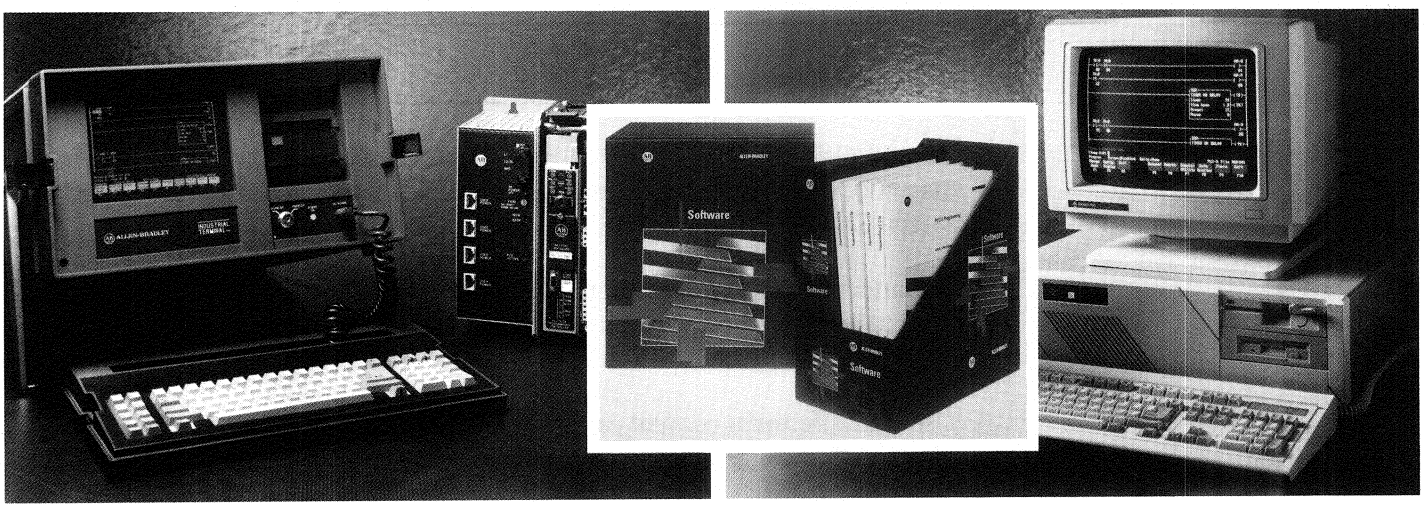
ALLEN-BRADLEY

PLC-5 Programming Software 6200 Series

Product Data



Develop programs online or offline. You can develop, document, and maintain ladder logic programs online while directly connected to a processor, or offline on a stand-alone programming terminal. Online also attaches to any processor on your Data Highway Plus.

Master one 6200 series software package, and you master them all. The PLC-2, PLC-3, PLC-5, and PLC-5/250 programming software packages use the same menu structure. So once you learn to use the PLC-5 programming software, you can quickly adjust to using any of the other 6200 series software packages.

Rely on Allen-Bradley support and service. You can use the software with the confidence that no one knows your Allen-Bradley processors better than Allen-Bradley. And Allen-Bradley supports its software with phone support, warranties, and support continuation programs.

Benefits

System Configuration

I/O rack support. The software supports the following number of I/O racks:

This Processor:	Supports Rack Numbers:	For:
PLC-5/10, -5/12, -5/15	0 – 3 octal (4 full racks)	512 inputs 512 outputs
PLC-5/25	0 – 7 octal (8 full racks)	1024 inputs 1024 outputs
PLC-5/40, -5/40L	0 – 17 octal (16 full racks)	2048 inputs 2048 outputs
PLC-5/60, -5/60L	0 – 27 octal (24 full racks)	3072 inputs 3072 outputs
6008-LTV	0 – 3 octal (4 full racks)	512 inputs 512 outputs

With PLC-5/40, -5/40L, -5/60 and -5/60L processors, you can scan a rack more than once by manually configuring the scan list in the processor configuration screens.

Expanded local I/O. The channel configuration and status screens for PLC-5/40L and -5/60L processors let you auto-configure, control and monitor expanded local I/O racks. You can have up to 16 local chassis.

Use multiple main control programs. With PLC-5/40, -5/40L, -5/60 and -5/60L processors, you can have up to 16 main control programs controlling your process. Each main control program can be a sequential function chart or a ladder program that controls one aspect or one machine of your process. You can also inhibit a main control program through a ladder program or through the processor configuration screens. Using main control programs helps modularize your program and makes troubleshooting easier.

Configure Channels for Communiation. You can configure up to four channels for scanner, adapter, and DH+ communications on PLC-5/40 and -5/60 processors and two channels on PLC-5/40L and -5/60L processors.

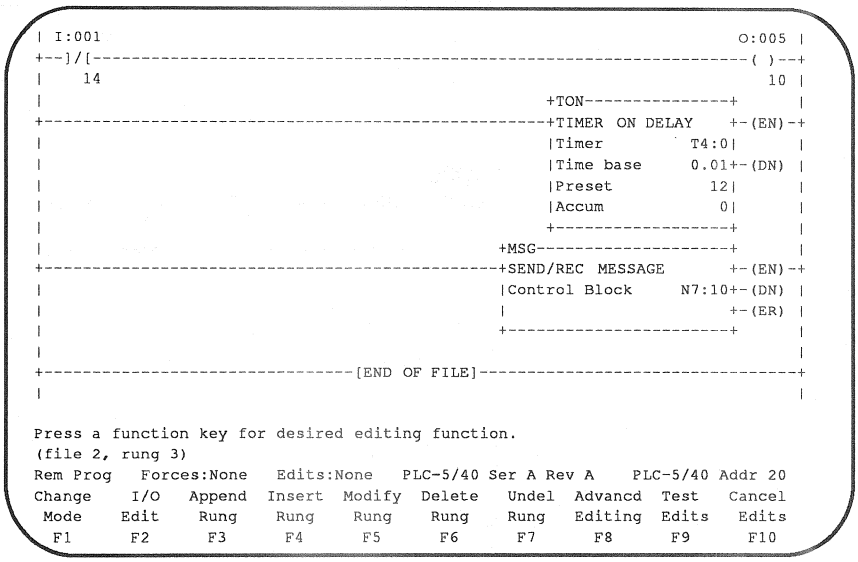
Programming through the RS port. Using channel 0 directly connected to your computer's serial port, you can program PLC-5/40, -5/60, -5/40L and -5/60L processors in System mode using DF1 protocol. You can also access data for PLC-5/40, -5/60, -5/40L and -5/60L processors in System mode using point-to-point or DF1 protocol (to connect terminals, modems, KF2 modules).

By configuring channel 0 for User mode, you can access ASCII data using serial communications (to connect ASCII terminals, bar code readers, dataliners, etc.).

Create and Edit Ladder Logic Programs

The ladder editor lets you create new or modify existing ladder logic programs. Figure 1 shows a sample ladder program. You can use the available function keys to enter instructions and use the software prompts to enter addresses, or you can type instructions and addresses directly on the command line.

Figure 1
Develop Ladder Logic



Search for and replace instructions and addresses. You can search for instructions and addresses within ladder logic programs. To specify an instruction or address, use the available function keys or type the instruction or address directly on the command line. When the software locates the item you specify, you can replace that item with a different instruction or address. The search utility also lets you search for rungs marked as insert, replace, and delete zones.

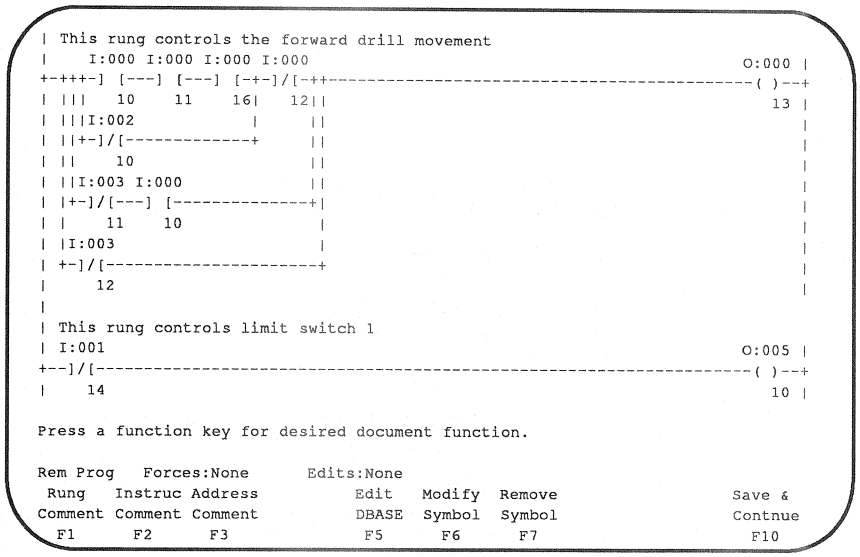
Cut, copy, and paste instructions and addresses. You can cut and copy groups of rungs from a specific program file and paste those rungs in the same program file or in a different program file. You can also save cut or copied rungs to disk files for use with other processor memory files and then view the saved files.

Compare Online and Offline Processor Memory. You can compare ladder logic, force table entries, data table entries and program directories between two online processors, two offline processor memory files, and between online processor memory and an offline processor memory file and create a report of the differences.

Access help text. The ladder editor also includes help. If you press **[Alt-H]** from any screen in the ladder editor, the software displays contextual information about where you are in the ladder editor. From the context information, you can then select further information about additional topics or any of the PLC-5 instructions.

Document rungs, instructions, and addresses in ladder programs. As you create and edit ladder programs, you can use the documentation utility to add rung, instruction, and address comments to your files. You can also assign symbols to addresses. A symbol is a name (up to ten characters) you use instead of an alphanumeric address. Figure 2 shows sample rung comments and your documentation options.

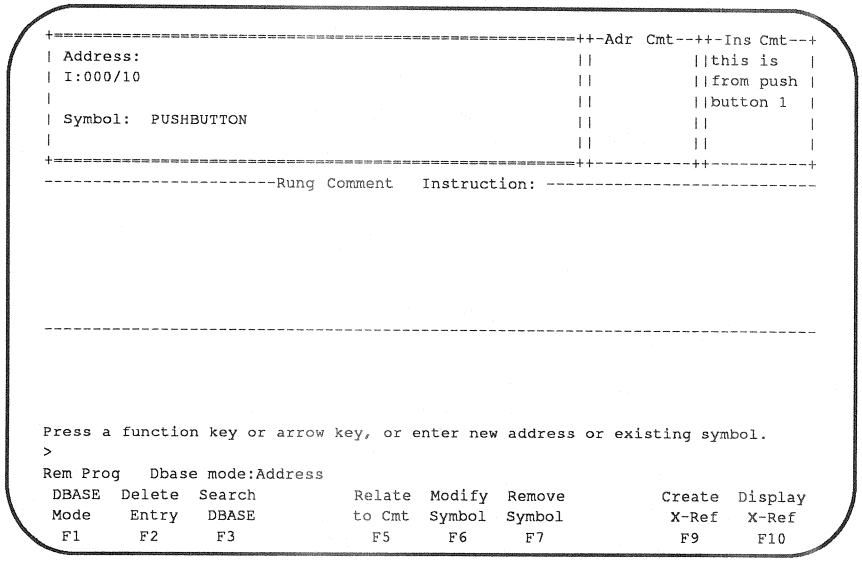
Figure 2
Enter Comments and Symbols Using the Documentation Screen



Comments and symbols make understanding and debugging ladder programs easier because they help explain the ladder logic. The software stores comments and symbols in files on the hard disk of your programming terminal.

Edit comments and symbols from a database. You can use the database editor to search for, replace and edit the rung comments, instruction comments, address comments, and symbols you define for a processor memory file. Figure 3 shows the database entry for an address that has an address comment, an instruction comment, and a symbol.

Figure 3
Edit the Comment and Symbol Database



Generate and view address cross-references. Use address cross-references to:

- track addresses used as both input and output addresses and display this information on a rung
- view a list of addresses used in the processor memory file and go to a rung using one of the addresses listed

Convert files to ASCII text files. Re-use existing work by exporting these comment and symbol files and processor memory (ladder logic for your programs) to ASCII text files.

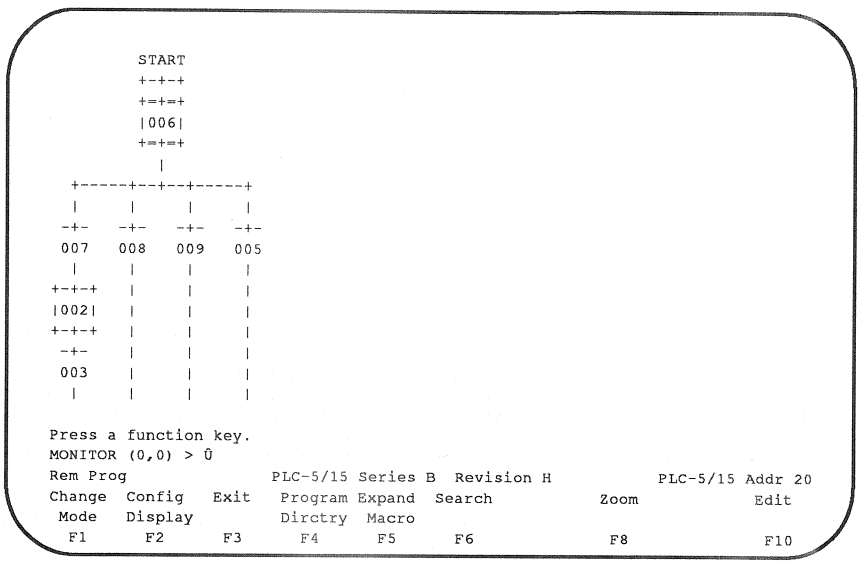
Then you can use popular word processing packages to edit the files. When you finish modifying the files, you can import them back to the format that the programming software uses. This flexibility of converting files lets you:

- edit comments and symbols with your own word processing packages and then easily re-use them between processor memory files
- edit ladder logic away from your programming site and store programs for safekeeping

Create and Edit Sequential Function Charts

The sequential function chart editor lets you create and modify sequential function charts (SFCs). An SFC is a structured programming tool that uses steps and transitions to control the flow of ladder program files. A step corresponds to a control task; a transition corresponds to a condition that must occur before the programmable controller can perform the next control task. Figure 4 shows a sample SFC.

Figure 4
Control Program Flow with a Sequential Function Chart



Use SFC Auto Scrolling. You can configure your SFC display so that, when in RUN or TEST mode, the portion of the SFC that is active will automatically scroll onto the screen. The cursor highlights steps as they become active (i.e., you can see which steps are active at any given time).

Use Step Actions. PLC-5/40, -5/40L, -5/60, and -5/60L processors support step actions. An action is a subset of a step; in each step you can assign up to 8 ladder files (actions) and specify when and how each should be executed (qualifiers). (If you are using a PLC-5/10, -5/12, -5/15, or -5/25 processor, you assign ladder programs directly to steps.)

Force SFC Transitions. With PLC-5/40, -5/40L, -5/60, and -5/60L processors, you can force transitions on or off to control your program flow for diagnostic purposes.

More advanced functions of the SFC editor let you:

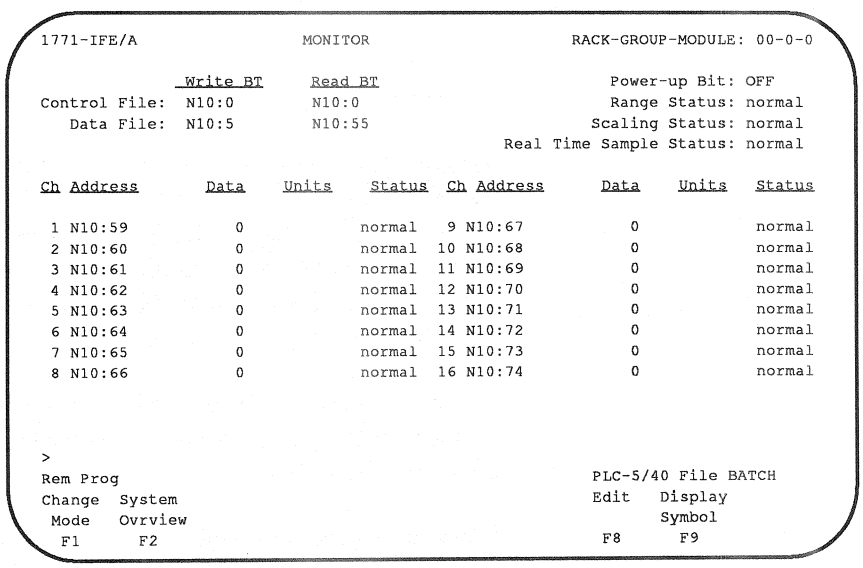
- Use branch structures to direct program flow
- Search for SFC structures
- Use GOTO statements and labels to alter normal program flow
- Create sub-charts (macros) within your SFC to help modularize and organize your SFC
- Assign names and comments to macros, steps and transitions to easily identify the operation of the macros, steps and transitions of your program (PLC-5/40, -5/40L, -5/60, -5/60L processors)

Configure and Monitor Intelligent I/O

Configure intelligent I/O modules in your system. The I/O Configuration utility in the programming software helps you configure intelligent I/O modules through a series of menu-driven screens. The software accesses module-specific information in processor memory. Module-specific information can consist of module configuration information, I/O data values and module status information.

Monitor analog I/O modules. With the I/O configuration utility, you can also monitor the online operation of intelligent I/O modules. Figure 5 shows status information for an online 1771-IFE analog I/O module.

Figure 5
Monitor a 1771–IFE Analog Module Online

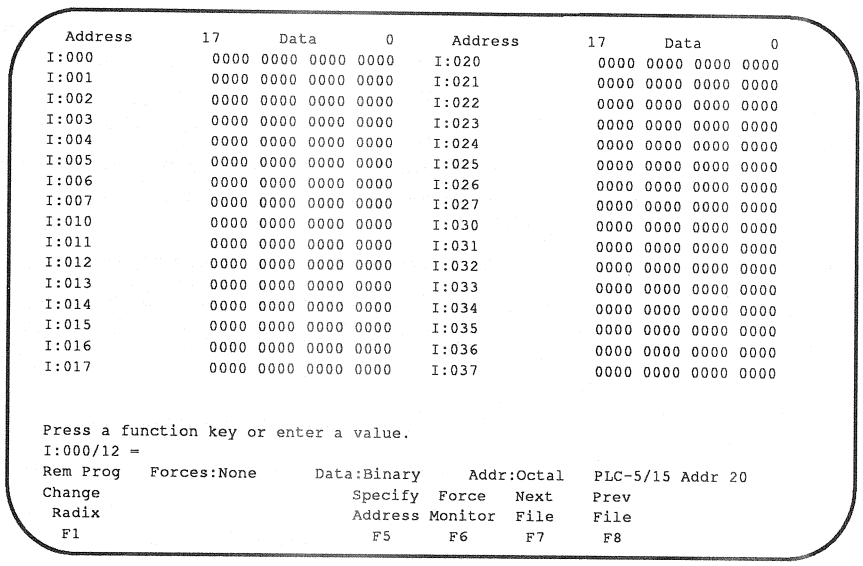


Monitor Data Table Files and Program Files

The programming software provides utilities that let you monitor data table files and program files. The information you monitor helps you troubleshoot problems in a processor memory file.

Monitor data. You can monitor the data values the processor produces. You can monitor several different types of data table files, including input/output, timer, counter, integer, floating point, and status files. Figure 6 shows sample data for an input address. You can also display the data in a binary, octal, decimal, hexadecimal/BCD, or ASCII format, whichever fits your application the best.

Figure 6
Monitor Data Values at an Input Address



Monitor and allocate processor memory. The software provides a program directory and a memory map. You use the program directory to display the program files for the current processor memory. You use the memory map to display the data table allocations that show where the processor stores different types of data. The memory map displays the size and type of each memory storage area that is allocated in processor memory.

Produce a contact histogram. A contact histogram records the transition time of a specific memory location. You can generate a contact histogram for any data table bit or word.

Force inputs and outputs. Forcing inputs and outputs lets you turn specific bits on or off when you test your program operation. Use forcing to override program operation or to control an input or output device.

Display system status. You can display system status information about the processor you are using. This status information tells you what processor you are using, as well as characteristics about that processor, such as major and minor fault status.

Maintain and Re-use Existing Work

The programming software has file operation utilities that let you maintain and re-use the disk files associated with a processor memory file. With these file operations you can:

- Rename a processor memory file, comment and symbol file, exported comment and symbol file, exported processor memory file, documentation report file, or processor-memory rung cut file.
- Copy the contents of a processor memory file, comment and symbol file, exported comment and symbol file, exported processor memory file, documentation report file, or processor-memory rung cut file to another file within the same directory.
- Copy to and from a floppy these files: processor memory, cross-reference, comment and symbol, exported comment and symbol, exported processor memory, documentation report, or processor-memory rung cut file. Use the copies as backup files.
- Delete a processor memory file, cross-reference file, comment and symbol file, exported comment and symbol file, exported processor memory file, documentation report file, or processor-memory rung cut file.
- Merge the documentation files of one processor memory file with those of another processor memory file; you can also merge the program files of one processor memory file with those of another processor memory file through the Program Directory.
- Compare ladder logic, data table, force table and program directories between online processors, between an online processor and an offline processor memory file, or between two offline processor memory files and create a report of the differences.

Generate Reports that Describe Your Processor Memory File

The reports you can generate provide comprehensive information about your processor memory file. You can use this information to troubleshoot, maintain, and upgrade your present processor memory file. After you generate a report, you can either view the report from your programming terminal or print the report.

You specify the amount of detail you want in each available report; you also select which reports you want. Table A lists the reports you can generate.

Table A
Available PLC-5 Reports

This Report:	Provides This Information:
Ladder Program Listing	A printed copy of your ladder program
Ladder Cross -reference	What addresses are used by which rungs in your ladder program
SFC Listing	A printed copy of your Sequential Function Chart program
SFC Cross-reference	What program files are used by which steps and transitions in your Sequential Function Chart
Memory Map	The amount of processor memory assigned to each data file type
Processor Status	The data in the processor status file and channel configuration/status information for PLC-5/40, -5/40L,-5/60, and -5/60L processors
I/O Status	Status of the I/O configured with the processor
Data Table	The values in the data table
Force Status	Which bits are forced on or off
Symbol Table	The symbols used and their associated addresses
Unused Addresses	Which addresses have comments, are in the database and are not used in program files
Memory Usage	Which addresses are used in your program
Program Directory	The types of program files that are defined and the associated file names and sizes

Choose a Communication Set-up for Your System

The programming software lets you use the following communication interfaces between your programming terminal and processor:

- 1784-KT, 1784-KT2 or 1784-KTK1 to connect a T60, T35, T50, IBM personal computer, or IBM-compatible programming terminal (including microchannel computers) directly to a programmable controller or to a DH+ link or DH II that contains programmable controllers. Figure 7 shows a 1784-KT connected to a processor on a DH+ link.
- 1784-KL/B Series B to connect a T47 programming terminal to a programmable controller (Figure 8)

Figure 7
Connection to DH+ through 1784–KT Communication Interface Module

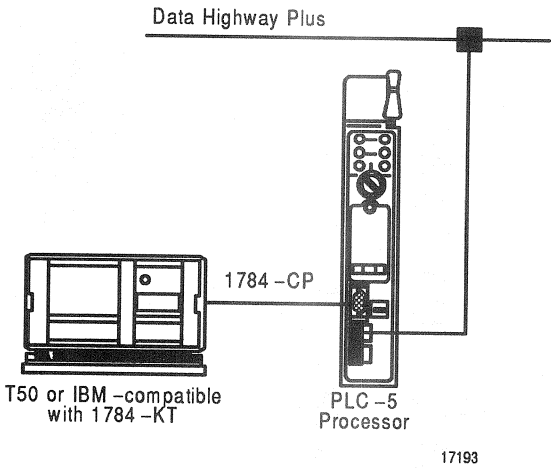
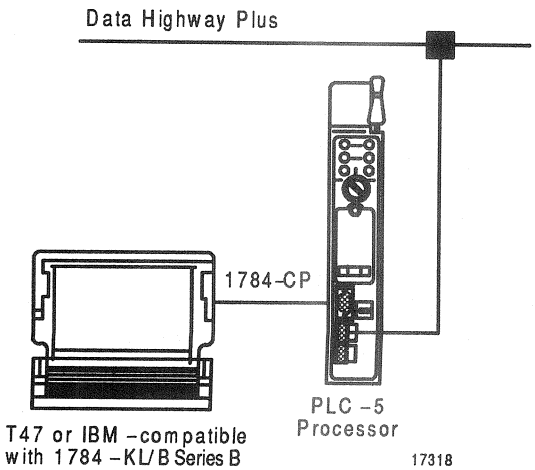


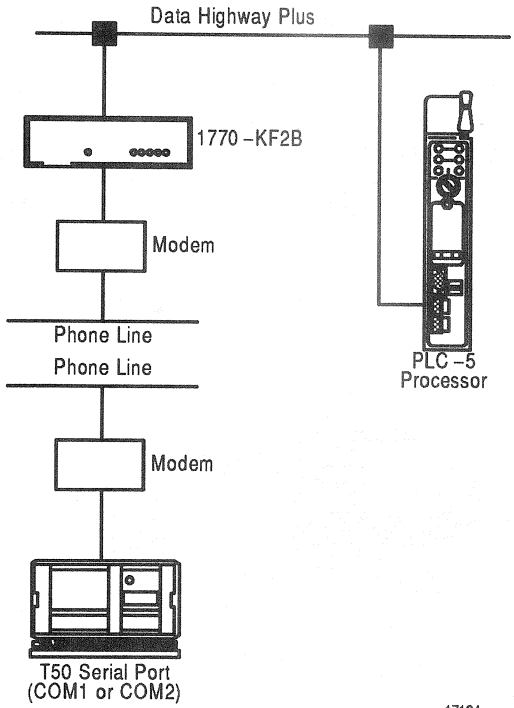
Figure 8
Direct Connection through 1784–KL/B Series B Communication Interface Module



Use a serial port. You can use a direct connect (PLC-5/40, -5/60 processor s, channel 0) or use a COM1 or COM2 serial port and a 1770-KF2 Series B or 1785-KE Communication Interface Module to connect a programming terminal to a programmable controller through a DH+ link.

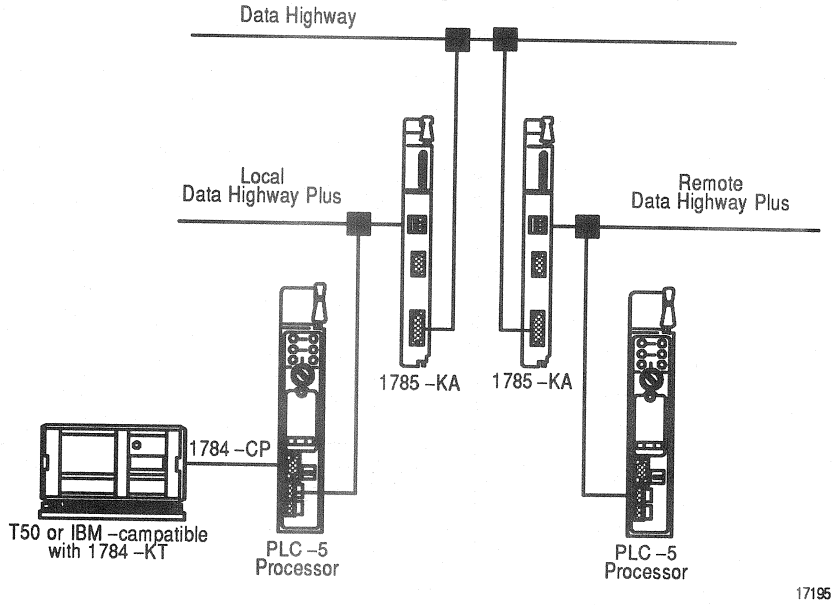
Use a modem. You can use a serial port, 1770–KF2B or 1785–KE, and an external modem to connect a programming terminal to a programmable controller through a DH+ link (Figure 9).

Figure 9
Modem Connection through a Serial Port to a DH+ Link



Attach to a programmable controller that is on a remote DH+ link. While connected to your DH+ link with a 1784-KT or 1784-KL/B Series B communication board, you can attach to any programmable controller on a remote DH+ link in the Data Highway network (Figure 10). This remote programming option expands the range of processors you can use for program development.

Figure 10
Example DH+ to DH to DH+ Network Configuration



Configure the Software for Your Application

The programming software has utilities that let you configure the terminal display to best fit your needs and environment.

Select colors for display on color monitors. The programming software provides a color selection utility from which you can select foreground and background colors for the different items that the software displays. For example, you can select foreground and background colors for prompts and messages.

Select display options from configuration screens. The programming software has several configuration screens that let you select what you want a ladder editor or SFC screen to display. For example, in the ladder editor, you can select whether the software displays only one rung of ladder logic per screen, as many rungs as will fit, or only the rungs you select.

General User Interface

The programming software organizes its functions in a hierarchical, tree structure. For a complete overview, contact your Allen-Bradley sales representative or distributor for a demonstration.

You access functions by pressing the appropriate function key on a given menu. For example, the main menu shown in Figure 11 shows the features listed in Table B.

Figure 11
Select Options with Function Keys

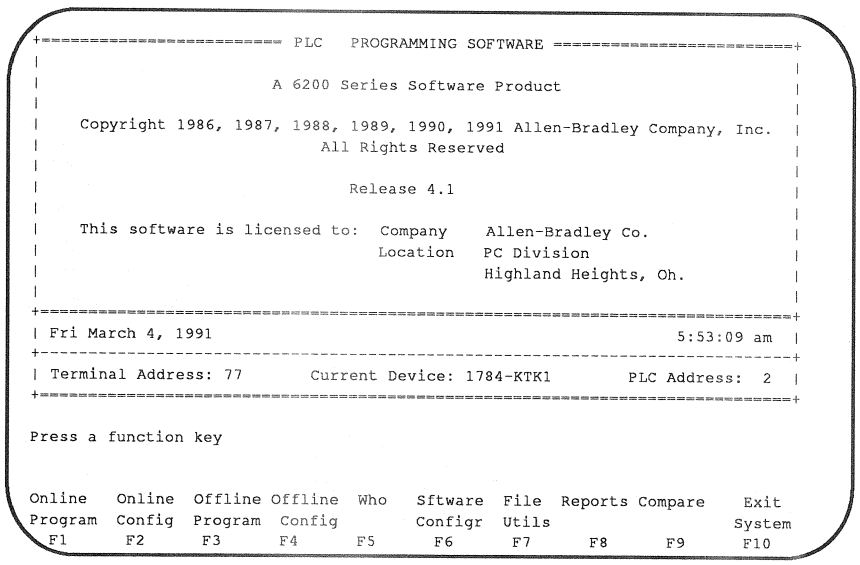


Table B
Example Function Keys

If You Want to:	Press This Key:
Create and edit ladder programs and SFCs when your terminal is attached to the processor.	[F1] – Online Programming/Documentation
Specify the communications hardware configuration between your terminal and the processor.	[F2] – Online Configuration
Create and edit ladder programs and SFCs without being attached to a processor.	[F3] – Offline Programming/Documentation
Select a processor memory file to edit offline.	[F4] – Offline Configuration
See what stations are active on your DH+ link.	[F5] – WHO
Select system options, color options, directory paths, printer configurations, and startup states.	[F6] –Software Configuration
Manipulate disk files.	[F7] – File Utilities
Create, print or view documentation reports and histograms.	[F8] – Reports
Compare ladder logic, data table entries, force table entries and program directories between two online processors, between two offline processor memory files or between an online processor and an offline processor memory file.	[F9] – Compare
Exit the system.	[F10] – Exit System

The software also provides configuration options that let you start the software at a screen other than the main menu and short cuts (Alt key combinations) that let you jump to certain screens without having to select a function key on each intervening screen.

System Requirements

The PLC-5 programming software is available on either 3 1/2" or 5 1/4" disks. Table C lists the catalog number for the available PLC-5 programming software packages.

Table C
Available PLC-5 Programming Software Packages

3 1/2" Disks		5 1/4" Disks	
6201–PLC5	PLC-5 Programming Terminal SW Online Programming and Documentation	6211–PLC5	PLC-5 Programming Terminal SW Online Programming and Documentation
6203–PLC5	PLC-5 Programming Terminal, Dev and Doc SW Online and Offline Programming and Documentation	6213–PLC5	PLC-5 Programming Terminal, Dev and Doc SW Online and Offline Programming and Documentation

To use the software, you need a compatible programming terminal that has the correct system hardware. The following tables list the types of programming terminals you can use and the system requirements for a programming terminal.

You can use any of the programming terminals listed in Table D below:

Table D
Tested Programming Terminals

Manufacturer:	Product:
Allen-Bradley	• 1784-T35 • 1784-T50 • 6160-T60 • 1784-T45 • 1784-T47

Your programming terminal must have the DOS system hardware listed in Table E below:

Table E
Required DOS System Hardware

Computer Hardware	• 5.0 Mbyte hard disk space (for 6200 software) • 640 Kbyte RAM to run 6200 Series software online. To run the software offline, we recommend an additional 384 Kbytes of extended or expanded memory • floppy disk drive (5 1/4" or 3 1/2") • monochrome or color monitor
Operating System	• DOS 3.2, 3.3, or 4.x • A-B DOS 3.2*x* (T50, T45), 4.01 (T47)
Printer Interface	• parallel or serial • 80, 132, or 255 columns
Communication Hardware	Use one of the following processor communication interface modules: • 1784–KT (DH, DH+, DH II) • 1784–KT2 (DH, DH+, DH II) • 1784–KTK1 (DH+) • 1784–KL/B Series B –T47, T45 (DH+, DH II) • 1770-KF2 Series B (serial to DH+) • 1785–KE (serial to DH+)

Software Support and Service

Allen-Bradley Support Program

When you purchase the PLC-5 programming software and return the software registration card, Allen-Bradley provides a support agreement for one year that includes:

- Software and documentation updates
- Telephone consultations
- Software newsletters
- Technical tips available on an electronic bulletin board

After one year, to continue to receive this software support, you can purchase additional coverage in one year increments through Allen-Bradley's support continuation program.

Allen-Bradley Distribution Network

Allen-Bradley uses local distributors to ensure quick turn-around on your orders and local support. While no one knows your Allen-Bradley PLC-5 processors better than Allen-Bradley, no one knows your local situation better than your local Allen-Bradley distributor.

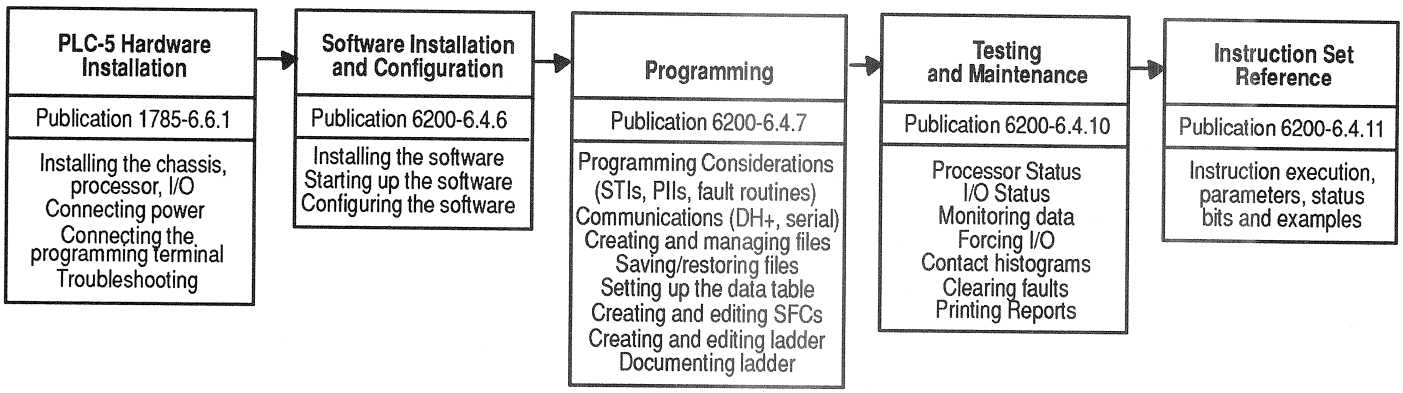
PLC-5 Programming Software Documentation

Your PLC-5 programming software purchase includes five manuals, which are organized according to the tasks you perform. These manuals are:

This Module:	Explains:
PLC-5 Family Hardware Installation	how to install your PLC-5 processor and I/O and how to configure the hardware in your system
Software Installation and Configuration	how to install, start up and configure 6200 Series Software
Programming	considerations for programming your system, basics of file handling, and ladder and SFC program entry, edit and documentation
Testing and Maintenance	the tasks and procedures for starting up and maintaining your program
Instruction Set Reference	instruction execution, parameters, status bits, and programming examples

Figure 12 shows you how the five manuals fit together as a set and describes the tasks each manual covers.

Figure 12
6200 Series Documentation Set



This documentation set structure lets you find the information you need without having to read through information unrelated to your current task.

Allen-Bradley Training Program

After you purchase the PLC-5 programming software, you may decide that you want further training. You can send your PLC-5 programmers to Allen-Bradley PLC-5 programming courses. For information about available training programs, contact your local Allen-Bradley sales office or distributor.

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