Allen-Bradley
by ROCKWELL AUTOMATION

Reduce downtime with **redundant process control**

ControlLogix® and CompactLogix™ controller solutions keep critical processes running

BEGIN

DOWNTIME. WHAT'S THE PLAN?

Lost production is inevitable, so planning for outages is critical.

Your plan should include understanding the control system reliability. Identifying the type of disruption and severity of the outcome helps evaluate risk mitigation options — before a downtime incident occurs.

A good place to start is with a risk assessment. Depending on your manufacturing environment and application, the results of the assessment can determine techniques to help keep your people and equipment safe.

One of those suggestions may be to build programmable logic controller redundancy into your operations.

What are some of the considerations in your industry and application?

ADVANTAGES OF REDUNDANT CONTROLLERS

Some production environments are continuous or irreversible and require high availability at all costs. Disruption of the process could be catastrophic from a safety and profitability perspective. If any failure or stoppage occurs after production starts, the product is often scrapped, and the process reinitiated to realize a quality output. Think life sciences, food and beverage, pulp and paper, oil and gas, mining, cement, etc.

Other industries or applications simply can't afford to restart their production because it can take days, weeks or more to get back to full operation. An example is the metals industry. What if a large furnace in a steel mill experiences a failure? It could take days to reach a stable operating temperature so production can resume.

These examples are more aligned with critical industries where reliability at the highest levels is required. Some applications need high availability for other reasons, including customer service. Think baggage handling.

In all cases, consider the value of redundant control — and cost of downtime.

THE COST OF DOWNTIME

Wouldn't it be great if you could identify and eliminate downtime before it occurs? Using technology advancements in artificial intelligence and machine learning might be a good strategy, but often require a data scientist to mine and make sense of the data. While weighing the costs and risks, another alternative to consider to help prevent production stoppages is system redundancy.

Looking at the big picture, any uptime solution is better than the high price of doing nothing:

Loss of product

Any interruption of continuous processes can result in loss of profit, uptime and product. Machines sit idle, materials are scrapped and processes and people must recalibrate and start over.

Upstream and downstream costs

When your capital assets are out of commission, there's more at stake than lost production. Downtime leads to the non-utilization of resources, not only for the equipment that's down, but also for the upstream and downstream equipment in your process workflow. This underutilizes your human resources as well.

Decreased return on investment

When human and capital resources are not in use due to a downtime incident, company resources continue to be consumed . Total cost of ownership increases while your return on investment decreases.

Avoid these scenarios by choosing an alternative that's between "do nothing" and data scientist — controller redundancy with Logix. With an investment in extra hardware and the accompanying software, you can help reduce unplanned downtime caused by failures, faults or system maintenance requirements.

Logix controllers with redundant capabilities

Reliable control systems deliver consistent operation of your production floor. To increase reliability, consider implementing redundant control into your system.

Redundant capability isn't new to the Logix family of controllers. Continued investment makes this functionality available in the latest Logix product portfolios.

And whether you need one-click activation or would rather program the data sync yourself, Studio 5000 Logix Designer® software provides the design environment for configuring your redundant control.

Logix control redundancy details

	ControlLogix Redundancy		Hot Backup
Controller support	ControlLogix 5580	ControlLogix 5570	ControlLogix 5570 / 5580 CompactLogix 5370 / 5380
Required module	1756-RM2	1756-RM2	n/a
Network support	EtherNet/IP	EtherNet/IP and ControlNet	EtherNet/IP ControlNet (ControlLogix only)
I/O support	1756, 5094, 1794, 1734, 1738, 1715	1756, 1794, 1734, 1738, 1715	1756, 1794, 5069
Software	Studio 5000 Logix Designer v33 and later	Studio 5000 Logix Designer RSNetWorx™ (if using ControlNet)	Studio 5000 Logix Designer Logix Hot Backup Code Generator RSNetworx (if using ControNet)
Data synchronization	Automatic	Automatic	User configured
Switchover time	≥ 20ms	≥ 20ms	≥ 250ms
Program duplication for secondary controller	Automatic	Automatic	User initiated
Online edits	Automatically sent to both controllers	Automatically sent to both controllers	User initiated in both controllers
Network address swap for HMI	Yes	Yes, on EtherNet/IP	No
Forced status equalization	Yes	Yes	No
Output status during switchover	Maintained	Maintained	Maintained
Firmware update in run mode	Yes	Yes	Yes
High availability systems reference manual	DOWNLOAD		
User manual	DOWNLOAD	DOWNLOAD	Contact local sales office (Reference Technical Note 68593)

ControlLogix 5580 controller quick look

		Network Support			I/O Support			Security		Process				High Availability
Controller catalog	Description	Ethernet	Use of embedded Ethernet port	ControlNet / DeviceNet / DHRIO	Existing I/O*	5069 I/O	5094 I/O	CIP security**	62443-4-2 compliant	Embedded process objects	Phase Manager™ software	Sequence Manager™ software***	Default Process Tasking model	Supports a redundancy configuration ****
1756-L8xE	Standard controller	■	▲	▲	■	▲	■	■	▲	●	■	●	●	■
1756-L8xE-NSE	No stored energy	■	▲	▲	■	▲	■	■	▲	●	■	●	●	■
1756-L8xEK	Conformally coated	■	▲	▲	■	▲	■	■	▲	●	■	●	●	■
1756-L8xEXT	Harsh environment	■	▲	▲	■	▲	■	■	▲	●	■	●	●	■
1756-L8xEXTS	Harsh environment safety	■	▲	▲	■	▲	■	■	●	●	■	●	●	●
1756-L8xEP	Process controller	■	▲	▲	■	▲	■	■	▲	■	■	■	■	■
1756-L8xES	Safety controller	■	■	■	■	■	■	■	●	●	■	●	●	●

■ Supported in all configurations

▲ Supported in standard (but not redundant) configuration

● Not Supported

* ControlLogix® 5580 controllers configured for redundancy will support the same I/O as a ControlLogix® 5570 redundant controller; for example, 1769 I/O isn't supported in a ControlLogix® 5570 redundant controller, so it's also not supported with ControlLogix® 5580 redundancy

** Support added in version 34. For more information, refer to **SECURE-AT001**

*** Support added in version 35. For more information, refer to **1756-UM015**

**** New functionality delivered through the Studio 5000 Logix Designer® application version 33 firmware and software; no new controller catalog number required to enable this feature

CompactLogix 5380 controller quick look

		Network Support			I/O Support			Security		Process				High Availability
Controller catalog	Description	Ethernet	Use of embedded Ethernet port	ControlNet / DeviceNet / DHRIO	Existing I/O*	5069 I/O	5094 I/O	CIP security**	62443-4-2 compliant	Embedded process objects	Phase Manager™ software	Sequence Manager™ software***	Default Process Tasking model	Supports a redundancy configuration ****
5069-L3xER 5069-L3xERM	Standard controller	■	▲	●	▲	▲	▲	▲	●	●	■	●	●	●
5069-L3xER-NSE	No stored energy	■	▲	●	▲	▲	▲	▲	●	●	■	●	●	●
5069-L3xERMK	Standard conformally coated	■	▲	●	▲	▲	▲	▲	●	●	■	●	●	●
5069-L3xERP	Process controller	■	▲	●	▲	▲	▲	▲	●	■	■	●	■	●
5069-L3xERS2 5069-L3xERMS2	Safety SIL 2 controller	■	▲	●	▲	▲	▲	▲	●	●	■	●	●	●
5069-L3xERS3 5069-L3xERMS3	Safety SIL 3 controller	■	▲	●	▲	▲	▲	▲	●	●	■	●	●	●
5069-L3xERS2K 5069-L3xERMS2K	Safety SIL 2 conformally coated	■	▲	●	▲	▲	▲	▲	●	●	■	●	●	●
5069-L3xERMS3K	Safety SIL 3 conformally coated	■	▲	●	▲	▲	▲	▲	●	●	■	●	●	●

■ Supported in all configurations

▲ Supported in standard (but not redundant) configuration

● Not Supported

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Whether you're in an industry where near 100% uptime with full backup capabilities is required or where high availability is needed for other reasons, you have options.

With scalable alternatives for I/O, memory and cost, ControlLogix and CompactLogix redundant controllers deliver high performance and high availability for most industries and applications.

LEARN MORE

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LifecycleIQ™ Services

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Contact your Rockwell Automation/distributor

Connect with us.

AMERICAS: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444
EUROPE/MIDDLE EAST/AFRICA: Rockwell Automation NV, Pegasus Park, De Kleetlaan 12a, 1831 Diegem, Belgium, Tel: (32) 2663 0600, Fax: (32) 2 663 0640
ASIA PACIFIC: Rockwell Automation, No. 2 Corporation Road, Singapore, 618494, Singapore, Tel: (65) 6302 8686, Fax: (65) 6302 8787
UNITED KINGDOM: Rockwell Automation Ltd., Pitfield, Kiln Farm, Milton Keynes, MK11 3DR, United Kingdom, Tel: (44)(1908) 838-800, Fax: (44)(1908) 261-917

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