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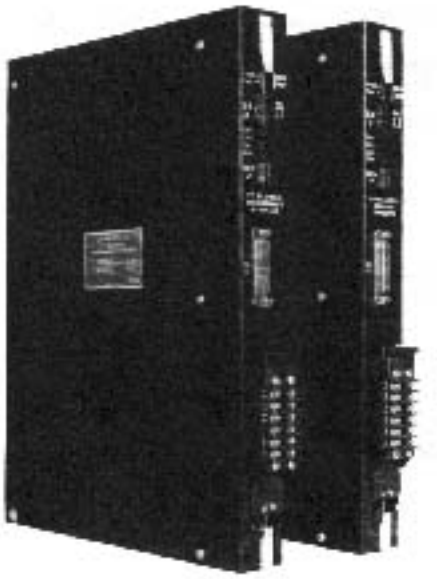
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ALLEN-BRADLEY

Allen-Bradley I/O Scanner Modules

(Cat. No. 1775-S4A, -S4B)

Product Data



Description

The I/O scanner modules provide I/O and RS-232-C communication channels for the PLC-3 programmable controller. The two scanner modules are:

- I/O Scanner-Programmer Interface Module (cat. no.1775-S4A
- I/O Scanner-Message Handling Module (cat. no. 1775-S4B)

Table A outlines the benefits, features, and functions for these modules.

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Table A
Benefits, Features, and Functions of the PLC-3 Scanner Modules

Benefits	Features	Functions
High speed I/O communication with up to 2,048 inputs and 2,048 outputs per scanner	Four I/O communication channels	Communicate with I/O Adapter Modules (cat no 1771-AS) in I/O chassis You can connect up to 16 I/O chassis to one I/O channel on the scanner
Ability to execute a faster scan for selected I/O chassis	I/O scan priority	Scan the I/O chassis according to a sequence that you select
Ladder diagram programming or report generation capability	RS-232-C communication channel	Communicates with an Industrial Terminal (cat no 1770-T4) or an RS-232-C compatible device
Easy troubleshooting	Status LED indicators	Keep you informed of the general scanner module status and the active status of each I/O communication channel
Easy identification of PLC-3 system with multiple scanner modules	Thumbwheel switch	Distinguishes one scanner from another The PLC-3 processor requires one 1775-S4A scanner with its thumbwheel switch set to 1
Backup system capability	Backup connector	Transfers control over to a backup PLC-3 processor if a fault shuts down the primary PLC-3 processor
Efficient production floor planning for: ▪ I/O communication ▪ Peer-to-peer communication ▪ Backup communication	Terminal swing arm for extensive cabling	Makes connections to: ▪ Bulletin 1771 I/O chassis up to 10,000 cable feet away from scanner via Twinaxial Cable (cat no 1770-CD) ▪ Communication channels on 1775-S4A scanners in up to 6 separate PLC-3 systems ▪ Communication channel on a 1775-S4A scanner in another PLC-3 system

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The following two sections of this publication explain the functional differences between the 1775-S4A scanner and the 1775-S4B scanner. These differences are summarized in table B. This publication also explains the hardware components on the scanners.

Table B
Functional Differences Between 1775-S4A and 1775-S4B Scanners

Function	Type of Scanner		
	Number One 1775-S4A	Another 1775-S4A	1775-S4B
Required for PLC-3 processor operation	Yes	No	No
I/O Scanning with four I/O channels	Yes	Yes	Yes
Backup or peer-to-peer communication capability	Yes	Yes	No
Required for PLC-3 backup operation	Yes	No	No
Programming interface with channel 5	Yes[1]	Yes	No
Programming interface with channel 0 on PLC-3 front panel	Yes	No	No
Report generation interface with channel 5	No	No	Yes

[1] To Operate channel 5 on the number one 1775-S4A scanner you must make I/O channel 4 inactive through the PLC-3 LIST function.

You can find detailed information on these scanners in:

- I/O Scanner-Programmer Interface Module User's Manual (publication 1775-6.5.2, formerly 1775-805)
- I/O Scanner-Message Handling Module User's Manual (publication 1775-6.5.3, formerly 1775-806)

Using the 1775-S4A Scanner

The 1775-S4A scanner is a required module for the PLC-3 programmable controller. When you are setting up your PLC-3 system, you must insert a 1775-S4A scanner into the PLC-3 Main Processor Chassis (cat. no. 1775-A1) and set its thumbwheel switch to one. This number one 1775-S4A scanner communicates between the PLC-3 programmable controller and:

- the industrial terminal for programming interface
- 1771I/O chassis for I/O scanning interface
- a backup PLC-3 processor that takes control over the outputs if the primary PLC-3 processor faults
- up to six PLC-3 processors for peer-to-peer communication

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Programming Interface

The 1775-S4A scanner provides an RS-232-C compatible channel (channel 5) that can communicate with the industrial terminal. You can use the industrial terminal to:

- enter and monitor ladder diagram program instructions
- enter and monitor data table values
- force inputs and outputs
- operate the PLC-3 LIST function
- load and record ladder diagram programs with a Data Cartridge Recorder (cat. no. 1770-SB) or Data Cassette Recorder (cat. no. 1770-SA)
- print out ladder diagram program through channel C interface to a printer

The number one 1775-S4A scanner supports operation of channel 0 on the PLC-3 front panel. If you are using channel 5 on the number one 1775-S4A scanner, you must make I/O channel 4 inactive through the PLC-3 LIST function.

Additionally, through LIST selections for the number one 1775-S4A scanner, you can configure channel 0 on the PLC-3 front panel for communication with the industrial terminal or an RS-232-C compatible device.

I/O Scanning Interface

The 1775-S4A scanner provides terminals for four separate I/O communication channels. These channels can communicate with I/O adapter modules in I/O chassis. In scanning these I/O channels, the 1775-S4A scanner:

- reads the status of output image table words from the data table and transmits this data to update the status of the terminals on the corresponding output module groups
- receives the status from the terminals on the input module groups and writes this data into the corresponding input image table word in the data table

You can connect up to 16 I/O chassis on a single I/O channel. Through the PLC-3 LIST function, you can select the sequence that the 1775-S4A scanner scans the I/O chassis. If an I/O chassis requires a faster update time, you can list the chassis more than once in the sequence.

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Backup Communication

Through LIST selections for the 1775-S4A scanner, you can configure an I/O channel for a backup communication function. In operating this function, the I/O channel of a 1775-S4A scanner in the primary PLC-3 processor is connected to the same channel of a 1775-S4A scanner in the backup PLC-3 processor. An input file receives data from the backup processor. An output file sends data to the backup processor.

By cabling between the connectors labeled BACK UP on a number one 1775-S4A scanner in the primary PLC-3 processor chassis and a number one 1775-S4A scanner in the backup PLC-3 processor chassis, you can set up a PLC-3 backup system. In this system, if a fault disables the PLC-3 processor, the second PLC-3 processor can take control of the outputs. For detailed information on the PLC-3 backup system, refer to the PLC-3 Programmable Controller Backup Concepts Manual (publication 1775-6.3.1, formerly 1775-803).

Peer-to-Peer Communication

Through LIST selections for the 1775-S4A scanner, you can configure an I/O channel for peer-to-peer communication. In this function, you connect the I/O channel of a 1775-S4A scanner in one PLC-3 processor to the same channel of a 1775-S4A scanner in each of up to 6 PLC-3 processors. You must designate one PLC-3 processor as the master of this communication channel. The other PLC-3 processors on the channel act as slaves.

In peer-to-peer communication, the master communicates with each slave. Through the LIST function you select a separate file in the master PLC-3 processor for each slave. This file is the source for data that transfers to the slave PLC-3 processor(s). You also select a file in each slave PLC-3 processor that receives the data.

Peer-to-peer communication allows PLC-3 processors to exchange data such as part counts and production status information.

Additional 1775-S4A Scanners

You can add up to 14 additional 1775-S4A scanners for additional I/O communication and RS-232-C capability. Each additional 1775-S4A scanner provides four I/O communication channels and a RS-232-C communication channel.

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Using the 1775-S4B Scanner

The 1775-S4B scanner is an optional module for the PLC-3 programmable controller. The 1775-S4B scanner communications between the PLC-3 programmable controller and:

- RS-232-C compatible devices for report generation interface
- 1771 I/O chassis for I/O scanning interface

Report Generation Interfaces

The 1775-S4B scanner provides an RS-232-C compatible channel (channel 5) that can communicate with data terminals, computers, printers, modems, and other RS-232-C compatible devices. You can use these devices to program in the report generation language available with the 1775-S4B scanner.

By using the report generation language, you can enter and store messages from the data terminal. You can execute these messages through the data terminal or by using the MSG instruction in the ladder diagram program.

Report generation allows you to format text and data for display on a CRT screen or printer. You can also display graphic presentations on a CRT screen.

I/O Scanning Interface

The 1775-S4B scanner has terminals for four separate I/O communication channels. You can use these channels for I/O scanning the same as the 1775-S4A scanner.

Looking at the PLC-3 Scanner Modules

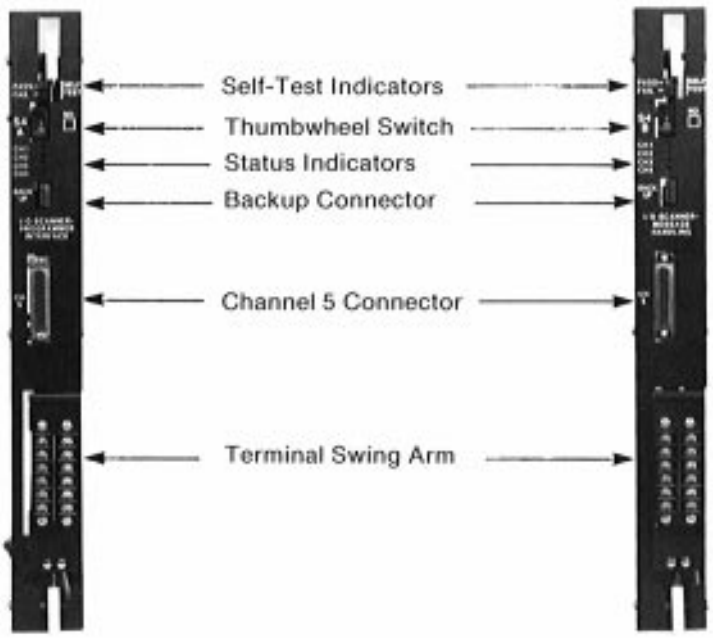
Both scanner modules have the following hardware components (figure 1):

- self-test indicators
- thumbwheel switch
- status indicators for the I/O channels
- backup connector
- channel 5 connector
- terminal swing arm

We describe these components in the following sections.

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Figure 1
Hardware Features on the PLC-3 Scanner Modules



Self-test Indicators

At the top of the scanner's front edge, LED indicators labeled PASS and FAIL keep you informed on the general condition of the scanner. These indicators have the following meanings:

PASS (green)	FAIL (red)	Meaning
On	Off	Normal operation
Off	On	Module fault
On	On	Power-up or system reset
Off	Off	PLC-3 processor is turned off

Thumbwheel Switch

The thumbwheel switch is below the self-test indicators. Setting it at a unique number (1 to 15) enables the PLC-3 processor to distinguish one scanner from another. That is, a 1775-S4A scanner and a 1775-S4B scanner in the PLC-3 processor chassis can be set at the same number.

CAUTION: Do not change the thumbwheel setting on a scanner module while PLC-3 processor power is on. Equipment damage could result.

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Remember, you must have a 1775-S4A scanner with its thumbwheel switch set at 1 in the PLC-3 main processor chassis.

I/O Channel Status Indicators

Below the thumbwheel switch are four green LEDs labeled:

- CH1
- CH2
- CH3
- CH4

Each LED corresponds to one of the four I/O communication channels. Depending on your use for the I/O communication channel, each indicator has the following meanings:

If you are using the channel for I/O scanning with a 1775-S4A or 1775-S4B scanner:

If the LED is:	Then:
On	Communication between the scanner module and the I/O chassis on the corresponding I/O channel is properly established
Flashing	There is a fault on one or more of the I/O chassis on the corresponding I/O channel
Off	No I/O chassis are connected to the corresponding I/O channel or the channel is inactive

If you are using the channel for peer to peer communication with 1775-S4A scanners:

If the LED is:	Then:
On	The channel is functioning properly.
Flashing	The in put file that receives the data from a slave PLC-3 processor is too small.
Off	There is a communication problem along the channel or the channel is inactive.

If you are using the channel for backup communication with 1775-S4A scanners:

If the LED is:	Then:
	The channel is functioning properly.
Flashing	The input file that receives the data from the backup PLC-3 processor is too small.
Off	The channel has not received data during the last 200ms or the channel is inactive.

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Backup Connector

Below the I/O channel status indicators is a backup connector. You can use this connector to set up the backup system capability for switching control over the outputs. This connector is only used for 1775-S4A scanner number one.

Channel 5 Connector

Below the backup connector is a 25-pin D-shell connector labeled CH5. This connector provides communication with:

- an industrial terminal for ladder diagram programming and configuring the PLC-3 system if you are using a 1775-S4A scanner
- an RS-232-C compatible device for report generation if you are using a 1775-S4B scanner

To use channel 5 on 1775-S4A scanner number one, you must make I/O channel 4 inactive through the PLC-3 LIST function.

Terminal Arm Swing

Near the bottom of the scanner module is a Terminal Swing Arm (cat. no. 1775-WA). This swing arm contains the connection for I/O communication channels 1 to 4. Functions of these channels include:

Function	Compatibility
Scanning I/O	1775-S4A or 1775-S4B scanners
Peer to peer communication	1775-S4A scanner only
Backup communication	1775-S4A scanner only

Electrostatic Discharge

Under some conditions, electrostatic discharge can degrade performance or damage an I/O scanner module. If you observe the following precautions you can guard against electrostatic damage.

- Touch a grounded object to discharge yourself before handling the module.
- Do not touch the backplane connector or connector pins.
- When not in use, keep the module in its static-shield bag.

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Product Data
I/O Scanner Modules

Specifications

Location
- Single slot in a PLC-3 processor chassis

Functions
- I/O interface
- RS-232-C interface for ladder diagram programming
- RS-232-C interface for report generation

I/O Capacity
- 2,048 inputs and 2,048 outputs

Channels Per Scanner
- 4 I/O communication
- 1 RS-232-C communication

Communication Rate
- 57.6 or 115.2 kbaud (I/O channel)
- 110 baud to 19.2 kbaud (RS-232-C channel)

I/O Channel Cable Length
- 10,000 cable feet (max)

Nominal I/O Scan Times Per I/O Adapter
- 5.5 to 6.5ms for 1 channel
- 6ms for 2 channels
- 6ms for 3 channels
- 6.0 to 6.5ms for 4 channels

Environmental Conditions
- Operational Temperature: 0 to 60° C (32 to 140° F)
- Storage Temperature: -40 to 85°C (-40 to 185° F)
- Relative Humidity: 5 to 95% (without condensation)

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