ProcessLogix – Changing the World of Process Control
Process control solutions for a competitive world

While you might consider the traditional solution of a Distributed Control System (DCS) for continuous process applications and a programmable logic controller (PLC)-controlled solution for discrete manufacturing, you probably ask yourself, “Why can’t someone give me the advantages of both in one package for my process applications?”

Welcome to ProcessLogix

The Allen-Bradley ProcessLogix control system sets new standards in scalable process control systems, by providing the highest level of performance, flexibility and ease of use at the lowest life-cycle cost of ownership. And by integrating this cost-effective solution with other Rockwell Automation products utilising the new Integrated Logix Architecture, you can have seamless control – throughout your process and discrete manufacturing applications.

DCS functionality with a PLC price profile

ProcessLogix blends a powerful, open Microsoft Windows NT-based client/server system, controller, I/O, advanced engineering tools and networking capabilities into a suite of features and services never before available in such a cost-effective and flexible control architecture. Using ProcessLogix you can benefit from DCS functionality with the price profile of a PLC/SCADA system.

Advanced technology - proven expertise

Rockwell Automation works closely with a well-trained, global network of Process Application Solution Providers to help you match the right process solutions to your application. This gives you the confidence that your solution is designed, integrated and installed by people who fully understand both your specific application requirements and the control system.
ProcessLogix – a new breed of process control system

Simple, scalable, powerful

The Allen-Bradley ProcessLogix system combines powerful distributed control technology with the Rockwell Automation Integrated Logix Architecture for integrated process, sequential, motion and drive system applications, communicating on the ControlNet open network. This scalable, easy-to-commission ProcessLogix system incorporates familiar ‘drag and drop’ function block programming, integrated alarming, a library of powerful process control functions, and a global database.

ProcessLogix fits your application

ProcessLogix meets the control needs of industries such as pharmaceutical, specialty chemicals, food and beverage, utilities, pulp and paper, metals and cement.

And since critical applications often call for redundant system components, ProcessLogix can be expanded to include redundancy where you need it, reducing the risk of a process shutdown due to a single component failure.

ProcessLogix features include:

- Integrated detail displays, custom graphics, alarms, history, and reports
- Integrated deterministic network
- Peer to peer messaging between controllers
- Operation of non-ProcessLogix controllers
- Common interface for process and discrete control
- Standard and user-definable application templates
- Natural hierarchical control building environment

This example is defined as:

<table>
<thead>
<tr>
<th>Item</th>
<th>Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 ProcessLogix Server providing both server and client (operator and engineering) functionality</td>
<td></td>
</tr>
<tr>
<td>1 1757-PLX52 Controller providing 92 points</td>
<td></td>
</tr>
<tr>
<td>32 AI points</td>
<td>12 AO points</td>
</tr>
<tr>
<td>32 DI points</td>
<td>16 DO points</td>
</tr>
</tbody>
</table>

ProcessLogix serves industries such as food and beverage...
A typical large-scale ProcessLogix system

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<tbody>
<tr>
<td>1 redundant ProcessLogix Server Pair providing redundant system server functionality</td>
<td></td>
</tr>
<tr>
<td>7 ProcessLogix Clients providing operator and engineering station functionality</td>
<td></td>
</tr>
<tr>
<td>1 1757-PLX52 Controller providing 92 points</td>
<td>32 AI points, 12 AO points, 32 DI points, 16 DO points</td>
</tr>
<tr>
<td>1 1757-PLX52 Controller pair providing 360 points</td>
<td>128 AI points, 40 AO points, 128 DI points, 64 DO points</td>
</tr>
<tr>
<td>1 1757-PLX52 Controller providing 150 points</td>
<td>16 AI points, 6 AO points, 96 DI points, 32 DO points</td>
</tr>
<tr>
<td>1 1757-PLX52 Controller providing 222 points</td>
<td>60 AI points, 18 AO points, 96 DI points, 48 DO points</td>
</tr>
<tr>
<td>1 1757-PLX52 Controller pair providing 360 points</td>
<td>128 AI points, 40 AO points, 128 DI points, 64 DO points</td>
</tr>
<tr>
<td>1 1757-PLX52 Controller pair providing 492 points</td>
<td>22 AI points, 6 AO points, 320 DI points, 144 DO points</td>
</tr>
</tbody>
</table>

...pulp and paper, cement, metals...
ProcessLogix fits your application – precisely

Modular Integration

The controller, engineering tools and operator interface are designed to operate as a single highly optimized system. Regardless of the application, the Controller uses a single set of components – control processor, chassis, I/O, power supply, communication modules, and network.

The interchangeability of these modules allows you to easily and affordably mix and match control capabilities to fit your application.

Control processor, chassis and I/O modules

Controlbus, at the heart of the design, provides the key to distributed and flexible control — building distributed network capabilities into the backplane of the controller. This compact chassis gives you the flexibility to use the ProcessLogix control processor for applications that require complex integrated regulatory functionality, <50ms logic, sequential/batch control functions and/or the ControlLogix processor for discrete applications that require sub-millisecond logic.

The ProcessLogix Controller is designed for integrated continuous (loop), logic (Boolean), motor, sequential and batch control functions through a library of templates called Function Blocks (FBs).

The Power Supply is separate from the chassis and does not consume any slots.

The ProcessLogix Controller module supports both non-redundant and redundant controller configurations, as well as peer-to-peer messaging.

The ControlLogix Processor module features high speed logic, motion control, drive systems control and sequential performance, as well as peer-to-peer messaging.

The ControlNet Bridge links Controlbus with the ControlNet networks. ControlNet is an open, flexible, high performance network supporting both Supervisory/Peer (controllers to HMI) and I/O Network communications. Data throughput is 5 Mbits/sec via single or redundant media options and features deterministic data delivery. The physical media is either coaxial or fibre optic.

The ControlLogix I/O modules include several, analog and speciality I/O types, permitting either the ProcessLogix or ControlLogix controllers to be used effectively across a variety of discrete and process-oriented applications. The analog modules permit scaling to engineering units to take place on board of the module. In addition, modules provide over-range and under-range detection. Analog input modules provide 16 bit resolution and analog output modules provide 13 bit resolution plus sign. ControlLogix I/O modules are software-configurable, to either hold last state or default to a user-defined state.

ProcessLogix also supports FLEX Ex. FLEX Ex can be distributed throughout hazardous areas to provide ultimate safety without incurring additional costs for running individual I/O wiring over long runs to get to a safe area.

The Redundancy Module provides and controls fully redundant controller chassis operation. It is not necessary to use redundancy-specific hardware components. Synchronization of primary and secondary is completely transparent to the user. The System Redundancy Module (SRM), which connects to its redundant partner via double fibre optic cable, can be replaced on-line without disrupting control of the user's process.

Removal and Insertion Under Power (RIUP) ensures that inserting or removing a module while the system is under power results in no additional disruption across the backplane.

Approved for your application

The controller and I/O system are approved for mounting in Class I, Division 2, Groups A, B, C, and D areas and fully meet stringent industrial CE-Mark immunity and emissions requirements.
Rockwell Automation helps control water and wastewater facilities worldwide.

The ProcessLogix system helps you manage both batch and continuous process control.

Each ControlLogix Module functions like an intelligent network node attached to the ControlBus. Using ControlNet Bridge modules you can simply expand this network to include further chassis. This way, ProcessLogix provides ultimate scalability to your application.
The ProcessLogix Server

The ProcessLogix NT Server/Client has the following features:
- Integrated Database
- Client/Server architecture
- Redundancy
- Connectivity to open interfaces such as OLE and ODBC
- Based on Microsoft Windows NT 4.0 workstation

The ProcessLogix Server can be optionally redundant. This provides a high availability platform by enabling a pair of similarly configured NT server systems to support each other in a Primary/Backup fashion. If the Primary fails, a fully functioning Backup will assume the Primary’s role. The Primary automatically propagates all database transactions to the Backup over the network so that both databases remain synchronized.

The ODBC Data Exchange option enables two-way exchange of data between the ProcessLogix Server database and an ODBC-compliant local or network third-party database. It uses standard Structured Query Language (SQL) commands. The ProcessLogix Server acts as a client application in this configuration. Information exchanged includes point values, point history, and user file data.

Whenever another application requires data from the ProcessLogix database, Open Data Access is required. Examples include reading data into a Microsoft Excel Spreadsheet or running a query on the database from Microsoft Access.

The ODBC Driver allows the Server database to be queried using SQL commands from ODBC client applications, such as Microsoft Access. The Server database is exposed as a number of read-only ODBC tables including Points, Event History and Process History. It is optimized for Microsoft Access and hence other ODBC ad hoc query/report applications.

The OPC Server allows a third-party OPC client or server application to read/write ProcessLogix point parameters.

The Network Server provides extremely efficient access to the ProcessLogix database for network based applications such as Microsoft Excel Data Exchange, Network Node Interface and Network API options.
Station status showing alarm and message.

ProcessLogix offers effective integration with drives systems.

Standard PID point detail display.
A good process control system will allow you to engineer your system following a standard process. This is certainly the case with ProcessLogix.

Let’s start the process by considering the PID diagram for a reactor in a process plant. There will be a range of devices such as valves, pumps and transmitters connected to the unit. Each device needs a Control Module to perform its relevant function and assign physical inputs and outputs.

A Control Module is generated by grouping Function Blocks. A common PID loop, for example, is composed by four Function Blocks (analog input, data acquisition, PID calculation and analog output).

When complete, the Control Module is loaded to the controller and directly tested from the monitoring environment of Control Builder. Since ProcessLogix is completely integrated you can view, test and operate the PID loop from a ProcessLogix operator station.

The next step is to configure the sequences for the equipment modules. Using Control Builder you create and group Sequential Function Blocks into a Sequential Control Module to define the sequence of actions to perform the relevant functions, using transactional condition and action blocks, such as ‘Open Valve’ or ‘Change Setpoint’. When finished, this is downloaded to the controller and tested within Control Builder and/or an Operator Station.

All device detail and group displays, alarming and navigation are pre-configured by the programming of your control application and complete, ready for an operator to run your facility. The only additional work needed is to create any custom graphics required for the Operator station using Display Builder.

For complex recipe and batch management functionality you can add the RSBatch server to the ProcessLogix system. From this you generate a graphical configuration of the batch server to define your units, equipment modules, recipe parameters and relationships. The configured phases will directly
communicate with the Sequential Control Modules controlled in the ProcessLogix processor. Once this engineering step is complete, all equipment modules are activated, controlled and tested from the batch operator client, which can be fully integrated into the ProcessLogix operator station.

The next step is to generate the recipe. This is done using the RSBatch Recipe Editor, a hierarchical Sequential Function Chart editor that creates the necessary operations and unit procedures.

Finally you can configure your controllers, stations and printers on Ethernet and seamlessly integrate non-ProcessLogix systems using Quick Builder.

**An overview of the tools used**

**Control Builder**
Control Builder enhances engineering productivity by enabling ‘top-down’ implementation and enables the creation of reusable control strategies. It comes complete with a comprehensive set of tools for configuring I/O, continuous, logic, motor, sequential, batch and advanced control functions through a library of Function Blocks.

**RSBatch**
RSBatch is a complete, SP88 compliant, batch process management solution. It provides efficient, predictable operation of batch processing, consistency between batches and generation of event information during batch runs. Batch process management allows reuse of code, recipes, phases and logic between process with similar procedures.

**Display Builder**
Display Builder is a fully integrated development environment for customer human machine interface displays. It comes with a library of commonly used plant equipment to further speed up graphic development and control of an HMI. Graphic displays can be significantly enhanced through the use of Visual Basic scripting and ActiveX components to create effects such as high-speed animation, tool tips and control of a station from an application.

**Quick Builder**
Quick Builder provides greater productivity through capabilities such as filtering user views of the database, multipoint edit facilities and the intuitive Windows style interface. Additions and modifications to the ProcessLogix database can be made while the system is on-line.

**Further tools for efficient engineering**

**Recipe Management** provides facilities to create recipes and download them to nominated process units, for single or multi-stream, single batch applications.

**Downtime Analysis** may be used to detect, record and code any equipment breakdowns or process delays to provide plant downtime analysis.

**Point Control Scheduler** allows point supervisory control to be automatically scheduled to occur at a specified time. This may occur on a ‘one-shot’ basis, at a pre-determined interval, or on specific days.

**RSTune** makes analyzing and tuning PID loops fast, easy and accurate.

**Statistical Process and Quality Control (SPQC)** provides powerful statistical processing capabilities for real-time data collected by the system.

**Extended Event Archiving** may be used when the events logged by the system are required to be archived for later review. Storage of over 1 million events is easily achievable.

**Optional Alarm Paging** allows up to 100 pagers to be configured, each with a schedule of operation – so users are only paged when they are on call.

**Custom applications**
ProcessLogix provides configurable, powerful application enablers to support individual application requirements.
A familiar and intuitive operating environment

State of the art, object based graphics provide a powerful interface for the user. The use of industry standards, such as Microsoft Windows NT and the Internet, minimizes operator training by providing a familiar operating environment.

Familiar features

Extensive use of user configurable pull-down menus and toolbars allow easy navigation and fast access to key data. The usability of the operator interface is further enhanced with features such as copy and paste, live video integration, ActiveX documents, scripting, launching applications and support for standard peripherals such as sound cards, touch screens, dual screens video cards and trackballs.

Integrated Alarms and Events

Alarms are configured by Control Builder, generated by the Controller Processor, recorded into the event system and acknowledged by operators on the ProcessLogix Server alarm summary display. Users do not have to separately configure process alarms in both the controller and the supervisory system.

Exception Handlers

Exception Handlers allow for the sequencing of abnormal operations such as hold, abort and restart. These handlers are encapsulated within the main control sequence but can be easily actioned to provide functions such as a controlled shutdown under a hold condition or emergency shutdown under a stop condition.

Trending

Deviations in process behaviour can be quickly analyzed using ProcessLogix’s trending capabilities. Data may be trended in one or more time scales in formats such as single, dual, and triple bar graphs, multi-plot and multi-range line graphs, X-Y scatter plots, numeric tables, and group trends. Copy and paste capabilities permit all or portions of a trend to be copied and pasted into an application like Microsoft Excel with no engineering effort required.

On-line documentation

ProcessLogix provides system information using Internet technology.

On-line documentation is formatted in Hypertext Markup Language. This allows access by standard Internet browsers or the built-in safe browser, which ensures that on-line data can never obscure vital system parameters or the operator toolbar.

Security

To maintain system security ProcessLogix provides configurable security levels, control levels and area assignments. These may be configured for each individual operator or alternatively for each operator station. Up to six security levels limit operator access to ProcessLogix functions. Up to 255 control levels limit operator control of individual items of plant and equipment.

Reporting

Reports can be generated periodically, on an event-driven or demand basis and configured on-line. Report output can be directed to screen, printer, file, or directly to another computer for analysis or viewing electronically.

On-line historical data

History collection is available over a wide range of frequencies in both average and snapshot/production formats. A large amount of history can be retained on-line, with automatic archiving allowing retention of and access to unlimited quantities of historical data.
**ProcessLogix Station**

Improved tools provide tightly integrated customer developed faceplates for application specific templates.

**Integrated Detail Displays**

Users can operate control strategies using these standard displays or, if they choose, create per-point custom detail displays. The ProcessLogix System provides maximum useability and flexibility at the same time.

**Group Displays**

Operators can use group displays to efficiently operate Equipment Modules. The engineering effort required to provide group displays is basically eliminated by the system providing a comprehensive set of preconfigured device and sequence faceplates.

**Integrated On-line Documentation**

The ProcessLogix system gives users quick access to system information and support using the latest Internet technologies. It features SafeBrowse, Internet-aware HTML (hypertext markup language) documentation, on-line help and on-line technical support.
Supporting your enterprise-wide integration

ERP systems are well suited to answer the question of what and how much to build, but fall short on automating control of the process of how to produce it.

For many industries today it is fundamental to have complete information available throughout the organization. Whether the information is needed to meet government regulations, minimize recall exposures or find the root cause of a product malfunction, comprehensive product data is invaluable in the manufacturing environment.

Rockwell Automation offers specific solutions to close the gap between the ERP world and the shop floor with our Manufacturing Businessware. Depending on your requirements, Rockwell Automation offers a number of solutions.

Whether it is RSSQL running as a transaction manager to bridge between your control system and the rest of the Enterprise, or RSVw32’s Visual Basic for Applications (VBA) in combination with the DCOM-Connector for a flexible, customizable vertical integration into an ERP system, or RSBatch tightly integrated to SAP, Rockwell Automation can help tie your facility together.

Supporting your installed applications

Rockwell Automation Global Technical Services (GTS) provides you with professional services to meet your needs throughout the life cycle of your automation investment. These services are an additional resource to your plant. They deliver technological know-how and industry-specific expertise to help you meet key business goals and compete more effectively.

Availability and Optimization Services can increase system and equipment up-time, while improving productivity and reducing support costs. Services include:

- Hardware Support Services to keep your system, instrumentation, and equipment in optimal running condition.
- The Asset Management Program offers you an attractive alternative to owning and managing spare parts.
- The System Enhancement and Support Program can improve your productivity and system availability with expert assistance, automatic software updates, automatic documentation management and an electronic bulletin board.
- Site-Support Specialists apply the resources of an experienced service professional to the challenge of implementing your automation technology in a quick and proper manner.

ProcessLogix training

Rockwell Automation offers both scheduled and custom training options depending on your requirements:
GTS supports Rockwell Automation products through a worldwide network of dedicated, thoroughly trained, engineering professionals. Focused on services that encompass Applied Knowledge, Training and Performance and Asset Management, GTS is dedicated to maximizing your competitiveness, providing unrivalled quality, being consistent throughout the world and facilitating best-in-the-world products.