ALLEN-BRADLEY

PLC-3/10 I/O Scanner Module

(Cat. No. 1775-SR)

Product Data

Fast and Convenient I/O Scanning

The PLC-3/10 Programmable Controller I/O Scanner Module (Cat. No. 1775-SR) provides high-speed I/O communication to Allen-Bradley 1771 Universal I/O System.

With four available I/O communication channels, you can connect each channel to 1771 I/O chassis up to 10,000 cable-feet from the PLC-3/10 chassis.

The features, benefits, and functions for this module are outlined below:

Table A

Features	Benefits	Functions
Four I/O communication channels	High speed I/O communication with up to 2,048 inputs and 2,048 outputs	Communicate with I/O Adapter Modules (Cat. No. 1771-AS, -ASB) in I/O chassis. You can connect up to 16 I/O chassis to one I/O channel on the scanner.
I/O scan priority	Ability to execute a faster scan for selected I/O chassis	Scan the I/O chassis according to a sequence that you select.
RS-323-C communication channel	Ladder diagram programming capability	Communicates with an Industrial Terminal (Cat. No. 1770-T4)
Status LED indicators	Easy troubleshooting	Keep you informed of the general scanner module status and the active status of each I/O communication channel.
Thumbwheel switch	Easy identification of a PLC-3/10 system with two scanner modules	Distinguishes one scanner from another. The PLC-3/10 processor requires one scanner with its thumbwheel switch set to 1.
Backup connector	Backup system capability	Transfers control over to a backup PLC-3/10 processor if a fault shuts down the primary PLC-3/10 processor.
Terminal swing arm for extensive cabling	Efficient production floor planning for: • I/O communication • Backup communication • Peer-to-peer communication	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 channel on a 1775-SR scanner in another PLC-3/10 system. • Communication channels on 1775-SR scanners in up to six separate PLC-3 or PLC-3/10 systems.

Using the 1775-SR Scanner

The 1775-SR scanner is a required module for the PLC-3/10 programmable controller. When you are setting up your PLC-3/10 system, you must insert a 1775-SR scanner into the PLC-3/10 Processor Chassis (Cat. No. 1775-A3) and set its thumbwheel switch to one. This number one 1775-SR scanner communicates between the PLC-3/10 programmable controller and:

- the industrial terminal for programming interface
- 1771 I/O chassis for I/O scanning interface
- a backup PLC-3/10 processor that takes control over the outputs if the primary PLC-3/10 processor faults
- up to six PLC-3 or PLC-3/10 processors for peer-to-peer communication

WARNING: Remove system power before removing or inserting the 1775-SR scanner in the PLC-3/10 chassis. Failure to observe this warning could result in damage to PLC-3/10 components and/or undesired operation with injury to personnel.

Important: Do not insert the 1775-SR scanner into the PLC-3 Main Processor Chassis (Cat. No. 1775-A1, -A2). The 1775-SR scanner is not compatible with the PLC-3 programmable controller.

Programming Interface

The 1775-SR 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
- operate the PLC-3/10 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 compatible printer

The number one 1775-SR scanner supports operation of channel 0 on the PLC-3/10 front panel. If you are using channel 5 on the number one 1775-SR scanner, you must make I/O channel 4 inactive through the PLC-3/10 LIST function.

Additionally, through LIST selections for the number on 1775-SR scanner, you can configure channel 0 on the PLC-3/10 front panel for communication with the industrial terminal or an RS-232-C compatible device.

I/O Scanning Interface

The 1775-SR 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-SR 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-3/10 LIST function, you can select the sequence that the 1775-SR 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.

Backup Communication

Through LIST selections for the 1775-SR scanner, you can configure an I/O channel for a backup communication function. In operating this function, an I/O channel on a 1775-SR scanner in the primary PLC-3/10 processor is connected to an I/O channel on a 1775-SR in the backup PLC-3/10 processor. An output file sends data to the backup processor.

By cabling between the connectors labeled BACK UP on a number one 1775-SR scanner in the primary PLC-3/10 processor chassis and a number one 1775-SR scanner in the backup PLC-3/10 processor chassis, you can set up a PLC-3/10 backup system. In this system, if a fault disables the primary PLC-3/10 processor, the backup PLC-3/10 processor can take control of the outputs.

Peer-to-Peer Communication

Through LIST selections for the 1775-SR 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-SR scanner in one PLC-3/10 processor to the same channel of a I/O scanner module in each of up to six PLC-3 or PLC-3/10 processors. If you are connecting to a PLC-3 programmable controller, you connect to an I/O channel on an I/O Scanner-Programmer Interface (Cat. No. 1775-S4A). You must designate one processor as the

master of this communication channel. The other 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 or PLC-3/10 processor for each slave. This file is the source for data that transfers to the slave processor(s). You also select a file in each slave processor that receives the data.

Peer-to-peer communication allows PLC-3 and PLC-3/10 processors to exchange data such as part counts and production status information.

Additional 1775-SR Scanner

You can insert an additional 1775-SR scanner for additional I/O communication and RS-232-C compatibility. An additional scanner provides four I/O communication channels and an RS-232-C communication channel.

When inserting an additional 1775-SR scanner, set its thumbwheel switch to 2.

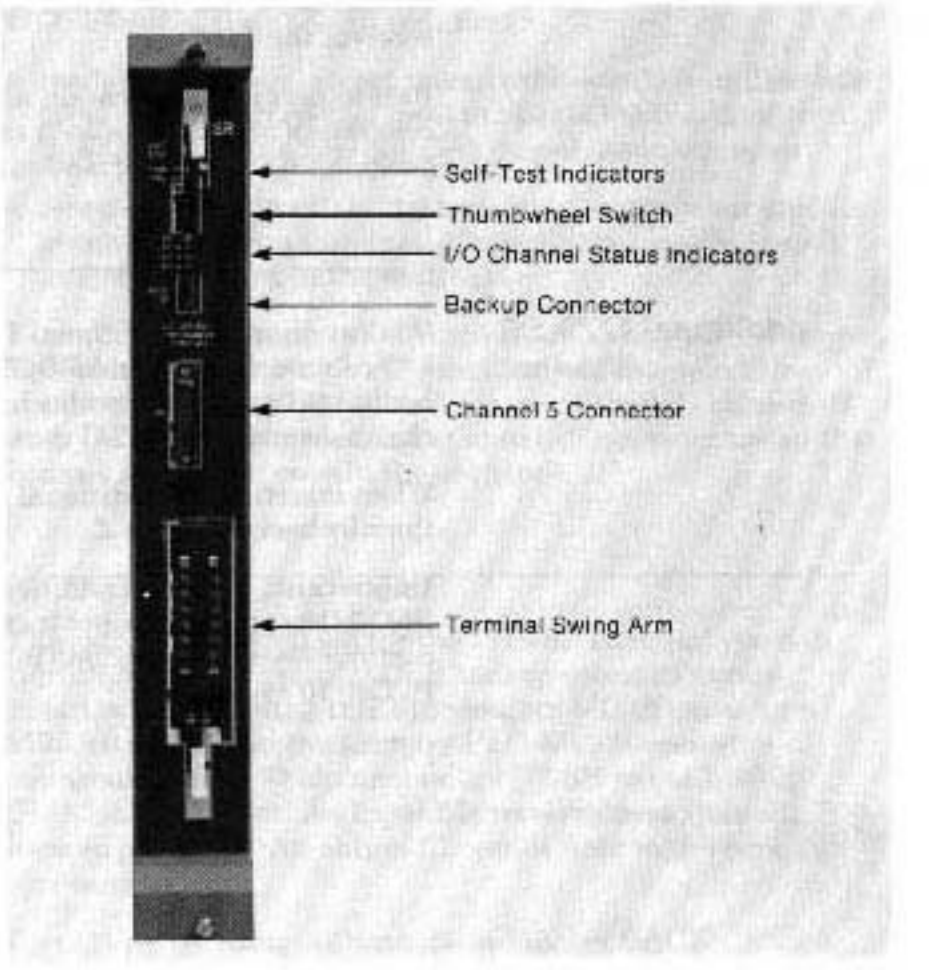
Important: Using an additional 1775-SR scanner in a PLC-3/10 system does not increase I/O capacity. You can communicate at up to 2,048 inputs and 2,048 outputs per PLC-3/10 system.

Looking at the 1775-SR Scanner

The 1775-SR scanner has the following hardware features (Figure 1):

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

Figure 1
Hardware Features on the PLC-3/10 I/O Scanner Module



We describe these features in the following sections.

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-3/10 processor is turned off

Thumbwheel Switch

The thumbwheel switch is below the self-test indicators. Setting it at a unique number (1 or 2) enables the PLC-3/10 processor to distinguish one scanner from another:

If you are using:	Then set the thumbwheel(s) to:
one scanner module	1
two scanner modules	1 and 2

CAUTION: Do not change the thumbwheel setting on a 1775-SR module while PLC-3/10 processor power is on. Equipment damage could result.

Remember, you must have a 1775-SR scanner with its thumbwheel set at 1 in the PLC-3/10 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:

If the LED is:	Then
On	Communication between the scanner 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 backup communication:

If the LED is:	Then
On	The channel is functioning properly.
Flashing	The input file that receives the data from the backup PLC-3/10 processor is too small.
Off	The channel has not received data during the last 200 ms or the channel is inactive.

If you are using the channel for peer-to-peer communication:

If the LED is:	Then
On	The channel is functioning properly.
Flashing	The input file that receives the data from a slave PLC-3 or PLC-3/10 processor is too small.
Off	There is a communication problem along the channel or the channel is inactive.

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-SR 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-3/10 system.

To use channel 5 on 1775-SR scanner number one, you must make I/O channel 4 inactive through the PLC-3/10 LIST function.

Terminal Swing Arm

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

- scanning I/O
- backup communication
- peer-to-peer communication

Make connection for these channels with 1770-CD cable.

Related Publications

For detailed information on using the 1775-SR scanner for I/O scanning or backup communication, refer to the:

- PLC-3 I/O Scanner-Interface Module User's Manual (publication 1775-6.5.2).
- PLC-3 Backup Concepts Manual (publication 1775-6.3.1)

Specifications

Location

- Single slot in a PLC-3/10 processor chassis

Functions

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

I/O Capacity

- 2,048 inputs and 2,048 outputs

Channels per Scanner

- 4 I/O communication or
- 1 RS-232-C communication and 3 I/O 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 Lengths for Communication Rates

- up to 5,000 cable feed for 115.2 kbaud
- up to 10,000 cable feet for 57.6 kbaud

Nominal I/O Scan Times per I/O Adapter

- 5.5 to 6.5 ms for 1 channel
- 6 ms for 2 channels
- 6 ms for 3 channels
- 6.0 to 6.5 ms 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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With offices in major cities worldwide

WORLD HEADQUARTERS
Allen-Bradley
1201 South Second Street
Milwaukee, WI 53204 USA
Tel: (414) 382-2000
Telex: 43 11 016
FAX: (414) 382-4444

EUROPE/MIDDLE EAST/AFRICA HEADQUARTERS
Allen-Bradley Europa B.V.
Amsterdamseweg 15
1422 AC Uithoorn
The Netherlands
Tel: (31) 2975/60611
Telex: (844) 18042
FAX: (31) 2975/60222

ASIA/PACIFIC HEADQUARTERS
Allen-Bradley (Hong Kong) Limited
Room 1006, Block B, Sea View Estate
28 Watson Road
Hong Kong
Tel: (852) 887-4788
Telex: (780) 64347
FAX: (852) 510-9436

CANADA HEADQUARTERS
Allen-Bradley Canada Limited
135 Dundas Street
Cambridge, Ontario N1R 5X1
Canada
Tel: (519) 623-1810
FAX: (519) 623-8930

LATIN AMERICA HEADQUARTERS
Allen-Bradley
1201 South Second Street
Milwaukee, WI 53204 USA
Tel: (414) 382-2000
Telex: 43 11 016
FAX: (414) 382-2400

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