

1756 GuardLogix Controllers



A GuardLogix® controller is a ControlLogix controller that also provides safety control. The GuardLogix system is a dual controller solution—you must use a 1756-L6xS/1756-L7xS primary controller and a 1756-LSP/1756-L7SP safety partner to achieve up to SIL CL 3/PLe/Cat. 4. A major benefit of this system is that it's still a single project, safety and standard together. The safety partner controller is a part of the system, is automatically configured, and requires no user setup.

During development, safety and standard have the same rules; multiple programmers, online editing, and forcing are all allowed. Once the project is tested and ready for final validation, you set the safety task to a SIL 3 integrity level, which is then enforced by the GuardLogix controller. When safety memory is locked and protected, the safety logic can't be modified and all safety functions operate with SIL 3 CL integrity. On the standard side of the GuardLogix controller, all functions operate like a regular Logix controller. Thus, online editing, forcing, and other activities are all allowed.

With this level of integration, safety memory can be read by standard logic and external devices, like HMIs or other controllers, eliminating the need to condition safety memory for use elsewhere. The result is easy system-wide integration and the ability to display safety status on displays or marquees. Use Guard I/O™ modules for field device connectivity on Ethernet or DeviceNet networks, and for safety interlocking between GuardLogix controllers use Ethernet or ControlNet networks. Multiple GuardLogix controllers can share safety data for zone to zone interlocking, or a single GuardLogix controller can use remote distributed safety I/O between different cells/areas.

In addition to the standard features of a ControlLogix controller, the GuardLogix controller has these safety-related features.

Table 14 - Features - GuardLogix Controllers

Feature	1756-L61S, 1756-L62S, 1756-L63S, 1756-L71S, 1756-L72S, 1756-L73S, 1756-L73SXT
Safety communication options	Standard and safety <ul style="list-style-type: none"> • EtherNet/IP • ControlNet • DeviceNet
Network connections, per network module	<ul style="list-style-type: none"> • 100 ControlNet (1756-CN2/A) • 40 ControlNet (1756-CNB/D, 1756-CNB/E) • 128 ControlNet (1756-CN2/B) • 256 EtherNet/IP; 128 TCP (1756-EN2x) • 128 EtherNet/IP; 64 TCP (1756-ENBT)
Controller redundancy	Not supported
Programming languages	Relay ladder with safety application instructions
Primary Controller	Safety Partner
1756-L61S, 1756-L62S, 1756-L63S	1756-LSP
1756-L71S, 1756-L72S, 1756-L73S	1756-L7SP
1756-L73SXT	1756-L7SPXT

1756-L7xS GuardLogix Controllers Specifications

Table 15 - Technical Specifications - 1756-L7xS GuardLogix Controllers

Attribute	1756-L71S	1756-L72S	1756-L73S	1756-L7SP
User memory	2 MB	4 MB	8 MB	—
Safety memory	1 MB	2 MB	4 MB	(2)
I/O memory	0.98 MB			—
Optional nonvolatile memory storage	1 GB (1756-SD1 ships with every controller) 2 GB (1756-SD2)			—
Digital I/O, max	128,000			—
Analog I/O, max	4000			—
Total I/O, max	128,000			—
Replacement battery	—			
Energy storage modules	<ul style="list-style-type: none"> 1756-ESMCAP capacitor energy storage module (removable, ships installed with every controller) 1756-ESMNSE capacitor energy storage module (removable, no residual WallClockTime power backup) 1756-ESMNRM capacitor energy storage module (nonremovable, secures controller by preventing USB connection and SD card use) 			<ul style="list-style-type: none"> 1756-SPESMNSE capacitor energy storage module for the safety partner (removable, no residual WallClockTime power backup) 1756-SPESMNRM capacitor energy storage module for the safety partner (nonremovable, secures controller by preventing USB connection and SD card use)
Current draw @ 1.2V DC	5 mA			
Current draw @ 5.1V DC	800 mA			
Power dissipation	2.5 W			
Thermal dissipation	8.5 BTU/hr			
Isolation voltage	30V (continuous), basic insulation, USB port to backplane, type tested at 500V AC for 60 s			
Weight, approx	0.25 kg (0.55 lb)			
Slot width	2, (both modules needed; each is one slot)			
Module location	Chassis-based, any slot (the safety partner must be installed in the slot to the immediate right of the primary controller)			
Chassis	1756-A4, 1756-A7, 1756-A10, 1756-A13, 1756-A17			
Power supply, standard	1756-PA72, 1756-PB72, 1756-PA75, 1756-PB75			
Wire category ⁽¹⁾	3 - on USB ports			
North American temperature code	T4A			
IEC temperature code	T4			
Enclosure type rating	None (open-style)			

(1) Use this Conductor Category information for planning conductor routing. Refer to Industrial Wiring and Grounding Guidelines, publication [1770-4.1](#).

(2) Same as corresponding primary controller.

Table 16 - Environmental Specifications - 1756-L7xS GuardLogix Controllers

Attribute	1756-L71S, 1756-L72S, 1756-L73S, 1756-L7SP
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Temperature, surrounding air, max	60 °C (140 °F)
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g (45 g with SD card installed)
Emissions CISPR 11 IEC 61000-6-4	Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz

Table 17 - Certifications - 1756-L7xS GuardLogix Controllers

Certification ⁽¹⁾	1756-L71S, 1756-L72S, 1756-L73S, 1756-L7SP
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2004/108/EC EMC Directive, compliant with: <ul style="list-style-type: none"> EN 61000-6-4; Industrial Emissions EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) European Union 2006/42/EC MD, compliant with: <ul style="list-style-type: none"> EN 60204-1; Electrical equipment of machines EN ISO 13849-1; Safety-related parts of control systems EN 62061; Functional safety of safety-related control systems
C-Tick	Australian Radio communications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> EN 60079-15; Potentially Explosive Atmospheres, Protection 'n' EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3
TÜV certified for functional safety ⁽²⁾	Capable of SIL CL 3 according to IEC 61508, capable of Category 4 according to EN954-1, and capable of PL(e) according to ISO 13849-1 when used as described in the GuardLogix Controller Systems Safety Reference Manual, publication 1756-RM093 .

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

(2) When used with specified firmware revisions.

1756-L6xS GuardLogix Controllers Specifications

Table 18 - Technical Specifications - 1756-L6xS GuardLogix Controllers

Attribute	1756-L61S	1756-L62S	1756-L63S	1756-LSP
User memory	2 MB	4 MB	8 MB	—
Safety memory	1 MB	1 MB	3.75 MB	Same as corresponding primary controller
I/O memory	478 KB			—
Optional nonvolatile memory storage	128 MB (1784-CF128) ⁽²⁾ 1 GB (1784-SD1, ships with every controller) 2 GB (1784-SD2)			—
Digital I/O, max	128,000			—
Analog I/O, max	4000			—
Total I/O, max	128,000			—
Replacement battery	1756-BA2 (0.50 g lithium)			
Energy storage modules	—			
Current draw @ 1.2V DC	—			
Current draw @ 5.1V DC	1200 mA			
Current draw @ 24V DC	14 mA			
Power dissipation	3.5 W			
Thermal dissipation	11.9 BTU/hr			
Isolation voltage	30V (continuous), Basic Insulation Type, RS-232 to system Type tested at 720V DC for 60 s			
Serial cables	1756-CP3 or 1747-CP3, right angle connector to controller, straight to serial port, 3 m (9.84 ft)			
Weight, approx	0.32 kg (0.70 lb)			
Slot width	2, (both modules needed; each is one slot)			
Module location	Chassis-based, any slot (the safety partner must be installed in the slot to the immediate right of the primary controller)			
Chassis	1756-A4, 1756-A7, 1756-A10, 1756-A13, 1756-A17			
Power supply standard	1756-PA72, 1756-PA75, 1756-PB72, 1756-PB75			
Wire category ⁽¹⁾	2 - on RS-232 port			
North American temperature code	T4A			
Enclosure type rating	None (open-style)			

(1) Use this conductor category information for planning conductor routing as described in the system level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

(2) RSLogix™ 5000 programming software, version 18 or later.

Table 19 - Environmental Specifications - 1756-L6xS GuardLogix Controllers

Attribute	1756-L61S, 1756-L62S, 1756-L63S, 1756-LSP
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F) on 1756-L61S, 1756-L62S, 1756-L63S, 1756-LSP
Temperature, storage IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions CISPR 11 IEC 61000-6-4	Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on RS-232 port
Surge transient immunity IEC 61000-4-5	±2 kV line-earth (CM) on RS-232 port
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz

Table 20 - Certifications - 1756-L6xS GuardLogix Controllers

Certification⁽¹⁾	1756-L61S, 1756-L62S, 1756-L63S, 1756-LSP
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/EC EMC Directive, compliant with: <ul style="list-style-type: none"> • EN 61000-6-4; Industrial Emissions • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) European Union 2006/42/EC MD, compliant with: <ul style="list-style-type: none"> • EN 60204-1; Electrical equipment of machines • EN ISO 13849-1; Safety-related parts of control systems • EN 62061; Functional safety of safety-related control systems
C-Tick	Australian Radio communications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
FM	FM Approved Equipment for use in Class I, Division 2 Group A, B, C, D Hazardous Locations
KC	Korean Registration of Broadcasting and Communication Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3
TÜV certified for functional safety ⁽²⁾	Capable of Cat. 4/PL e according to EN ISO 13849-1 and SIL 3 according to EN 62061/IEC 61508 when used as described in the GuardLogix Controller Systems Safety Reference Manual, publication 1756-RM093 .
UL certified for functional safety ⁽²⁾	Capable of SIL CL 3, see UL File E256621.

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

(2) When used with specified firmware revision.