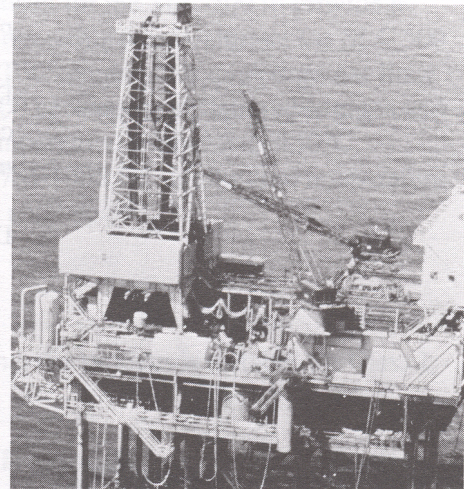




SLC 500 Class I, Division 2 Hazardous Location Certification

Feature Summary



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Allen-Bradley has obtained Class I, Division 2 certification from Underwriters Laboratories for the U.S. (UL) and Canada (C-UL), and from the Canadian Standards Association (CSA). This certification applies to the majority of modular style components in the SLC 500 family of small programmable controllers.

Class I, Division 2 certification permits use of an electrical device in an environment where explosive gases are periodically present. Certified SLC 500 components are a convenient solution for control applications in potentially hazardous locations. You get the flexibility of modular components while reducing the need for additional enclosures. Installations include:

- petrochemical plants
- spray paint areas
- dry cleaning plants
- dip tanks containing flammable or combustible liquids

What is Class I, Division 2?

Article 500 of NFPA 70, National Electrical Code, designates as hazardous any location in which a combustible material is or may be present in the atmosphere in sufficient concentration to produce an ignitable mixture. Article 500 defines three major categories: Class I, Class II, and Class III. Each category is divided into two divisions: Division 1 and Division 2.

Class I is defined as - “Locations in which *flammable gases or vapors are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures.*”

Division 1 is defined as - “Locations in which ignitable concentrations of flammable gases or vapors *can exist under normal operating conditions.*”

Division 2 is defined as:

- “Locations where the liquids, gases, or vapors are normally confined within closed containers or closed systems, from which they can escape only in cases of accidental rupture, or breakdown of such containers or systems.”
- “Locations in which ignitable concentrations of vapors and gases are normally prevented by mechanical ventilation.”
- “Locations adjacent to a Division 1 location, and to which ignitable mixtures may be occasionally communicated.”

Benefits of Class I, Division 2 Certified SLCs

A Class I, Division 2 certified controller may reduce the cost and time of installation because it will not require explosion-proof, or purged and pressurized enclosures. Of course, wiring and devices, such as push buttons and switches, used in conjunction with the controller must also meet Class I, Division 2 requirements.

Why SLCs Meet Class I, Division 2 Certification Standards

SLCs are able to be certified for use in hazardous locations because the operating temperature of the internal circuitry is much lower than the autoignition temperature of most flammable gases and vapors.

Requirements for Electrical Equipment for Use in a Class I, Division 2 Environment

Under normal operating conditions, electrical equipment for use in a Class I, Division 2 must be “non-incendive.” This means that the equipment does not have “ignition capable energy” under normal operating conditions. The maximum operating temperature of the equipment must be determined and marked on the product nameplate.

SLC 500 Operating Temperature Code

All electrical and control equipment for use in a Class I, Division 2 location is tested to determine the maximum surface temperature of the device. Use a device with a particular temperature code only in applications where the gases and vapors involved have a higher autoignition temperature

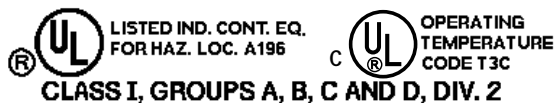
T3C 160°C (320°F) was chosen for the SLC 500 to provide a wide margin of safety. The operating temperature of the SLC 500 is significantly lower. The T3C temperature code does not limit the usefulness of the SLC 500 because most flammable gases and vapors have autoignition temperatures higher than 160°C (320°F). Refer to NFPA 497M-1986 for autoignition temperature of various flammable gases and vapors.

Identifying the Certification

Look for This Label!

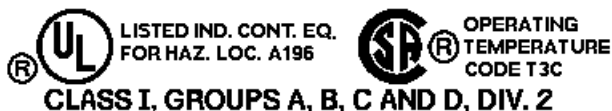
The labels below indicate that the product is suitable for Class I, Division 2 applications.

Hazardous Location by UL and C-UL



Important: C-UL certification is accepted in Canada as the equivalent of CSA approval.

Hazardous Location by UL and CSA



Hazardous Location by CSA only



UL/C-UL/CSA File Numbers

SLC 500 controllers meet the requirements for UL standard 508 and CSA Class 3218 02 for industrial control equipment. UL and CSA file numbers are as follows:

UL Ordinary Location A191	File Number 113724
UL Hazardous Location A196	File Number 10314
C-UL Hazardous Location	File Number 10314
CSA Hazardous Location	File Number LR11924

Applications

The certification makes the SLC 500 modular product line especially appealing for petrochemical plants, spray paint areas, dry cleaning plants, dip tanks containing flammable or combustible liquids, plants manufacturing organic coatings, solvent extraction plants, and operations involving storage and handling of liquefied petroleum and natural gas.

Oil and Gas Industries

On oil drilling platforms, space is at a premium and safety is a major concern. Programmable controllers are most often located in Class I, Division 2 areas out of necessity. Allen-Bradley programmable controllers are used in artificial lift methods, separation processes, well testing, crude oil transport, dehydration, and gas compression. These processes require the sequencing of valves, measurement of inflows and outflows, and discrete control. Similar processes are used in onshore production facilities.

Automotive Industry

In the automotive industry, areas adjacent to spray paint booths normally are classified Class I, Division 2. Volatile paint vapor can escape from the spray paint booth and create a hazard. Electrical and control equipment installed in these areas must be listed for use in a Class I, Division 2 location for control of robots or manual override devices.

Special Considerations in Class I, Division 2 Installations

Keep the following in mind for Class I, Division 2 installation:

- All SLC 500 products must include the Class I, Division 2 labeling shown on page 3.
- Follow SLC 500 installation procedures.
- Read and follow all *warnings, cautions, and attentions*.
- Never install, remove, or wire modules, or operate any selector switch while the circuit is alive. Electrical arcs can cause ignition of gases if this is not followed.
- Peripheral devices (for example, pushbuttons and lamps) should be Class I, and Division 2 certified or determined to be safe for the installation.
- Installation personnel must be familiar with and must follow wiring methods described in N.E.C. Article 501-4 - "Wiring Methods."
In Canada, consult C.E.C. Part 1, Section 18.

SLC 500 Components Listed as Class I, Division 2

Models that Carry Certification Marking

Most modular style SLC 500 components, including communication and programming devices, have been certified for use in Class I, Division 2 hazardous locations by UL and CSA. Relay contact, 32-point, and fused I/O modules have been certified for Class I, Division 2 hazardous location by CSA only. Modules introduced since 1998 have been certified for Class I, Division 2 hazardous location by UL and C-UL. C-UL is accepted in Canada as the equivalent to CSA. Refer to the following table which lists the modular components and their agency certification.

Catalog Number	Agency Certification			Description
	UL A196	C-UL	CSA	
1746-A4	•		•	4-Slot Chassis — Modular Hardware Style
1746-A7	•		•	7-Slot Chassis — Modular Hardware Style
1746-A10	•		•	10-Slot Chassis — Modular Hardware Style
1746-A13	•		•	13-Slot Chassis — Modular Hardware Style
1746-BAS	•		•	BASIC Module
1746-FIO4I				Analog Module (2) Inputs — Selectable Current or Voltage & (2) Current Outputs
1746-FIO4V				Analog Module (2) Inputs — Selectable Current or Voltage & (2) Voltage Outputs
1746-HSCE	•		•	High-Speed Counter Encoder Module
1746-IA4	•		•	AC Input Module (4) Inputs — 100/120V ac
1746-IA8	•		•	AC Input Module (8) Inputs — 100/120V ac
1746-IA16	•		•	AC Input Module (16) Inputs — 100/120V ac
1746-IB8	•		•	DC Input Module (8) Inputs — Sink 24V dc
1746-IB16	•		•	DC Input Module (16) Inputs — Sink 24V dc
1746-IB32			•	DC Input Module (32) Inputs — Sink 24V dc
1746-IC16	•		•	DC Input Module (16) Inputs — Sink 48V dc
1746-IG16	•		•	DC Input Module (16) Inputs — TTL Source 5V dc
1746-IH16	•		•	DC Input Module (16) Inputs — Sink 125V dc
1746-IM4	•		•	AC Input Module (4) Inputs — 200/240V ac
1746-IM8	•		•	AC Input Module (8) Inputs — 200/240V ac
1746-IM16	•		•	AC Input Module (16) Inputs — 200/240V ac
1746-IN16	•		•	Input Module (16) Inputs — 24V ac/dc
1746-IO4			•	Combination Module — (2) Inputs 100/120V ac and (2) Outputs Relay
1746-IO8			•	Combination Module — (4) Inputs 100/120V ac and (4) Outputs Relay
1746-IO12			•	Combination Module — (6) Inputs 100/120V ac and (6) Outputs Relay
1746-ITB16	•		•	Fast DC Input Module (16) Inputs — Sink 24V dc
1746-ITV16	•		•	Fast DC Input Module (16) Inputs — Source 24V dc
1746-IV8	•		•	DC Input Module (8) Inputs — Source 24V dc
1746-IV16	•		•	DC Input Module (16) Inputs — Source 24V dc
1746-IV32			•	DC Input Module (32) Inputs — Source 24V dc

Catalog Number	Agency Certification			Description
	UL A196	C-UL	CSA	
1746-NI4	•		•	(4) Analog Inputs — Each selectable to accept either current or voltage.
1746-NI8	•		•	(8) Analog Inputs — Each selectable to accept either current or voltage.
1746-NIO4I	•		•	(2) Analog Inputs, Selectable, Current or Voltage — (2) Analog Current Outputs
1746-NIO4V	•		•	(2) Analog Inputs, Selectable, Current or Voltage — (2) Analog Voltage Outputs
1746-NO4I	•		•	Analog Module (4) Current Outputs — 0 to 20 mA
1746-NO4V	•		•	Analog Module (4) Voltage Outputs — -10V dc to +10V dc
1746-NR4	•		•	RTD/Resistance Input Module
1746-NT4	•		•	SLC 500 Thermocouple/mV Module
1746-OA8	•		•	AC Output Module (8) Triac — 120/240V ac
1746-OA16	•		•	AC Output Module (16) Triac — 120/240V ac
1746-OAP12			•	High Current Output Module (12) Triac — 120/240V ac
1746-OB8	•		•	DC Output Module (8) Transistor Source — 10-50V dc
1746-OB16	•		•	DC Output Module (16) Transistor Source — 10-50V dc
1746-OB16E	•	•		Electronically Protected DC Output Module (16) Current Source 10-30V dc
1746-OB32			•	DC Output Module (32) Transistor Source — 10-50V dc
1746-OBP8	•	•		High Current DC Output Module (8) Current Source — 24V dc
1746-OBP16			•	High Current DC Output Module (16) Current Source — 24V dc
1746-OG16	•		•	DC Output Module (16) Outputs — TTL Sink 5V dc
1746-OV8	•		•	DC Output Module (8) Transistor Sink — 10-50V dc
1746-OV16	•		•	DC Output Module (16) Transistor Sink — 10-50V dc
1746-OV32			•	DC Output Module (32) Transistor Sink — 5-50V dc
1746-OVP16			•	High Current DC Output Module (16) Current Sink — 24V dc
1746-OW4			•	Relay Output Module (4) Outputs — 10-250V ac / 10-125V dc
1746-OW8			•	Relay Output Module (8) Outputs — 10-250V ac / 10-125V dc
1746-OW16			•	Relay Output Module (16) Outputs — 10-250V ac / 10-125V dc
1746-OX8			•	Isolated Relay Output Module (8) Outputs — 10-250V ac / 10-125V dc
1746-P1	•		•	Power Supply — Chassis Mount (120/240V ac — 2A with user power)
1746-P2	•		•	Power Supply — Chassis Mount (120/240V ac — 5A with user power)
1746-P3	•		•	Power Supply — Chassis Mount (24V dc — 3.6A)
1746-P4			•	Power Supply — Chassis Mount (120/240V ac — 10A with user power)
1746-P5	•		•	Power Supply — Chassis Mount (125V dc — 5A with user power)
1746-P6	•	•		Power Supply — Chassis Mount (48V dc — 5A with user power)
1747-AIC	•		•	Isolated Link Coupler
1747-ASB	•		•	SLC™ Remote I/O Adapter Module
1747-DCM	•		•	Direct Communication Module
1747-DSN	•		•	Distributed I/O Scanner
1747-DTAM-E	•		•	Data Table Access Module (DTAM™)
1747-KE	•		•	DH485/RS-2132C Interface Module
1747-L511	•		•	SLC 5/01™ Central Processor Unit (Processor) 1K User Memory
1747-L514	•		•	SLC 5/01™ Central Processor Unit (Processor) 4K User Memory
1747-L524	•		•	SLC 5/02™ Central Processor Unit (Processor) 4K User Memory

Catalog Number	Agency Certification			Description
	UL A196	C-UL	CSA	
1747-L532	•		•	SLC 5/03™ Central Processor Unit (Processor) 12K User Memory
1747-L541	•		•	SLC 5/04™ Central Processor Unit (Processor) 12K Program Memory and 4K Data Memory
1747-L542	•		•	SLC 5/04™ Central Processor Unit (Processor) 28K Program Memory and 4K Data Memory
1747-L542P	•		•	SLC 5/04P Central Processor Unit (Processor) 32K Memory
1747-L543	•		•	SLC 5/04™ Central Processor Unit (Processor) 60K Program Memory and 4K Data Memory
1747-L551	•		•	SLC 5/05™ Central Processor Unit (Processor) 16K User Memory
1747-L552	•		•	SLC 5/05™ Central Processor Unit (Processor) 32K User Memory
1747-L553	•		•	SLC 5/05™ Central Processor Unit (Processor) 64K User Memory
1747-PIC	•		•	Converter RS-232/DH485
1747-PT1	•		•	Hand-Held Terminal
1747-SDN			•	DeviceNet™ Scanner
1747-SN	•		•	Remote I/O Scanner

Certified Models Not Required to Carry Certification Marking

The following accessories are also listed by UL and CSA for Class I, Division 2 applications, but are not required to carry certification markings.

Catalog Number	Description
1746-C7	6-inch Chassis Interconnect Cable
1746-C9	36-inch Chassis Interconnect Cable
1746-N2	Modular Card Slot Filler
1747-BA	Battery (for RAM memory retention)
1747-C10	1.8m (6 ft.) Processor to Peripheral Programming/Communication Replacement Cable
1747-C11	Processor to Isolated Link Coupler Replacement Cable
1747-C13	Specialty Module to Isolated Link Coupler Cable
1747-C20	6.1m (20 ft.) Processor to Peripheral Programming/Communication Replacement Cable
1747-CP3	RS-232C Programmer Cable
1747-M1	SLC 5/01 and SLC 5/02 EEPROM with 1K User Memory Backup
1747-M2	SLC 5/01 and SLC 5/02 EEPROM with 4K User Memory Backup
1747-M3	SLC 5/01 and SLC 5/02 UV PROM with 1K User Memory Backup
1747-M4	SLC 5/01 and SLC 5/02 UV PROM with 4K User Memory Backup
1747-M5	SLC 5/01 and SLC 5/02 Adapter Socket
1747-M11	SLC 5/03, SLC 5/04 and SLC 5/05 Flash EPROM with up to 32K User Memory Backup
1747-M12	SLC 5/03, SLC 5/04 and SLC 5/05 Flash EPROM with up to 64K User Memory Backup
1747-M15	SLC 5/03, SLC 5/04 and SLC 5/05 Flash EPROM Adapter

Catalog Number	Description
1747-PTA1E	Memory Pak — English

Allen-Bradley Support

In today's competitive environment, when you buy any product, you expect that product to meet your needs. You also expect the manufacturer of that product to back it up with the kind of customer service and product support that will prove you made a wise purchase.

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- sales and order support
- product technical training
- warranty support
- support service agreements

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