-pair shielded cable that is run in a direct path between successive nodes. Figures 3-9 and 3-10 show cabling and networking of the MODBUS PLUS.

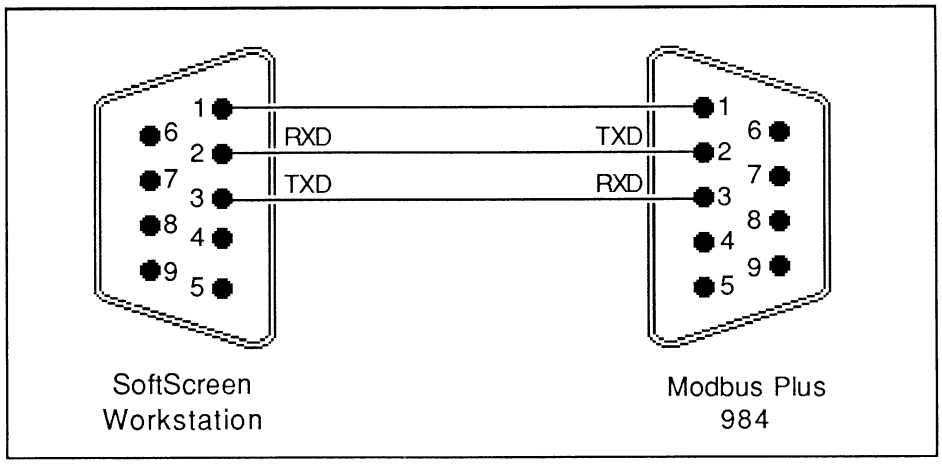


Figure 3-9. Cabling to the MODBUS PLUS 984

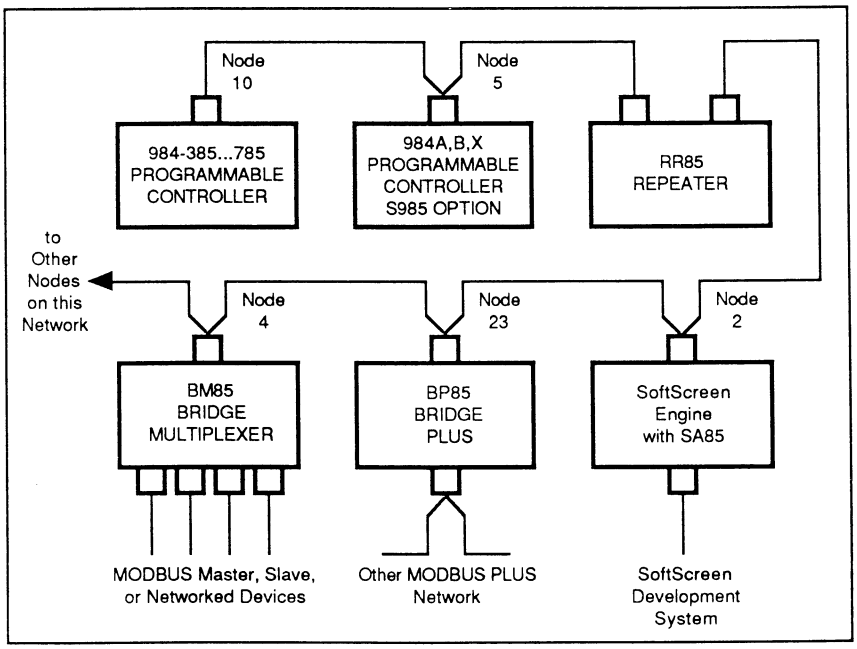


Figure 3-10. MODBUS PLUS Network Configuration

3.5.3 Modicon MODBUS PLUS Addressing

The address expressions (entered for Expression in various configuration forms) that are specific to the Modbus Plus PLC interface are shown in the table below:

Table 3-6. MODBUS Plus 984 Addressing

Device	PLC Address	Number Type	Size	R/W
Coil status	00001-09999	Decimal	Bit	R
Input status	10001-19999	Decimal	Bit	R
Holding register	40001-49999	Decimal	Word	R/W
Input register	30001-39999	Decimal	Word	R

Valid bit addresses for holding and input registers are 0-16.

Expressions follow the same format whether they are used in data display objects, data entry objects, or recipe values. For example, if the expression **[PLC1:40001, SB]** is entered in the development system software for a data display object, the 8320 engine will read and display the value in signed binary of PLC1, word 40001.

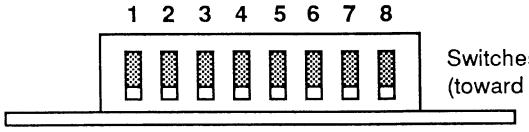
NOTE

The most and least significant bits are swapped if **Block Move To Coils in the PLC** is done. Example:

Bit 1 of 40001 goes to 00010
Bit 16 of 40001 goes to 00026

3.5.4 Setting the MODBUS PLUS Address

A unique network address is required for each device on the MODBUS PLUS network. As shown below, you will need to set the SA85 address to one that will be used in your application. The resulting address will be one higher than the binary value you set into switches 1 through 6. Switches 7 and 8 are not used. This address should be the same as the one used in the configuration form on the development system. Figure 3-11 shows the network address switch settings, and Figure 3-12, on the following page, shows the SA85 Network Indicators.



ADDRESS	SWITCH POSITION 1	2	3	4	5	6	ADDRESS	SWITCH POSITION 1	2	3	4	5	6
1	0	0	0	0	0	0	33	0	0	0	0	0	1
2	1	0	0	0	0	0	34	1	0	0	0	0	1
3	0	1	0	0	0	0	35	0	1	0	0	0	1
4	1	1	0	0	0	0	36	1	1	0	0	0	1
5	0	0	1	0	0	0	37	0	0	1	0	0	1
6	1	0	1	0	0	0	38	1	0	1	0	0	1
7	0	1	1	0	0	0	39	0	1	1	0	0	1
8	1	1	1	0	0	0	40	1	1	1	0	0	1
9	0	0	0	1	0	0	41	0	0	0	1	0	1
10	1	0	0	1	0	0	42	1	0	0	1	0	1
11	0	1	0	1	0	0	43	0	1	0	1	0	1
12	1	1	0	1	0	0	44	1	1	0	1	0	1
13	0	0	1	1	0	0	45	0	0	1	1	0	1
14	1	0	1	1	0	0	46	1	0	1	1	0	1
15	0	1	1	1	0	0	47	0	1	1	1	0	1
16	1	1	1	1	0	0	48	1	1	1	1	0	1
17	0	0	0	0	1	0	49	0	0	0	0	1	1
18	1	0	0	0	1	0	50	1	0	0	0	1	1
19	0	1	0	0	1	0	51	0	1	0	0	1	1
20	1	1	0	0	1	0	52	1	1	0	0	1	1
21	0	0	1	0	1	0	53	0	0	1	0	1	1
22	1	0	1	0	1	0	54	1	0	1	0	1	1
23	0	1	1	0	1	0	55	0	1	1	0	1	1
24	1	1	1	0	1	0	56	1	1	1	0	1	1
25	0	0	0	1	1	0	57	0	0	0	1	1	1
26	1	0	0	1	1	0	58	1	0	0	1	1	1
27	0	1	0	1	1	0	59	0	1	0	1	1	1
28	1	1	0	1	1	0	60	1	1	0	1	1	1
29	0	0	1	1	1	0	61	0	0	1	1	1	1
30	1	0	1	1	1	0	62	1	0	1	1	1	1
32	0	1	1	1	1	0	63	0	1	1	1	1	1
32	1	1	1	1	1	0	64	1	1	1	1	1	1

Figure 3-11. MODBUS PLUS Network Address Switch Settings

3.5.5 **Reading the Network Indicator**

The board has a rear panel indicator that shows the communication status at the Modbus Plus port. Figure 3-12 shows the indicator location.

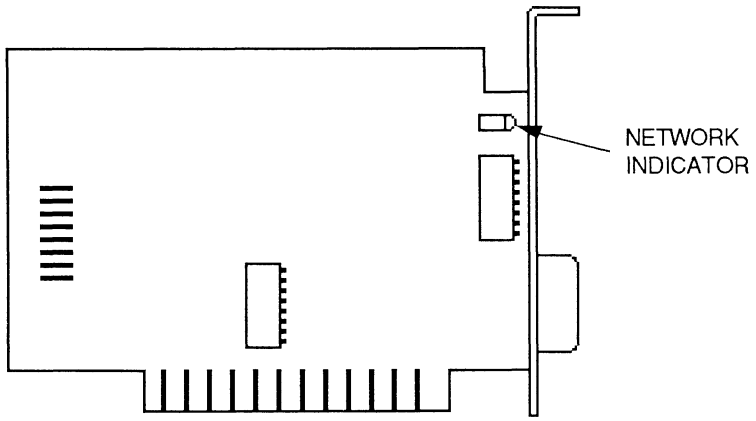


Figure 3-12. SA85 Network Indicator

MODBUS PLUS status is shown by flashing a repetitive pattern. The patterns are:

Six flashes per second The node's normal operating state. The node is successfully receiving and passing the token. All nodes on the network should be flashing this pattern.

One flash per second The node is off-line after just being powered up, or after exiting the four flashes per second mode. In this state, the node monitors the network and builds a table of active nodes and token-holding nodes. It remains in this state for five seconds, then attempts to go to its normal operating state.

Two flashes, then OFF for two seconds The node is hearing the token being passed among other nodes, but is never receiving the token. Check the network for an open circuit or defective termination.

Three flashes, then OFF for 1.7 seconds The node is not hearing any other nodes. It is periodically claiming the token, but finding no other node to which to pass it. Check the network for an open circuit or defective termination.

Four flashes, then OFF for 1.4 seconds The node has heard a valid message from another node that is using the same address as this node. The node remains in this state as long as it continues to hear the duplicate address. If the duplicate address is not heard for five seconds, the node then changes to the pattern of one flash every second.

3.5.6 MODBUS PLUS Communication Status Register

The communication status registers contain information about the communication on the MODBUS PLUS network. The SA85 card is configurable as either Port 3 or Port 4 on the SoftScreen Engine. The communication status registers for these two COM ports are shown below:

#9	Communication status for port 3
#10	Communication status for port 4

The communication status registers are 32-bit, fixed point registers. Error codes for these registers are in Table 3-7, on the following page.

By testing specific bits in the communication status registers, the appropriate text, alarm or message can be generated to indicate the current status of communication. For example, the expression #9&128 could be used to test for a timeout error. A timeout error would be indicated if the expression evaluated to 256; while a value of 0 would indicate no timeout error.

3.5.7 MODBUS PLUS Error Codes

Table 3-7. MODBUS PLUS Error Codes

ERROR	REASON
1	Initialization error
2	Communications lost
3	Routing error
4	Interface command error
5	No SA85 board
6	No 8112 board
7	First diagnostic test failed
8	Second diagnostic test failed
9	Configured node address doesn't match SA85's
60	Node not running
64	Address error. Station address sent, doesn't match the one received
113	2.5 Second interface timeout
114	Bad interface opcode
115	Interface data error
116	Interface test error
117	Interface transfer-done error
118	Bad interface path
119	Bad transfer state
120	Bad transfer length
128	Timeout - took too long to get a response
129	Illegal MODBUS function for the slave
130	Illegal data address for the slave

Table continues on the following page.

Table 3-7. MODBUS PLUS Error Codes (continued)

ERROR	Reason
131	Illegal data value for the slave
132	Device failure - the slave's PC has failed to respond
133	Acknowledge, a delay is occuring because the slave's PC is processing the message
134	Busy, the PC is processing another message

3.6 CONNECTING THE 8320-SOFTSCREEN WORKSTATION TO MODICON MODBUS

This section describes the functional definition of the 8320-SoftScreen to MODBUS interface. The interface to MODBUS is through any MODBUS port on a MODICON programmable controller. The purpose of the MODBUS interface is to access and/or modify registers and coils of the target programmable controller from a Xycom SoftScreen Workstation engine. Thus, the user is able to monitor registers, output coils, and discrete inputs and to change registers via the SoftScreen software menus. SoftScreen supports both MODBUS RTU and MODBUS ASCII protocols.

3.6.1 Serial Port Configuration

Modicon MODBUS connects to SoftScreen via RS-232C, and can connect to any of the serial ports *except* port 1 which is used for uploading or downloading from the development system or multidrop network. If using ports 2 or 3, make sure the jumpers on the 8320-SoftScreen controller board are positioned to RS-232C as shown in Tables 2-2 and 2-3 on pages 2-9 and 2-10.

NOTE
Make sure the port you use is the same one specified in the SoftScreen software under Configuration-Ports.

3.6.2 **Electrical Interface**

The electrical interface for the MODBUS interface is asynchronous RS-232C. Figure 3-13 shows the cabling between the 8320-SoftScreen Workstation and the MODBUS 584, and Figures 3-14 and 3-15 show cabling to the MODBUS 984 via 9 and 25 pin connectors, respectively.

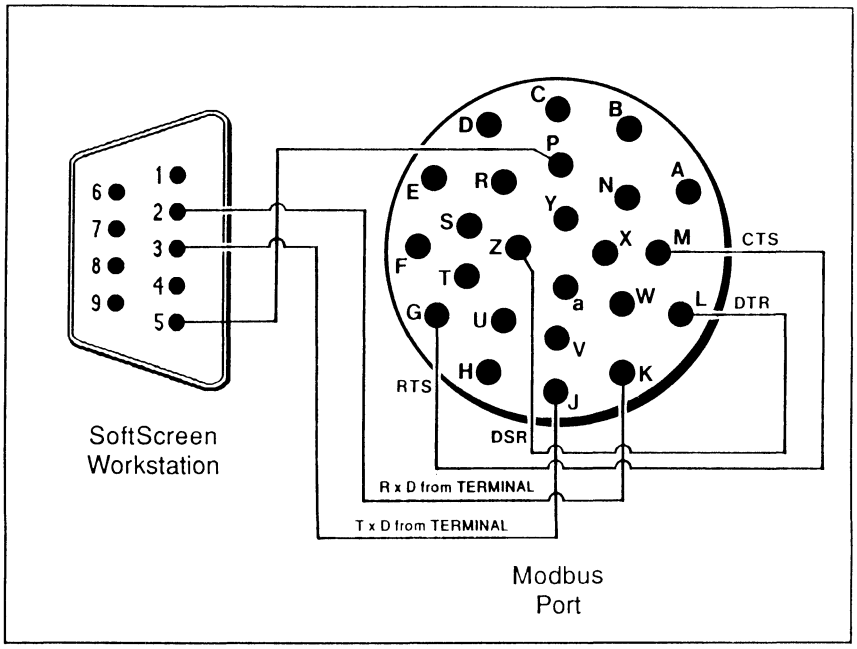


Figure 3-13. Cabling to the MODBUS 584

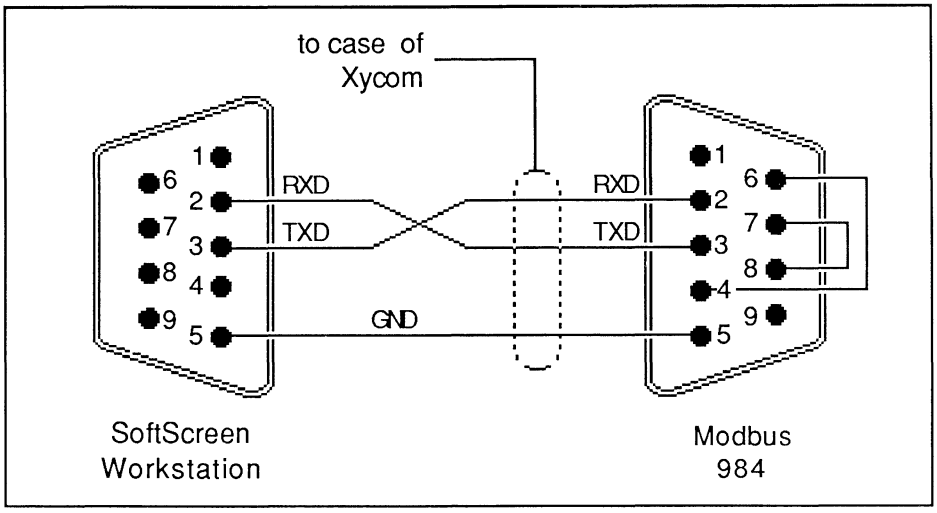


Figure 3-14. Cabling to the MODBUS 984, 9-pin

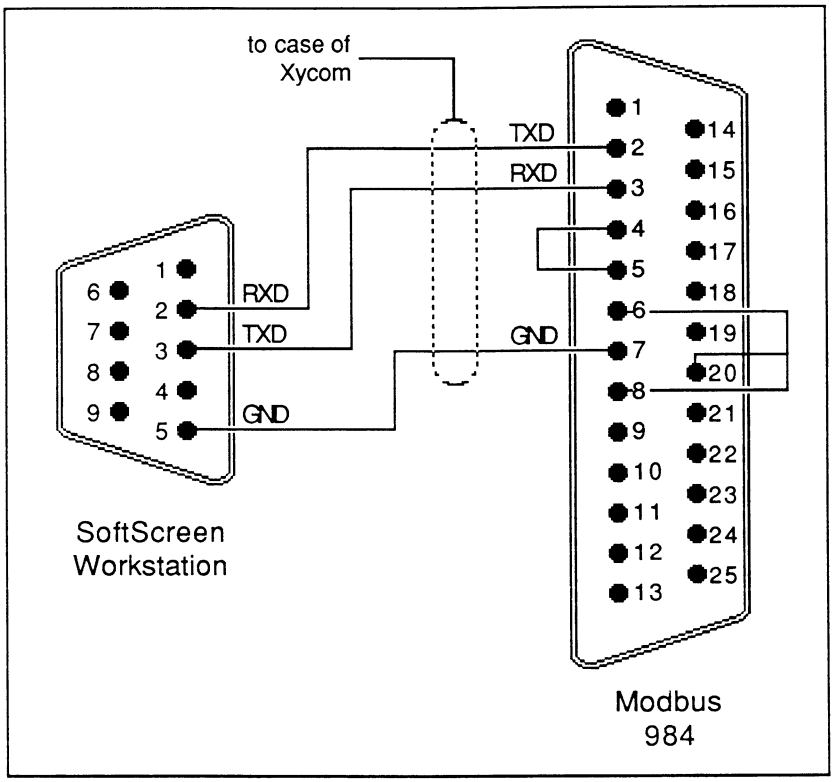


Figure 3-15. Cabling to the MODBUS 984, 25-pin

Figure 3-16 shows the network configuration for the MODBUS interface.

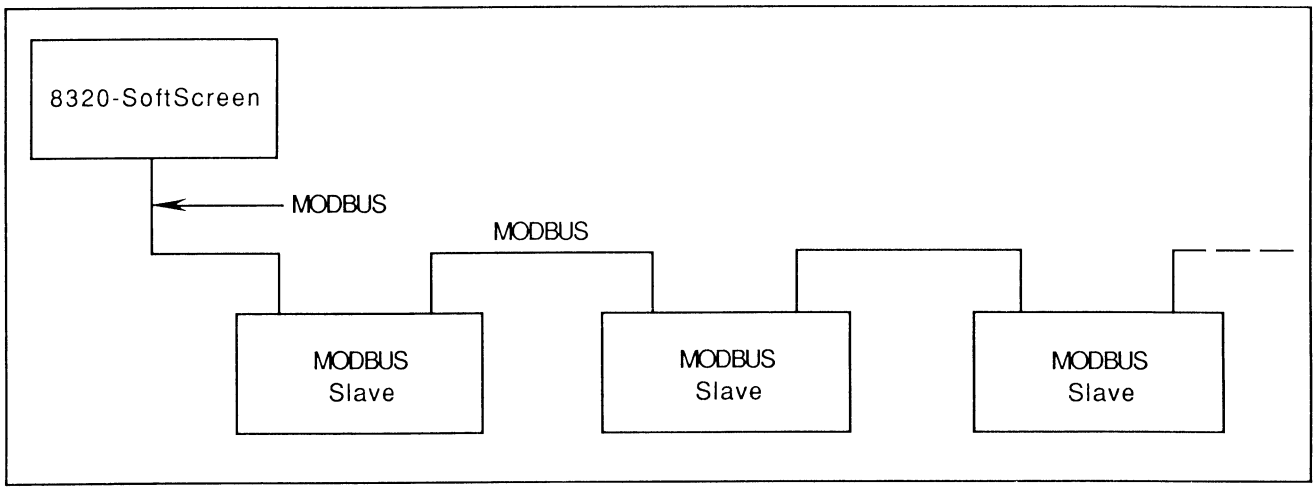


Figure 3-16. Modbus Network Configuration

3.6.3 Modicon MODBUS Addressing

The address expression formats specific to the MODBUS PLC interfaces are shown below:

Table 3-8. MODBUS 384 and 484 Addressing

Device	PLC Address	Number Type	Size	R/W
Coil status	0001-0999	Decimal	Bit	R
Input status	1001-1999	Decimal	Bit	R
Holding register	4001-4999	Decimal	Word	R/W
Input register	3001-3999	Decimal	Word	R

Table 3-9. MODBUS 584 and 984 Addressing

Device	PLC Address	Number Type	Size	R/W
Coil status	00001-09999	Decimal	Bit	R
Input status	10001-19999	Decimal	Bit	R
Holding register	40001-49999	Decimal	Word	R/W
Input register	30001-39999	Decimal	Word	R

Expressions follow the same format whether they are used in data display objects, data entry objects, or recipe values. For example, if the expression **[PLC1:40001, SB]** is entered in the development system software for a data display object, the 8320 engine will read and display the value in signed binary of PLC1, word 40001. For more information on expression value formats, see Appendix C of your SoftScreen Development System Manual.

3.6.4 MODBUS Communication Status Register

The communication status registers contain information about the communication between the MODBUS PLC and the SoftScreen Workstation engine. There are three communication status registers, one for each available COM port: #8 for port 2, #9 for port 3, and #10 for port 4. The communication status registers are 32-bit, fixed point registers with these bit assignments:

Upper 16 Bits
Bits 0-2 Unused
Bit 3 Receive Error
Bit 4 Transmit Error
Bit 5 CRC or LRC Error
Bit 6 Address Error
Bit 7 Timeout Error
Bits 8-15 Unused

Lower 16 Bits
Bits 0-15 Unused

By testing specific bits in the communication status registers, the appropriate text, alarm or message can be generated to indicate the current status of communication. For example, the expression #8&128 could be used to test for a timeout error. A timeout error would be indicated if the expression evaluated to 128, while a value of 0 would indicate no timeout error.

3.7 CONNECTING THE 8320-SOFTSCREEN WORKSTATION TO OMRON

This section describes the functional definition of the 8320-SoftScreen to OMRON interface.

3.7.1 Serial Port Configuration

The OMRON PLC can connect to the SoftScreen engine via RS-232C or RS-422.

If using RS-232C, you can use any serial port *except* port 1 which is used for uploading or downloading from the development system or multidrop network. If using ports 2 or 3, make sure the jumpers on the 8320-SoftScreen controller board are set to RS-232C as shown in Tables 2-2 and 2-3 on pages 2-9 and 2-10.

If using RS-422, you can connect to serial ports 2 or 3. Make sure the jumpers are set to RS-422 as shown in Tables 2-2 and 2-3 on pages 2-9 and 2-10.

> **NOTE**
> Make sure the port you use is the same one specified in the SoftScreen software under Configuration-Ports.

3.7.2 **Electrical Interface**

The electrical interface for the OMRON interface is asynchronous RS-232C or RS-422. Figure 3-17 shows the cabling between the 8320-SoftScreen Workstation and the OMRON PLC for RS-232C, while Figure 3-18 on the following page shows the connections for RS-422.

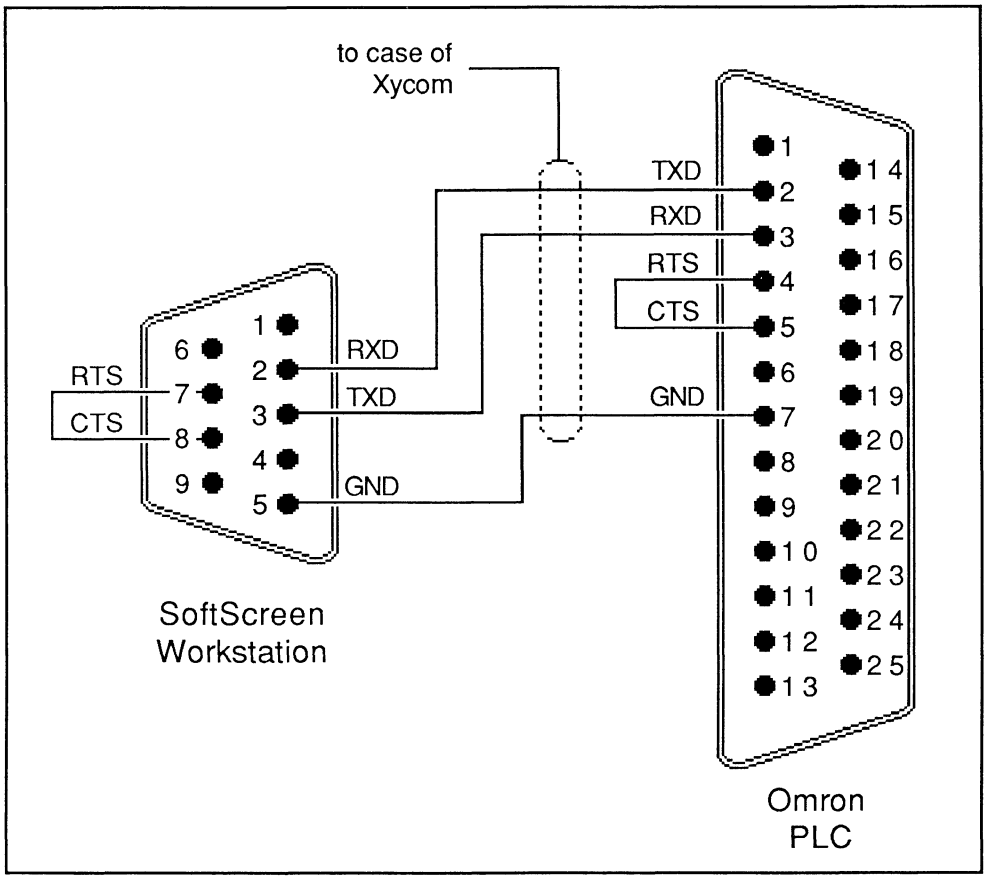


Figure 3-17. Cabling to the OMRON via RS-232C

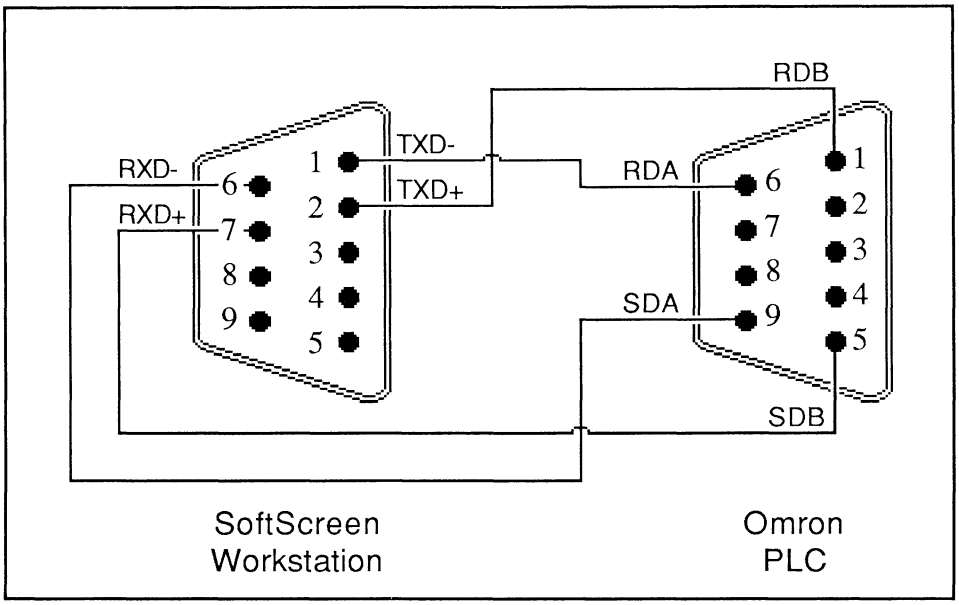


Figure 3-18. Cabling to the OMRON via RS-422

3.7.3 **OMRON Addressing**

The address expressions specific to the OMRON PLC interface are shown in the table below:

Table 3-10. OMRON Addressing

Device	**PLC Address**	**Number Type**	**Size**	**R/W**
Internal relay	IR0000-IR0246	Decimal	Word	R0-246 W30-49 W232-246
Holding relay	HR0000-HR0099	Decimal	Word	R/W
Auxiliary relay	AR0000-AR0022	Decimal	Word	R0-22 W7-22
Data memory	DM0000-DM1999	Decimal	Word	R0-1999 W0-999
Timer/counter	TC0000-TC0511	Decimal	Bit	R/W

For example, if the expression **[PLC1:DM706 3]** is entered in the development system software for a data display object, the 8320 engine will read and display the value in PLC1, word DM706, bit 3.

For more information on expression value formats, see Appendix C of your SoftScreen Development System Manual.

3.7.4 OMRON Communication Status Register

The communication status registers contain information about the communication between the OMRON PLC and the SoftScreen Workstation engine. There are three communication status registers, one for each available COM port:

#8	Communication status for port 2
#9	Communication status for port 3
#10	Communication status for port 4

The communication status registers are 32 bit fixed point registers with the following bit assignments:

Upper 16 Bits

Bits 0-4	Unused
Bit 5	Receive Error
Bit 6	Frame Check Sequence (FCS) Error
Bit 7	Timeout Error
Bits 8-15	Unused

Lower 16 Bits

Bits 0-15	Unused

By testing specific bits in the communication status registers, the appropriate text, alarm or message can be generated to indicate the current status of communication.

For example, the expression #8&128 could be used to test for a timeout error. A timeout error would be indicated if the expression evaluated to 128, while a value of 0 would indicate no timeout error.

3.8 CONNECTING THE 8320-SOFTSCREEN WORKSTATION TO SIEMENS

The Siemens direct connect can read data from the addresses listed below. Since the programming port does not allow data to be written to these addresses, there will not be a corresponding command to write data to these addresses.

TYPE	DESCRIPTION
I0 - I127	input image (PII)
QO - 0127	output image (PIQ)
F0 - F255	flags (F)
TS0 - TS127	timer status
TV0 - TV127	timer value
CS0 - CS127	counter status
CV0 - CV127	counter value

For the input image, output image, and flags, the address used in the PLC program is of the form b.x where b is the byte number in that address type and x is the bit number within the specified byte. The address used in SoftScreen is of the form [b x] where b is the byte number in that address type and x is the bit number within the specified byte. For example, [F3 7] specifies flag memory byte 3, bit 7.

This direct connect can also read and write to data blocks 2 through 255.

3.8.1 Serial Port Configuration

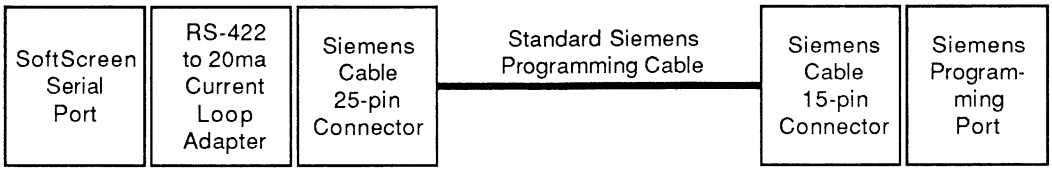
The Siemens PLC connects to SoftScreen via RS-422 to a 20 mA current loop conversion connector, and can connect to serial ports 2 or 3. (Port 1 is used for uploading or downloading from the development system or multidrop network, and port 4 is a dedicated RS-232C port.) Make sure the jumpers on the 8320-SoftScreen controller board are set to RS-422 as shown in Tables 2-2 and 2-3 on pages 2-9 and 2-10.

> **NOTE**
> Make sure the port you use is the same one specified in the SoftScreen software under Configuration-Ports.

3.8.2 **Electrical Interface**

The 8320-SoftScreen Workstation connects to the Siemens PLC via RS-422 and a 20 mA current loop adapter. There are two different cabling methods for this interface. They are both shown below.

The **first** method utilizes an RS-422 to 20mA current loop adapter and a cable available from Siemens. The RS-422 side of the adapter connects to the 9-pin serial port of the 8320-SoftScreen engine. (If the adapter is a 25-pin adapter, use a 9-to-25 pin converter between the serial port and the adapter.) The 20 mA current loop side attaches to the 25-pin connector of the Siemens cable. The 15-pin connector on the other end of the cable connects to the Siemens CPU programming port as illustrated below. This is the recommended method.



Consult Siemens for the Siemens Programming Cable part number

The **second** method utilizes an RS-422 to 20 mA current loop converting cable available from Xycom and a user-fabricated cable. The loop adapter connects the 9-pin serial port of the 8320 SoftScreen engine and one end of the 15-pin user-fabricated cable. The other end of the cable then connects to the Siemens CPU as illustrated on the following page.

NOTE
This cable is intended for use with the Siemens 115U 94X PLC. For other PLC models, use the method described above.

The pinouts for the user fabricated cable are shown in Figure 3-19.

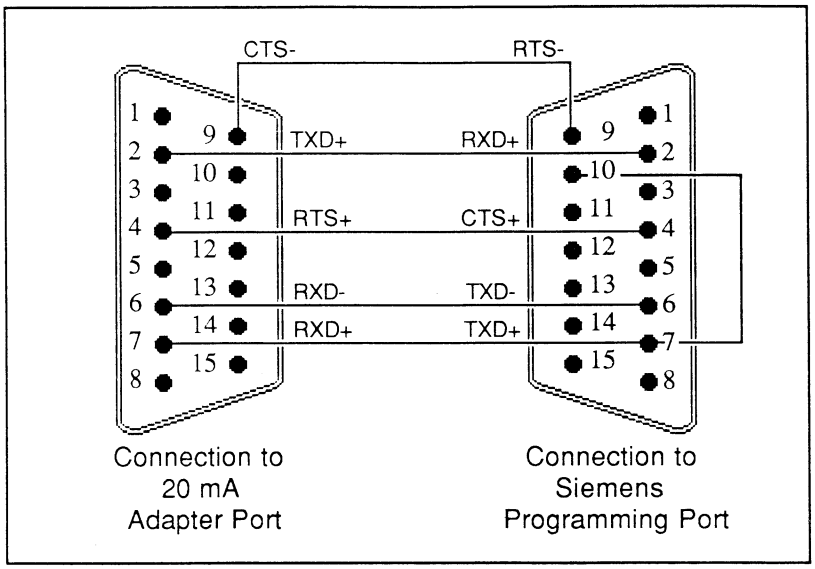


Figure 3-19. Pinouts for the User-Fabricated Cable to the Siemens PLC

3.8.3 Siemens Addressing

All Siemens addresses are in decimal. The address explanation formats specified to the Siemens PLC interface are shown below and on the following pages:

Table 3-11. Siemens 100 Series CPU Addressing

Device	100 CPU Address	102 CPU Address	103 CPU Address	Size	R/W
Input (I)	I0000-I0127	I0000-I0127	I0000-I0127	Byte	R
Output (Q)	Q0000-Q0127	Q0000-Q0127	Q0000-Q0127	Byte	R
Flag (F)	F0000-F0127	F0000-F0127	F0000-F0127	Byte	R
Timer status (TS)	TS0000-TS015	TS0000-TS028	TS0000-TS0127	Word	R
Timer value (TV)	TV0000-TV015	TV0000-TV028	TV0000-TV0127	Word	R
Counter status (CS)	CS0000-CS015	CS0000-CS031	CS0000-CS031	Word	R
Counter value (CV)	CV0000-CV015	CV0000-CV031	CV0000-CV031	Word	R
Data block	DB2-DB63	DB2-DB63	DB2-DB255	N/A	N/A
*Right byte (DB DR)	DR000-DR255	DR000-DR255	DR000-DR255	Byte	R
*Left byte (DB DL)	DL000-DL255	DL000-DL255	DL000-DL255	Byte	R
*Word (DB DW)	DW000-DW255	DW000-DW255	DW000-DW255	Word	R/W
*§Floating pt.(DB FP)	FP000-FP254	FP000-FP254	FP000-FP254	Double word	R/W
*Bit in word (DB BI)	BI000-BI255	BI000-BI255	BI000-BI255	Bit	R/W

Table 3-12. Siemens 900 Series CPU Addressing

Device	921/922 CPU Address	928 CPU Address	94X CPU Address	Size	R/W
Input (I)	I0000-I0127	I0000-I0127	I0000-I0127	Byte	R
Output (Q)	Q0000-Q0127	Q0000-Q0127	Q0000-Q0127	Byte	R
Flag (F)	F0000-F0255	F0000-F0255	F0000-F0255	Byte	R
Timer status (TS)	TS0000-TS0127	TS0000-TS0255	TS0000-TS0127	Word	R
Timer value (TV)	TV0000-TV0127	TV0000-TV0255	TV0000-TV0127	Word	R
Counter status (CS)	CS0000-CS0127	CS0000-CS0255	CS0000-CS0127	Word	R
Counter value (CV)	CV0000-CV0127	CV0000-CV0255	CV0000-CV0127	Word	R
Data block	DB2-DB0255	DB3-DB0255	DB2-DB255	N/A	N/A
*Right byte (DB DR)	DR000-DR255	DR000-DR255	DR000-DR255	Byte	R
*Left byte (DB DL)	DL000-DL255	DL000-DL255	DL000-DL255	Byte	R
*Word (DB DW)	DW000-DW255	DW000-DW255	DW000-DW255	Word	R/W
*§Floating pt.(DB FP)	FP000-FP254	FP000-FP254	FP000-FP254	Double word	R/W
*Bit in word (DB BI)	BI000-BI255	BI000-BI255	BI000-BI255	Bit	R/W

Table 3-12. Siemens 900 Series CPU Addressing - Continued

Device	90U CPU Address	95U CPU Address	Size	R/W
Input (I)	I0000-I0127	I0000-I0127	Byte	R
Output (Q)	Q0000-Q0127	Q0000-Q0127	Byte	R
Flag (F)	F0000-F0128	F0000-F0256	Byte	R
Timer status (TS)	TS0000-TS0031	TS0000-TS0127	Word	R
Timer value (TV)	TV0000-TV0031	TV000-TV0127	Word	R
Counter status (CS)	CS0000-CS0031	CS0000-CS0031	Word	R
Counter value (CV)	CV0000-CV0031	CV0000-CV0031	Word	R
Data block	DB2-DB0127	DB2-DB0255	N/A	N/A
*Right byte (DB DR)	DR000-DR255	DR000-DR255	Byte	R
*Left byte (DB DL)	DL000-DL255	DL000-DL255	Byte	R
*Word (DB DW)	DW000-DW255	DW000-DW255	Word	R/W
*§Floating pt.(DB FP)	FP000-FP254	FP000-FP254	Double word	R/W
**Bit in word (DB BI)	BI000-BI255	BI000-BI255	Bit	R/W

* These data items are contained within a data block. To access an item, you must specify the data block number, data item type, and data item word address. E.g. to specify the left byte in word 22 of data block 12, use [DB12-DL22]. To specify the floating point value at word address 31 of data block 9, use [DB9-FP31].

** For data block bit in word, (DB BI), a bit address from 0-15 **must** be specified. Valid bit addresses for I, Q, and F are 0-7. Valid bit addresses for TS, CS, TV, CV, and DW are 0-15. Valid bit addresses for DR, and DL are 0-7 and are read-only.

§ See next page

§ If you do not specify floating point format in your expressions for floating point registers, SoftScreen will automatically assign floating point format, regardless of the default PLC format setting.

SoftScreen and the Siemens PLC store floating point data types in different formats. SoftScreen uses a fixed-point format in which more than nine significant digits can be displayed, while the Siemens PLC uses IEEE single floating point format in which only seven significant digits can be displayed. E.g. SoftScreen can display the 8-digit value 1234.5678, but a digit will be lost when the value is sent to and stored in the PLC. When the value is read back, it may be displayed as 1234.5677 or 1234.5679.

3.8.4 Siemens Communication Status Register

The communication status registers contain information about the communication between the Siemens PLC and the SoftScreen Workstation engine. There are three communication status registers, one for each COM port:

#8	Communication status for port 2
#9	Communication status for port 3
#10	Communication status for port 4

The communication status registers are 32 bit fixed point registers with the following bit assignments:

Upper 16 Bits

Bits 0	No Response
Bit 1	Timeout Error
Bit 2	Parity Error
Bit 3	Bad Response
Bit 4	Unused
Bit 5	Block Write Error
Bit 6	Block Length Error
Bit 7	No Block Exists
Bits 8-15	Unused

Lower 16 Bits

Bits 0-15	Unused

By testing specific bits in the communication status registers the appropriate text, alarm or message can be generated to indicate the current status of communication. For example, the expression #8&2 could be used to test for a timeout error. A timeout error would be indicated if the expression is evaluated to 2, while a value of 0 would indicate a timeout error.

3.9 CONNECTING THE 8320-SOFTSCREEN WORKSTATION TO SQUARE D SY/MAX

The Square D interface provides the ability to access and/or modify the data table area of the target SY/MAX PC from a Xycom intelligent terminal. The target SY/MAX device contains up to 9999 readable or writable registers. All processors are supported with the exception of the Model 100, which requires a slightly different software protocol.

The 8320-SoftScreen Workstation can be connected directly to a Square D processor or can be connected via the SY/MAX network. In the network configuration, the 8320-Workstation is connected to a Network Interface module (NIM), which, in turn, is connected to the Square D processor. The NIM can also be connected to a network of NIMs and processors which gives the 8320-Workstation accessibility to a network of SY/MAX devices.

The user interface provides the ability to monitor or change areas of the SY/MAX devices via SoftScreen menus. The way the user accesses the device is by specifying a Network address (optional) and a register address in the SY/MAX device. All SY/MAX devices will use the decimal numbering system.

3.9.1 Serial Port Configuration

The Square D PLC connects to SoftScreen via RS-422, and can connect to serial ports 2 or 3. (Port 1 is used for uploading or downloading from the development system or multidrop network, and port 4 is a dedicated RS-232C port.)

Make sure the jumpers on the 8320-SoftScreen controller board are set to RS-422 as shown in Tables 2-2 and 2-3 on pages 2-9 and 2-10.

> **NOTE**
> Make sure the port you use is the same one specified in the SoftScreen software under Configuration-Ports.

3.9.2 **Electrical Interface**

The electrical interface for Square D is asynchronous RS-422, linked serially to the target SY/MAX family device. Figure 3-20 shows the necessary cabling.

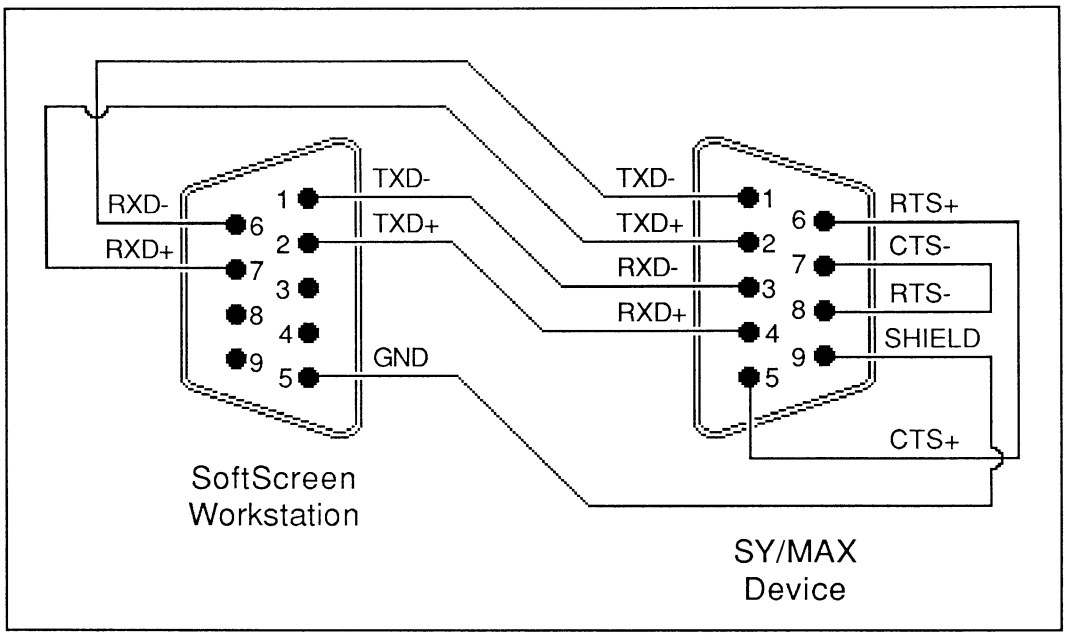


Figure 3-20. Cabling to the SY/MAX PLC

3.9.3 **Square D Addressing**

The address expression formats specific to the Square D PLC interface are shown below:

Table 3-13. Square D Addressing

Device	PLC Address	Number Type	Size	R/W
All	S0001-S9999	Decimal	Word	R/W

For example, if the expression **[PLC1:S1234 3]** is entered in the development system software for a data display object, the 8320 engine will read and display the value in PLC1, word S1234, bit 3.

Square D S memory can be written to as words (e.g. [S1]) or as bits (e.g. [S1 3]).

Valid bit addresses are 1 to 16.

For more information on expression value formats, see Appendix C of your SoftScreen Development System Manual.

3.9.4 Square D Communication Status Register

The communication status registers contain information about the communication between the Square D PLC and the SoftScreen Workstation engine. The communication status registers for the available COM ports are:

#8	Communication status for port 2
#9	Communication status for port 3

The communication status registers are 32-bit fixed point registers with the following bit assignments:

Upper 16 Bits

Bits 0	Transmit Error
Bit 1	Receive Error
Bit 2	Timeout Error
Bit 3	Bit Write Error
Bits 4-15	Unused

Lower 16 Bits

Bits 0-15	Unused

By testing specific bits in the communication status registers, the appropriate text, alarm or message can be generated to indicate the current status of communication. For example, a timeout error would be indicated if the expression evaluated to 4, while a value of 0 would indicate no timeout error.

3.10 CONNECTING THE 8320-SOFTSCREEN WORKSTATION TO TEXAS INSTRUMENTS 405/435

This section describes the functional definition of the SoftScreen to Texas Instruments Series 405/435 interface. The interface to the TI PLC is through the PLC's programming port.

The purpose of the Texas Instruments driver is to access and/or modify memory and timer/counter variables of the target programmable controller from a Xycom 8320-SoftScreen Workstation.

3.10.1 Serial Port Configuration

The Texas Instruments 405/435 PLC connects to SoftScreen via RS-232C, and can connect to any serial port *except* port 1, which is used for uploading or downloading from the development system or multidrop network.

Make sure the jumpers on the 8320-SoftScreen controller board are set to RS-232C as shown in Tables 2-2 and 2-3 on pages 2-9 and 2-10.

> **NOTE**
> Make sure the port you use is the same one specified in the SoftScreen software under Configuration-Ports.

3.10.2 **Electrical Interface**

The Texas Instruments Series 405/435 PLC connects to the 8320-SoftScreen Workstation through RS-232C. Figure 3-21 shows the necessary cabling between the Workstation and the TI PLC.

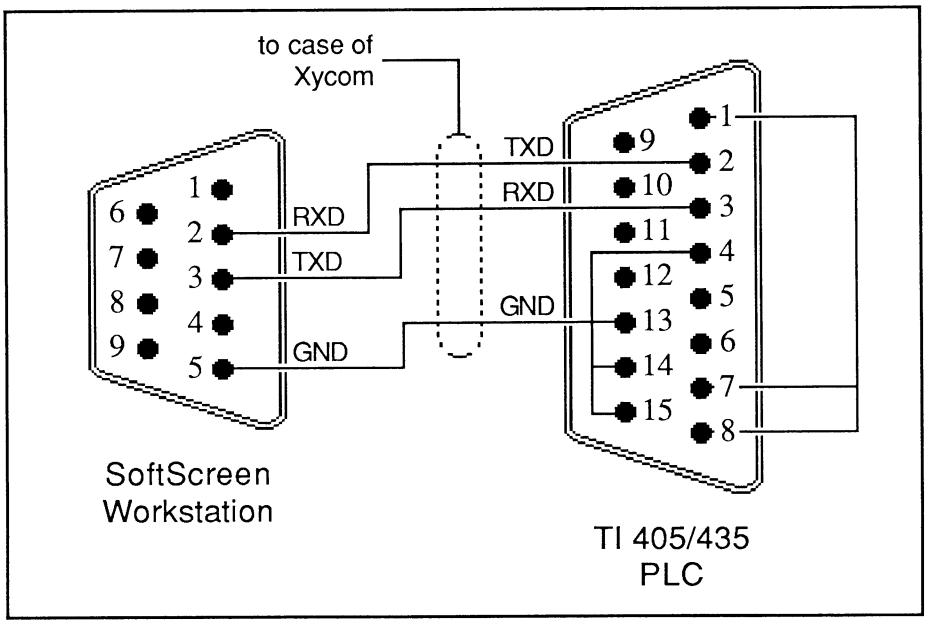


Figure 3-21. Cabling to the TI Series 405/435

3.10.3 **TI-405/435 Addressing**

The address expression formats specific to the TI-405/435 PLC interfaces are shown in the table below:

Table 3-14. TI 405/435 Addressing

Device	PLC Address	Number Type	Size	R/W
Timer	T0000-T0177	Octal	Word	R/W
Counter	CT000-CT177	Octal	Word	R/W
User register	U0000-U6377	Octal	Word	R/W
Remote I/O memory	GX000-GX777	Octal	Bit	R/W
Input memory	X0000-X0477	Octal	Bit	R/W
Output memory	Y0000-Y0477	Octal	Bit	R
Control relay	C0000-C0737	Octal	Bit	R/W
Stage memory	S0000-S0577	Octal	Bit	R/W
Timer relay	TR000-TR177	Octal	Bit	R/W
Counter relay	CTR00-CTR177	Octal	Bit	R/W
Special relay	SP000-SP137	Octal	Bit	R
	SP320-SP617	Octal	Bit	R
V memory	V0000-V41230	Octal	Word	R/W
Scratch pad memory	SPD00-SPD8FF	Hex	Byte	R/W

For example, if the expression **[PLC1:CT123 3]** is entered in the development system software for a data display object, the 8320 engine will read and display the value in PLC1, word CT123, bit 3.

NOTE
Valid bit address for T, CT, U, and V are 0-15, and are read only.
Valid bit addresses for SPD are 0-7 and are read only.

For more information on expression value formats, see Appendix C of your SoftScreen Development System Manual.

3.10.4 TI-405/435 Communication Status Register

The communication status registers contain information about the communication between the TI-405/435 PLC and the SoftScreen Workstation engine. There are three communication status registers, one for each available COM port:

#8	Communication status for port 2
#9	Communication status for port 3
#10	Communication status for port 4

The communication status registers are 32-bit, fixed point registers with the following bit assignments:

Upper 16 Bits

Bit 0-3	Unused
Bit 4	Receive Error
Bit 5	Enquiry Error
Bit 6	BCC Error
Bits 7	Timeout error
Bits 8-15	Unused

Lower 16 Bits

Unused

By testing specific bits in the communication status registers, the appropriate text, alarm or message can be generated to indicate the current status of communication. For example, the expression #8&128 could be used to test for a timeout error. A timeout error would be indicated if the expression is evaluated to 128, while a value of 0 would indicate no timeout error.

3.11 CONNECTING THE 8320-SOFTSCREEN WORKSTATION TO TEXAS INSTRUMENTS 500/505

This section describes the functional definition of the SoftScreen to Texas Instruments Series 500/505 interface. The interface to the TI PLC is through the PLC's programming port.

The purpose of the Texas Instruments driver is to access and/or modify memory, drum variables, and timer/counter variables of the target programmable controller from a Xycom 8320-SoftScreen Workstation.

3.11.1 Serial Port Configuration

The Texas Instruments 500/505 PLC connects to SoftScreen via RS-422 or RS-232C. For RS-422, SoftScreen can connect to serial ports 2 or 3. For RS-232C, SoftScreen can connect to ports 2, 3, or 4. (Port 1 is used for uploading or downloading from the development system or multidrop network, and port 4 is a dedicated RS-232C port.)

Make sure the jumpers on the 8320-SoftScreen controller board are set appropriately as shown in Tables 2-2 and 2-3 on pages 2-9 and 2-10.

> **NOTE**
> Make sure the port you use is the same one specified in the SoftScreen software under Configuration-Ports.

3.11.2 **Electrical Interface**

The Texas Instruments Series 500/505 PLC connects to the 8320-SoftScreen Workstation through RS-422 or RS-232C. Figure 3-22 shows the necessary cabling between the 8320-SoftScreen Workstation and the TI PLC for RS-422, while Figures 3-23 and 3-24 on the following page show the connections for RS-232C.

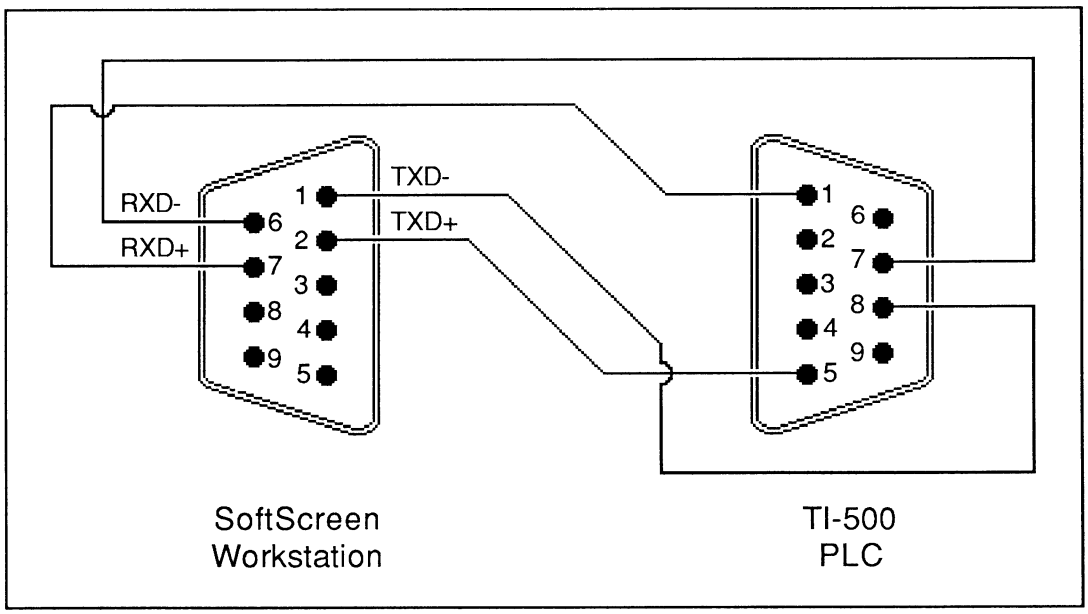


Figure 3-22. Cabling to the TI Series 500/505 via RS-422

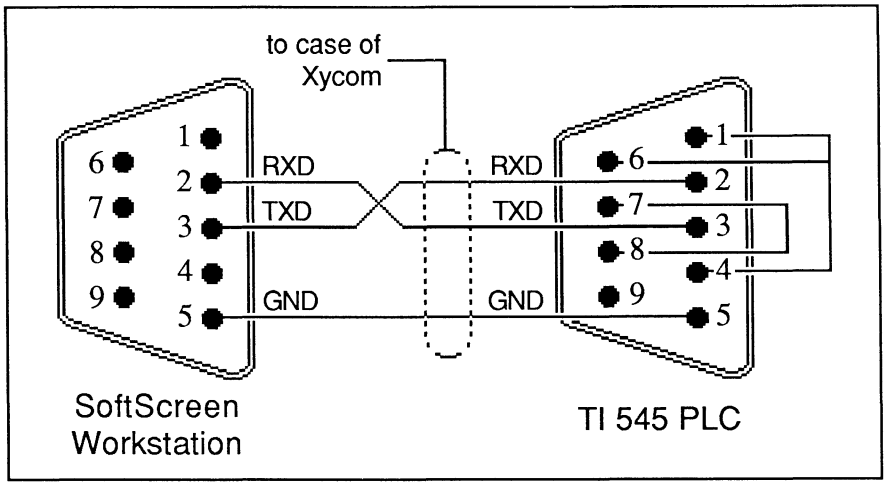


Figure 3-23. Cabling to the TI 500/505 via RS-232C, 9-pin

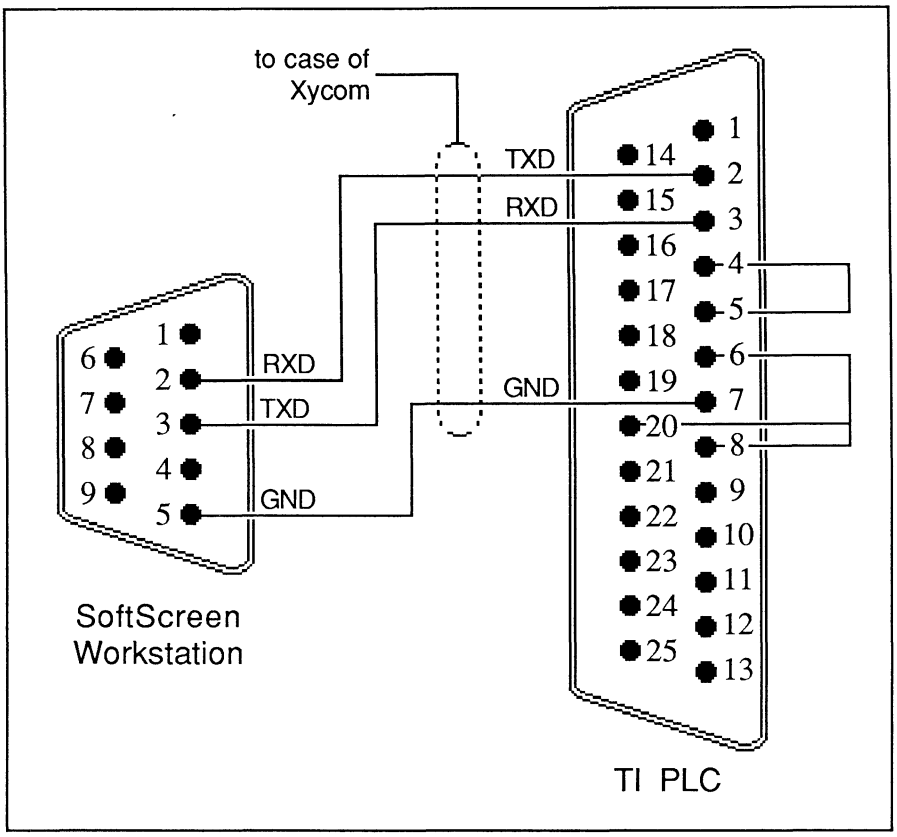


Figure 3-24. Cabling to the TI 500/505 via RS-232C, 25-pin

3.11.3 TI-500/505 Addressing

The address expression formats specific to the TI-500/505 PLC interfaces are shown below: All addresses are decimal and have a starting address of 1.

Table 3-15. TI 500/505 Addressing

Device	PLC Address*	Size	R/W
Input	X0001-X65535	Bit	R/W
Output	Y0001-Y65535	Bit	R
Internal coil	C0001-C65535	Bit	R/W
Variable	V0001-V65535	Word	R/W
Constant	K0001-K65535	Word	R/W
Word input	WX001-WX65535	Word	R/W
Word output	WY001-WY65535	Word	R
Drum step current	DSC01-DSC65535	Word	R/W
Drum step preset	DSP01-DSP65535	Word	R/W
Status word	STW01-STW65535	Word	R
Timer/counter preset	TCP01-TCP65535	Word	R/W
Timer/counter current	TCC01-TCC65535	Word	R/W
Analog alarm acknowledge	AACK1-AACK65535	Word	R/W
Analog alarm deadband	AADB1-AADB65535	Floating point	R/W
Most significant word of analog alarm C-flags	ACFH1-ACFH65535	Word	R/W
Least significant word of analog alarm C-flags	ACFL1-ACFL65535	Word	R/W
Analog alarm error	AERR1-AERR65535	Floating point	R/W
Analog alarm high alarm limit	AHA1-AHA65535	Floating point	R/W
Analog alarm high-high alarm limit	AHHA1-AHHA65535	Floating point	R/W
Analog alarm low alarm limit	ALA1-ALA65535	Floating point	R/W
Analog alarm low-low alarm limit	ALLA1-ALLA65535	Floating point	R/W
Analog alarm orange deviation alarm limit	AODA1-AODA65535	Floating point	R/W
Analog alarm process variable	APV1-APV65535	Floating point	R/W
Analog alarm process variable high limit	APVH1-APVH65535	Floating point	R/W
Analog alarm process variable low limit	APVL1-APVL65535	Floating point	R/W
Analog alarm rate of change alarm limit	ARCA1-ARCA65535	Floating point	R/W
Analog alarm set point	ASP1-APS65535	Floating point	R/W
Analog alarm set point high limit	ASPH1-ASPH65535	Floating point	R/W
Analog alarm set point low limit	ASPL1-ASPL65535	Floating point	R/W
Analog alarm sample rate	ATS1-ATS65535	Floating point	R/W
Analog alarm flags	AVF1-AVF65535	Word	R/W

Table continued on the following page

Table 3-15. TI 500/505 Addressing (Continued)

Device	PLC Address*	Size	R/W
Analog alarm yellow deviation alarm limit	AYDA1-AYDA65535	Floating point	R/W
Constant	K1-K65535	Word	R/W
Loop alarm acknowledge	LACK1-LACK65535	Word	R/W
Loop alarm deadband	LADB1-LADB65535	Floating point	R/W
Most significant word of loop C-flags	LCFH1-LCFH65535	Word	R/W
Least significant word of loop C-flags	LCFL1-LCFL65535	Word	R/W
Loop error	LERR1-LERR65535	Floating point	R/W
Loop high alarm limit	LHA1-LHA65535	Floating point	R/W
Loop high-high alarm limit	LHHA1-LHHA65535	Floating point	R/W
Loop gain	LKC1-LKC65535	Floating point	R/W
Loop derivative gain limiting coefficient	LKD1-LKD65535	Floating point	R/W
Loop low alarm limit	LLA1-LLA65535	Floating point	R/W
Loop low-low alarm limit	LLLA1-LLLA65535	Floating point	R/W
Loop output	LMN1-LMN65535	Floating point	R/W
Loop bias	LMX1-LMX65535	Floating point	R/W
Loop orange deviation alarm limit	LODA1-LODA65535	Floating point	R/W
Loop process variable	LPV1-LPV65535	Floating point	R/W
Loop process variable high limit	LPVH1-LPVH65535	Floating point	R/W
Loop process variable low limit	LPVL1-LPVL65535	Floating point	R/W
Loop rate of change alarm limit	LRCA1-LRCA65535	Floating point	R/W
Loop ramp/soak flags	LRSF1-LRSF65535	Word	R/W
Loop ramp/soak step number	LRSN1-LRSN65535	Word	R/W
Loop set point	LSP1-LSP65535	Floating point	R/W
Loop set point high limit	LSPH1-LSPH65535	Floating point	R/W
Loop set point low limit	LSPL1-LSPL65535	Floating point	R/W
Loop rate	LTD1-LTD65535	Floating point	R/W
Loop reset	LTI1-LTI65535	Floating point	R/W
Loop sample rate	LTS1-LTS65535	Floating point	R/W
Loop V-flags	LVF1-LVF65535	Word	R/W
Loop yellow deviation limit	LYDA1-LYDA65535	Floating point	R/W

Valid bit addresses for all devices except X, Y and C are 0-15.

***NOTE**

PLC address numbers are for reference only. Check your PLC documentation for memory size limits.

Expressions follow the same format whether they are used in data display objects, data entry objects, or recipe values. For example, if the expression **[PLC0:WX10 3]** is entered in the development system software for a data display object, the 8320 engine will read and display the value in PLC0, word WX10, bit 3.

For more information on expression value formats, see Appendix C of your SoftScreen Development System Manual.

NOTE
SoftScreen and the TI Series 500 PLC store floating point data types in different formats. SoftScreen uses a fixed-point format in which more than 9 significant digits can be displayed, whereas the TI PLC uses IEEE single floating point format in which only 7 significant digits can be displayed. For example, the 8-digit value 1234.5678 can be displayed in SoftScreen, but a digit will be lost when the value is sent to and stored in the PLC. When the value is read back, it may be displayed as 1234.5677 or 1234.5679.

NOTE
If you do not specify floating point format in your expressions for floating point registers, SoftScreen will automatically assign floating point format, regardless of the default PLC format setting.

NOTE
When using V memory as floating point (FP) values, two V memory locations are needed to store the value. Once a V memory location is defined as FP in an application, it must always be defined as floating point in that application. For example, if you specify [V1, FP] the value will be stored in both V1 and V2 locations.

3.11.4 TI-500/505 Communication Status Register

The communication status registers contain information about the TI-500/505 PLC and the SoftScreen Workstation engine. There are three communication status registers, one for each available COM port:

#8	Communication status for port 2
#9	Communication status for port 3
#10	Communication status for port 4

The communication status registers are 32-bit, fixed point registers with the following bit assignments:

Upper 16 Bits

Bit 0	Receive Error
Bit 1	Transmit Error
Bit 2	CRC Error
Bit 3	Address Error
Bit 4	Timeout Error
Bit 5	Read Only Error
Bit 6	Unused
Bit 7	Error Task Code returned by PLC (see bits 8-15)
Bits 8-15	Error Task Codes
00010	Address out of range
00011	Data not found
00100	Illegal request
00101	Request exceeds memory size
00111	Fatal Error detected
01000	Keylock protect error
01001	Incorrect amount of data
01010	Illegal in current mode
01110	Illegal write
01111	Data not inserted
10000	Invalid data
10001	Invalid in current mode

Lower 16 Bits

Unused

By testing specific bits in the communication status registers, the appropriate text, alarm, or message can be generated to indicate the current status of communication.

For example, the expression #8&16 could be used to test for a timeout error. A timeout error would be indicated if the expression evaluated to 16, while a value of 0 would indicate no timeout error.

3.12 CONNECTING THE 8320-SOFTSCREEN WORKSTATION TO WESTINGHOUSE

This section describes the functional definition of the SoftScreen to Westinghouse Numa-Logic PLC. The protocol used is specific to the Numa-Logic PLC. Refer to the Westinghouse documentation for details.

3.12.1 Serial Port Configuration

Westinghouse PLC connects to SoftScreen via RS-232C. It can connect to any serial port *except* port 1, which is used for uploading or downloading from the development system or multidrop network. Make sure the jumpers on the 8320-SoftScreen controller board are set to RS-232C as shown in Tables 2-2 and 2-3 on pages 2-9 and 2-10.

3.12.2 Electrical Interface

Figure 3-25 shows how to connect the SoftScreen Workstation to a Westinghouse programmable controller via asynchronous RS-232.

NOTE
Make sure the port you use is the same one specified in the SoftScreen software under Configuration-Ports.

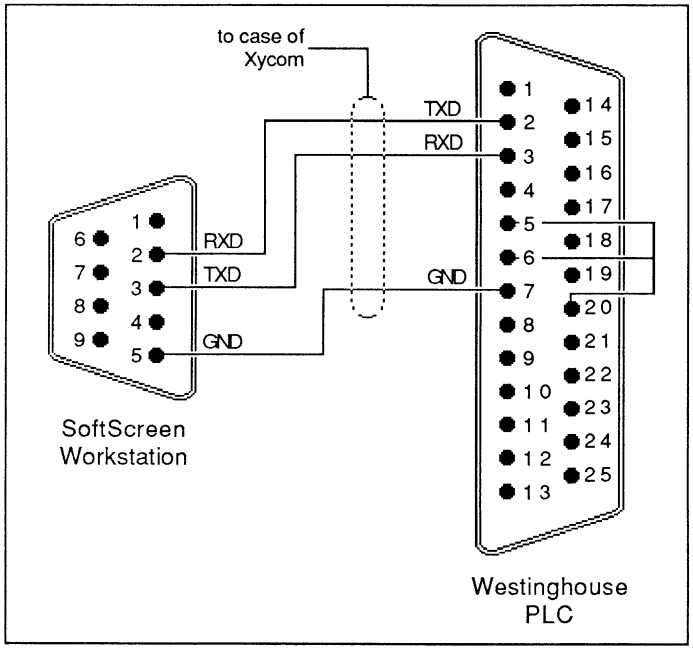


Figure 3-25. RS-232 Connection to Westinghouse PLC

3.12.3 **Westinghouse Addressing**

The address expressions (entered for Expression in various configuration forms) that are specific to the Westinghouse PLC interface are shown in the table below:

Table 3-16. Westinghouse Addressing

Device	**PLC Address**	**Number Type**	**Size**	**R/W**
All	0000-FFFF	Hex	Word	R/W

Valid bit addresses are 0-15.

For example, if the expression **[PLC1:FFFF 3]** is entered in the development system software for a data display object, the engine will read and display the value in PLC1, word FFFF, bit 3.

3.12.4 **Westinghouse Communication Status Register**

The communication status registers contain information about the communication between the Westinghouse PLC and the SoftScreen Workstation engine. There are three communication status registers, one for each available COM port:

#8	Communication status for port 2
#9	Communication status for port 3
#10	Communication status for port 4

The communication status registers are 32-bit, fixed point registers with the following bit assignments:

Upper 16 Bits

Bit 0	Transmit Error
Bit 1	Receive Error
Bit 2	Timeout Error
Bit 3	Synchronization Error
Bit 4	Block Checksum Error
Bits 8-15	Message Status from Westinghouse PLC

Lower 16 Bits

Bits 0-15	Unused

By testing specific bits in the communication status registers, the appropriate text, alarm or message can be generated to indicate the current status of communication.

For example, the expression #8&4 could be used to test for a timeout error. A timeout error would be indicated if the expression evaluated to 4, while a value of 0 would indicate no timeout error.

3.13 CONNECTING THE SOFTSCREEN WORKSTATION WITH OTHER MACHINES RUNNING SOFTSCREEN (XYCOM TERMINAL)

This method is used to access data from other machines running SoftScreen. The other machine behaves similar to a PLC. Multiple machines can be connected on the same line.

3.13.1 Serial Port Configuration

The SoftScreen Master to SoftScreen Slave connection can be made via RS-485 or RS-232C. In RS-485 mode, the master can connect to the network through serial ports 2 or 3. In RS-232C mode, the master can use ports 2, 3 or 4. (Port 1 is used for uploading or downloading from the development system; Port 4 is a dedicated RS-232C port.)

Each slave connects to the network through serial port 1. When operating in RS-232C mode, only 1 slave terminal can be connected to the master. For multiple slaves, RS-485 must be used.

Make sure the jumpers on the 8320 controller board are set appropriately as shown in Tables 2-2 and 2-3 on pages 2-9 and 2-10.

> **NOTE**
> Make sure the port you use is the same one specified in the SoftScreen software under Configuration - Ports.

3.13.2 **Electrical Interface**

Figure 3-26 shows electrical interface used when connecting other machines to Xycom terminals.

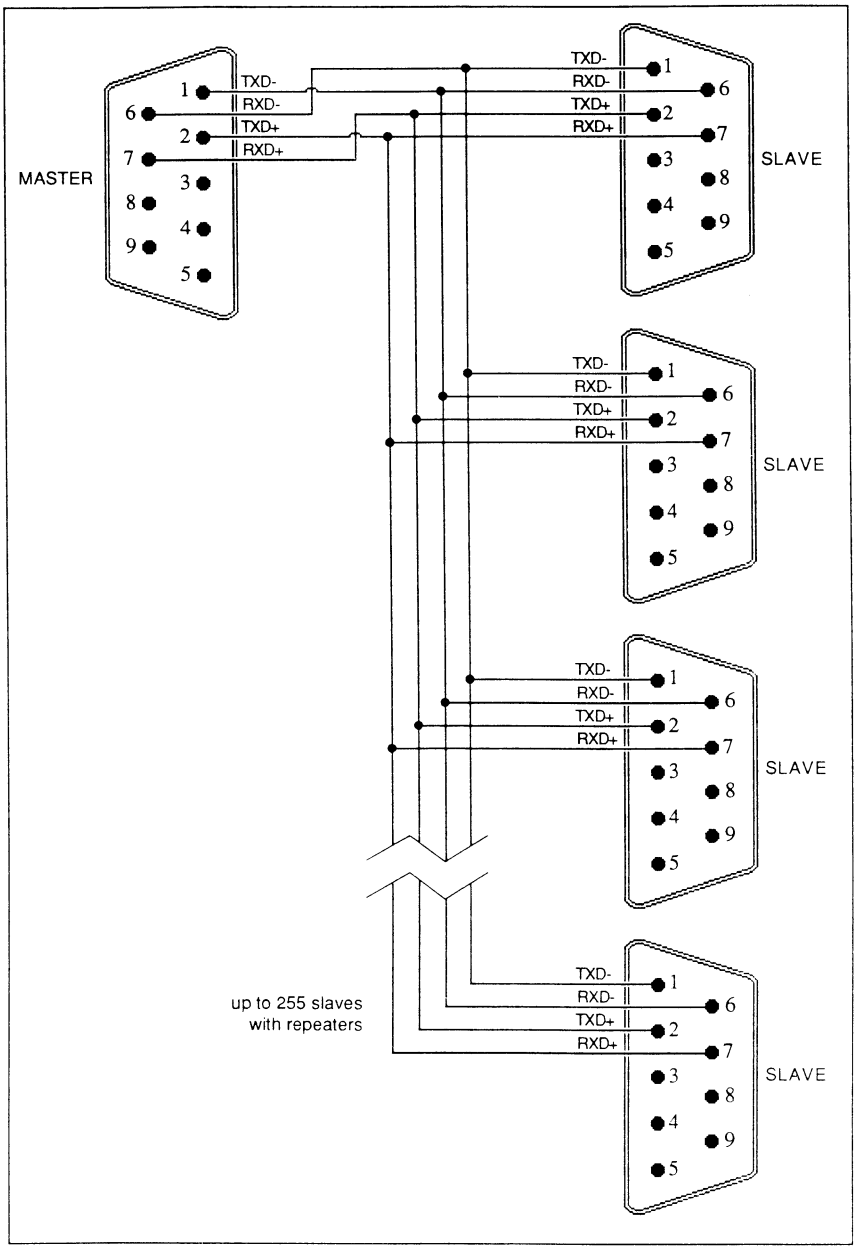


Figure 3-26. RS-485 Connection of SoftScreen

3.13.3 Xycom Terminal Addressing

The address expressions (entered for Expression in various configuration forms) that are specific to the Xycom Terminal interface are shown in the table below:

Table 3-17. Xycom Expressions

Device	PLC Address	Number Type	Size	R/W
Terminal	Station number	Decimal	F/P	R/W
Internal Register	#1 - #7	Decimal	F/P	R/W
	#8 - #19	Decimal	F/P	R
	#20 - #500	Decimal	F/P	R/W

Registers #1 - #7 are Time/Date locations and registers #8 - #19 are Read only.

Station number of the Xycom Terminal is 0-255. The internal register of the terminal is 1-500 for 8320 and PC/AT engines, and 1-100 for 2000 series engines.

For example, if the expression [3#50] is entered in the development system software for a data display object, the SoftScreen engine will read and display the value in register 50 of Station 3.

4.1 INTRODUCTION

This section discusses both the 8320-SoftScreen Workstation menus and how the unit functions as the runtime engine for the SoftScreen software.

4.2 SELECTING MENUS

When the 8320-SoftScreen Workstation boots up, an initial screen is displayed. To access the menu selections, type **<CTRL><BREAK>** from the keyboard or **<back space><down arrow>** from the keypad.

All choices can be accessed from the keyboard in either of the following ways:

- **First Letter**: Type the **highlighted** letter of the selection (e.g., **D** for **D**iagnostics).
- **Cursor Method**: Use the cursor keys to select the menu item as indicated in the box at the bottom of the screen. When the menu item is highlighted, press <Enter>.

The escape key, or <ESC>, will return to the prior menu or exit to the SoftScreen engine screen from the Main Menu.

> **NOTE**
> In addition to selecting options from the Main Menu, you can type one command from the Main Menu: **.CM**. .CM (which must be typed in capital letters) clears all memory and resets the engine files.

4.3 MAIN MENU

Menu selections available on the Main Menu are:

Diagnostics
Setup
Clock

These three selections access all the features of the 8320-SoftScreen Workstation. The following sections explain how to get to the various features using the First-Letter method.

4.4 DIAGNOSTICS MENU

The Diagnostics Menu provides the following selections:

Individual Tests
Continuous Test
Total Test

Individual Tests — Type **D**iagnostics **I**ndividual Tests from the Main Menu. This allows testing any of the system diagnostics one at a time. The system diagnostics – processor, ROM, RAM, clock, comm ports, peripheral chips, printer port, speaker, relay, keypad keys, keyboard port, video, battery, RS-485 ports, and touch screen – are described below and on the following page.

Continuous Test — Type **D**iagnostic **C**ontinuous Test from the Main Menu. It provides access to 8320-SoftScreen continuous testing feature. Press <ESC> twice to exit.

Total Test — Type **D**iagnostic **T**otal Test from the Main Menu. It provides access to all of the SoftScreen continuous testing features (tests processor, ROM, RAM, clock, comm ports, and peripheral chips), one by one. Press <ESC> twice to exit.

During any of the tests, a message that indicates the test being performed appears on the screen. The message is cleared if the test passes. If the test fails, another message, which gives some indication of the type of failure, is displayed.

If a failure occurs, press the space bar to continue the test or press <ESC> to terminate the test. The following are brief descriptions of each test.

> **NOTE**
> **Bold** text indicates tests which are performed at power-up.

Processor — tests selected instructions and registers.

ROM — tests BIOS, Extended BIOS, and SoftScreen engine ROMs, adding up certain bytes to get a checksum. In each case, a failure will indicate what the checksum is and should be.

RAM — tests DRAM, VRAM, and CMOS RAM. A failure in each case will give the location of the error, the data expected, and the data found at that location.

Clock performs two tests on the real time clock: a running test and a RAM test. An error message will indicate which failed.

Comm Ports test involves serial loop back wiring to be installed on all comm ports. A failure will indicate port, type of failure, and the pin causing the error.

CONNECTIONS:	
RS-232C Loop Back Connections	RS-485 Loop Back Connections
DCD(1)-DTR(4) RXD(2)-TXD(3) RTS(7)-CTS(8)	TXD-(1)-RXD-(6) TXD+(2)-RXD+(7) RTS-(3)-CTS-(9) RTS+(4)-CTS+(8)

Peripheral Chips — Tests peripheral chips, DMA, UIC, PIT, and PIO and indicates any failures.

Printer Port — Test writes data to the printer. Will indicate either an out of paper or an off line condition. A successful test will print three lines of data.

Speaker — Test pulses speaker, 0.5 sec. duration. Press a key to terminate.

Relay — Test pulses relay, 0.5 sec. duration. Press a key to terminate.

Keypad Keys — Draws a picture of the keypads in white on a black screen. When a key is pressed it turns red; when released it turns blue. Press <CTRL><BREAK> to exit.

Keyboard — Confirms the operation of the keyboard connectors. The user is prompted to unplug the keyboard from the front panel and plug it into the rear port. Between each step a key must be pressed to continue.

Video — Prompts the user with a menu that allows various patterns and colors on the screen to be displayed. The user must hit a key between each pattern/color or press <ESC> to end the test.

Touch Screen Test — Applicable only for units equipped with a touch screen. Press and release each square, (a character 'R' is displayed within each square).

4.5 SETUP MENU

The Setup Menu provides the following selections:

Station Address
Current Engine Status

Station Address

The Setup Menu allows defining the station address for the SoftScreen Workstation engine. If more than one station is used, each Workstation must be set up individually. This menu prompts for the station number to assign the Workstation. You can enter up to three digits. On the engine main screen, the number will be displayed to three places. For example, if you enter 1, it will be displayed as 001. Up to 255 stations can be multi-dropped together.

> **NOTE**
> More than 31 stations will need a repeater.

Current Engine Status

This shows you the name of screens, recipes and reports of the current application. It also tells you the engine version number and the configuration for the PLC ports.

4.6 CLOCK MENU

The Clock Menu allows checking or setting the following parameters: year, month, day, hour, minute, and second. Use the arrow keys to select check or set clock and press <Enter>. If you choose set, use the arrow keys to highlight the area to change and enter the new specification.

4.7 OBJECT CONFIGURATION

Objects are either static or dynamic. Dynamic objects change appearance as tied to an expression value. Static objects remain the same shape they were created in. On the development software, however, all objects look static. On the engine, dynamic objects appear in the size determined by the expression value entered in the development software.

On the engine, circles, ovals, rectangles, and squares grow proportionately to the minimum and maximum values. A bar will expand left, right, up, or down, as specified in the development system. The object will never be displayed larger than the maximum value or smaller than the minimum value, regardless of the values read.

4.7.1 State Configuration

The 8320-SoftScreen engine evaluates states entered in the Object Configuration Menus in the development system software. The expressions are evaluated top to bottom (1 to 6, or 1 to 8, depending on the number of states available). If the result of the conditional statement is true, the changes specified under States will occur on the engine. If the expression is false, the object or text is displayed on the engine in the color in which it was created on the development system. If the expression results in a value, the expression is assessed as true or false, with non-zero values being true, and 0 being false.

4.8 ALARM SUMMARY

All alarms contained in an application are continuously scanned, even when they are not displayed on the current screen. This allows an alarm message to be displayed on the current screen if any alarm in the entire application occurs. The displayed message contains the object tag name in which the alarm occurred, the alarm value, the date, and time.

If alarm acknowledge was disabled in the SoftScreen development system, the alarm will appear on the screen for the time specified in System Configuration. (The user at the engine can however override the specified time by pressing Home to cancel the alarm message.) If alarm acknowledge was enabled, the alarm message appears until Home is pressed on the 8320-SoftScreen Workstation keypad.

All alarms are recorded in an alarm summary, which can list up to 100 alarms. (To make room for alarms over 100, the oldest acknowledged alarm is deleted. If there is no acknowledged alarm, the oldest is deleted.) The alarms are listed chronologically, with the oldest alarm appearing first. The alarm summary contains the following information: object name, alarm condition (high, low, or out of alarm), alarm value, date, time, and status. For an acknowledge-enabled alarm, the status message will either be the date and time of acknowledgement or the message that an acknowledgement is still required. The user can use the arrow keys and page up and page down keys to select any alarm and press Home to acknowledge it. For an alarm with acknowledge disabled, the status message is blank. A sample alarm summary is shown below:

Object Name	Alarm Type	Value	Time	Date	Status
Object 1	HIGH alarm	345.00	13:30:20	11/15/91	ack 13:31:15 11/15/90
Object 1	out of HIGH alarm		13:35:20	11/15/91	
Object 7	LOW alarm	2.00	13:37:20	11/15/91	waiting for Ack

NOTE

The screen name of the alarm summary is AlarmSum. It is not user-configurable. For it to display on the engine, it must be tied to a function or pseudo key or touch button in the development system. No other screens can be named AlarmSum.

The 8320-SoftScreen Workstation user can scroll through the alarm summary using the arrow and page up and down keys. The ESC key is used to exit, and DEL deletes an alarm that is not waiting to be acknowledged. The alarms are listed white on blue. White on black indicates the alarm currently selected.

4.8.1 AlarmView

This screen is exactly like the Alarm Summary Screen described in Section 4.10, except for Delete, (both keyboard and touchscreen) will have no effect. This is useful if the supervisor does not want the operator to delete any alarms. The screen name of AlarmView is AlarmVu.

4.9 DATA ENTRY

On the SoftScreen engine, data entry points appear as pound signs (#'s), with one # per place. To enter data values in the place of #'s, the end user must press Home to position the cursor at the first data entry field. Enter the information, and press <Enter>. Additional fields can be edited by pressing Home. Pressing Home twice causes the cursor to advance. If a value above the maximum or below the minimum (as defined in the Object Configuration at the development system) is entered, the maximum or minimum number will be used.

If there are multiple data entry objects on one screen, pressing Home, PgUp or PgDn repeatedly will cause the cursor to cycle through each data entry object on the screen.

The numbers entered in place of the #'s at the 8320-SoftScreen engine data entry points will be displayed as the numbers entered until the screen is redrawn. When the screen is redrawn the #'s will reappear, even though the value entered has already been sent.

4.10 PASSWORDS

In some instances, the end user at the 8320-Workstation is prompted to enter a password before being able to access a screen or enter information. This password is set in the SoftScreen offline development system and transferred when downloaded to the engine. The passwords are set in the development software in the Configuration-Edit-Password and Screen-Control-Security Menus.

For more information on setting the passwords, see Chapter 4 of the SoftScreen Development System Manual.

4.11 DATA REGISTERS

Data registers are 32-bit memory locations in the SoftScreen Workstation engine which are used for communication between a device and the workstation. Both the SoftScreen Workstation and the PLC device can read/write to most data registers. The registers are placed in battery-backed CMOS memory, so that the information is retained, even after you turn your SoftScreen Workstation off.

Registers can hold values or mathematical calculations, or pointers to other values. There are 500 registers.

Table 4-1. Register Assignments

Symbol	Representation
#1	Year
#2	Month
#3	Day
#4	Hour
#5	Minute
#6	Second
#7	Day of Week
#8	Port 1 error code
#9	Port 2 error codes
#10	Port 3 error codes
#11	Port 4 error codes
#12	Printer errors
#13 - #19	RESERVED - NOT USER CONFIGURABLE
#20 - #500	General purpose registers

Registers #8 - #19 are read only.

4.11.1 PLC Points

To optimize PLC communication, all current PLC points (which include the current screen, pseudo keys, and alarmed points) are stored in a single internal table that contains 200 entries.

> **NOTE**
> The total number of PLC points that can reside in one screen, and any alarmed points in the entire application is 200. The total number of Alarm PLC points in the entire application can be up to 100. The total number of Report PLC points in a single report is 200.

5.1 PREVENTIVE MAINTENANCE

The SoftScreen Workstation is designed to withstand the harsh environment of the factory floor. Routine maintenance can help keep your SoftScreen Workstation in good operating condition. Preventive maintenance consists of several basic procedures and checks that will greatly reduce the chances of system malfunction. Preventive maintenance should be scheduled along with the regular equipment maintenance to minimize SoftScreen Workstation down time.

Some preventive measures are listed below.

- **Remove dust and dirt from PC components.** If dust builds up on heat sinks and circuitry, an obstruction of heat dissipation could cause the unit to malfunction. If dust reaches the electronic boards, a short circuit could occur.

- **Check the connections to I/O modules,** especially in environments where shock could loosen the connections. Check to see that all plugs, sockets, terminal strips, and module connections are solid and that the module is seated completely on its connector. Tighten screws to prevent the module from loosening.

- **Remove articles such as drawings and manuals from the unit.** They could obstruct air flow which creates hot spots, which cause the system to malfunction.

- **Do not move noise generating equipment too near the SoftScreen Workstation.**

- **Stock spare parts** to minimize down time resulting from part failure. The spare parts stocked should be 10 percent of the number of each unit used. The main CPU card should have one spare each, regardless of the number of CPUs used. Each power supply should have a back-up. See the spare parts list in Section 5.2.3.

- **When replacing a module, make sure it is the correct type.** If the new module solves the problem, but the failure reoccurs after a while, check for inductive loads that may be generating voltage and current spikes and may require external suppression.

5.2 MAINTENANCE

5.2.1 Replacing the Fuse

The 8320-SoftScreen Workstation uses a standard 3 Amp fuse. The fuse holder/access door is located under the power receptacle and should be carefully pried open.

> **WARNING**
> Disconnect the power to the terminal before removing the fuse.

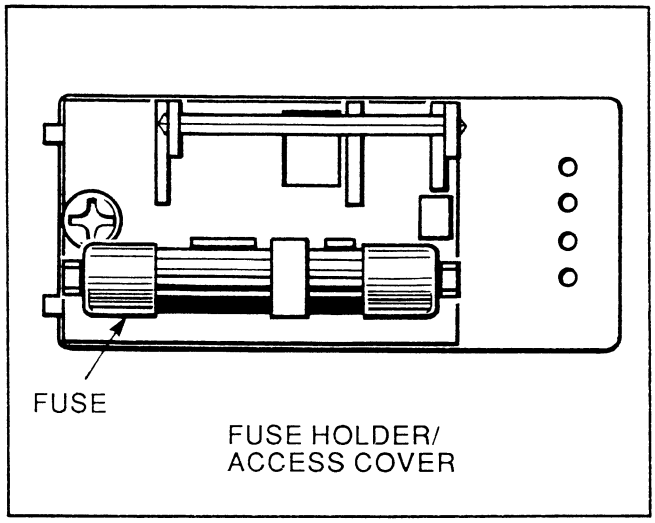


Figure 5-1. Fuse Holder/Access Door

5.2.2 **Replacing the Backup Battery**

To remove the backup battery, use a screwdriver to position the slotted cap vertically, remove the cap, and then remove the battery.

> **WARNING**
> Disconnect the power to the terminal before removing the battery.

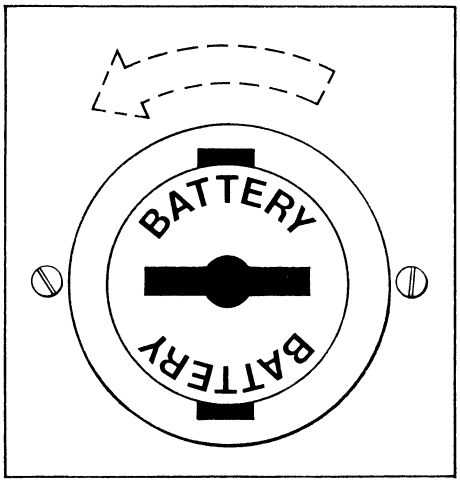


Figure 5-2. Battery Replacement

5.2.3 **Spare Parts List**

In case you need to re-order parts to your SoftScreen Workstation, use the part numbers specified below:

Table 5-1. Spare Parts Lists

DESCRIPTION	PART NUMBER
80 Watt Power Supply	94457-001
Lexan Screen	94157-002
3 Amp Fuse	81757-001
#10-32 Nuts	80580-002
Power Cord	88760-001
VGA Video Cable	96246-001
Battery	93474-001

5.3 PRODUCT REPAIR PROGRAM / RETURNING A UNIT TO XYCOM

Xycom's Product Repair Service performs services to restore equipment to normal operating condition and to implement engineering changes which enhance operating specifications. Products returned to Xycom will be tested with standard Xycom test diagnostics. Contact the RMA department for information on your particular turnaround time.

5.3.1 Preparing the Unit for Shipment

1. Obtain an RMA number for your unit by calling your local Product Repair Department or Xycom Repair Center. Have the following information ready:

   - Company name and shipping and billing address
   - Type of service desired - product repair or product exchange
   - Product model number, part number, quantity, serial number(s), and warranty status
   - Failure mode and failure systems
   - Purchase order number or repair order number

   You will then receive your RMA number. **This number must appear on the outside of the shipping container and on the purchase order.**

2. To speed processing, attach any failure information to the unit.

3. Place the unit securely in a heavy-duty box.

4. Mark the RMA number on the outside of the box as well as on your purchase order.

5. Send the unit to the Xycom Repair Center.

A.1 SPECIFICATIONS

Table A-1 contains specifications for the 8320-SoftScreen Workstation.

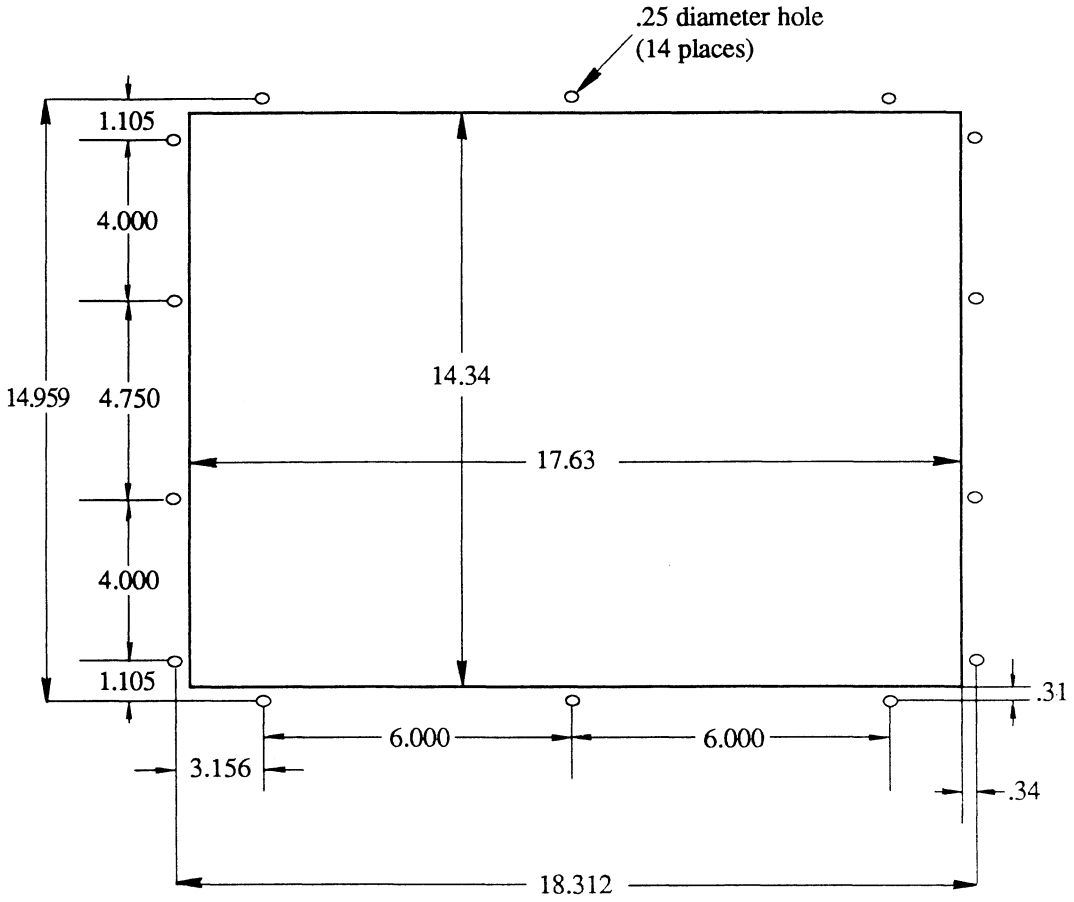
Table A-1. 8320-SoftScreen Workstation Specifications

CHARACTERISTIC	SPECIFICATION
Mechanical	
Dimensions	
Height	15.7" (399 mm)
Width	19" (483 mm)
Depth	17.5" (445 mm)
Weight	40 lbs. (18.14 kg)
Mounting	EIA standard 19" rack or panel
Keypads	sealed membrane 20 Function Keys 35 Numeric/Hex Keys
Monitor	VGA resolution (640 x 480) Software supports: • 16 simultaneous colors (base, foreground, and background) • 32 patterns • 6 line types
Serial Ports	2 (or 4 with Xycom's optional 8111 or 8112 expansion card) RS-232C or RS-485 independently selected optically isolated
Parallel Port	Centronics-compatible parallel printer port

Table A-1. 8320-SoftScreen Workstation Specifications (Continued)

CHARACTERISTIC	SPECIFICATION
Electrical	
Power Supply	115 VAC @ 60 Hz 230 VAC @ 50 Hz switch-selected 115 VAC: 0.7 Amp typical, 2 Amp maximum 230 VAC: 0.4 Amp typical, 1 Amp maximum
Environmental	
Temperature	
Operating	0°C to 50°C (32° to 122°F)
Non-operating	-40°C to 60°C (-40° to 140°F)
Humidity	10 to 80% relative, non-condensing
Shock	
Operating	15 g peak acceleration (11 msec duration)
Non-operating	30 g peak acceleration (11 msec duration)
Vibration	
Operating	.006" peak to peak 1.0 g peak acceleration
Non-operating	.015" peak to peak 2.5 g peak acceleration

A.2 CUTOUT DIMENSIONS



Depth: 16.25

All dimensions are in inches.

The depth does not account for any cabling that may extend beyond the unit.

Figure A-1. Cutout Dimensions

A.3 CONNECTOR PINOUTS

A.3.1 Printer Port

This is the uppermost connector on the ORB. It is a 25-pin D-type female connector.

Table A-2. Printer Port

PIN	SIGNAL	PIN	SIGNAL
1	STROBE	10	ACK
2	DATA0	11	BUSY
3	DATA1	12	PE
4	DATA2	13	SELECT
5	DATA3	14	AUTOFEED
6	DATA4	15	ERROR
7	DATA5	16	INIT
8	DATA6	17	SELECT-IN
9	DATA7	18-25	GND

A.3.2 Keyboard Port

This is a standard, 5-pin DIN keyboard connector, keyed to permit only one connection alignment.

Table A-3. Keyboard Connector

PIN	SIGNAL
1	Clock
2	Data
3	N/C
4	GND (SG)
5	+5 VDC
Shell	GND (FG)

A.3.3 **Video Connector**

This is a 15-pin D-type female connector, with the standard VGA signals. See the considerations in Chapter 2 before connecting a slave monitor.

Table A-4. Video Connector

PIN	SIGNAL	PIN	SIGNAL
1	RED	9	N/C
2	GREEN	10	GND
3	BLUE	11	N/C
4	N/C	12	N/C
5	GND	13	HSYNC
6	RGND	14	VSYNC
7	GGND	15	N/C
8	BGND		

A.3.4 **Serial Ports**

Serial Ports 1 and 2 can be configured to either RS-232C or RS-485 (they are shipped from Xycom as RS-232). They are located below the printer port, and are both 9 pin DIN male connectors. Configuring the ports to RS-485 and/or back to RS-232C requires certain jumpers to be altered (refer to Section A.3.5). Both pinouts are listed below.

Table A-5. RS-232C Port

PIN	SIGNAL	PIN	SIGNAL
1	DCD	6	N/C
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	N/C
5	GND		

Table A-6. RS-485 Port

PIN	SIGNAL	PIN	SIGNAL
1	TXD-	6	RXD-
2	TXD+	7	RXD+
3	RTS-	8	CTS+
4	RTS+	9	CTS-
5	GND		

A.3.5 **Serial Port Jumpers**

The jumpers in Table A-7 must be in the correct positions to match the desired configuration for the Serial Ports. The locations of these jumpers is shown in Figure A-8. The factory settings are RS-232.

Table A-7. Serial Port Jumpers

Port 1			Port 2		
Jumper	**RS-232C**	**RS-422**	**Jumper**	**RS-232C**	**RS-422**
J10	out	in	J48	out	in
J11	B	A	J32	B	A
J18	B	A	J34	B	A
J19	B	A	J35	B	A
J20	B	A	J36	B	A
J21	B	A	J37	B	A
J23	B	A	J39	B	A
J24	B	A	J40	B	A
J26	B	A	J43	B	A

Xycom's optional 8111 Memory Expansion Card provides two additional serial ports, ports 3 and 4. Port 4 is a dedicated RS-232C port, whereas port 3 can be jumper configured to RS-232C or RS-485 as shown in Table 2-3 below:

Table A-8. Optional 8111 Expansion Card Serial Port 3 Jumpers

Jumper	RS-232C	RS-485
J2	B	A
J3	B	A
J4	A	B
J5	B	A
J6	B	A
J7	A	B
J9	B	A
J10	B	A
J11	out	in
J12	out	in

When configured for RS-485, the inputs CTS and RXD may be terminated. Each signal for each port is independently enabled by a pair of jumpers. Removing the jumpers as indicated below will terminate a specific signal.

COM 1:	RXD: J14 and J15 CTS: J12 and J13	COM 2:	RXD: J54 and J55 CTS: J52 and J53

A.3.6 **Setting the Memory Unit Jumpers**

If you are using Xycom's optional 8111 Memory Expansion Card, set the jumpers as shown in Table A-9 below:

Table A-9. Memory Unit Jumpers

Jumper	First Expansion Card	Second Expansion Card
J43	A	B
J47	B	A

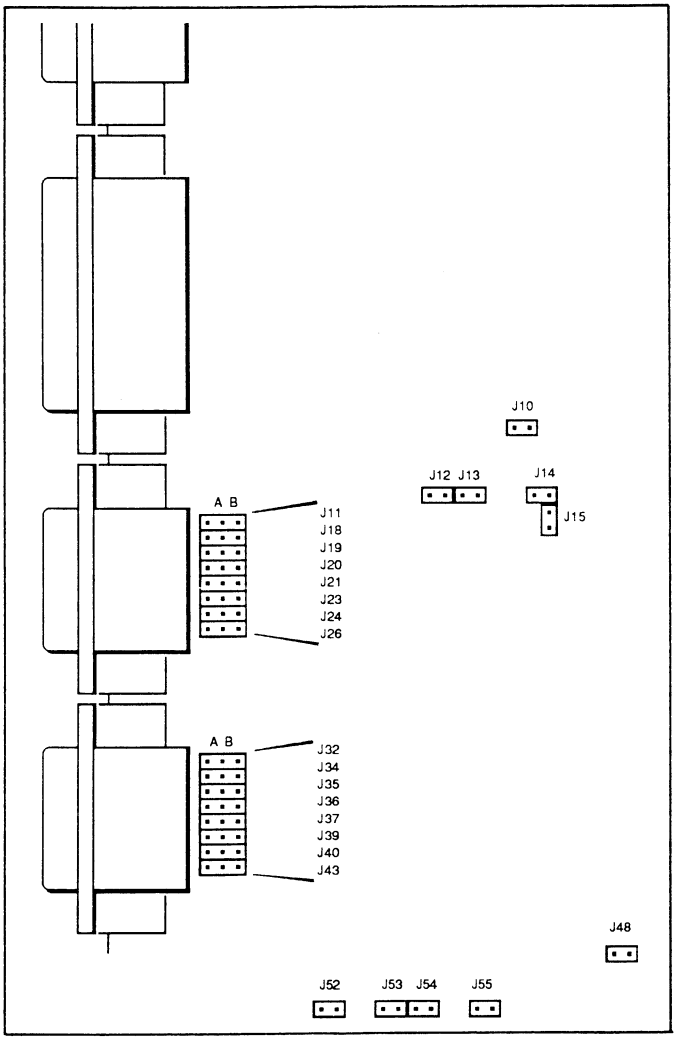


Figure A-2. Jumper Locations

A.4 ERROR MESSAGES

The table below shows the error messages that may appear on the 8320-SoftScreen Workstation:

Table A-10. Error Messages

Message	Meaning
HIGH alarm	The process has exceeded the maximum value and is in high alarm.
LOW alarm	The process has dropped below the minimum value and is in low alarm.
Out of HIGH alarm	The value has dropped to an acceptable level.
Out of LOW alarm	The value has increased to an acceptable level.
Printer is offline	The printer is offline and cannot print until set online.
Printer is back online	The printer has been set online and printing can occur.
Communication error on port x	A communication error occurred on the specified port ("x"). Refer to the section in Chapter 3 that is specific to your PLC for information on the meaning of the communication status error.
Communication restored on port x	The specified port ("x") is now communicating properly.
Recipe not performed	A recipe could not be performed because there are too many recipes to be handled by the write table. To correct this, reduce the number of recipes performed.

NOTE

The alarm message will appear at the bottom center of the screen. It will be displayed the amount of time specified in the SoftScreen development software under Configuration-Target. If an alarm must be acknowledged (which is set up in the software in an object's configuration form under Application-Load-Screen-Edit-Display or in an alarm object's configuration form under Application-Load-Screen-Edit-Control-Alarm-Create), the message will appear until you press Home or a properly configured pseudo key. See Development System for more information on pseudo keys.

Numerical

A

B

C

C - Continued

D

E

F

G

I

J

K

M

O

P

Q

R

S

T

U

W