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Process application products from several Rockwell Automation brands and our new ProcessLogix Process Control System help you implement cost-effective, incremental process improvements tailored to your process and process needs. With these products, you'll be able to improve the way you monitor and control a new pilot production line or enhance the way you configure, maintain, and control existing processes.

Our process application products build on the reliability of familiar tools and technologies to help you quickly and easily develop your configuration, monitoring, and control capabilities. For instance, the ProcessLogix Process Control System implements the latest ControlLogix and ControlNet products.

With the formation of our Process Business Unit, additional resources have been added to make sure that customers have the help they need to assist them in configuring, commissioning, and maintaining process control systems based on process control products from Allen-Bradley and Rockwell Software.

The ProcessLogix Process Control System is not our first venture into process control. Since the inception of the PLC processor, incremental enhancements to the PLC product line increased its use in process applications. As early as 1973, we began adding math capabilities and CRT-based programming that made controllers useful for more than just discrete control. By 1974, analog I/O, a vital process control component, became available. By the late 1970s, PLC processors could communicate over local area networks such as the Data Highway network.

From the mid 1980s through the early 1990s, the PLC processor's expanded instruction set became more process-oriented. Both PLC processors and associated electronic interface device performance improved.

Recently, we expanded PLC process capability with process-specific I/O modules such as the Temperature Control Module. In addition, process-specific software packages such as **RS**Frameworks software make it even easier to integrate PLC processors into process control applications.

Most of these enhancements have assisted the electrical engineer, our traditional user, in increasing PLC use further into the process portion of an application. The ProcessLogix Process Control System now provides a control *solution* that integrates easily into Allen-Bradley architecture while meeting the needs of process control and instrument engineers.

Process Control Products

Process control products include: software, process control I/O modules, the ProcessLogix Process Control System, and products for PC-based control and process monitoring.

Products/Systems:	See page:
ProcessLogix Process Control System	10-2
ProcessPak5 Software Solution	10-7
RS Batch System	10-9
RS Tune Software	10-10
RS Logix Frameworks	10-11
OpenAutomation Systems	Section 8
Process Control I/O Modules	
Temperature Control Module	10-12
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Configurable Flowmeter Module	10-12
Smart Transmitter Interface Products	10-12

ProcessLogix Process Control System

Designed for batch and continuous process-control applications, this fully-integrated solution combines a DCS (Distributed Control System) server-based model with the newest Allen-Bradley control architecture without compromising the functionality of either. Based on ControlLogix architecture, the ProcessLogix system blends software, hardware and networking capabilities into a suite of features and services (such as the Producer/Consumer services) never before available to the process control engineer. The ProcessLogix system uses the ControlNet network as the primary communication link between the ProcessLogix system server, controller, and I/O modules. ProcessLogix systems can be configured to meet redundant application requirements at the server, controller, and network levels.

Whether your control strategies are primarily continuous or batch, and involve some percentage of high-speed discrete functionality, the ProcessLogix system provides these services using a common set of process, communication, and control components that help you address your plant's raw material handling, processing, and packaging requirements. Sample applications include pharmaceutical (batch and process), water treatment (process and discrete), and refining (continuous). The ProcessLogix system is compatible with **RS**Batch software ([page 10-9](#)). [For a typical configuration, see page 10-4.](#)

Features

The ProcessLogix Process 208.Control System offers:

- A fully-integrated solution from the server through the controller, I/O, and network layers
- A powerful process development environment that uses a “drag and drop” function block editor
- A complete library of process functions including Boolean, logic (value conditioning, comparison, state, selection), and utility, auxiliary, I/O, regulatory, and sequential control blocks
- Uses Sequential Control Modules for basic batch functions
- Uses **RSBatch** when additional batch process and recipe management functionality is required
- Provides operators with smart displays, including operational procedures, and a comprehensive set of alarms

Redundant Control

Critical applications often call for redundant system components. The ProcessLogix system can be expanded to include redundancy where it is desirable. Redundancy reduces the risk of process shutdown due to single component failure. ProcessLogix system designers can selectively choose to make networks, servers, and controllers redundant. Redundancy modules (catalog number 1757-SRM) installed in the chassis communicate over dedicated fiber-optic cable as shown on [page 10-4](#).

Communication

The ControlNet network provides the primary communication link between the ProcessLogix system server, controller, and I/O modules. An Ethernet network is used to support connections between operator workstations and the ProcessLogix servers as shown on [page 10-4](#).

Specifications Class I Div 2 Hazardous

These specifications apply to the ProcessLogix process controller module as well as all other ProcessLogix hardware with the exception of individual I/O modules and the ControlNet hardware.

Shock	Operating: 5 g (½ sine, 30 msec) Non-operating: 20 g (½ sine, 30 msec)
Vibration	Operating: 10-60 Hz 0.1 inch peak-to-peak displacement. 0.5 g peak acceleration Non-operating: 0-60 Hz 1 inch peak-to-peak displacement. 1 g peak acceleration
Environmental Conditions	• Operating: 0 to 60° C (32 to 140° F) • Non-operating: -40 to 85° C (-40 to 185° F) • Relative humidity: 5 to 95% (without condensation)
Battery (for 1757-PLX52)	• 1757-BEM • 1757-PLXBAT
Weight (1757-PLX52) (1757-SRM)	0.5 kg (1.09 lb) 0.45 kg (1 lb)

System Requirements

The following table lists minimum system requirements for the ProcessLogix server (catalog number 1757-PLXC).

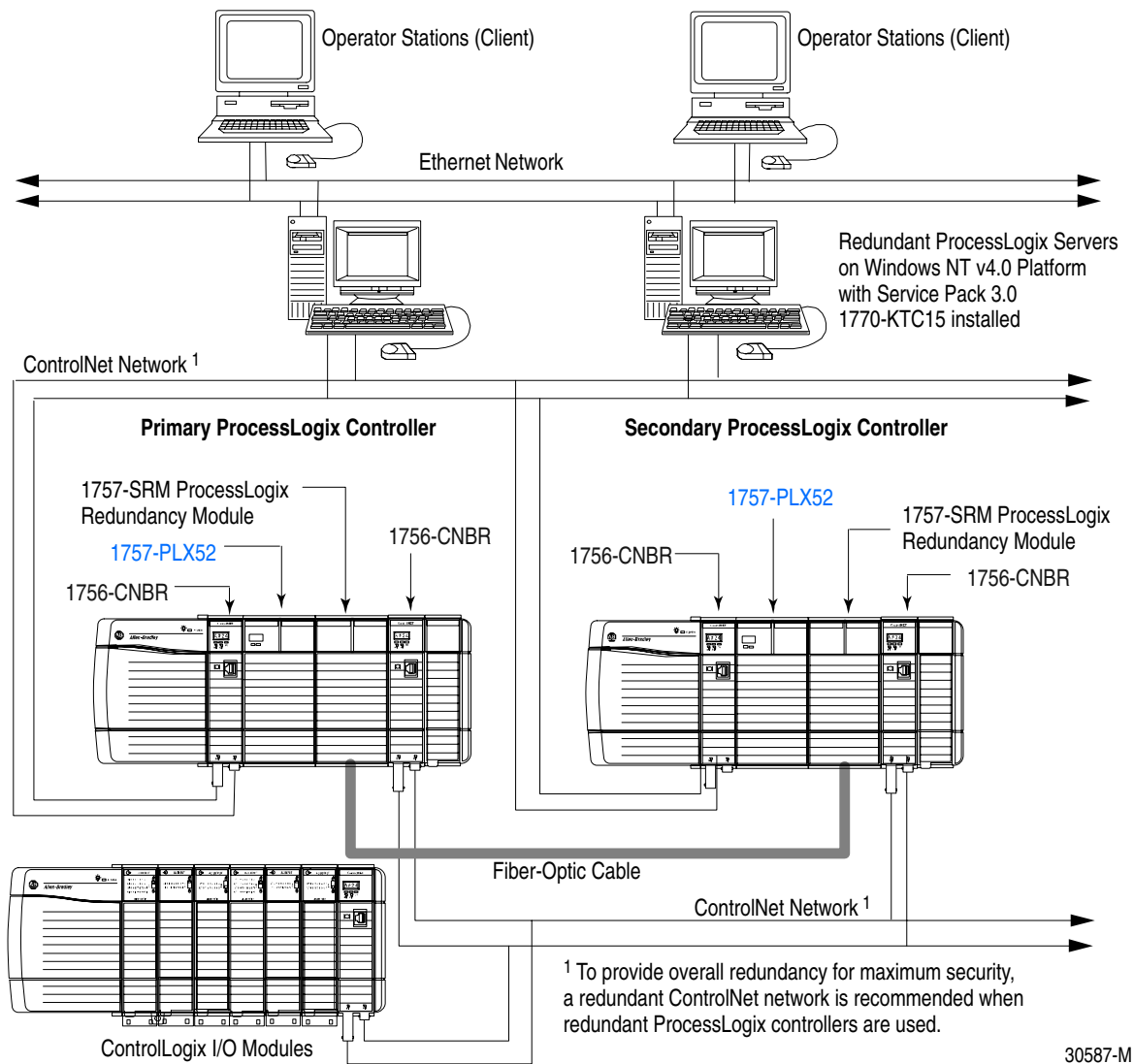
Processor	Pentium Pro 200
Memory	64M bytes (128M bytes if redundant)
Hard Disk	2 Gbytes
Display Resolution	1024 × 768; 256 colors
Operating System	Microsoft Windows NT v4.0 with Service Pack 3.0
Network Protocols	TCP/IP, NFS
CD-ROM Drive	8x
Peripherals	Keyboard, mouse, mini-cartridge tape drive
Software	RS LinX software communicates with ControlNet devices

The following table lists system requirements for the ProcessLogix client.

Processor	Pentium Pro
Memory	64M bytes
Hard Disk	850M bytes
Operating System	Microsoft Windows NT v4.0 with Service Pack 3.0 or Windows 95
CD-ROM Drive	8x
Peripherals	Keyboard and mouse

For a ProcessLogix products guide, see [page 10-5](#).

Typical Configuration²⁰⁹.



30587-M

ProcessLogix Process Control System

ProcessLogix Products Guide210.

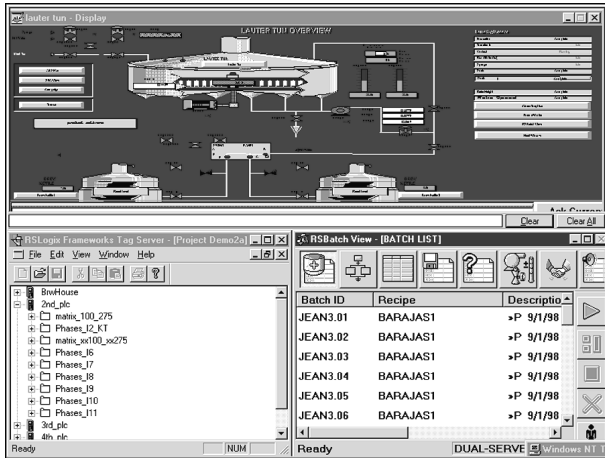
Many of these products such as the chassis are covered in the Logix5550 / ControlLogix System section of the catalog. So there are many page references to that section as a source for more information.

Product	Function	Catalog Number
Process Controller Module and Redundant Components		
ProcessLogix Process Controller Module	Two-slot module that supports non-redundant and redundant controller configurations. If the primary 1757-PLX52 controller module fails in a ProcessLogix system, another 1757-PLX52 controller module will take over the assigned functions. (Does not support removal and insertion under power.)	1757-PLX52
Spare Battery	Use the Process Controller Module's battery only when power is continuously maintained on the chassis—without frequent interruptions. This battery is not rechargeable and must be replaced periodically.	1757-PLXBAT
Battery Extension Module	Provides power to the ProcessLogix 1757-PLX52 controller to maintain its user configuration in the event of rack power failure. Use this module only when power to the chassis is frequently interrupted. It comes with a rechargeable battery. When using the 1757-BEM, remove the controller battery (1757-PLXBAT).	1757-BEM
ProcessLogix Redundancy Module	Two-slot module that provides a fully-redundant chassis. Synchronization of primary and secondary process controller modules is completely transparent to users, with minimal control switchover time in the event of a system failure. (Does not support removal and insertion under power.)	1757-SRM
Fiber-optic Redundancy cables for redundant controller module (1757-SRM)	1 meter	1757-SRC1
	3 meters	1757-SRC3
	10 meters	1757-SRC10
ProcessLogix Server		
Personal Computer	Supports ProcessLogix Server functionality for all applications (example: 5 stations, databases with more than 2,000 points, advanced control or other applications, extra high-speed data acquisition). In a redundant system, you need a second server linked to the primary server and used as a backup system. Active linking ensures that the data in the secondary server is constantly updated to mirror the primary server. You must purchase a ProcessLogix Server Software License.	1757-PLXC
Monitor	High-Resolution 17-inch monitor	1757-PLXCRT
Chassis		
All I/O modules and the Redundancy Module can be removed and inserted under power but only when the equipment is installed in ordinary, non-hazardous locations.		
See page 6-8	4-slot	1756-A4
	7-slot	1756-A7
	10-slot	1756-A10
	13-slot	1756-A13
	17-slot	1756-A17
Power Supplies		
Power supplies do not take up a chassis slots.		
See page 6-21	120/220V ac, 95 Watts	1756-PA72
	24V dc, 97 Watts	1756-PB72
Communication Modules		
ControlNet Communication Interface Module (Non-redundant), page 6-19	Links the process controller with one of two (non-redundant) ControlNet process control networks	1756-CNB
ControlNet Communication Interface Module (Redundant), page 6-19	Links the process controller with one of two (redundant) ControlNet process control networks	1756-CNBR
ControlNet RS-232-C Personal Computer Interface, page 12-23	Lets you connect devices to a ControlNet network that do not have the capability to communicate directly on a ControlNet network	1770-KFC15

(continued)

ProcessLogix Products Guide (*continued*)

Software		
ProcessLogix Server Software	Includes Control Builder, Quick Builder, and Display Builder software. ProcessLogix 50 Point Server License 1757-PLXS50 ProcessLogix 100 Point Server License 1757-PLXS100 ProcessLogix 300 Point Server License 1757-PLXS300 ProcessLogix 650 Point Server License 1757-PLXS650 ProcessLogix 1,000 Point Server License 1757-PLXS1000 ProcessLogix 2,000 Point Server License 1757-PLXS2000	Included with the ProcessLogix server (catalog number 1757-PLXC)
Control Builder Software	A graphical, object-oriented, development software package. Create control strategies using icons that represent function blocks. By pointing and clicking your mouse, you can wire the blocks together to create control loops. Once you have developed your control strategy, you can monitor control execution and make changes to control parameters.	Included with ProcessLogix server software (catalog number 1757-PLXxxx)
ProcessLogix Station Software. The maximum number of concurrent users connected to one server in a ProcessLogix System is 10.	1 user	1757-PLXRTO1
	5 user	1757-PLXRTO5
	10 user	1757-PLXRTO10
RSBatch System, page 10-9	Software that provides an efficient, predictable operation of batch processing, which results in consistency between batches.	9380-RSBx series
Analog Input Modules ¹		
	See page 6-12	1756-IF6I 1756-IF16 1756-IT6I 1756-IR6I
Analog Output Modules ¹		
	See page 6-12	1756-OF6CI 1756-OF6VI 1756-OF8
AC Input Modules ¹		
	See page 6-10	1756-IA8D 1756-IA16 1756-IA16I 1756-IM16I
AC Output Modules ¹		
	See page 6-10	1756-OA16 1756-OA16I 1756-OA8D
DC Input Modules ¹		
	See page 6-10	1756-IB16I 1756-IB16D 1756-IB32
DC Output Modules ¹		
	See page 6-11	1756-OB16I 1756-OB16D 1756-OB32
Taps		
You need a tap for each connection to the ControlNet trunkline.		
Straight T-Tap	A type of ControlNet tap that provides two trunk-cable connectors, one on each side, along with a drop cable exiting bottom, forming a “T” shape	1756-TPS
Right Angle T-Tap		1756-TPR
Straight Y-Tap	A type of ControlNet tap that provides two trunk-cable connectors exiting the top, along with a drop cable exiting bottom, forming a “Y” shape	1756-TPYS
Right Angle Y-Tap		1756-TPYR
I/O Module Terminal Blocks		
See page 6-14	RTB with 20-screw-clamp terminal connection points	1756-TBNH
	RTB with 36-screw-clamp terminal connection points	1756-TBCH
Terminal Blocks, Cables, and Connectors – Refer to the ProcessLogix System Planning Guide, publication 1757-2.1.		
¹ See page 6-13 for I/O module weights.		



ProcessPak5 Software Solution211.

ProcessPak5, the integrated process software solution, brings together field-proven and industry-leading Rockwell Software products and includes powerful development tools and features to address common process control applications. It is proven, interoperable software for process control automation, integrated into one robust, OPC-compliant solution. It is scalable and cost-effective to help ensure easier installation plus faster and simpler start-up.

Two distinctively different packages have been developed, both optimized to address the specific needs of process control applications; one for regulatory process control and one for batch process control. So, whatever your PLC-based process control needs are, ProcessPak5 from Rockwell Software is the solution for you.

Included in the standard ProcessPak5 is the core functionality of RSView32™, RSView32 Active Display System™, RSLogix Frameworks™, RSLogix 5™, RSLinx™, Library Manager, Logic Wizard, View Wizard and Equipment Editor. In addition, ProcessPak5 for Batch incorporates the functionality of RSBatch™ for recipe development and automating your batch-oriented production processes. By integrating all these products with the Library Manager, you can reduce development time because you reuse logic libraries to automatically generate your project control code and HMI graphics. All ProcessPak5 software comes on a single CD and therefore has one common install and requires only one license.

ProcessPak5 Components

We've brought together the following software to provide you with the best tools available to automate your process.

- **RSView32** is the Windows-based HMI software for monitoring and control that incorporates Microsoft VBA as an embedded programming language, with up to 72,000 tags
- **RSView32 Active Display System** lets you monitor and manipulate data at remote stations
- **RSLogix Frameworks** is the logic editor that lets you graphically program systems, eliminating the need to address every programmed instruction

- **RSLogix 5** is the ladder logic editor provided to develop unique blocks within the Frameworks application
- **RSLinx** is the robust communication interface for all of the applications
- **RSBatch** (included in ProcessPak5 for Batch) is the modular batch solution
- **Equipment Editor** graphically models your P&ID drawings. The logic wizard leverages this model to associate project-specific equipment modules with standard Object Templates
- **Library Manager** encapsulates control code and HMI graphics for commonly-used equipment modules into reusable Object Template files. These Object Templates can be reused from project to project, creating standardized code that can be used company-wide
- **Logic Wizard** transforms the Object Templates into project-specific control code. Application tags and PLC control code is automatically generated
- **View Wizard** automatically populates the tag database and generates graphics and parameter files to your new HMI project via associations in the area model

Benefits

- The Library Manager and Wizards let engineers focus on the design of the system instead of the generation of control code.
- An easily accessible Library Manager lets you store all of your applications together, resulting in greater organization and reduced development time.
- The ability to extend control code and graphics as company standards throughout your organization change results in dramatically reducing your development time and maintenance efforts.
- ProcessPak5 automatically generates the majority of your project without having the engineer ever enter tag addresses.
- Two days of phone consulting are provided at no charge to help you get started with your project. Additional consulting by Rockwell Software authorized consultants is also available.
- Tags are set up once, saving in development time.
- The Library Manager is developed on top of Microsoft Visual SourceSafe™, so there is inherent protection on your intellectual property.
- ProcessPak5 is system-tested for interoperability

System Requirements²¹³.

Client Workstation

- PC with a 166 MHz Pentium processor
- Microsoft Windows NT (v4.0 or later with Service Pack 3)
- 96M bytes of RAM
- 4 Gbyte hard drive

Engineering Workstation

- PC with a 300 MHz Pentium processor
- Microsoft Windows NT (v4.0 or later with Service Pack 3)
- 128M bytes of RAM
- 4 Gbyte hard drive

View Server

- PC with a 333 MHz Pentium processor
- Microsoft Windows NT (v4.0 or later with Service Pack 3)
- 256M bytes of RAM
- 6 Gbytes hard drive

Using a Two-server System

- PC with a 333 MHz Pentium processor
- Microsoft Windows NT (v4.0 or later with Service Pack 3)
- 256M bytes of RAM

- 6 Gbyte hard drive

Using a One-server System

- PC with a 333 MHz Pentium processor
- Microsoft Windows NT (v4.0 or later with Service Pack 3)
- 384M bytes of RAM
- 8 Gbyte hard drive

Ordering Information

Product	Catalog Number
ProcessPak5 for Batch, 15,000 Tag	9510-PBENE
ProcessPak5 for Batch, 10,000 Tag	9510-PB10000ENE
ProcessPak5 for Batch, 5,000 Tag	9510-PB5000ENE
ProcessPak5 for Batch, 2,500 Tag	9510-PB2500ENE
ProcessPak5 for Batch, 1,000 Tag	9510-PB1000ENE
ProcessPak5 for Batch Engineering Work Station	9510-PBEWENE
ProcessPak5 for Batch Client	9510-PBCENE
ProcessPak5	9510-PPKENE
ProcessPak5 Engineering Work Station	9510-PPKEWENE
ProcessPak5 Client	9510-PPKCENE
ProcessPak5 2 Days of Consulting	9510-PRPKCNS2
ProcessPak5 5 Days of Consulting	9510-PRPKCNS5



RSBatch System

Based on the ISA's international batch control standard (S88.01), **RSBatch** and **RSBatch** for ProcessLogix are Rockwell Software scalable object-oriented, modular batch solutions. **RSBatch** is designed to work with any vendor's process-connected devices. Rockwell Software supports the interface to Allen-Bradley SLC, PLC-5, and ControlLogix processors. **RSBatch** for ProcessLogix is tightly integrated with the Allen-Bradley Distributed Control System (DCS), ProcessLogix Process Control System.

The **RSBatch** system is designed with an open software architecture, allowing integration with a variety of HMI, ERP / MRP systems, and other applications. This provides users with an optimal, flexible solution—from the simplest unit-level tasks to highly complex, network-structured, multi-product operations. **RSBatch** for ProcessLogix integrates Rockwell Software batch expertise with the next-generation Allen-Bradley ProcessLogix process control system. It offers an efficient system development and a system approach to batch configuration.

Rockwell Automation is the only automation supplier providing integrated batch capabilities for DCSs, as well as a complete range of PLC processors. You can standardize on one batch manufacturing software package, regardless of which control strategy is required.

The best measure of effective batch automation is consistency of product. **RSBatch** leverages the modular Batch automation concepts inherent to SP88. This enforces a methodology that provides efficient, predictable operation of batch processing, which results in consistency between batches. **RSBatch** automatically generates an exhaustive log of every event and all formula and actual ingredient addition information, as well as operator comments and actions during each batch run. Batch process management allows reuse of code, recipes, phases, and logic between processes with similar procedures. **RSBatch** brings all facets of batch automation and process management together.

Features

- **Recipe Management and Execution.** Graphically create and manage recipes and execute recipes automatically.
- **Process Simulation.** Test recipes for your entire batch process without a process connection.
- **Integration.** Integrate with a variety of software applications, including Rockwell Software **RSView32** and Microsoft Visual Basic.
- **Process Control.** Control your process through any of today's most popular process-connected devices within one process.
- **Data Collection.** Collect detailed electronic batch record data about your process to generate detailed reports.
- **Information Exchange.** Integrate and exchange batch and recipe information with corporate information systems.
- **Security.** **RSBatch** includes security using the native Windows NT 4.0 user and group model, a proven security system.

System Requirements

- IBM-compatible Pentium166 MHz, 256K bytes cache
- Microsoft Windows NT 4.0 Workstation/Server with Service Pack 3
- Minimum 48M bytes of RAM
- 1 Gbyte of hard disk space
- Monitor resolution of at least 800 × 600 pixels (1024 × 768 recommended)
- **RSBatch** requires the use of **RSLink** (sold separately) or compatible DDE server

Ordering Information

For specific information on ordering 9380 and 9381 series **RSBatch** software products, refer to the Rockwell Software web sight at: <http://www.software.rockwell.com/rsbatch/>.

9323 Series 217.218.

Optimize your process with **RSTune** software, the Window-based software that makes analyzing and tuning PID control loops fast, easy, and accurate. Using **RSTune**, you can analyze, simulate, document and download optimal tuning parameters, all from an intuitive and familiar software environment. There are two varieties of **RSTune** available: **RSTune** and **RSTune Professional Edition**. **RSTune Professional Edition** includes the full feature set of **RSTune**, plus advanced process optimization tools.

Features

- Easy-to-use Auto Tune sequence reduces the time required to tune from hours to minutes
- Seamless connectivity to control loops using **RSLink** or **WINTelligent LINX** software
- Selection of PID loop tuning categories for loops using **RSLink** or **WINTelligent LINX** software for all supported processors
- Analysis of settings prior to downloading them improves efficiency
- Access to online context-sensitive help to reduce troubleshooting time

System Requirements

- IBM-compatible 486 or greater (Pentium recommended)
- Microsoft Windows 95/98 or Windows NT (v3.51 or later)
- 8M bytes of hard disk space (or more based on application requirements)
- 8M bytes of RAM (16M bytes recommended)
- 16-color VGA graphics adapter at 640 × 480 resolution (800 × 600 recommended)
- **RSLink** or **WINTelligent LINX** is required for use with **RSTune** and **RSTune Professional**

Ordering Information

Product	Catalog Number
RSTune PID Loop Tuner	9323-1003ENE
RSTune / RSLink PID Loop Tuner and RSLink Bundle	9323-TRL1303ENE
RSTune Professional PID Loop Tuner	9323-P1003ENE
RSTune Professional / RSLink PID Loop Tuner and RSLink Bundle	9323-PRL1303ENE
RSTune Demo Disc	9323-1003V
PID Logistics for PLC-5 A.I. Series	9321-L5250D
PID Logistics Stand Alone for PLC-5 A.I. Series	9323-L5255D
PID Logistics for PLC-500 (SLC 500) A.I. Series	9323-S5250D

9324 Series219.

RSLogix Frameworks is a system-orientated development tool that provides function block diagramming (FBD) for programming the PLC-5 and SoftLogix 5 controllers.

This object-based programming lets you focus on the control of your process, eliminating the need to micro-manage each controller. Multiple developers use this 32-bit graphical programming tool, based on the IEC 1131-3 standard, to configure systems that consist of multiple controllers. In function block diagramming, program elements appear as blocks connected as in a circuit diagram. Each block is a graphical object that performs a specific function or control algorithm. Because of its structured approach to accessing and visualizing data, FBD is most useful in applications involving a large flow of information between control components. The function block programming language is better suited than other languages for solving analog control problems such as PID loop control.

Frameworks comes with a wide array of function blocks contained in its standard and process-focused libraries. In addition, unlike other function block programming packages on the market, Frameworks lets you build your own custom blocks, giving you unparalleled flexibility.

Frameworks consists of three main components:

- **Diagram Developer** – provides online / offline diagram design and maintenance capabilities
- **Function Builder** – is for developing custom blocks
- **Tag Server** – gives you the means to economically create an operator station that manages tag-address relationships when integrating your project with other projects through the use of AdvanceDDE

Benefits

- Multiple developers access one database while developing or maintaining a project designed to run on a system of PLC-5 and SoftLogix 5 controllers
- Provides proven technology, lower cost, excellent connectivity to plant-floor devices, and high familiarity to plant-floor personnel
- The graphical development and runtime tools ease the development and shorten time to troubleshoot and diagnose problems
- The library-based environment reduces development cost through flexibility, reuse and standardization of custom and standard function blocks
- Leverage of Microsoft technology reduces the need for new learning through consistent look and feel of Microsoft software and the Rockwell Software suite of tools

System Requirements

- IBM-compatible Pentium
- Microsoft Windows NT (version 4 or later)
- 32M bytes of RAM
- 16M bytes of free hard disk space (or more based on application requirements)
- 16-color VGA Graphics Adapter; 640 x 480 or greater resolution

Ordering Information

Product	Catalog Number
RSLogix Frameworks Professional	9324-FW5PROENE
RSLogix Frameworks Engineering Station	9324-FW5ENGINE
RSLogix Frameworks Standard	9324-FW5DDENE
RSLogix Frameworks Operator Station	9324-FW5OPENE
RSLogix Frameworks Runtime	9324-FWRTENE

Process Control I/O Modules220.

The following process control I/O modules save you engineering time. They have been especially designed to help you quickly and easily develop your configuration, monitoring, and control capabilities. See descriptions of each I/O module and a list of benefits to follow.

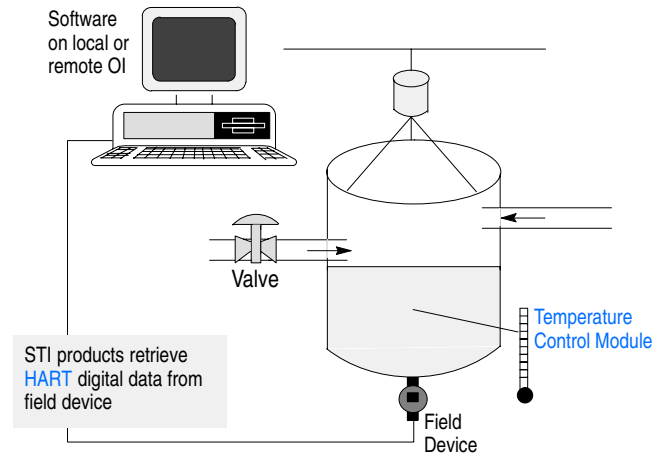
- *Temperature Control Module (cat. no. 1771-TCM, -TCMR221.)* is an intelligent I/O module whose 8 thermocouple inputs (max) each serve as the process variable for a corresponding PID loop. This module features 8 isolated thermocouple inputs and on-board automatic tuning of heat and cool PID parameters. (An RTD input version is also available.) The 1771-TCM and 1771-TCMR modules are compatible with all PLC-5 configurations. [For a typical configuration, see page 10-13.](#) [For a selection chart, see page 10-14.](#)
- *Barrel Temperature Control Module (1746-BTM)* is an intelligent I/O module that can accommodate 4 heat/cool PID loops for temperature control applications. The module has 4 thermocouple inputs, each of which functions as the controlled variable (C) input for a PID loop. The PID algorithm is performed on the module for each of the loops. The manipulated variable (M) output of each loop is sent from the module to the SLC processor's data table as both a numeric value and as a time-proportioned output (TPO) signal. Your ladder logic can send either the M numeric value to an analog output module, or the TPO signal to a digital output module to close the loop. For very fast cut-off, your ladder logic can use the TPO signal transferred to the input image. Communication between the module and the processor is bi-directional. Use with SLC 5/02, 5/03, 5/04, or 5/05 processors. [Also see the Pro-Set 200 Injection Molding Control System, page 11-10.](#) [For a selection chart, see page 10-14.](#) [For a typical configuration, see page 11-7.](#)
- *Configurable Flowmeter Module222. (1771-CFM)* interfaces PLC processors with magnetic pickups, single-channel shaft encoders, turbine flowmeters, or any source of TTL pulses. The CFM module supports rates as high as 100kHz and counts as large as 9,999,999. Use this module for various flow and / or turbine metering applications (such as turbine-shaft speed monitoring and brewery flow monitoring). Compatible with PLC-5 processors. [For a selection chart, see page 10-14.](#) [For a typical configuration, see page 10-13.](#)
- *Smart Transmitter (HART Protocol) Interface Products (cat. nos. 1770-HT1, -HT8, -HT16223.)* let your PLC-5 processors access all of the analog and digital information generated by your HART-compliant field devices (FDs). The digital process values can be used to qualify analog FD inputs, enabling your PLC-based programs to compensate more precisely and control your process more accurately. This process data is used to qualify your primary variable, making your process control more accurate. [For a typical configuration, see page 10-13.](#) [For a selection chart, see page 10-14.](#)

Benefits

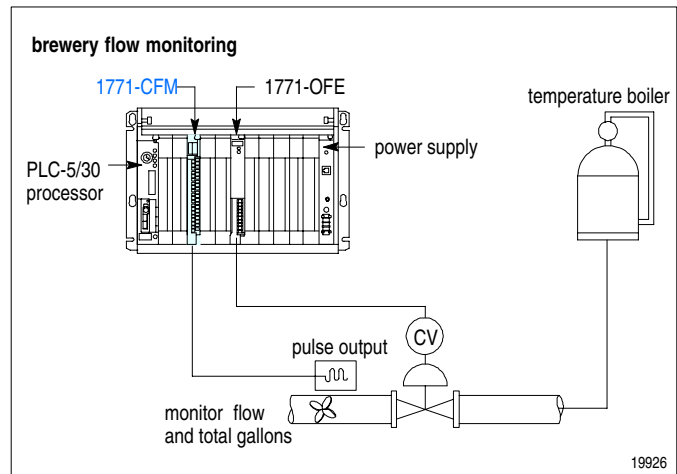
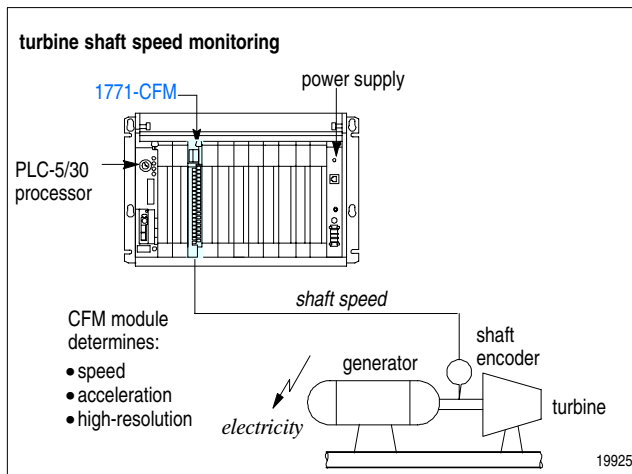
Your analog systems, field devices, and PLC processors interface seamlessly with our process application products, yielding the following overall benefits:

- Closely integrated control of the complete process – from the I/O to the operator interface (OI)
- A monitoring and control system scaled to the size and needs of your process, yet flexible enough to allow you to add modules as your process and process needs change
- Simplified configuration from both local and remote operator interface workstations
- Reduced time and costs of startup and maintenance
- Increased accuracy of your process signals
- Simplified monitoring and control of your overall process
- Easier management and maintenance of your field devices

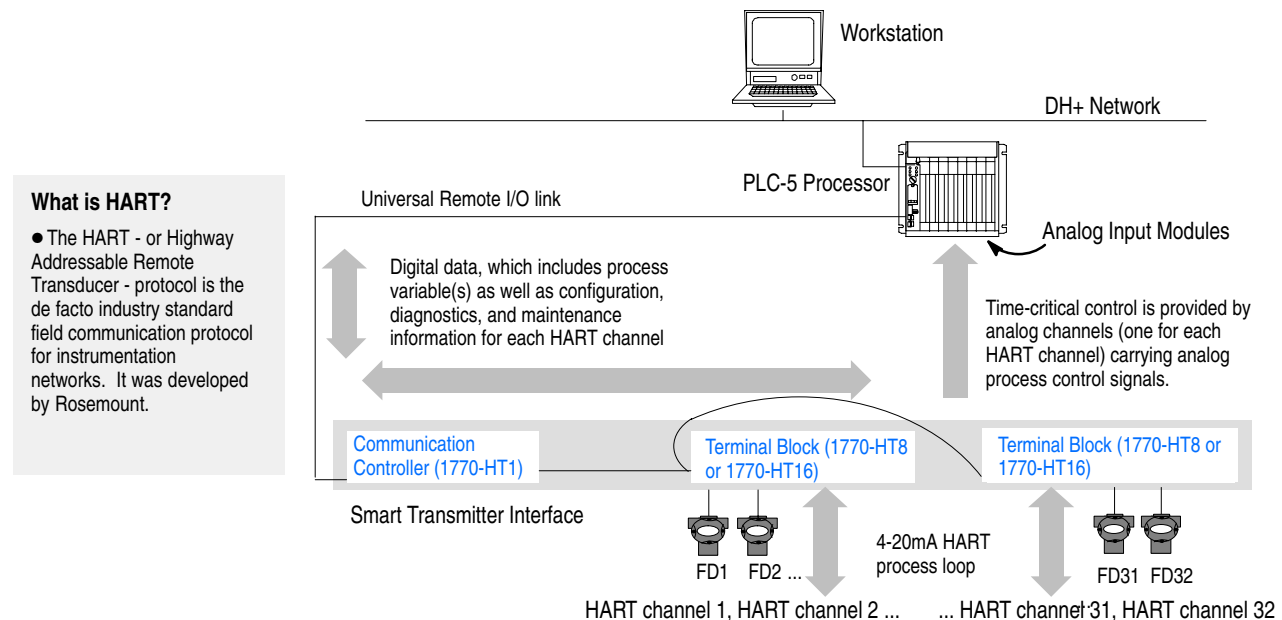
Typical Process Configuration with Process Application Products 224. [(1771-TCM (or -TCMR), and Smart Transmitter (HART Protocol) Interface Products 225.]



Typical Configuration (1771-CFM226.)



Typical Configuration Smart Transmitter (HART Protocol) Interface Products 227. (1770-HT1, -HT8, -HT16228.)



229.Process Control Modules

Catalog Number/ Module	Number of Inputs/ Outputs	Resolution / Accuracy	Analog Inputs	Analog Outputs	Data Format	Slots	Backplane Current Load	I/O Connection Hardware
18-1771-TCM, -TCMR Temperature Control Module230.	8 temp. inputs (for 8 PID heat/cool loops)	16-bit resolution or 15-bits plus sign bit	Thermocouple (TCM) RTD (TCMR)	None	16-bit Integer (natural binary)	1	1.1A (TCM) 1.2A (TCMR)	1771-RTP1
Description — The temperature control module is an intelligent I/O module that can accommodate 8 heat/cool PID loops for temperature control applications. The module has 8 thermocouple inputs, each of which functions as the controlled variable (C) input for a PID loop. The PID algorithm is performed on the module for each of the loops. The manipulated variable (M) output of each loop is sent from the module to the PLC processor's data table as both a numeric value and as a time-proportioned output (TPO) signal. Your ladder logic can send either the M numeric value to an analog output module, or the TPO signal to a digital output module to close the loop. For very fast cut-off, your ladder logic can use the TPO signal single-transferred to the input image. The 1771-TCM module has a thermocouple input (+100mV) for each PID loop. The 1771-TCMR module has an RTD input for each PID loop. With the module, we provide configuration software that consists of easy-to-use faceplates. The module provides auto-tuning of PID loops, self-calibration (external reference required) self-diagnostics, and detection of input open-circuit (including thermocouple break). This module includes special tuning options for temperature control in plastics machinery applications but can be used in most other temperature control situations as well.								
1771-CFM Configurable Flowmeter Module231.	4 Input channels	Totalizer Mode: ±0.025% High-Resolution Mode: ±0.007%	•50mV to 200V ac peak (optional 500mV to 200V ac peak for improved noise immunity) •4-40V dc pulses with open collector (TTL compatible) •proximity probe inputs	None	16-bit integer (natural binary)	1	1A (max)	1771-WN
Description — The configurable flowmeter module interfaces PLC processors with magnetic pickups, single-channel shaft encoders, turbine flowmeters, or any source of TTL pulses. The CFM module supports rates as high as 100kHz and counts as large as 9,999,999. Use this module for various flow and / or turbine metering applications (such as turbine-shaft speed monitoring and brewery flow monitoring). Compatible with PLC-5 processors.								
1746-BTM Barrel Temperature Control Module232.	4 analog inputs	0.1° C/step or 0.1° F/step	Thermocouple type J and K (-50 to +50mV and -100 to +100 mV)	None	16-bit integer (natural binary)	1	110 mA @ 5V dc 85 mA @ 24V dc	1746-RT32
Description — This intelligent I/O module can accommodate 4 heat/cool PID loops for temperature control applications. The module has 4 thermocouple inputs, each of which functions as the controlled variable (C) input for a PID loop. The PID algorithm is performed on the module for each of the loops. The manipulated variable (M) output of each loop is sent from the module to the SLC processor's data table as both a numeric value and as a time-proportioned output (TPO) signal. Your ladder logic can send either the M numeric value to an analog output module, or the TPO signal to a digital output module to close the loop. For very fast cut-off, your ladder logic can use the TPO signal transferred to the input image. Communication between the module and the processor is bi-directional. Use with SLC 5/02, 5/03, 5/04, or 5/05 processors. This module includes special tuning options for temperature control in plastics machinery applications but can be used in most other temperature control situations as well.								

For more information about the Configurable Flowmeter Module, see product data, publication 1771-2.226.

Smart Transmitter (HART Protocol) Interface Products

Catalog Number / Module	Function	Communication Medium	Transmission Rate	Power Supply Current Load (separate 24V dc)
1770-HT1 Smart Transmitter (HART Protocol) Communication Controller	Interfaces terminal blocks to a remote I/O link for a total of 32 HART channels maximum	Twinax (remote I/O link)	Remote I/O link: •57.6k bit/s @10k ft •115.2k bit/s @ 5k ft •230.4k bit/s @ 2.5k ft	600 mA
1770-HT8 Smart Transmitter (HART Protocol) 8-channel Terminal Block	Interfaces communication controller to up to 8 HART channels	Not Applicable	Not Applicable	200 mA
1770-HT16 Smart Transmitter (HART Protocol) 16-channel Terminal Block	Interfaces communication controller to up to 16 HART channels	Not Applicable	Not Applicable	400 mA
Description — PLC-5 processors can access all of the analog and digital information generated by your HART-compliant field devices (FDs). The digital process values can be used to qualify analog FD inputs, enabling your PLC-based programs to compensate more precisely and control your process more accurately. The 1770-HT1 Communication Controller receives commands from the PLC processor or workstation and passes them on, via the terminal blocks, to field devices. Responses from the field devices are sent through the terminal blocks to the communication controller and then on to the PLC processor or workstation. The 1770-HT8 and -HT16 Terminal Blocks (either 8 or 16 channels) pass analog and digital signals to and from the field devices. The analog signal is passed on to an analog I/O module and the digital signal are routed to the communication controller.				