



SOI-120 OPERATOR INTERFACE





IMPORTANT NOTES

1. READ ALL OF THE INFORMATION CONTAINED IN THIS MANUAL BEFORE YOU INSTALL THE PRODUCT.
2. The information contained in this manual applies to hardware and software version 1.0 or later.
3. This manual assumes a full working knowledge of the relevant PLC.

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PREFERRED: Use the original packaging material as supplied by Spectrum Controls. Place the device inside the conductive plastic bag.

ACCEPTABLE: Wrap the device in some type of antistatic material. Antistatic plastic material can be identified by its pink color, and can be obtained in sheet or bag form.

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Static, Inc.	(800-782-8424)	8000 Series bag
Charles Water	(617-964-8370)	CP-303 bag



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The equipment described in this manual is now listed with Underwriters Laboratories Inc. (UL) and the Canadian Standards Association (CSA). With this UL listing (file number E180101) and CSA listing (file number LR 101622), this equipment is suitable for use in Class I, Division 2, Groups A, B, C, and D hazardous locations or non-hazardous locations only.

When installing this equipment, you must ensure that the ultimate enclosure is in accordance with Class I, Division 2 wiring methods as described in the National Electrical Code (ANSI/NFPA 70) and the Canadian Electrical Code. You must also ensure that peripheral equipment is suitable for the location in which it is used.

Lastly, you must observe the warnings shown below. Failure to observe these warnings can cause personal injury.



WARNING
EXPLOSION HAZARD
Substitution of components may impair suitability for Class I, Division 2.



WARNING
EXPLOSION HAZARD
Do not connect or disconnect equipment while circuit is live unless the area is known to be non-hazardous.



ATTENTION
Use only with a Class 2 power source limited to 30 Vdc open circuit and 8 A short circuit.



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CHAPTER 1: USING THIS MANUAL

Read this chapter to familiarize yourself with the rest of the manual.
You will learn about:

- Contents of this manual
- Intended audience
- Conventions
- Related publications

Contents

The following table lists the contents of each chapter:

<i>Chapter title</i>	<i>Purpose</i>
Using this Manual	Provides an overview of the manual
Overview of the SOI-120	Contains a description of the SOI-120 and accessory devices
Initial Setup and Mode Menu	Describes the initial setup of the SOI-120 using the mode menu functions
Up/Downloading Application Programs	Describes how to upload and download application files between the SOI-120 and a personal computer
Running Applications	Describes the basic screen types, and describes the different function key operations



Installation	Provides procedures for mounting the SOI-120, including the wiring instructions and recommendations
Troubleshooting and Maintenance	Provides assistance in identifying and correcting common operating problems. Also provides cleaning recommendations
Appendices	Contains supplementary information that may be helpful. These include: Appendix A, SOI-120 Specifications Appendix B, SOI-120 Cable Diagrams Appendix C, SOI-120 Panel Cutout

Intended Audience

No special knowledge is required to operate the SOI-120. If you are installing the SOI-120, you must be familiar with the standard panel cutout and installation techniques. If you are wiring the SOI-120, you must be familiar with the electrical codes in your area (see inside front cover).

You should be familiar with the SOI-120 Programming Software (SOI-SPS). Related publications are listed below.

Conventions

Keys that you press on the SOI-120 are enclosed in brackets []. For example: [NEXT] refers to the NEXT key on the SOI-120.

References to menus are initial cap followed by the word Menu. For example: Special Menu, Main Menu, Other Menu.

All SOI-120 displays are shown inside a rectangular box.

1 Rst	2 Port	3 Test
4 PAD	5 Term	6 Other

Related Publications

The following publications may be helpful for additional reference.

<i>Catalog number</i>	<i>Publication</i>
0300054-xx	SOI-SPS Programming Software Manual for SOI products
0300050-xx	SOI-260 Users Manual



CHAPTER 2: OVERVIEW OF SOI-120

This chapter describes the SOI-120 and accessories. It contains these sections:

Section

General Information

Description

Keypad

Mode Key Operations 

DIP Switches

Communications Port

Compatibility

Programming the SOI-120

SOI-SPS Programming Software

Upload/Download Connections

Default Settings

Product Options



General Information

The SOI-120 interfaces with various types of programmable controllers (PLCs). The SOI-120 allows operators to monitor and manipulate process data on the plant floor.

RS-232 / RS-485 Selectable Communications Port.

The SOI-120 has a selectable RS-232/RS-485 port for communicating with the PLC.

Note: SOI-120 DeviceNet units do not have RS-485 functionality.

Memory Capability.

The communications protocol, configuration information, and user-programmed screens are stored in nonvolatile memory, providing storage for 244 screens.

Recipe Operations.

Recipe type functions allow operators to quickly modify blocks of data. Download data to a maximum of 10 non-sequential register addresses per screen. Link multiple recipe screens to download data to more than 10 addresses.

Flexible Function Key Operations.

Eight function keys provide a convenient way to trigger screen displays and to manipulate data in the PLC (change field status).

Point-Access/Display Function.

Allows you to monitor or modify data registers in the PLC. Use this function to set up and debug application programs, as well as monitor/modify data registers directly.

Description

The front panel of the SOI-120 terminal is shown below.

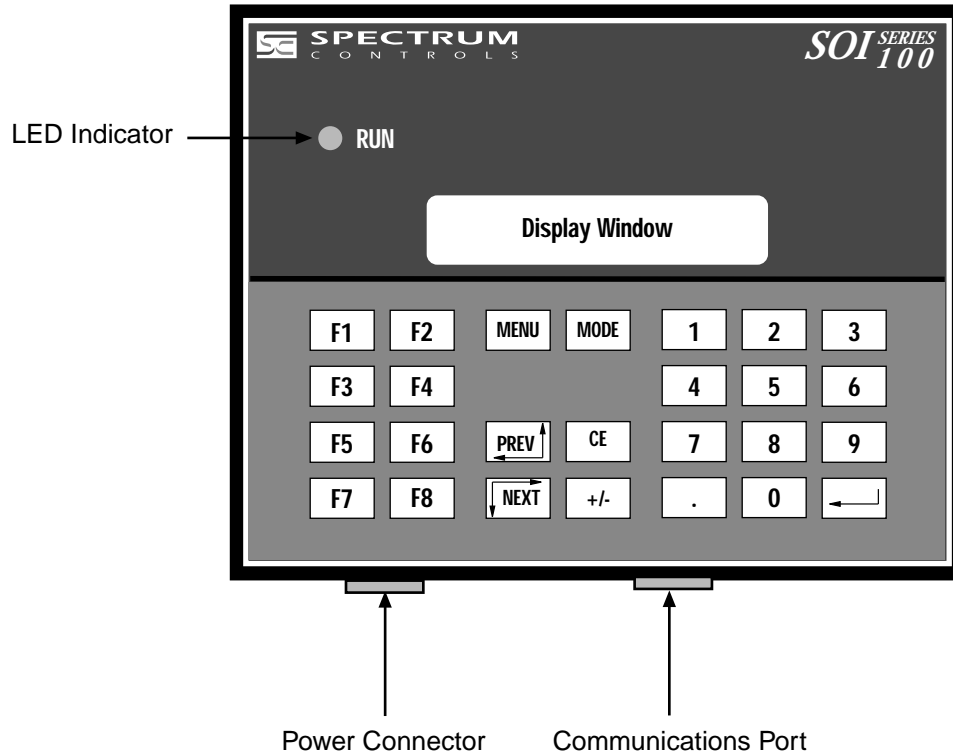


Figure 2.1 SOI-120 (front view)

Display

The 2 line by 20 character display uses high contrast LCD technology with LED backlighting.

Keypad

The keypad is separated by color into easily identified groups or functions.

LED Indicator

A RUN LED in the upper left corner of the terminal indicates proper operation of the SOI-120. This LED illuminates after the SOI-120 passes the self diagnostic tests.

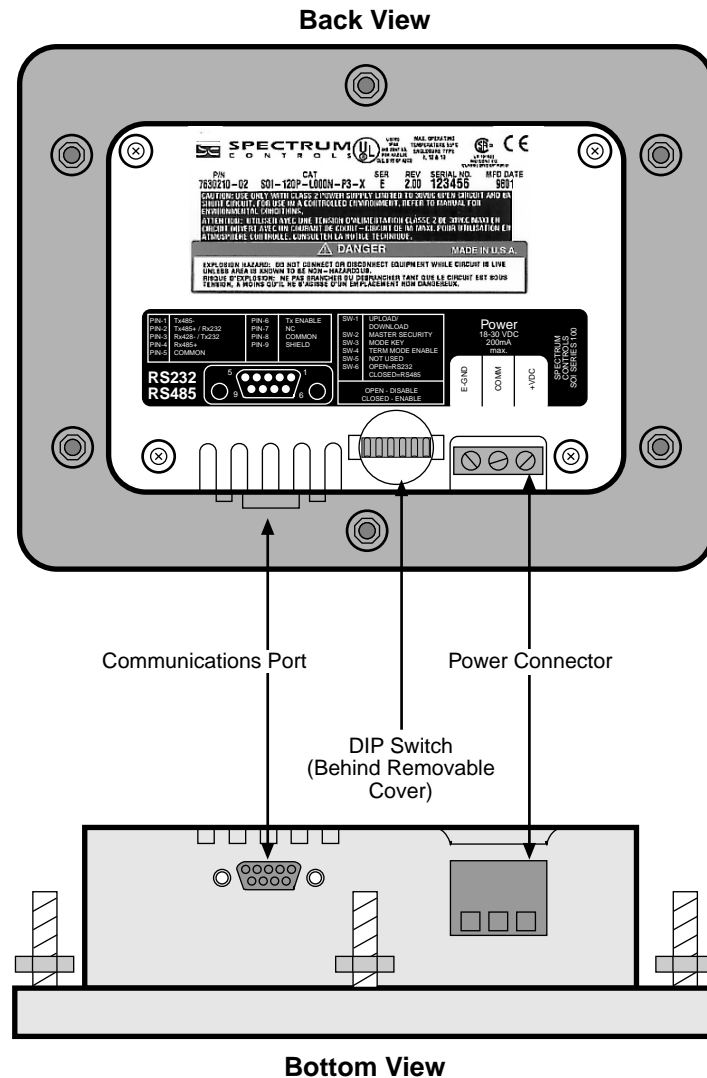


Figure 2.2 SOI-120 (back & bottom view)

Communications Port

The SOI-120 has a selectable RS-232 / RS-485 port.

Note: Units with DeviceNet Capability do not have RS-485 functionality.

DIP Switch

A six position DIP switch selects various operating settings. This switch is located under a removable cover on the back.

Power Connector

The power connector is a non-removable, screw terminal block located on the bottom of the unit. Connect 24 VDC to these terminals or use an AC Adapter as an option.

Keypad

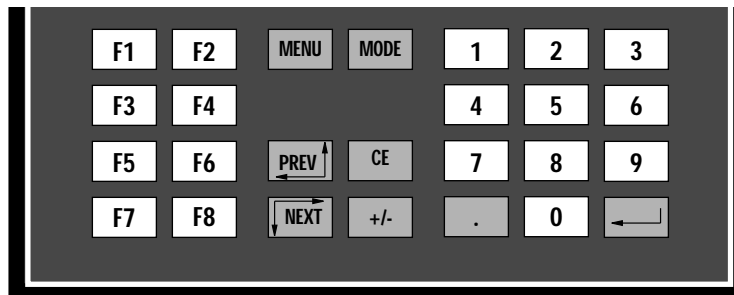


Figure 2.3 Keypad

The SOI-120 uses a sealed membrane, tactile feedback keypad. The keys are color coded to easily identify key functions.

<i>Key Color</i>	<i>Function</i>
Green	Movement/Operator Response
Light Gray	Display/Format Control
White	Numeric Entry

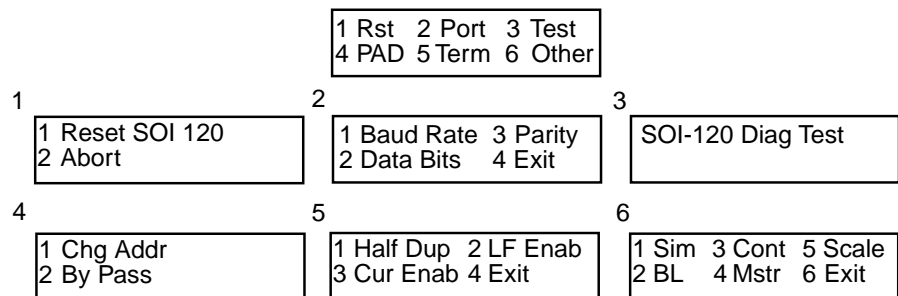


The following table defines the function of each keypad key.

Key	Function
	Returns to the Main Menu of an application. If an alarm screen is triggered, the MENU key is not functional until the alarm is acknowledged.
	Accesses special features and configuration operating parameters. DIP switch SW-3 enables or disables the MODE key.
	Steps back through a sequence of linked screens.
	Steps forward through a sequence of linked screens.
	Clears an entire value during data entry.
	Toggles a data entry value between positive or negative
	Enters a decimal point.
	Sends data to the controller. Data includes default values or data entered at the keyboard. Also used to acknowledge alarm screens.
→	Enters numbers 0 to 9 during data entry or selects a numbered item shown on the display.
→	Displays any application screen assigned to the key. These keys can also set or clear bits at eight consecutive registers in the PLC data field.

Mode Key Operations

The MODE key accesses a menu of options allowing you to set features and operating parameters of the SOI-120.





<i>Mode Menu</i>	<i>Select this option...</i>	<i>To perform this function</i>
1 Reset		Performs a system reset.
2 Com-Port	1 Baud Rate 2 Data Bits 3 Parity 4 Exit	Specifies 300, 1200, 2400, 9600, 19200, 38400 Specifies 7 or 8 data bits. Specifies even, odd or none parity Exits and returns to the Mode Menu
3 Test		Performs a self-diagnostic test.
4 P-A/D		Access to P-A/D. Allows monitoring and modification of data registers in the PLC.
5 Term	1 Half Dup 2 LF Enable 3 Cursor Enab 4 Exit	Switch between Half / Full Duplex Enable line feeds Turns cursor on or off Exit to mode key menu
6 Other	1 Sim 2 BL 3 Cont 4 Mstr 5 Scale 6 Exit	Allows you to simulate (run) your application program without being connected to a PLC. Allows adjustment of the display LED backlighting. Allows adjustment of the display contrast. Modifies the master security code of the SOI. Converts controller values to engineering units. Exits and returns to the Mode Menu.

DIP Switches

The 6 position DIP switch allows you to enable or disable certain functions. The DIP switch is accessed by removing the access cover on the back.

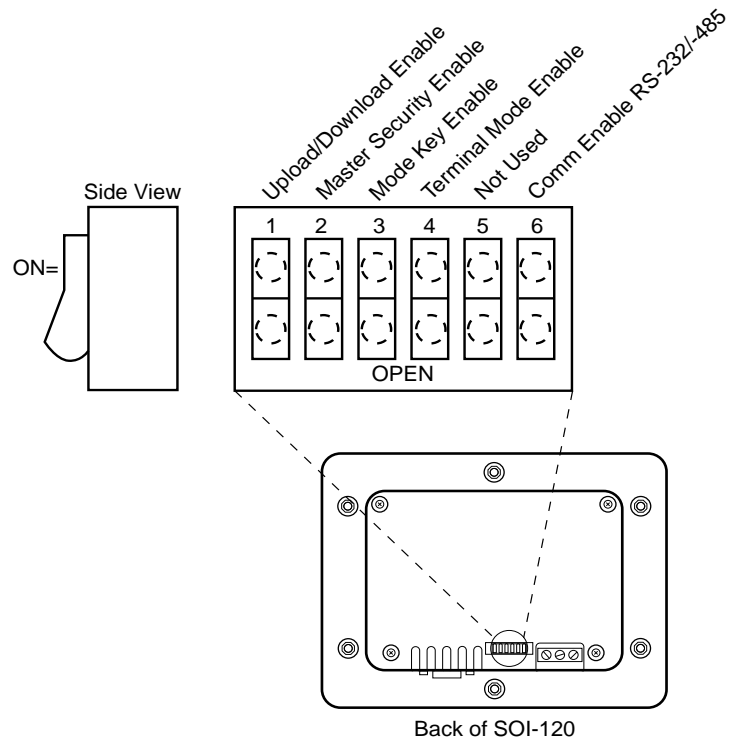


Figure 2.4 DIP Switch

Switch Position	Setting	Function
1*	ON	ON position allows the transfer of application files between the SOI-120 and a personal computer running SPS. All communication between the SOI-120 and PLC is disabled. The keypad is also disabled
	OFF	OFF enables communication between the SOI-120 and a PLC
2	ON	ON enables the master code. Enabling the master code allows any security code to be accessed or modified.
	OFF	OFF disables the master code. Disabling the master code still allows access to a security screen or special functions, but does not allow security codes to be modified.
3	ON	ON enables the MODE key on the front panel
	OFF	OFF disables the MODE key on the front panel.
4	ON	Enables terminal mode.
	OFF	Disables terminal mode.
6	ON	ON enables the RS-485 communications port
	OFF	OFF enables the RS-232 communications port. (Not used on DeviceNet SOI-120)

* SOI-120 is reset each time this switch position is changed.



Communications Port

All communications are through a 9 pin connector on the bottom of the SOI-120. The connector is both an RS-232 and RS-485 port, and is selected by placing switch number 6 in the ON or OFF position.

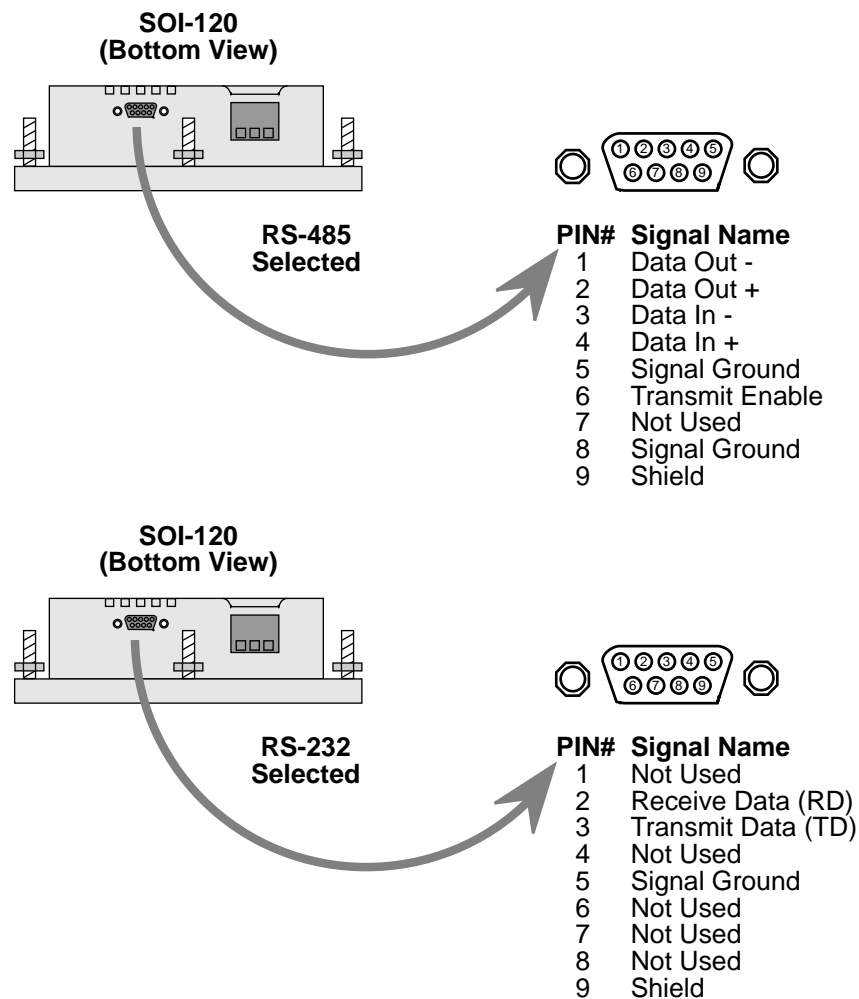


Figure 2.5 Communications Port

Note: For Communications Port information on SOI-120 DeviceNet units, please refer to Spectrum Controls Publication #0300142-xx, "DeviceNet Communications Reference."



Compatibility

The SOI-120 is compatible with a variety of Spectrum Controls products. Shown below are some of the compatible devices.

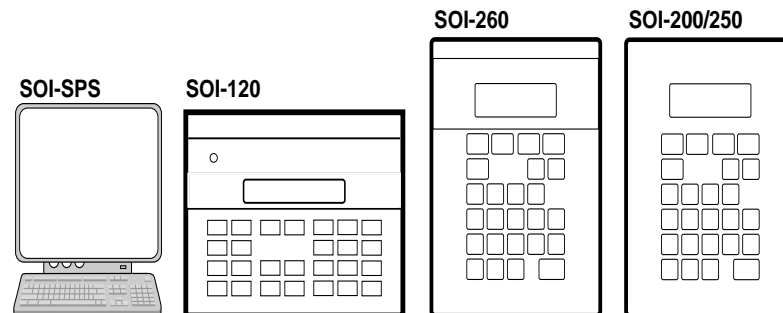


Figure 2.6 Compatible Devices

Programming the SOI-120

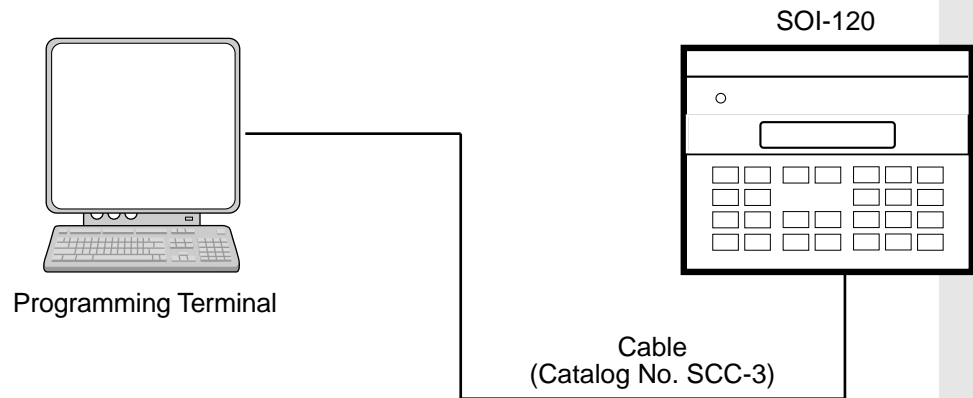
The SOI-120 is programmed off-line using a personal computer running SOI-SPS Programming Software. Operating system upgrades are also transferred using a personal computer.

SOI-SPS Programming Software

Use SOI-SPS software (Catalog No. SOI-SPS) to create application screens for both the SOI-120 and SOI-260 Operator Interface products. For a description of SOI-SPS, refer to the User Manual (Publication No. 0300054-xx).

Upload/Download Connections

For programming and configuration, the SOI-120 is connected to your computer's RS-232 port.



Default Settings

The SOI-120 is preset at the factory with the following default:

Operating System

The SOI-120 is provided with a default application file. The application file displays a screen with a message:

```
*** SOI-120 ***
No Program loaded
```

DIP Switch Settings

The SOI-120 is shipped with the following DIP Switch settings:

<i>DIP Switch Position</i>	<i>Default Setting</i>	<i>Function</i>
1	ON	Upload/Download enabled
2	OFF	Master Security disabled
3	ON	MODE key enabled
4	OFF	Terminal Mode disabled
5	OFF	Not used
6	OFF	RS-232 Communications enabled



Operating Parameters

The following operating functions are set using the SOI-120 menu functions. Refer to Chapter 3.

<i>Function</i>	<i>Parameter</i>	<i>Default Value</i> <i>RS-S232</i>
C-Port	Baud	9600
	Data Bits	8
	Parity	Even
Other	Simulate	OFF
	Master Code	00000000
	Scale	On



CHAPTER 3: INITIAL SETUP AND MODE MENU

This chapter describes how to apply power to and then configure the SOI-120 using the menu keys. Instructions on how to use the Simulate mode to run an application are provided. This chapter contains the following sections:

Section

Apply Power

Power-up Sequence

Mode Menu

Resetting the SOI-120

Setting Communication Parameters Manually

Test Functions

Terminal Mode

Point Access/Display (P-A/D)

Entering a New Master Security Code

Enabling / Disabling Scaling

Using the Simulate Mode



Apply Power

This section describes power connections for initial desktop setup and programming. Refer to Chapter 6 for installation wiring instructions.

Note: *For power connections for SOI-120 DeviceNet units, please refer to Spectrum Controls Publication #0300142-xx, "DeviceNet Communications Reference."*

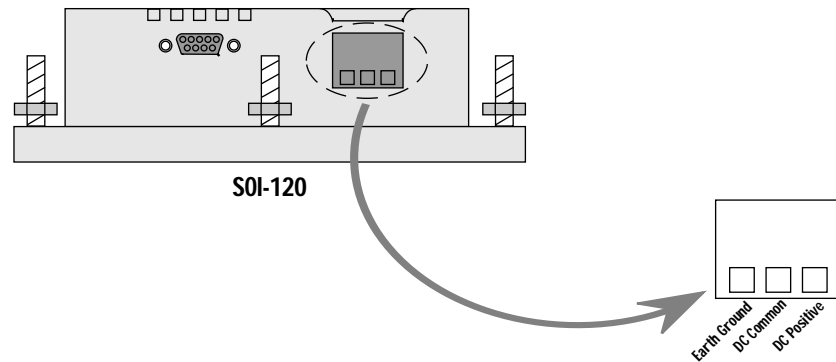


ATTENTION: Verify that the power is disconnected from the power source before wiring. Failure to disconnect power may result in electrical shock.



ATTENTION: Make sure that the supply voltage to the SOI-120 is 18 to 30 volts DC. The incorrect voltage may damage the SOI-120.

Connect the DC positive, DC common, and ground lines as shown below.



The SOI-120 performs a power-up sequence.



Power-up Sequence

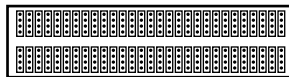
The power-up sequence is automatic, you do not have to respond to the screens. The sequence depends upon DIP switch position #1 (upload / download enable). The SOI-120 is shipped with this switch On.

Power-up Sequence (DIP Switch #1 On)

1. The SOI-120 verifies the system memory checksum, program checksum, and system RAM. After the test is completed, the result is displayed with the current DIP switch settings.

Memory Check: pass

2. The display is tested, every pixel of the display is turned on.



If all of the pixels do not turn on, the display may be defective.

3. SOI-120 information appears indicating the microprocessor core firmware version and communication port settings (RS-232 or RS-485).

Operator Interface
Core: 2.01 RS-232

4. The SOI-120 waits for an application download.

Programming Mode
Waiting Up/Download

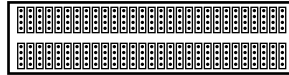
Power-up Sequence (DIP Switch #1 Off)

1. The SOI-120 verifies the system memory checksum, program checksum, and system RAM. After the test is completed, the result is displayed with the current DIP switch settings.

Memory Check: pass
DIP Switch: 101000



- The display is tested, every pixel of the display is turned on.



If all of the pixels do not turn on, the display may be defective.

- Operating system information appears indicating the firmware release number and protocol being used.



- The first application screen displays. If the SOI-120 is being powered up the first time you will see:

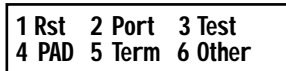


Mode Menu

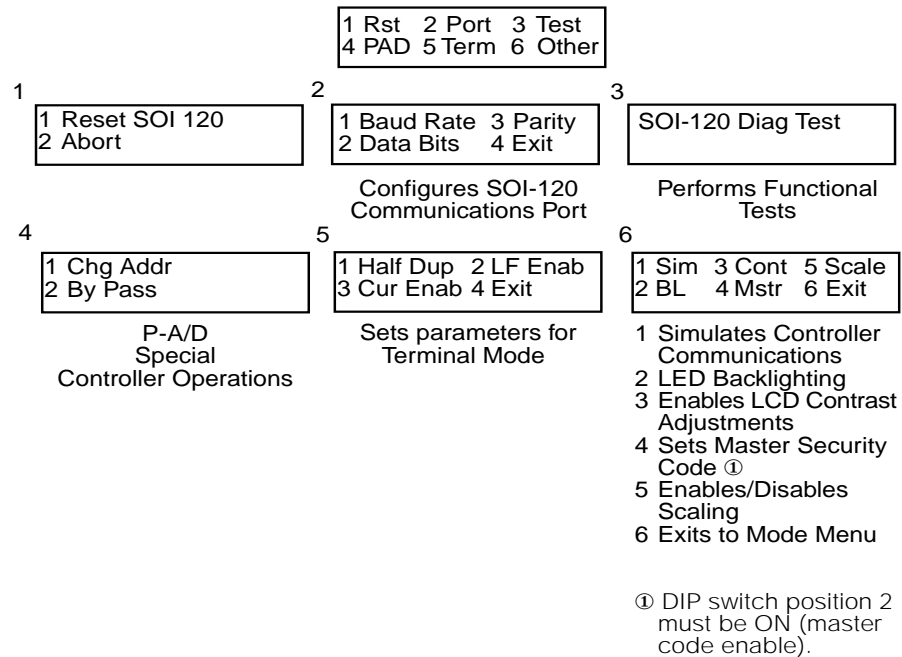
Access the Mode Menu by pressing the [MODE] key. All other functions are halted when the menu is displayed.

Note: *DIP switch SW-3 must be in the On position or the [MODE] key will not function.*

The Mode Menu provides access to six functions:



Select a menu item by pressing the corresponding numeric key [1] - [6]. The menu structure is shown below:



Resetting the SOI-120

Use the reset function to reset the SOI-120 after DIP switch changes or a configuration change using the Mode Menu.

To reset the SOI-120:

1 Rst 2 Port 3 Test
 4 PAD 5 Term 6 Other

- From the Mode Menu, select 1 Reset.

You are prompted:

1 = Reset SOI-120
 0 = Abort

- Press [1] on the keypad to initiate the reset.
-



The SOI-120 resets. This has the same effect as turning the power on and off. The SOI-120 performs the self-diagnostic tests and power-up displays as described in the previous section.

Setting Communication Parameters Manually

The Com-Port option in the Mode Menu lets you manually adjust the communication port parameters. Normally these parameters are set automatically from the programming software when an application is downloaded.

1 Rst	2 Port	3 Test
4 PAD	5 Term	6 Other

Select Port from the Mode Menu.

This menu displays:

1 Baud Rate	3 Parity
2 Data Bits	4 Exit

Select an item by pressing the corresponding numeric key [1]-[4].

Baud Rate

Selecting Baud Rate displays the current baud rate.

Baud Rate 19200 "Next" to change

Press [NEXT] to select a new rate: 300, 1200, 2400, 4800, 9600, 19200, 38400.

Data Bits

Selecting Data Bits displays the current setting.

Data Bits 7 "Next" to change

Press [NEXT] to select either 7 or 8 bits.

Parity

Selecting Parity displays the current setting.



```
Parity Even
"Next" to change
```

Press [NEXT] to select Even, Odd, or No parity.

Test Functions

Selecting Test from the Other Menu displays the test screen:

```
SOI-120 Diag Test
< Test Selection >
```

Use the Test Menu to perform the following:

Reset DUT (Display Under Test)

DIP switch positions

Display

Keyboard

Communications port

Random Access Memory (RAM)

System memory

Program memory

Transmit enable

Refer to Chapter 7, *Troubleshooting and Maintenance*, for instructions on how to perform these tests.

Terminal Mode

DIP switch position 4 on the SOI-120 enables the unit's terminal mode when ON. The terminal mode disables execution of the downloaded program and enables the SOI to function as a terminal device. In the terminal mode, the SOI displays any ASCII data received through the communications port. The ASCII codes associated with the keys on the SOI keypad are transmitted through the communications port when a key is pressed.

When using the SOI-120 in terminal mode, the keypad is mapped to characters shown in the following table.



SOI-120 Key	ASCII 8-bit	Hex	Decimal
F1		91	145
F2		92	146
F3		93	147
F4		94	148
F5		95	148
F6		96	149
F7		97	150
F8		98	151
Menu		85	133
Prev		82	130
Next		80	128
CE	<FF>	0C	12
+/-	+/-	2B/2D	43/45
(.)	(.)	2E	46
Enter	<CR>	D	13
9	9	39	57
8	8	38	56
7	7	37	55
6	6	36	54
5	5	35	53
4	4	34	52
3	3	33	51
2	2	32	50
1	1	31	49
0	0	30	48

* The MODE key sends no code but allows access to the P-A/D.

If the SOI-120 communications port is set up for 7-bits, the following codes are different:

SOI-120 Key	ASCII 7-bit	Hex	Decimal
F1		11 (DC1)	17
F2		12 (DC2)	18
F3		13 (DC3)	19
F4		14 (DC4)	20
F5		15 (NAK)	21
F6		16 (SYN)	22
F7		17 (ETB)	23
F8		18 (CAN)	24
Menu		5 (ENQ)	5
Prev		2 (STX)	2
Next		0 (NUL)	0

To activate the terminal mode, set DIP switch position 4 to the closed (ON) position and reset the SOI. The display will then blank and be ready to receive incoming ASCII data.

When you select TERM (menu selection 5), the following screen appears:



1 Half Dup 2 LF Enab
3 Cur Enab 4 Exit

Half Dup

Select this item to designate half duplex communications to and from the host device.

The half duplex selection echoes (displays) to the screen the SOI keys pressed.

LF Enab

Select this item to enable or disable the use of a Line Feed character each time a Carriage Return character is received.

Cur Enab

Select this item to enable or disable a block cursor display.

Exit

Select this item to exit Term operation.

Special Function -- Point Access/Display (P-A/D)

The Special Menu item provides access to the P-A/D feature. A security access code may be assigned in the application restricting access to the Special Menu. After selecting Special, the following menu is displayed if a Security Screen has been assigned:

```
* Security * Enter
: █
```

This menu appears after entering a security code or if no security screen has been assigned:

```
Point Access/Display
1 Chg Addr 2 Bypass
```



Note: *Below is a brief descriptions of the P-A/D feature.*

The P-A/D feature is extremely useful when starting up, troubleshooting or directly accessing PLC data registers for quick monitoring or modification.

This function allows access to all unrestricted PLC data registers. Use the P-A/D feature to display and modify PLC data register values directly. The NEXT and PREV keys scroll forward and backward through the PLC register types.

Select a desired register type by scrolling through the choices and then pressing the Enter key. The SOI-120 will then prompt you for the register numbers. Type in the desired register number and press Enter.

To enter a numeric value or change a bit status you must press ENTER once again to access the numeric or binary positions. Once accessing these positions, enter the desired values and press ENTER to send to the PLC.

Note: *After typing the desired register address, you must press ENTER twice to access the numeric or binary positions.*

Note: *To determine which data registers are supported, refer to SOI-SPS programming software manual, PLC reference section and the selected PLC operations manual.*

When in the P-A/D mode, pressing the MENU key at any time will exit you out of the P-A/D mode and return you to online operation.



ATTENTION: The P-A/D should be restricted only to authorized personnel. The P-A/D will allow you to read or write to all PLC data registers except for the Input and Output registers. It is possible to change PLC data which may alter the correct operation of the SOI-120



Using the Simulate Mode

The Simulate mode checks an application without having a controller connected. All data that normally would be sent by the controller such as data for a display is set to 0. Any ASCII data is set to (?). Selecting Simulate from the Mode Menu will:

- Halt communication between the SOI-120 and the controller.
- Simulate Communication with a controller.

Disabling the Simulate mode resumes normal operation.

To simulate an application:

1. Download the application from the SOI-SPS software.
2. Enable the Simulate mode.

1 Rst	2 Port	3 Test
4 PAD	5 Term	6 Other

3. From the Mode Menu, select item 6.

The Other Menu appears:

1 Sim	3 Cont	5 Scale
2 BL	4 Mstr	6 Exit

4. Select item 1.

The Simulate enable screen displays:

Simul Enable	OFF (0)
0=Off	1=On

5. Press [1] to enable the Simulate mode.
6. Press [6] to exit the Other Menu and return to the Mode Menu.
7. From the Mode Menu, reset the SOI-120. Refer to page 18.



The SOI-120 displays a series of diagnostic tests, enters run mode, loads the application and then displays the Mode Menu of the application.

8. Run the program as you normally would. Notice that all display registers show data as a set of zeroes.

Pressure = 0000 PSI

9. After verifying the operation of the program, press the [MODE] key. All other functions are halted and the Mode Menu is displayed.
10. Disable the Simulate mode.

Adjusting LED Backlighting Settings

The BL screen allows you to adjust the amount of LED backlighting required on the LCD display, which is adjustable in 4 steps.

Backlighting adjustments are useful if the ambient lighting conditions are not bright enough to allow clear viewing of the display.

To enter a new Backlight setting:

1 Rst 2 Port 3 Test
4 PAD 5 Term 6 Other

1. From the Mode Menu, select item 6.

The Other Menu appears:

1 Sim 3 Cont 5 Scale
2 BL 4 Mstr 6 Exit

2. Press [2] to select the BL function.

The BL adjustment screen appears:

Press NEXT to adjust
Backlight (ENTER-EX)



3. Press [NEXT] to select the desired backlight setting. Continuing to press NEXT will cycle through the four settings.
 4. Press [↵] (enter key) to accept the desired setting.
Your are returned to the Other Menu.
 5. Select item 6 to exit to the Mode Menu.
-

Adjusting LCD contrast settings

The contrast screen allows you to adjust the amount of contrast the display uses for viewing purposes. Contrast is adjustable in four steps. Contrast adjustments are useful for fine tuning the display in unique lighting, temperature, or viewing conditions.

To enter a new Contrast setting:

1 Rst	2 Port	3 Test
4 PAD	5 Term	6 Other

1. From the Mode Menu, select item 6.

The Other Menu appears:

1 Sim	3 Cont	5 Scale
2 BL	4 Mstr	6 Exit

2. Press [3] to select the Contrast function.

The Contrast adjustment screen appears:

Press NEXT to adjust Contrast (ENTER-EX)

3. Press [NEXT] to select the desired Contrast setting. Continuing to press NEXT will cycle through the four settings.
 4. Press [↵] (enter key) to accept the desired setting.
Your are returned to the Other Menu.
 5. Select item 6 to exit to the Mode Menu.
-



Entering a New Master Security Code

The Master Security code provides access to all security codes and allows them to be modified. Two Master Security codes perform special functions:

00000000 allows the operator to modify the existing Master code without requiring entering the current code.

99999999 does not allow operator to modify security codes. Changing of the Master Security code is through SPS software.

To enter a new Master Security code:

1 Rst	2 Port	3 Test
4 PAD	5 Term	6 Other

1. From the Mode Menu, select item 6.


The Other Menu appears:

1 Sim	3 Cont	5 Scale
2 BL	4 Mstr	6 Exit

2. Press [4] to select the Master Security code function.

The Master code entry screen displays:

Enter Current Master Code: _

3. Enter the current code and press .

You are prompted to enter the new code.

Enter New Master Code: _

4. Enter a new code. The code must be 8 digits in length. If you enter less than 8 digits the entry is padded with zeroes. For example, an entry of 1234 is entered as 12340000.

Note: *Security codes can contain the wildcard character (?). Any entered value will be seen as a match to the wildcard. You must make sure that the Master Security code is different from security codes using wildcard entries. Otherwise the Master Security code may be seen as a security code. For example, if the:*



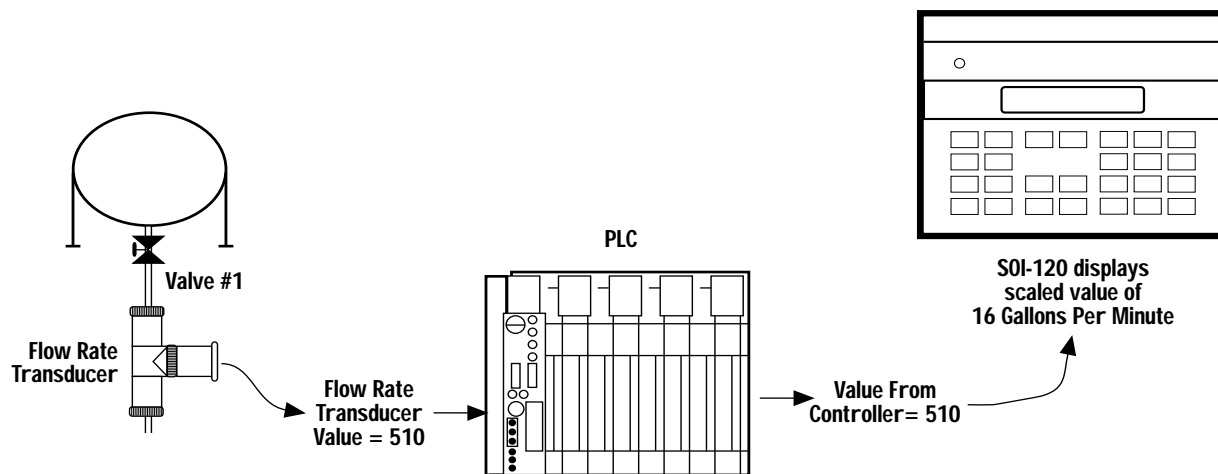
Security Code = 12??????

Master Code = 12368794

When the Master Security code above is entered, the SOI-120 interprets it as a security code.

Enabling / Disabling Scaling

Use scaling to convert data from a PLC to engineering units such as gallons or psi. When scaling is disabled, the values are not converted.



To enable or disable scaling:

1 Rst	2 Port	3 Test
4 PAD	5 Term	6 Other

- From the Mode Menu, select item 6.

The Other Menu appears:

1 Sim	3 Cont	5 Scale
2 BL	4 Mstr	6 Exit

- Select item 5.

The scale enable screen displays:



Scale Enable	OFF(0)
0=Off	1=On

3. Press [1] on the keypad to enable scaling or [0] to disable scaling.

You are returned to the Other Menu.

4. Select item 6 to exit to the Mode Menu.
-
-

CHAPTER 4: UP/DOWNLOADING PROGRAMS

This chapter describes how to transfer applications between the offline programming software (SOI-SPS) and the SOI-120. It contains the following sections:

Section

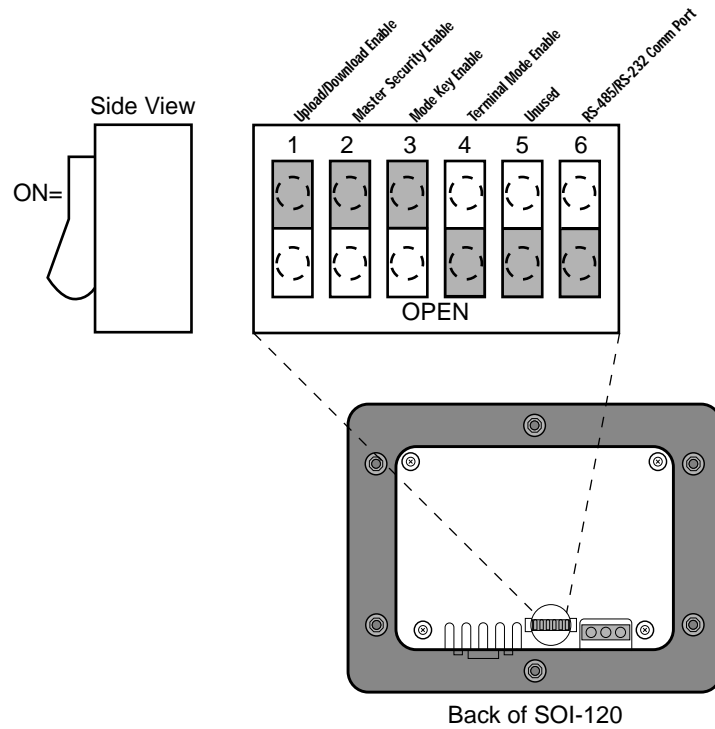
Upload / Download DIP Switch Settings

Upload / Download Connections

Computer Setup

Upload / Download DIP Switch Settings

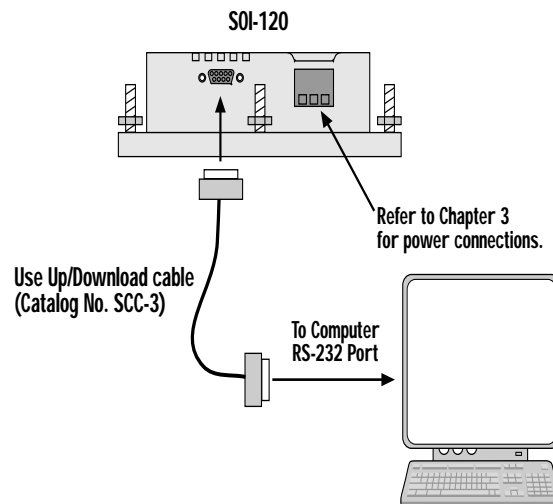
Before you can upload or download an application, you must verify that the DIP switches are set as shown. To access the DIP switch, remove the plug from the access hole on the back of the SOI-120 (align cover tabs with notches in hole to remove). The SOI-120 is shipped without the cover installed; you can find it in the hardware bag.



Upload / Down load Connections

To download an application to the SOI-120, you must:

- connect a power supply (refer to Chapter 3).
- connect the upload/download cable (SCC-3).





Computer Setup

Upload and download functions are initiated from a personal computer running the programming software SOI-SPS . Transfer functions automatically occur at 9600 Baud.

After the transfer is complete, the SOI-120 Baud rate is set to the parameters defined by the application program residing in the SOI-120.

Refer to the SOI-SPS Programming Software Manual for additional instructions.



CHAPTER 5: RUNNING APPLICATIONS

This chapter describes screen types and operating procedures that are common to most applications. It contains the following sections:

Section

DIP Switch Settings

Application Documentation

Bit Write Mode

Screen Types

Screen Navigation

Menu and Sub-Menu Screens

Security Screens

Data Display Screens

Data Entry Screens

Recipe Screens

Alarm Screens



DIP Switch Setting

Before running an application, verify that the DIP switch position #1 is in the OFF position. This enables communication with the controller. Refer to DIP switch description in Chapter 2, *Overview of the SOI-120*.

Application Documentation

It is the responsibility of the application designer to document the operation of an application program. This chapter only provides basic guidelines. Before running an application, you should understand what processes are being controlled and monitored.



ATTENTION: The function keys of the SOI-120 can be assigned different functions depending upon the application. The application designer must document these functions. Make sure you understand any function key operations prior to operating the SOI-120. Failure to do so may result in unintended operation.

Bit Write Mode

The application designer can assign the function keys [F1] to [F8] to set or clear a bit at a controller address. This bit may control a variety of processes. It is the responsibility of the application designer to document the use of the Bit Write mode function keys. Refer to Chapter 2, *Overview of the SOI-120*, for details on F1 through F8 operation.

Screen Navigation

The SOI-120 provides a variety of options for changing the screen displays:

- Screen links
- Advisor option
- Function keys



Screen Links

Use the [NEXT] and [PREV] keys to step backward and forward through this sequence.

Main Menu and sub-menu screens list screens that can be accessed by pressing the assigned numeric key [0] through [9]. A typical Main Menu screen provides links to individual screens or sub-menus:

1 Pump	3 Tank Status
2 Mixer Status	4 Recipe

In the example above, pressing [2] at the Main Menu displays the status of a holding tank. Pressing [4] displays a sub-menu of the recipe screen options.

Advisor Option

Applications can allow screen changes that are controlled by a PLC. When the logic controller writes a valid screen number to a specified Advisor register, the corresponding screen is displayed. The controller can initiate a screen change based upon a variety of inputs to the controller. For example, a pressure limit switch can be used to initiate the display of a pressure control screen. It is the responsibility of the application designer to document when and what screen changes may occur.

Function Keys

An application designer can link function keys [F1] through [F8] to individual screens (except alarm screens). Pressing an assigned function key displays the function key number for approximately 0.5 seconds and then the assigned screen. It is the responsibility of the application designer to document the operations assigned to function keys. There are two function key modes:

- Auto Return
- Continue



Auto Return

Auto return function keys return to the initial display after the linked screen is executed. For example, assume that an application is displaying screen #6 and an auto return function key [F3] is linked to a recipe screen #10. When [F3] is pressed, the recipe screen #10 is displayed. After the operator downloads a new recipe on screen #10, the initial screen #6 is displayed.

The following table describes when the return to initial screen occurs.

Function Key linked to: Returns to initial screen after:

Data Display screen	[Return], [PREV], or [NEXT] keys are pressed
Data Entry screen	A value is entered or [Return], [PREV], or [NEXT] keys are pressed*
Recipe screen	Recipe data is downloaded or [PREV] or [NEXT] keys are pressed*

* [PREV] or [NEXT] keys abort the operation.

Continue

Continue function keys do not return to the initial display but remain at the linked screen. For example, assume that an application is displaying screen #3 and a “continue” function key [F2] is linked to a data entry screen #5. When [F2] is pressed, the data entry screen #5 is displayed. The application continues from screen #5.

Screen Types

Application screens can have a variety of appearances. The SOI-120 can display six types of screens.

- Menu and Sub-menu Screens
- Security Screens
- Data Display Screens
- Data Entry Screens
- Recipe Screens



- Alarm Screens

Menu and Sub-Menu Screens


Menus and sub-menus provide a convenient method of accessing a large number of display screens.

Main Menu

Every application has a Main Menu screen. The Main Menu is the first application screen displayed after an initial power-up or reset.

1 Pump	3 Tank Status
2 Mixer Status	4 Recipe

The Main Menu provides access to the next level of screen and sub-menus.

To access the Main Menu, press the [MENU] key. Pressing this key at any time displays the Main Menu. The only time the Main Menu will not be displayed is when an alarm screen has been triggered but not acknowledged. You must acknowledge alarm screens by pressing , before another screen can be displayed.

Sub-Menus


Sub-menu screens function like the Main Menu. The only difference is that you must navigate through the other screens or use assigned function keys to access the sub-menus. Refer to the previous section for more information.

Security Screens

Security screens limit access to parts of an application. Although that text on a security screen may be changed by the application designer, many applications will use the default text:

RESTRICTED ACCESS
ENTER CODE:

A security code is a series of 1 to 8 digits. Each security screen can have up to 3 code entries. Entering any one of the codes provides access.

To enter a security code, use the number keypad. An asterisk (*) is displayed for each number entered. Press  after the entire code is entered.



If a valid security code has been entered, the next linked screen is displayed. If an invalid security code is entered, an error message appears. Once the error condition is acknowledged by pressing [NEXT], you can re-enter the code or return to the Main Menu.

Data Display Screens

Data display screens show either the actual or scaled value that is contained in a data register location within the PLC.

```
Pump 1 Pressure = 150 PSI  
Counter = 5
```


Data displays are updated at different intervals depending on the application and the size of the network.


Data Entry Screens

Data entry screens contain an entry field. The length and format of the data entry field depends upon the application designer. In addition, the application designer can place a data display field on the same screen:

```
Temp = 120 Deg F  
Enter New Temp:
```

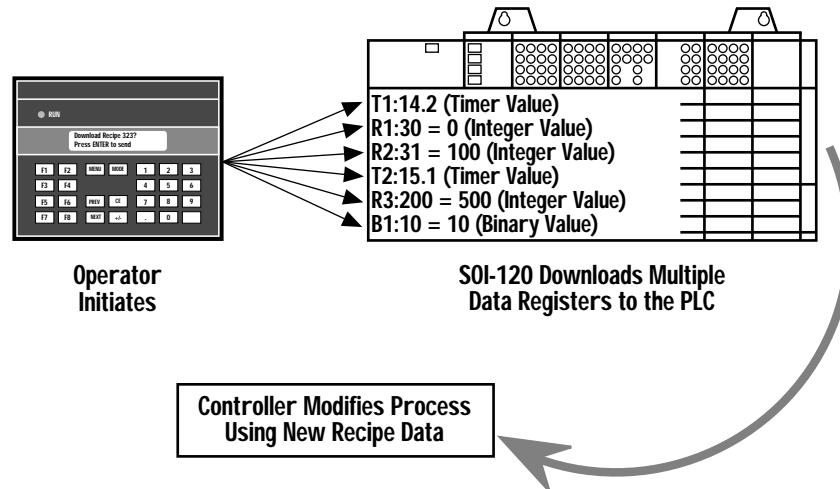
The data entry field must always appear last on the screen. The application designer cannot place text after a data entry field.


To enter data, use the numeric keypad. To modify an entry, press the clear entry key [CE] and re-enter value. Press the [+/-] key to toggle between positive and negative values. Press  after the entire value is entered.

Data entry screens can have a default value appear in the data entry field. A flashing cursor identifies the first digit of the default value. Pressing  writes the default to the controller or you can enter a different value by pressing the [CE] key.

Recipe Screens

Recipe screens allow the SOI-120 to write multiple data register values to the PLC at the same time. Recipe screens can also be linked so that more than one recipe is downloaded.




Depending upon the application designer, recipe screens will either automatically download data or display a prompt allowing the download to be initiated when  is pressed.

**Download Recipe 323?
Press ENTER to send**

Once the download is initiated, the SOI-120 writes the recipe data to the various controller addresses. You cannot modify the recipe data that is sent, recipe data is specified by the application engineer.

Alarm Screens

Alarm screens indicate conditions that are not expected during normal operation. Alarm screens are triggered when the controller writes the alarm screen number to the Advisor register. Refer to page 35 for additional information on the Advisor register.

You must respond to an alarm screen before any other screens can be displayed. The [MENU] key will not function while an alarm screen is displayed. Press  to acknowledge the alarm.

**Conveyor Overload
PRESS ENTER TO CLEAR**



CHAPTER 6: INSTALLATION

This chapter contains the following sections:

Section

Safety guidelines

Operating Environment

Enclosures

Equipment required

Clearances

Mounting Dimensions

Cutout Template

Installation

Connecting AC Power

Safety Guidelines

Install the SOI-120 terminal using publication NFPA 70E, Electrical Safety Requirements for Employee Workplaces as a guide.

In addition, grounding is an important safety measure in electrical installations. A source for grounding recommendations is the National Electrical Code published by the National Fire Protection Association of Boston, Massachusetts.

Refer to the inside front cover of this manual for additional guidelines.



Operating Environment

The SOI-120 is rated for operating temperature range of 32 to 131°F (0 to 55°C). The storage temperature range is -4 to 158°F (-20 to 70°C). The humidity rating is 5 to 95% relative humidity (non-condensing).

If you are using a DC power supply, check the environmental ratings of the supply.

Enclosures

The SOI-120 must be mounted in a panel or enclosure to protect the internal circuitry. The SOI-120 meets NEMA Type 4, 12, 13 ratings only when mounted in a panel or enclosure with the equivalent rating.

Allow enough spacing within an enclosure for adequate ventilation. For some applications, you may have to consider heat produced by other devices within a panel. The ambient temperature around the terminal must be maintained between 32° and 131°F (0° to 55°C).

Make sure that provisions are provided for accessing the back panel of the terminal for wiring, routine maintenance, and troubleshooting.

Equipment Required

Other than the tools required to make the panel cutout, the tools required for installation are:

- 7mm (M4) deep well socket wrench or nut driver
- small slotted screwdriver
- torque wrench (in. / lbs.)

The SOI-120 is tightened against the panel with six self-locking nuts.

Clearances

Make sure that you leave adequate room, as shown in Figure 6.1, for mounting, air flow, cabling, and access to DIP switches.

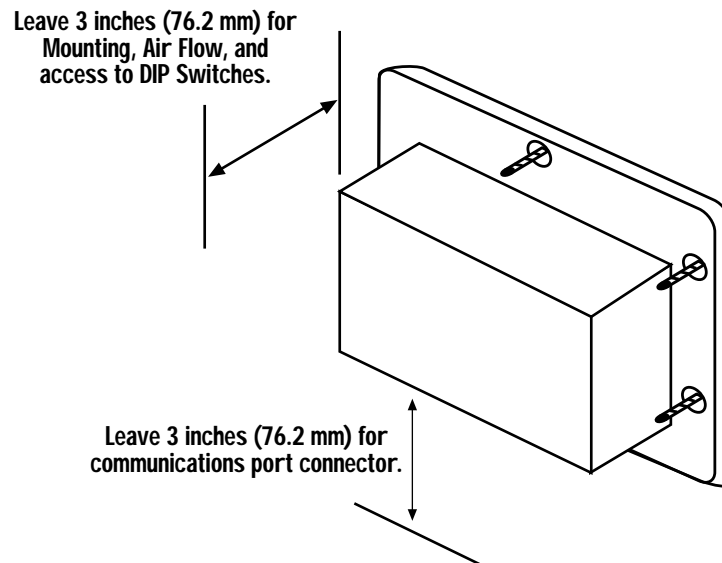


Figure 6.1 Recommended Clearances



Mounting Dimensions

Figure 6.2 shows the mounting dimensions of the terminal.

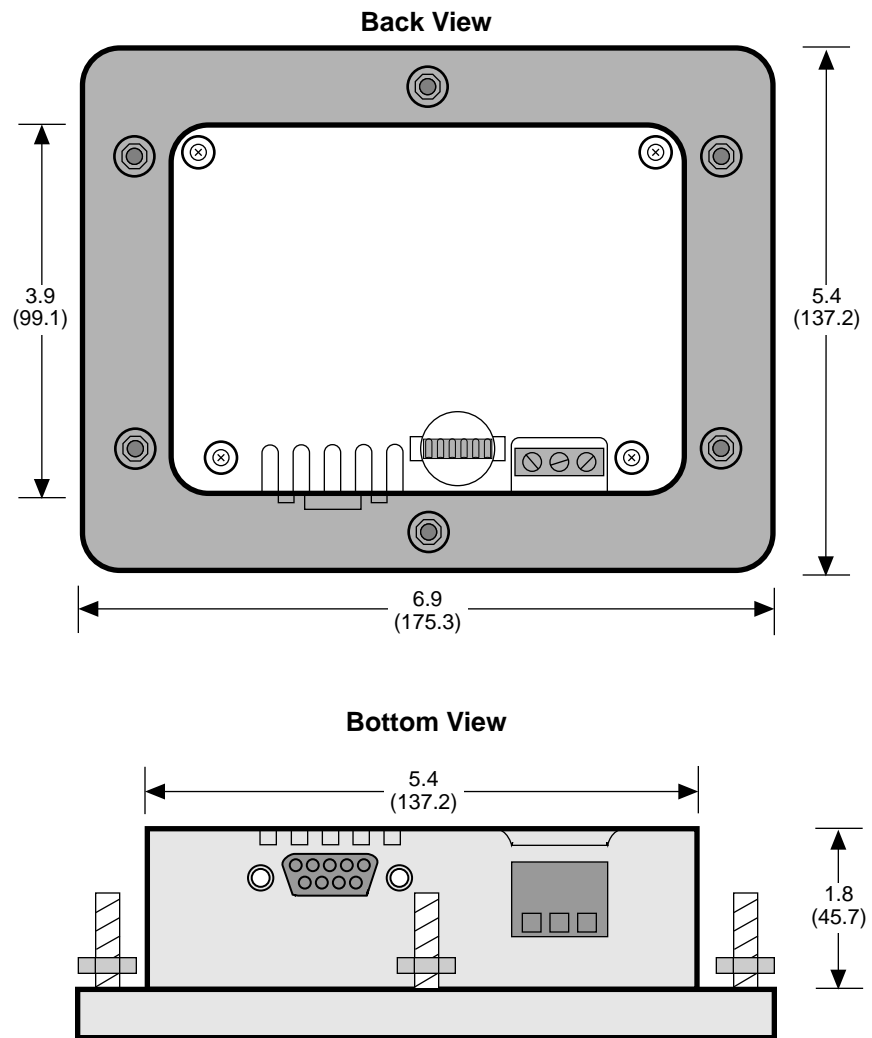


Figure 6.2 Mounting Dimensions in Inches (Millimeters)

Cutout Template

A cutout template (actual to scale dimensions) is provided in Appendix C to mark the cutout dimensions. Figure 6.3 is intended solely as a reference copy; please do not remove this page from the manual.

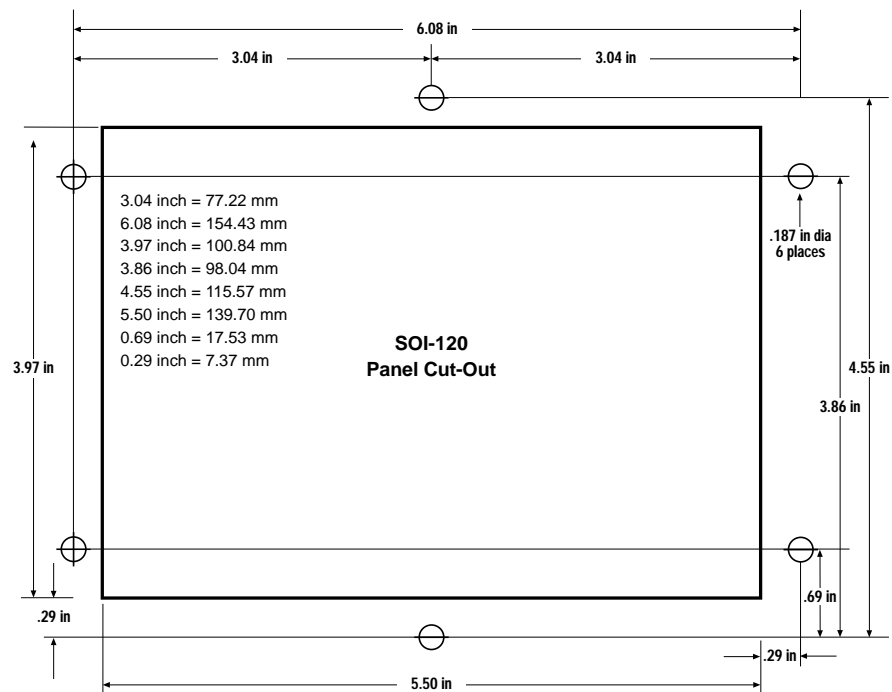


Figure 6.3 Panel cutout Dimensions in Inches

Note: *This illustration is NOT TO SCALE. Refer to Appendix C for the SOI-120 cutout template.*



Installation

To install the SOI-120 Terminal:



ATTENTION: Disconnect all electrical power from the panel before making cutout.

Make sure that area around panel cutout is clear.

Take precautions so that metal cuttings do not enter any components that may already be installed in panel.

Make sure that no objects are inserted or fall into the terminal through the ventilation slots or DIP switch access hole.

Failure to follow this warning may result in personal injury or damage to the panel components.

-
1. Cut an opening in the panel as shown in Figure 6.3. Use the full size cutout located inside the back cover of this manual. Remove any sharp edges or burrs.
 2. Make sure the neoprene sealing gasket is properly positioned on the SOI-120. This gasket forms a compression type seal. Do not use sealing compounds.
 3. Place the SOI-120 in the panel cutout.
-



ATTENTION: Mounting must be tightened to a torque of 4 inch pounds to provide a proper seal and to prevent potential damage to the SOI-120.

Spectrum Controls assumes no responsibility for water or chemical damage to the SOI-120 or other equipment within the enclosure because of improper installation.



4. Install the six self locking mounting nuts hand tight.
 5. Alternately tighten the mounting nuts until the SOI-120 is held firmly against the panel. Tighten mounting nuts to a torque of 4 inch-pounds. Do not overtighten nuts.
-
-

Connecting Power

The SOI-120 accepts power supply voltages from 18 to 30 VDC (use isolated DC power supply capable of providing at least 200 mA). Connect the SOI-120 directly to the power source or use an AC adapter, depending upon the source voltage.

Note: For power connections for SOI-120 DeviceNet units, please refer to Spectrum Controls Publication #0300142-xx, "DeviceNet Communications Reference."



ATTENTION: Verify that the power is disconnected from the power source before wiring. Failure to disconnect power may result in electrical shock. Make sure that the supply voltage to the SOI-120 is 18 to 30 volts DC. The incorrect voltage may damage the SOI-120. Do not overtighten the power connector screw terminals. Overtightening the terminals may damage the SOI-120.

To connect the SOI-120 to a power source:

1. Make sure the voltage source is not turned on.
2. Use AWG#16 or #14 stranded wire to connect the SOI-120 screw terminals to the DC power source (see below).

Note: The terminal block on the SOI-120 is not removable.

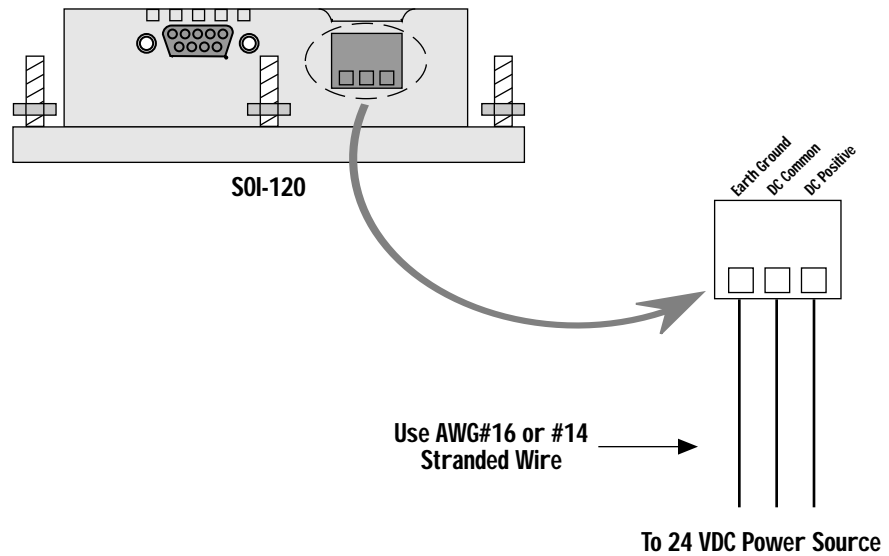


Figure 6.4 DC Power Connections

3. Connect communications cabling.
4. Apply voltage and verify the SOI-120 power-up sequence.



CHAPTER 7: TROUBLESHOOTING

This chapter describes how to isolate and correct the most common operating problems and routine maintenance tasks. It contains these sections:

Section

Troubleshooting Recommendations

Equipment Required

Common Operating Problems

Error Messages

Communication Error Codes

Using the Test Functions

DIP Switch Test

Display Test

Keyboard Test

Communication Port Test

RAM Test

System Memory Test

Program Memory Test

TXEN Test

Cleaning the Display Window



Troubleshooting Recommendations

Most errors are accompanied by an error message. Find the error message in the error message listing and perform the recommended corrective action.

If you encounter a problem that is not listed in a table, contact your local Spectrum Controls distributor for assistance.



ATTENTION: Make sure that no objects are inserted or fall into the terminal through the ventilation slots or DIP switch access hole. Always disconnect power when checking wiring connections. Failure to take adequate precautions may result in severe electrical shock or equipment damage.

Equipment Required

Other than verifying that the correct power source is connected to the terminal (use a voltmeter), no electronic diagnostic equipment is required for troubleshooting.

Common Operating Problems

If there is no display on the SOI-120, verify that 18 to 30 VDC is present at the terminal connectors. If not, check the power to/from the DC power source.

The most common problems are related to cabling configurations and the communication parameters (baud rate, data bits, parity). These parameters must be identical for both the SOI-120 and the controller. Cabling and the communications parameters are always the first things to check.

If the communications cabling and communications parameters are correct, perform the diagnostic tests (described in this chapter) to rule out any non-functioning features of the SOI-120.



Error Messages

Refer to the following when the SOI-120 displays an error message. Error messages, the probable cause, and the suggested corrective action are shown in the following format:

Error Message

Probable cause

Corrective action

ROM fail

Read-only memory (ROM) is incorrect

Possible defective ROM. Reset the SOI-120 and recheck. If problem still exists, re-download the operating system through the SPS programming software. If problem still exists, send SOI-120 in for repair.

RAM fail

RAM memory failed write or read test

Reset the SOI-120 and re-check. If problem still exists, send SOI-120 in for repair.

*.CFG file invalid

Application file checksum is incorrect

Possible bad application file. Download the program file (.CFG) and recheck.

Watch Dog Fault Press key to continue

Watch dog timer not within specs.

If problem persists, send SOI-120 for repair.



Watch Dog Fault Press Key to Reset

Watch dog timer timed out or pass bits not set

If problem persists, send unit in for repair.

PLC not found

This error message displays after a 2-second interval of attempting to establish communications with the PLC.

Communications not established with the PLC. Check cabling and communications parameters to verify that the PLC matches those of the SOI-120

Communication Loss

Press ENTER to reset

Communication with the PLC was lost after 16 attempts

Check the cabling between the SOI-120 and the PLC. Check PLC operating conditions.

Com Error Code: nnH Press ENTER to reset

Communication error code (nn)

Received a controller error code. Refer to next section for communication error code explanations.

Attempted Invalid Screen Access

Illegal or unprogrammed screen type detected (.CFG file error)

Check the program (.CFG) file and download. Check linking and so on.

Not Programmable

Master code is 99999999 and is not user-programmable.

A master code number of 99999999 may not be programmed. Download a new, valid master code number using SOI-series Programming Software (SPS).



Incorrect Master Code

Master code entry did not match

The master code entered did not match the master code of the program file.

Invalid Security Code Access Denied

Master code or 3 screen codes did not match.

Either an incorrect master security code or a coded that did not match the programmed 3 codes was entered; try again.

Loop Error XX

In the Self-Test Mode, the transmitted character did not match the received character. The transmitted character is displayed.

Verify that the loopback connector is connected to the communication and/or printer ports. If the loop-back connectors are in place, possible damage to the port drivers has occurred; send unit in for repair.

Input Error

Press a Key to Cont.

The low and high data values are then displayed in one of two formats:

Low Lim	High Lim
XXXXXX	XXXXXX

Low	XXXXXX
High	XXXXXX

The data entered is not within the programmed limits. The Low and High limits, as programmed, are displayed.

Verify that the displayed limits are as programmed for the entry field. Re-enter data within the entry limits.

READ ONLY

The controller location is not configured for a Write function (P-A/D function).



Verify that the controller location being accessed by the P-A/D is acceptable for Write functions.

Prog SW/OI Version Mismatch - OI Locked

An incorrect unlock code sent by the SOI-series Programming Software (SPS). Wrong version of the SPS.

Verify that the version of SPS is compatible for the controller type supported by the SOI-120.

Communication Error Codes

Communication error codes appear on the SOI-120 display as follows:

Com Error Code: nnH Press ENTER to Reset

The error code is in the form:

- nnH for PLC controllers that do not show extended error codes.
- X nnH for PLC controllers. The X indicates an extended error code.

The communication error codes provide valuable information when other symptoms either have not been discovered or have not been understood.

Note: For a complete list of error codes, consult the user manuals for the PLC being used.

Using the Test Functions

Use the test selection screen to test or check the following:

Reset DUT (resets terminal, terminates test function)

DIP switch positions

Display

Keyboard

Communications port

Random Access Memory



System memory

Transmit enable

To access the test functions:

1. Access the test functions from the Main Menu.

1 Rst	2 Port	3 Test
4 PAD	5 Term	6 Other

2. Select item 3 from the Main Menu to display the test selection screen:

SOI-120 Diag Test
< Test Selection >

3. Use the [NEXT] and [PREV] keys to scroll through the test options. Display the test you want to perform.
 4. Press [ENTER] to initiate the test.
 5. To terminate the test, press the [NEXT] and [PREV] keys to display Reset DUT in the test selection area. Press [ENTER] to reset the terminal.
-
-

DIP Switch Test

Use the DIP switch test to verify the DIP switch positions.

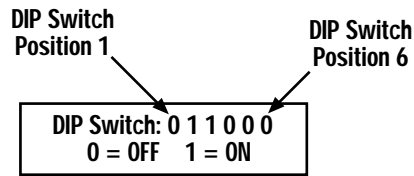
To perform the DIP switch test:

1. Use the [NEXT] and [PREV] keys to display DIP Switch on the test selection screen.

SOI-120 Diag Test
Dipswitch

2. Press [ENTER] to initiate the test.

The SOI-120 displays the current DIP switch settings.



The 6 positions of the DIP switch are shown in binary format (0 = Off, 1 = On). The leftmost value represents DIP switch position #1.

3. Press any key to terminate the DIP switch test and display the test selection screen:



4. To terminate the test function, press the [NEXT] and [PREV] keys to display Reset DUT in the test selection area. Press [ENTER] to reset the terminal.

Display Test

Use the display test to verify that each screen pixel is operating properly.

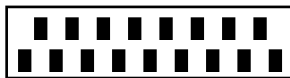
To perform the display test:

1. Use the [NEXT] and [PREV] keys to show Display on the test selection screen.



2. Press [ENTER] to initiate the test.

The SOI-120 turns all pixels on and then off. Then an alternate checkerboard pattern is displayed:



3. Press any key to terminate the test.

The test selection screen is displayed.



**SOI-120 Diag Test
Keyboard**

4. To terminate the test function, press the [NEXT] and [PREV] keys to display Reset DUT in the test selection area. Press [ENTER] to reset the terminal.
-
-

Keyboard Test

Use the keyboard test to verify that the keyboard is functioning properly.

To perform the keyboard test:

1. Use the [NEXT] and [PREV] keys to display Keyboard on the test selection screen.

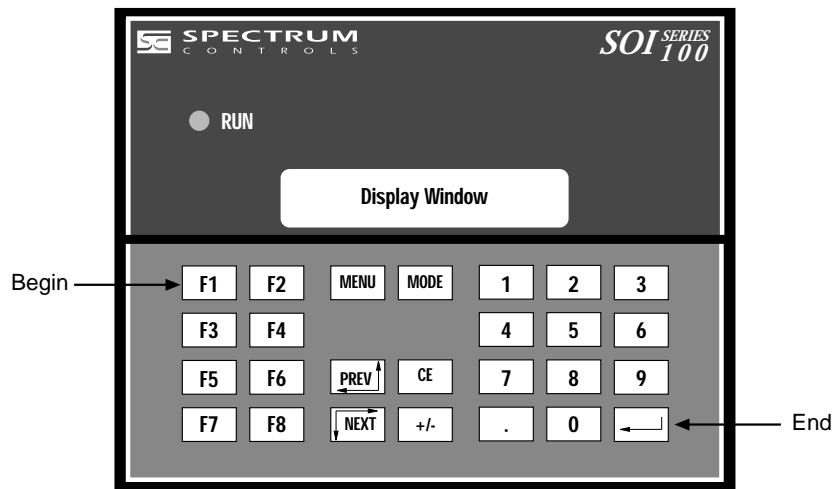
**SOI-120 Diag Test
Keyboard**

2. Press [ENTER] to initiate the test.

The SOI-120 prompts you to press each key in a sequential order.

Press "F1"

3. Press the keys as prompted from left to right beginning at the top.



You must press all of the keys in the order prompted. If you press the wrong key, you must start over with the first key.

4. Pressing the last key in the sequence terminates the keyboard test.

The test selection screen is displayed.

**SOI-120 Diag Test
Comm Port**

5. To terminate the test function, press the [NEXT] and [PREV] keys to display Reset DUT in the test selection area. Press [ENTER] to reset the terminal.

Communication Port Test

Use the communications test to verify the operation of the RS-232 / RS-485 port.

The communications test requires a loopback connector. You can construct a simple loopback connector as follows:

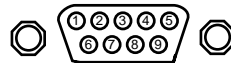


RS-232 Port
9-Pin Female



PIN#	Signal Name	Loopback Connector
1	Data Out	
2	Receive Data (RD)	 Connects pins 2 → 3
3	Transmit Data (TD)	
4		
5	Signal Ground	
6		
7		
8		
9	Shield	

RS-485 Port
9-Pin Female



PIN#	Signal Name	Loopback Connector
1	Data Out	 Connects pins 1 → 3 and pins 2 → 4
2	Data Out +	
3	Data In -	
4	Data In +	
5	Signal Ground	
6	Transmit Enable	
7		
8	Signal Ground	
9	Shield	

To test the communications port:

1. Use the [NEXT] and [PREV] keys to display Comm on the test selection screen.



2. Press [ENTER] to initiate the test.

The SOI-120 will continuously send out and receive a message at the same port. The message is SOI-120 self looping serial test ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789.



SOI-120 self looping
serial test ABCD

3. Press any key to terminate the communications test.

The test selection screen is displayed.

SOI-120 Diag Test
Display Control

4. To terminate the test function, press the [NEXT] and [PREV] keys to display Reset DUT in the test selection area. Press [ENTER] to reset the terminal.
-

Display Control Test

Use the Display Control Test to verify that the Backlighting and Contrast adjustments cycle through each respective setting.

1. Use the [NEXT] and [PREV] keys to display Display Control on the test selection screen.

SOI-120 Diag Test
Display Control

2. Press [ENTER] to initiate the test.

The SOI-120 displays and cycles through both the Backlighting and Contrast settings with the following screens displayed.

Display Brightness

Display Contrast

3. Once the test is complete, the next test selection is displayed.

SOI-120 Diag Test
Ram Test

4. To terminate the test function, press the [NEXT] and [PREV] keys to display the Reset DUT in the test selection area. Press [ENTER] to reset the SOI.



RAM Test

Use the RAM test to verify the SOI-120 Random Access Memory.

1. Use the [NEXT] and [PREV] keys to display RAM on the test selection screen.

```
SOI-120 Diag Test
Ram Test
```

2. Press [ENTER] to initiate the test.

The SOI-120 displays either a Pass or Fail message.

```
RAM: pass
Press ENTER
```

3. Pressing [ENTER] terminates the RAM test.

The test selection screen is displayed.

```
SOI-120 Diag Test
System Memory
```

4. To terminate the test function, press the [NEXT] and [PREV] keys to display Reset DUT in the test selection area. Press [ENTER] to reset the terminal.

System Memory Test

Use the System Memory test to verify the checksum of the operating system.

1. Use the [NEXT] and [PREV] keys to display System Memory test on the test selection screen.

```
SOI-120 Diag Test
System Memory
```

2. Press [ENTER] to initiate the test.

The SOI-120 displays either a Pass or Fail message.

```
System Memory: pass
Press ENTER
```

3. Pressing [ENTER] terminates the System Memory test.



The test selection screen is displayed.

SOI-120 Diag Test
Program Memory

4. To terminate the test function, press the [NEXT] and [PREV] keys to display Reset DUT in the test selection area. Press [ENTER] to reset the terminal.

Program Memory Test

Use the Program Memory test to verify the checksum of the current application file.

1. Use the [NEXT] and [PREV] keys to display Program Memory test on the test selection screen.

SOI-120 Diag Test
Program Memory

2. Press [ENTER] to initiate the test.

The SOI-120 displays either a Pass or Fail message.

System Mem: pass
Press ENTER

3. Pressing [ENTER] terminates the System Memory test.

The test selection screen is displayed.

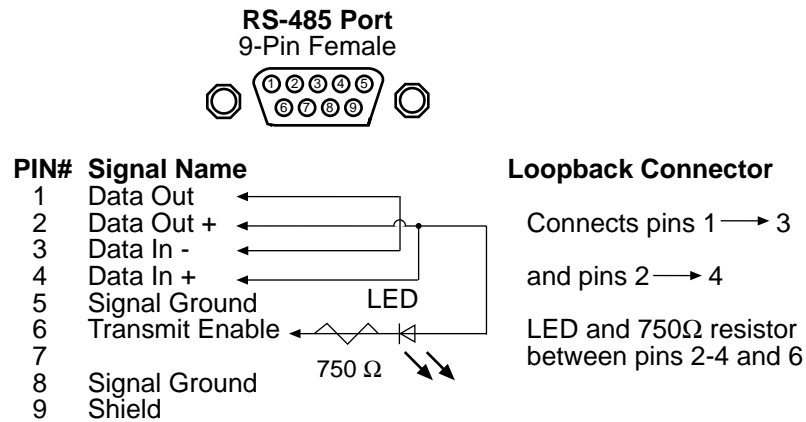
SOI-120 Diag Test
Toggle Cntrl Signal

4. To terminate the test function, press the [NEXT] and [PREV] keys to display Reset DUT in the test selection area. Press [ENTER] to reset the terminal.

TXEN Test

Only available when RS-485 is selected. Use the TXEN test to verify the transmit enable line at the RS-485 communications port.

The TXEN test requires a loopback connector with an LED. You can construct a simple loopback connector as shown below:



To test the transmit enable line:

1. Use the [NEXT] and [PREV] keys to display TXEN on the test selection screen.

S0I-120 Diag Test
Toggle Cntrl Signal

2. Press [ENTER] to initiate the test.

The LED should flash at approximately 1 second intervals indicating that the transmit enable line is functioning properly.

3. Pressing [ENTER] terminates the TXEN test.

The test selection screen is displayed.

S0I-120 Diag Test
Reset DUT

4. To terminate the test function, press the [NEXT] and [PREV] keys to display Reset DUT in the test selection area. Press [ENTER] to reset the terminal.
-



Cleaning the Display Window

To clean the display window:

ATTENTION: Use of abrasive cleaners or solvents may damage the window. Do not scrub or use brushes. Some types of paper towels may scratch the window; use only a soft sponge or cloth.

1. Disconnect power from the terminal at the power source.
 2. Using a clean sponge or a soft cloth, clean the display with a mild soap or detergent.
 3. Dry the display with a chamois or moist cellulose sponge to avoid water spots.
-
-

Removing Paint and Grease

Remove fresh paint splashes and grease before drying by rubbing lightly with isopropyl alcohol. Afterward, provide a final wash using a mild soap or detergent solution. Rinse with clean water.



APPENDIX A: SOI-120 SPECIFICATIONS

LCD Display

Character Size (H x W)	0.19 x 0.12 in. (4.75 x 2.95 mm)
Character Format	5 mm x 8 mm dot matrix
Column and Character	2 lines x 20 characters
Backlight	Yellow-green LED, fixed intensity
Contrast	Fixed
Display Viewing Area (H x W)	1.0 x 3.0 in. (15 mm x 76 mm)
Viewing Angle	Horizontal +/-30°, vertical -20° to +30°

Keypad

Keypad Type	Tactile embossed, domed keys, sealed membrane
Operation Force	16 oz (453 grams)
Operational Life	1 million operations



Electrical

Communications Port	RS-232/RS-485
Communication Distances	
RS-232	50 ft (15 meters) max
RS-485/422	10,000 ft (3047 meters) max
Input Voltage Range	18-30V DC
Input Current	200mA max

Environmental

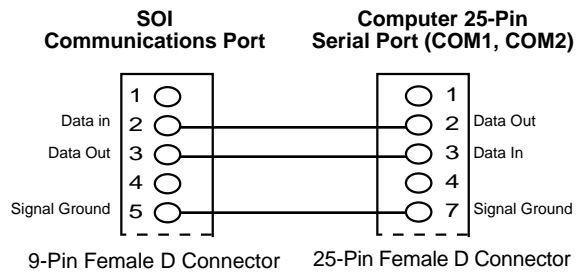
Operating Temperature	0 to 55°C (32 to 131°F)
Storage Temperature	-20 to 70°C (-4 to 158°F)
Relative Humidity	5 to 95%, non-condensing
Shock	30G operating, 50G non-operating
Vibration (5 to 2000 Hz)	2.5G operating, 5.0G non-operating
Agency Rating	NEMA Type 4, 12, 13 (indoor use only), CSA, & UL/cUL Class I Div 2 Groups A B C D. SOI-120 products marked Series D or later carry the CE mark and conform to the European Community EMC Directive on electromagnetic compatibility when mounted with at least 1 in. of clearance from any conductive surface that may be behind it.

Mechanical

Dimensions (Approximate)	
Height	3.9 in. (99.1 mm)
Width	5.4 in. (137.2 mm)
Depth	1.8 in. (45.7 mm)
Front Panel Size	
Height	6.9 in. (175.3 mm)
Width	5.4 in. (137.2 mm)
Weight	1.0 lb (0.45 kg) max
LED Indicator	Run LED (green)

APPENDIX B: SOI-120 CABLE DIAGRAMS

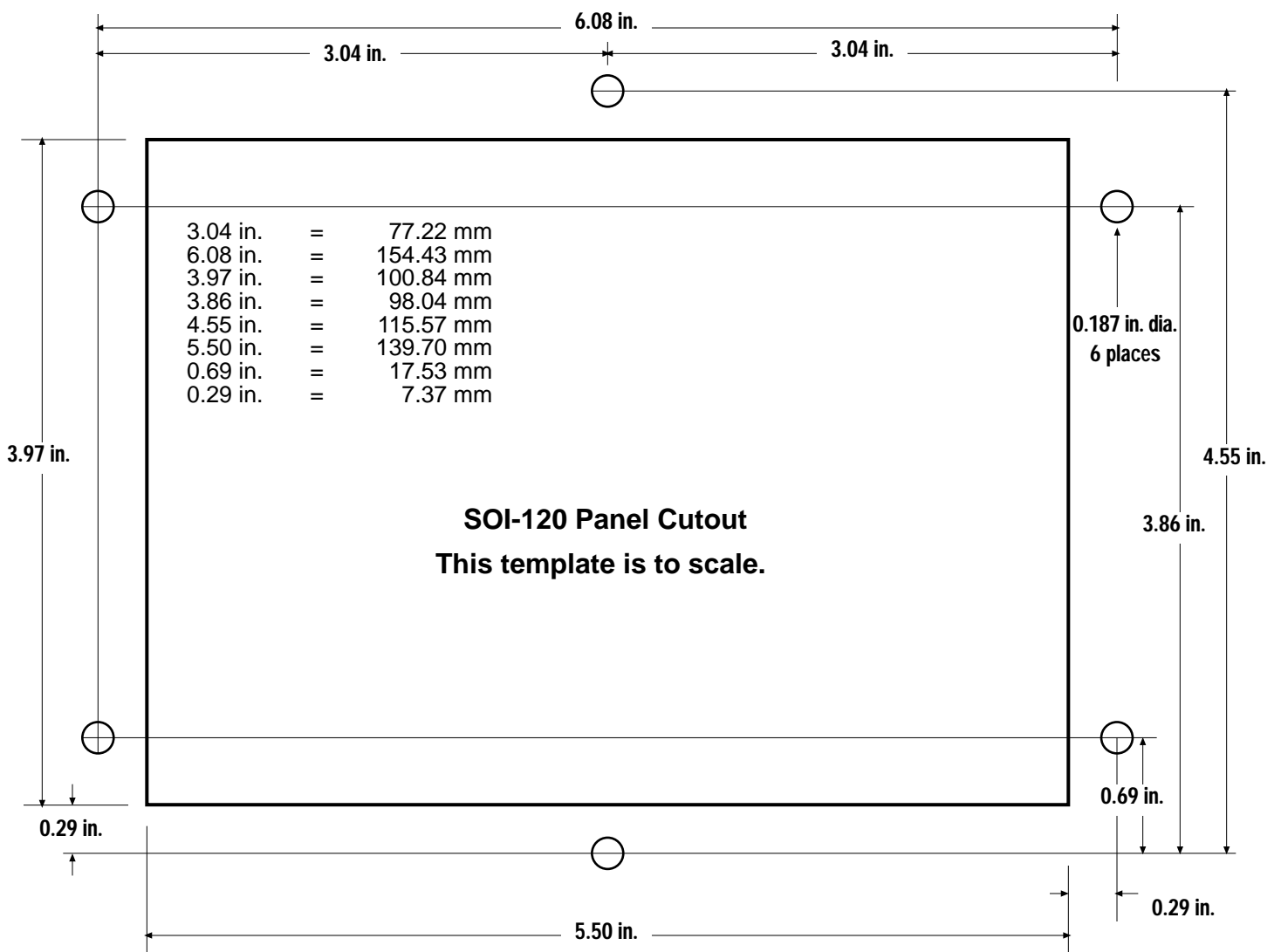
Use the SCC-3 Up/Download Cable to connect the RS-232 version of the SOI-120 to a personal computer for transferring applications. A 25-pin to 9-pin adapter may be required if your computer has a 9-pin communication port







APPENDIX C: SOI-120 PANEL CUTOUT







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