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Allen-Bradley

PLC-3 Family Programmable Controllers

Quick Start for Experienced Users



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Important User Information

Because of the variety of uses for the products described in this publication, those responsible for the application and use of this control equipment must satisfy themselves that all necessary steps have been taken to assure that each application and use meets all performance and safety requirements, including any applicable laws, regulations, codes and standards.

The illustrations, charts, sample programs and layout examples shown in this guide are intended solely for purposes of example. Since there are many variables and requirements associated with any particular installation, Allen-Bradley does not assume responsibility or liability (to include intellectual property liability) for actual use based upon the examples shown in this publication.

Allen-Bradley publication SGI-1.1, *Safety Guidelines for the Application, Installation, and Maintenance of Solid-State Control* (available from your local Allen-Bradley office), describes some important differences between solid-state equipment and electromechanical devices that should be taken into consideration when applying products such as those described in this publication.

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Throughout this manual we use notes to make you aware of safety considerations:



ATTENTION: Identifies information about practices or circumstances that can lead to personal injury or death, property damage or economic loss.

Attention statements help you to:

- identify a hazard
- avoid the hazard
- recognize the consequences

Important: Identifies information that is critical for successful application and understanding of the product.

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Table of Contents

Overview P–1

Using this Quick Start P–1
What You Need to Do P–1
System Components used in this Quick Start P–2
If You Need Help P–3

Configure and Ground I/O and Processor Chassis 1–1

Configure I/O Chassis 1–1
Configure Processor Chassis 1–2
Ground Processor and I/O Chassis 1–2

Install Power Supply 2–1

Install 1775-P3 Power Supply into the PLC-3/10 (or single-chassis PLC-3) 2–1
Install 1775-P1 Power Supply into the PLC-3 2–3

Install Processor, Memory, and Scanner Modules 3–1

Connect Front Panel Cable and Install Processor 3–1
Install Memory Module(s) 3–1
Install I/O Scanner Module(s) 3–2

Install, Wire, and Connect I/O 4–1

Install and Wire I/O Modules 4–1
Connect I/O 4–2

Configure a Personal Computer 5–1

Configure and Connect 1770-T4 Programming Terminal 5–1
Connect to Personal Computer 5–2

Troubleshooting and Specifications 6-1

Power-supply Module Indicators 6-1
Specifications 6-1

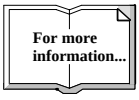
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Overview

Using this Quick Start

This quick start is designed to help you quickly install and connect a basic PLC-3 family programmable controller system. Use this guide if you are knowledgeable about PLC-3 family products but may not have used one or more of the products for a period of time. The information we provide is geared to "jog your memory."

What You Need to Do



For more information, see the PLC-3 Programmable Controllers Installation and Operations Manual, publication 1775-6.7.1.

step 1 *Install I/O and Processor Chassis*

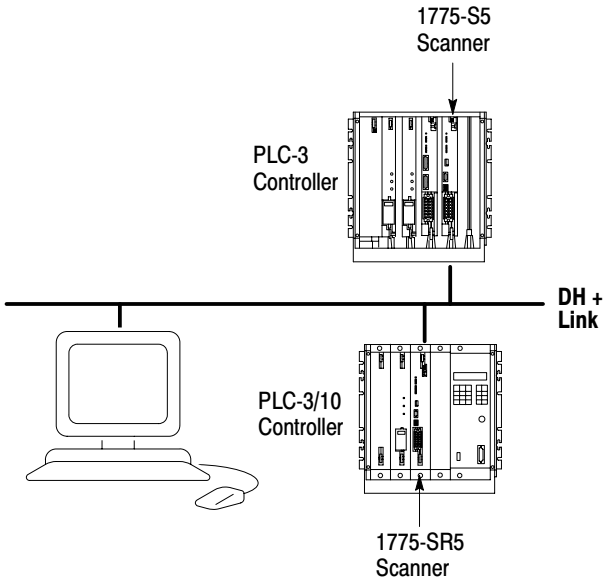
- a *Configure I/O chassis (page 1-1)*
- b *Ground I/O chassis (page 1-1)*
- c *Configure processor chassis (page 4-1)*

step 2 *Install Power Supply*

- a *Install 1775-P3 power supply (page 2-1)*
- b *Install 1775-P1 power supply (page 2-3)*

step 3 *Install Modules*

- a *Connect front panel cable (page 3-1)*
- b *Install the processor module (page 4-1)*
- c *Install memory module(s) (page 4-1)*
- d *Install I/O scanner module(s) (page 4-2)*



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step 4 *Install and Connect I/O*

a *Install and wire I/O modules (page 5-1)*

b *Connect I/O to scanner (page 5-2)*

step 5 *Configure and connect a programming terminal (page 6-1)*

System Components used in this Quick Start

Product name:	Catalog number:
I/O chassis	1771-A1B, -A2B, -A3B, -A4B
power supply	•1775-P3 (PLC-3/10) •1775-P1, -P3 (PLC-3)
processor chassis	•1775-A1, -A2 (PLC-3) •1775-A3 (PLC-3/10)
front panel cable	1775-CAK
processor	•1775-L4 (PLC-3/10) •1775-L3 (PLC-3)
memory module(s)	•1775-MS4, -MS8, -MSA, -MSD (PLC-3/10) •1775-ME4, -ME8, -MEA, -MED, -MEF (PLC-3)
I/O scanner module(s)	1775-S4A, -S4B, -S5, -SR5, -SR
I/O modules	1771-IE
programming terminal	1770-T4, 1784-T45, -T47, -T50, IBM-compatible PC using 6200 or AI series PLC-3 programming software
PLC-3 industrial terminal cable	1775-CAT
Belden 8723 cable or equivalent	1778-CR
25-pin male connector kits	1770-XXP
DH+ cable	1784-CP

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If You Need Help ...



If you need additional assistance in installing or connecting your PLC-3 family programmable controller system, start with the troubleshooting section in the appendix of this quick start. If you still experience difficulty, call 1-800-9NEWLIT to order one of the publications suggested below or contact your Allen-Bradley service representative.

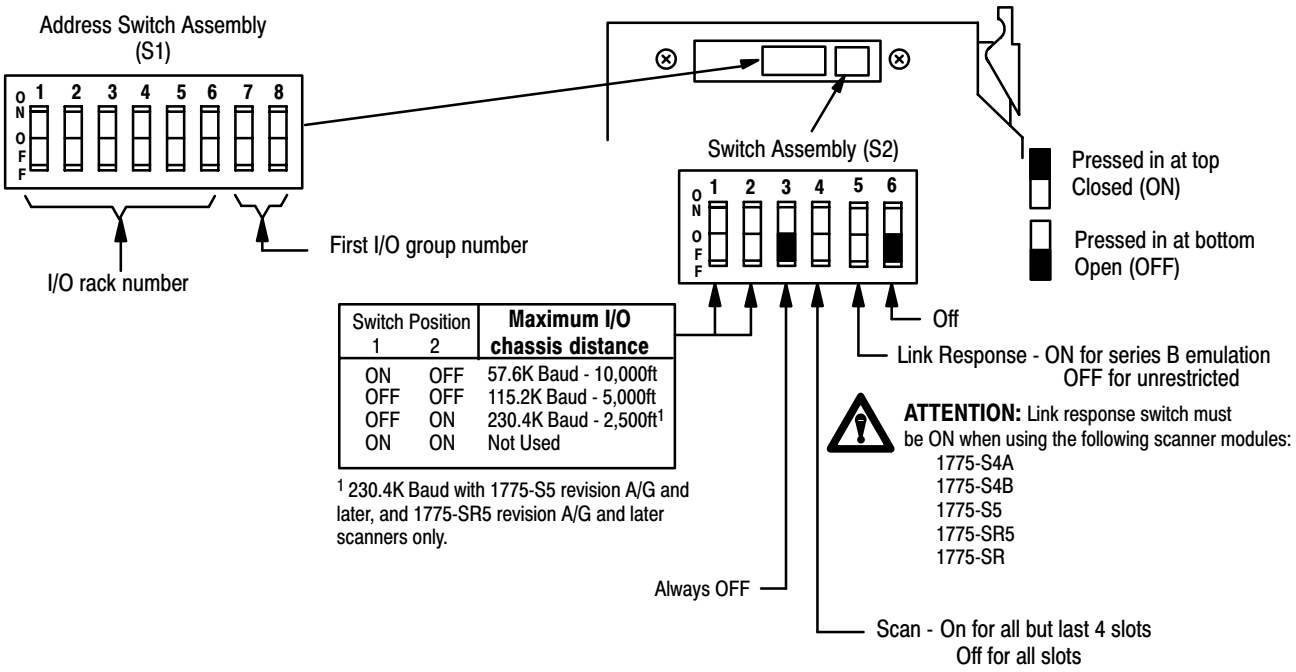
Publication title:	Publication number:
PLC-3 Programmable Controllers Installation and Operation Manual	1775-6.7.1
PLC-3 Family Programmable Controllers Programming Reference Manual	1775-6.4.1
Allen-Bradley PLC-3 Power Supply (1775-P1) Product Data	1775-2.4
PLC-3, -3/10 Family Memory Modules Installation Data	1775-2.27
PLC-3/10 Power Supply Module Installation Instructions	1775-5.1
PLC-3 Family I/O Scanner Communication-Adapter Module User Manual	1775-6.5.5
I/O Scanner-Programmer Interface Module User's Manual	1775-6.5.2
I/O Scanner-Message Handling Module	1775-6.5.3
PLC-3 Programmable Controller Backup Systems User Manual	1775–6.3.1

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Configure and Ground I/O and Processor Chassis

Configure I/O Chassis

a *Set the backplane switches.*

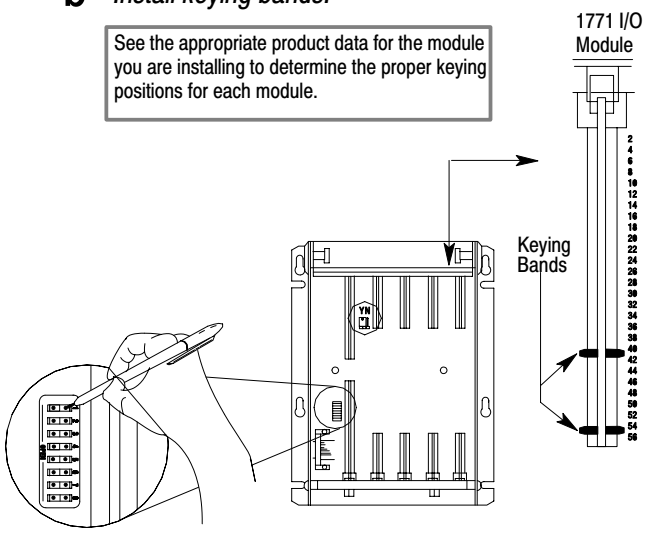


Switch Position 1	Switch Position 2	Maximum I/O chassis distance
ON	OFF	57.6K Baud - 10,000ft
OFF	OFF	115.2K Baud - 5,000ft
OFF	ON	230.4K Baud - 2,500ft[1]
ON	ON	Not Used

[1] 230.4K Baud with 1775-S5 revision A/G and later, and 1775-SR5 revision A/G and later scanners only.

b *Install keying bands.*

See the appropriate product data for the module you are installing to determine the proper keying positions for each module.

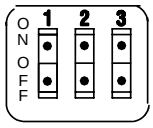


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Configure Processor Chassis

Set the backplane switches located near the upper left-hand corner of the chassis backplane.

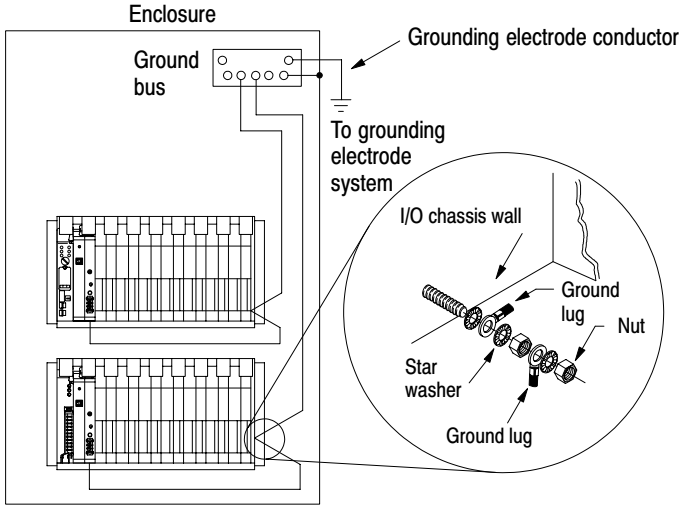
If you:	number the chassis:
are using expansion chassis	consecutively starting with 0
are not using expansion chassis	set the chassis number to 0 (processor module must be in chassis 0)



Switch:			Chassis Number
1	2	3	
off	off	off	0
on	off	off	1
off	on	off	2
on	on	off	3

ATTENTION: Number the chassis so that chassis o and the highest numbered chassis have the same power supply. Failure to configure the chassis in this way could result in unpredictable operation.

Ground Processor and I/O Chassis

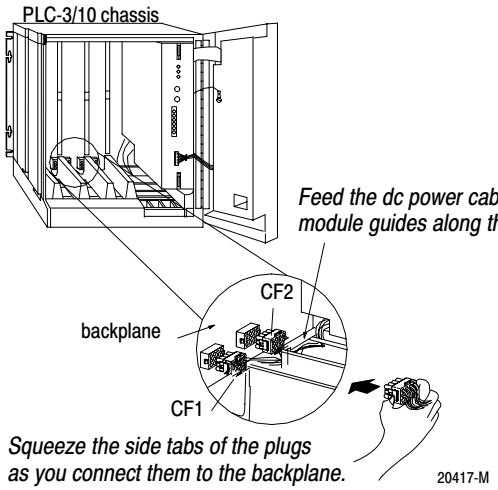


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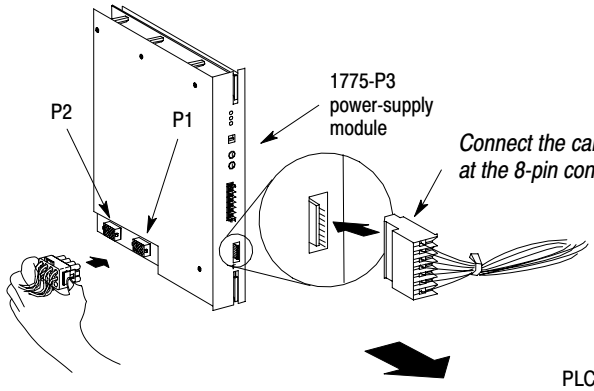
Install Power Supply

Install 1775-P3 Power Supply into the PLC-3/10 (or single-chassis PLC-3)

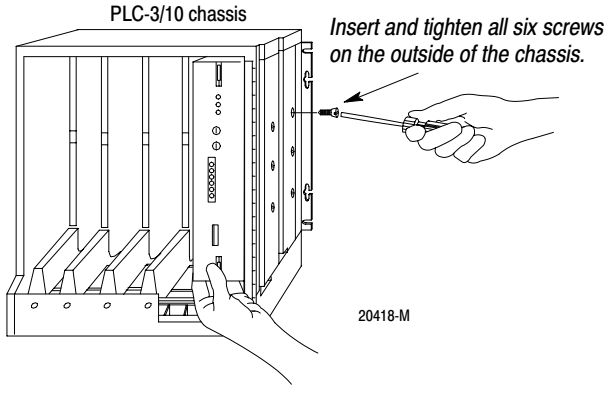
a *Install the dc power cable.*



b *Plug the cable assembly into the connectors on the power-supply module, connect the 8-pin control connector cable to the power-supply module, and insert the power-supply module in the right-most slot of the chassis.*

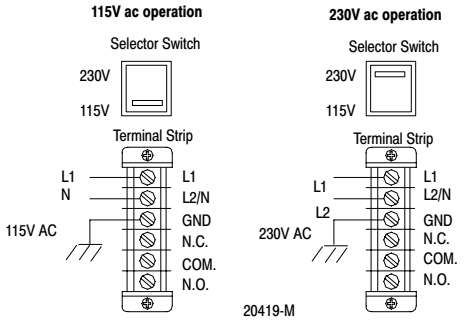


When you install the 1775-P3 power supply into a PLC-3/10, if there is a jumper plug (PN 967447-01) installed on the 8-pin control-connector terminals, remove and discard it.



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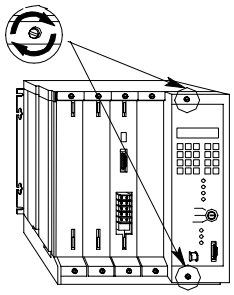
c *Set the voltage switch for the proper range.*



ATTENTION: Be sure to set the voltage selection switch properly or you may damage the power-supply module.

d *Connect the ac power line to the terminal strip on the power-supply module and connect any relay wires, then insert the PLC-3/10 module(s) into the chassis and turn the ac power on.*

e *Close the front door of the chassis and rotate the two retaining screws approximately 2-1/2 turns counter-clockwise.*



f *Turn on dc power and make sure the indicators on the power-supply module are lit as follows:*

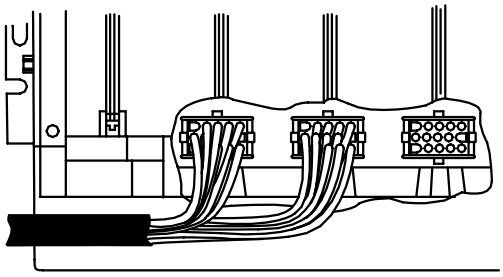
Indicator	Normal Operation	Means
AC ON	red	ac power is supplied to the unit
AC OK	green	ac line voltage is equal to or greater than the required minimum ac voltage
DC OK	green	the supply's internal dc voltages are in their proper operating range

If you don't see this, refer to chapter 8 for troubleshooting information.

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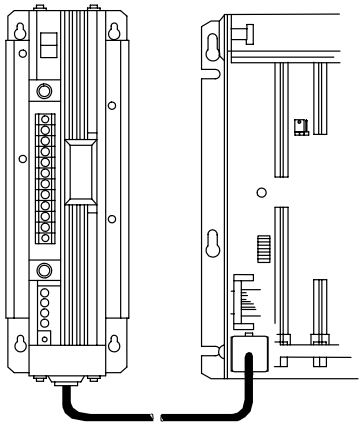
Install 1775-P1 Power Supply into the PLC-3

a *Connect the 1775-CAP chassis power cable to the processor chassis.*

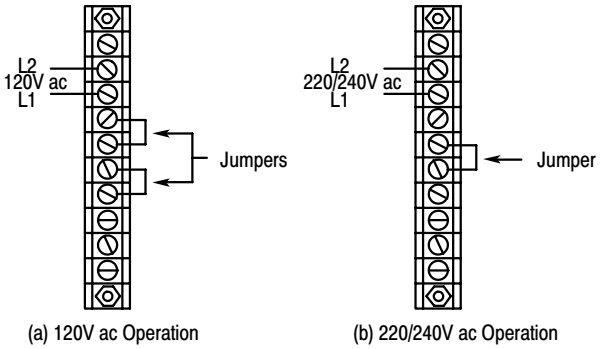


b *Optionally, connect the I/O chassis to the power supply using an I/O power cable.*

We do not recommend this connection for backup system configurations.



c *Make AC power connections.*



(a) 120V ac Operation (b) 220/240V ac Operation

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Install Processor, Memory, and Scanner Modules

Connect Front Panel Cable and Install Processor

Install the processor in the first slot on the left of the chassis for the best heat dissipation.
You must install the processor in the chassis numbered 0 if you are using expansion chassis.

Install Memory Module(s)

a *Remove power to the processor chassis.*

b *Insert the memory module into the processor chassis, guiding the module into the plastic tracks on the top and bottom of the slot.*

c *Snap the chassis latch over the top of the module to secure its position.*

(for PLC-3 processor only) d *Set the thumbwheel switch.*

If you are installing:	Set the thumbwheel switch(es):
one memory module	1
more than one memory module	consecutively, starting at 1

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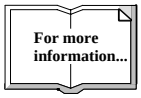
Install I/O Scanner Module(s)

ATTENTION: Do not change the thumbwheel setting on a scanner while power is on or equipment damage may result.

a *Set each thumbwheel switch to a unique number between 1 and 15.*

You must have a scanner with the thumbwheel set for 1. If you are installing a multiple chassis PLC-3 system, the scanner module whose thumbwheel you set to 1 must be in the chassis with the front panel.

b *Set the necessary switches for your application of the scanner module.*



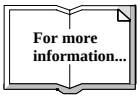
For information about switch settings, see the user manual for your particular scanner module. Some examples of switch settings for scanner modules include backup options, DH+ communication, station number identification, and termination.

c *Install the scanner module into any slot of the processor chassis.*

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Install, Wire, and Connect I/O

Install and Wire I/O Modules

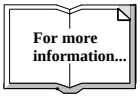


Specific wiring information for each type of I/O module is contained in the product data publication for that specific module. Therefore, refer to the appropriate product data publication when you follow these steps.

a *Open each module locking bar and insert each I/O module into the slot keyed for it. After you install each module group, secure the modules in place with the module locking bar.*

b *Snap each field wiring arm onto the the horizontal bar on the lower front edge of the I/O chassis, then swing each arm up to connect on the front edge of its module, pushing each arm until the locking tab holds it in place.*

c *Remove the terminal cover from each wiring arm and connect the wires between the I/O devices and the wiring arm terminals.*



Trim and strip the wires as necessary, and make certain that each wire is firmly in place. See chapter 3 of the PLC-3 Programmable Controllers Installation and Operation Manual, publication 1775-6.7.1, for more information.

d *Connect the power and ground wires.*

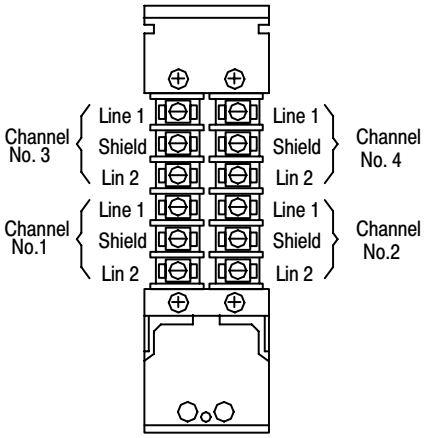
e *Use tie wraps to gather the wires at each wiring arm, then bundle the wires so the arms can pivot freely.*

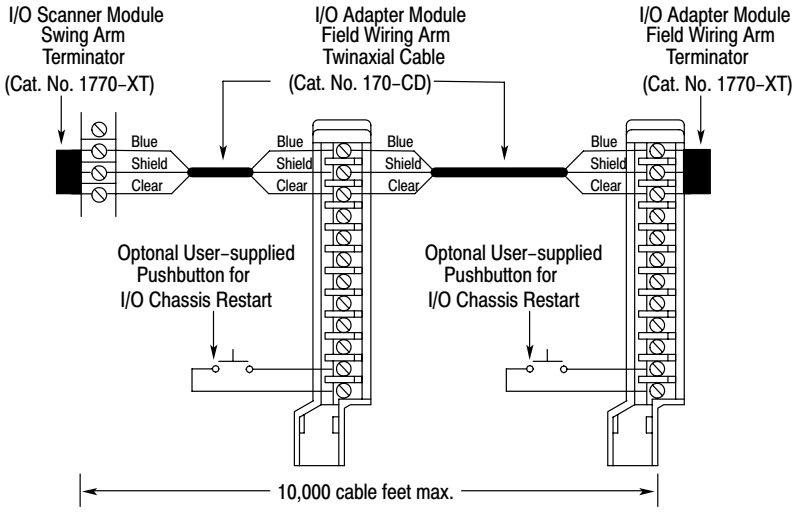
f *Replace the terminal covers and label the terminal status indicators appropriately.*

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Connect I/O

Connect the I/O scanner to the RIO adapters.





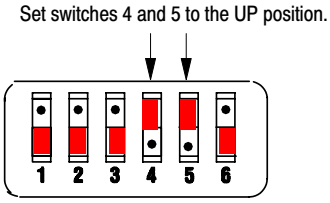
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Configure a Personal Computer

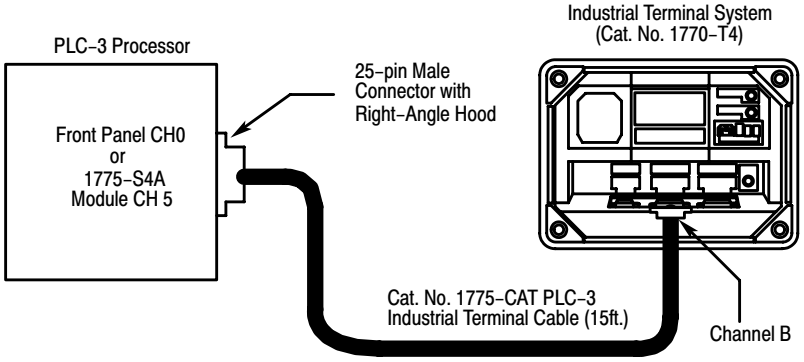
Configure and Connect 1770-T4 Programming Terminal

a *Remove the keyboard from the industrial terminal and locate the switch assembly on the front of the terminal.*

b *Set the terminal switches.*

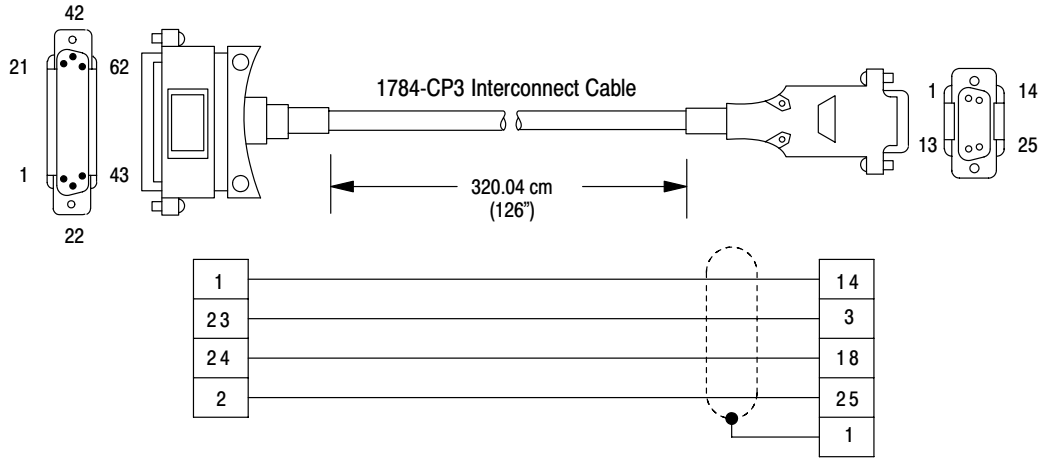


c *Connect terminal to processor using a 1775-CAT cable.*



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Connect to Personal Computer



Using 6200 Programming Software

For more information...

For specific information about using 6200 programming software, see the PLC-3 Programming Software Configuration Manual, publication 6200-6.4.16.

Any Allen-Bradley or IBM and IBM-compatible machine can be used as a programming device using 6200 or Application Interface (AI) programming software.

Before you install the 6200 PLC-3 programming software, you need the following:

- 640 KBytes of RAM as base memory (expanded or extended memory not required)
- 10 MBytes of disk space for storing files.
- Allen-Bradley DOS version 3.2*x* if you use a 1784-T50 or 1784-T45 programming terminal. If you use a 1784-T47 programming terminal use DOS 4.01. If you use an IBM PC/XT, IBM PC-AT, or IBM-compatible programming terminal, use DOS 3.2, 3.3, 4.*x,* or 5.0.
- monochrome or color graphics monitor
- installed 1785-KL, -KTP, -KT, -KT2, -KTK1 card

If your 1784-T50 has DOS version 2.11 or earlier, you must upgrade to the current version of Allen-Bradley DOS. The current version of Allen-Bradley DOS is version 3.21.

Using AI Programming Software

For more information...

For specific information about using AI programming software, see the PLC-3 Ladder Logistics Manual, publication 9399-L3man-06.01.89.

Before you install the AI PLC-3 programming software, you need the following:

- IPM PC XT, AT or compatible computer with DOS 2.1 or later
- monitor and graphics board. These display types are supported:
  monochrome display system
  CGA display system
  EGA display system
  VGA display system
- 640K RAM of system memory
- a floppy drive and a hard drive

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Troubleshooting and Specifications

Power-supply Module Indicators

If you don't see the power-supply module indicators lit as specified on page 3-2, use the following table to troubleshoot the problem.

Indicator:	Normal Operation:	If Not Lit:
AC ON	red	no ac power is being supplied to the unit
AC OK	green	an insufficient amount of ac power is being supplied to the unit
DC OK	green	the supply's internal dc voltages are not in their proper operating range

If the AC ON indicator is lit and either the AC OK or DC OK indicators are not lit, you must shut down ac power (or toggle the remote on/off for the PLC-3/10 chassis or lift and return the module interlock bar on the PLC-3 chassis) to reset the supply. If this does not clear the situation, you must troubleshoot the chassis using the PLC-3 Family Controllers Installation and Operation Manual, publication number 1775-6.7.1.

Specifications

Specifications for PLC-3 processors follow.

PLC-3 System

I/O Capacity

- 4096 inputs and 4096 outputs maximum

Memory Capacity

- 1.92M words maximum
- 16 bits per word

Data Table Size

- Expandable (limited only by available memory)

Scan Time (nominal)

- 1 ms per 1K words of relay-type instructions
- 2.5ms per 1K words (typical)

1775-P1 Power Supply

Input Voltage

- 120V AC: 97 to 132V AC
- 220/240V AC: 194 to 264 V AC

Memory Type

- Error Detecting and Correcting (EDC)

Alternate Language Modules

- 1775-S4B scanner module
- 1775-GA module

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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Specifications for PLC-3/10 processors follow.

PLC-3/10 System

Dimensions

- 19 by 20 by 14.5" (483by508 by 368 mm) mainframe and power supply

Mounting

- Panel or 19 inch rack mount

I/O Capacity (per system)

- 2048 inputs and outputs (total, any mix)
- 2048 inputs and 2048 outputs (total, complementary)
- 2 scanners (max)

Scan Time (nominal)

- 1 ms per 1K words of relay-type instructions
- 2.5ms per 1K words (typical)

Memory

- 16, 32, 64 or 128K of Error Detecting and Correcting (EDC) (128K maximum)
- 16 bits per word

Data Table Size

- Expandable (limited only by available memory)

Environmental Conditions

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

1775-P3 Power Supply

Input Voltage

- 115V AC
- 230V AC

Input Voltage Range

- 115V AC: 97 to 132V AC
- 230V AC: 194 to 264V AC

Input Current

- 115V AC: 3.0A @ 97V AC
- 230V AC: 1.5A @ 194V AC

Frequency Range

- 47 to 63Hz

Output Voltage @ Rated Current

- +5V DC: 28A ± 16V DC: 1A (total)

Overcurrent Shutdown Limit

- 125% of rated current

Input Power

- 210W(nom)

Fuses

- (2) 5A, 250 Volt, Slow Blow

Power Interlock Relay Contacts Rating

- 1A maximum, 250V maximum

Terminal Strip Wire Size

- 14AWG (max.)

External Transformer Rating (if used)

- 1000VA maximum (1 kVA)

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