

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Amikon cover with selected official Rockwell Automation pages

ALLEN-BRADLEY CONTROLLOGIX

1756-L81EP

5580 PROCESS CONTROLLER

Selected official pages cover process-controller features, specifications, installation, dimensions, connections and commissioning requirements.

ControlLogix 5580 Process Controllers

The ControlLogix 5580 process controllers are an extension of the Logix 5000 controller family that focuses on plant-wide process control. These process controllers come configured with a default process tasking model and dedicated PlantPax® process instructions optimized for process applications and that improve design and deployment efforts.

The ControlLogix 5580 process controllers provide extended protection in corrosive gas environments and can be used in temperature extremes from -25...+70 °C (-13...+158 °F) when deployed as part of a Logix-XT system.

Features - ControlLogix 5580 Process Controllers

Feature	1756-L81EP	1756-L83EP	1756-L85EP
Controller tasks	32 tasks, including a combination of one continuous, periodic, and event tasks, 1000 programs/task		
Built-in communication ports ⁽¹⁾	1 port USB ⁽²⁾ Embedded Ethernet port		
USB port communication	USB 2.0 Full speed (12 Mbps) Programming, configuration, firmware update, and online edits only		
Ethernet performance	10/100/1000 Mbps		
I/O Capacity (Class 0/1) - packets/second ⁽³⁾⁽⁴⁾	• 128,000 without CIP Security • 40,000 with integrity • 20,000 with integrity and confidentiality		
Message Rate Capacity HMI/MSG (Class 3) - messages/second ⁽³⁾⁽⁴⁾⁽⁵⁾			
front port	• 2000 without CIP Security • 1500 with integrity • 900 with integrity and confidentiality		
backplane ⁽⁶⁾	• 4000 with multiple 1756-EN4TR modules		
backplane in Logix redundancy ⁽⁶⁾	• 2000		
Communication options	• EtherNet/IP • ControlNet • DeviceNet • Data Highway Plus • Remote I/O • SERCOS • Third-party process and device networks		
EtherNet/IP nodes supported, max ⁽⁷⁾	100 nodes	250 nodes	300 nodes ⁽⁸⁾
OPC UA nodes supported max ⁽⁹⁾⁽¹⁰⁾	—	1200 nodes	15,000 nodes
Network connections per network module located in the local chassis	• ControlLogix 5580 Controllers front EtherNet/IP port. See 'EtherNet/IP nodes supported, max' in this table. • 1000 I/O; 528 EtherNet/IP; 512 TCP (1756-EN4TR or variant rated for harsh environments) • 256 EtherNet/IP; 128 TCP (1756-EN2x or variant rated for harsh environments) • 128 EtherNet/IP; 64 TCP (1756-ENBT or variant rated for harsh environments) • 100 ControlNet (1756-CN2/A or variant rated for harsh environments) • 40 ControlNet (1756-CNB/D, 1756-CNB/E or variant rated for harsh environments) • 128 ControlNet (1756-CN2/B or variant rated for harsh environments)		
Integrated motion	• SERCOS interface • Analog options (encoder input, LDT input, SSI input) • Integrated Motion on the EtherNet/IP network		
Controller redundancy	Full support with Studio 5000 Logix Designer application version 33.00.00 or later. ⁽¹⁾		
Programming languages	• Relay Ladder Logic (RLL) • Structured Text • Function Block Diagram • Sequential Function Chart (SFC)		

(1) When the controller is enabled for redundancy: the Ethernet port is off, Integrated motion is not supported, and DeviceNet, ControlNet, RIO, DH+ networks are not supported. See the Redundancy Systems User Manual, publication [1756-UM015](#).

(2) The USB port is intended for temporary local programming purposes only and not intended for permanent connection. Do not use the USB port in hazardous locations.

(3) I/O numbers are maximums; they assume no HMI/MSG. HMI/MSG numbers are maximums, they assume no I/O. Packet rates vary depending on packet size. For more details, see Troubleshoot EtherNet/IP Application Technique, publication [ENET-AT003](#), and the EDS file for a specific catalog number.

(4) For information on integrity and confidentiality, see the CIP Security with Rockwell Automation Products Application Technique, publication [SECURE-AT001](#).

(5) Maximums assume that the processor is the target, not the originator.

(6) Controller performance not impacted by CIP Security.

(7) A node is an EtherNet/IP device that you add directly to the I/O configuration, and counts toward the node limits of the controller. For more information on EtherNet/IP nodes, see the ControlLogix 5580 Controllers User Manual, publication [1756-UM543](#).

(8) Additional EtherNet/IP nodes may be possible depending on remaining controller resources.

(9) An OPC UA node is a data structure, such as a single tag, that can be exchanged between industrial processes to external resources and applications. For more information on OPC UA nodes, see the OPC UA in 5580 and 5380 Controllers User Manual, publication [1756-UM023](#).

(10) With Studio 5000 Logix Designer application version 36.00.00 or later.

Technical Specifications - ControlLogix 5580 Process Controllers

Attribute	1756-L81EP	1756-L83EP	1756-L85EP
Standard memory	3 MB	10 MB	40 MB
Digital I/O, max	128,000		
Analog I/O, max	4000		
Total I/O, max	128,000		
Nonvolatile memory storage	4 GB Secure Digital (SD) card (1784-SD4), ships pre-installed in the controller ⁽¹⁾		
Energy storage module	Embedded in controller, non-removable		
Number of power cycles	80,000		
Current draw @ 1.2V DC	5.0 mA		
Current draw @ 5.1V DC	1.20 A		
Power dissipation	6.2 W		
Thermal dissipation	21.2 BTU/hr		
Isolation voltage	50V (continuous), Basic Insulation type, USB port to backplane, Ethernet port to backplane, and USB port to Ethernet port Compliant and tested according to IEC/UL 61010-1		
Weight, approx	0.394 kg (.868 lb)		
Slot width	1		
Module location	Chassis-based, any slot		
Chassis	1756-A4, 1756-A4K, 1756-A7, 1756-A7K, 1756-A10, 1756-A10K, 1756-A13, 1756-A13K, 1756-A17, 1756-A17K Series B, Series C 1756-A7XT, 1756-A10XT Series C 1756-A7ZXT, 1756-A10ZXT		
Power supply, standard	1756-PA50, 1756-PA50K, 1756-PA72, 1756-PA72K, 1756-PA75, 1756-PA75K, 1756-PB50, 1756-PB50K 1756-PB72, 1756-PB72K, 1756-PB75, 1756-PB75K, 1756-PC75, 1756-PH75		
Power supply, redundant	1756-PA75R, 1756-PA75RK, 1756-PB75R, 1756-PB75RK, 1756-PSCA2, 1756-PSCA2K		
Wire category ⁽²⁾	3 - on USB port 2 - on Ethernet ports		
Wire size	Ethernet connections: Ethernet cabling and installation according to IEC 61918 and IEC 61784-5-2		
Temperature code	T4		
Enclosure type rating	None (open-style)		

(1) Larger versions may be available. See [Memory Cards on page 42](#).

(2) Use this conductor category information to plan conductor routing. See Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

Parts List

The controller ships with these parts:

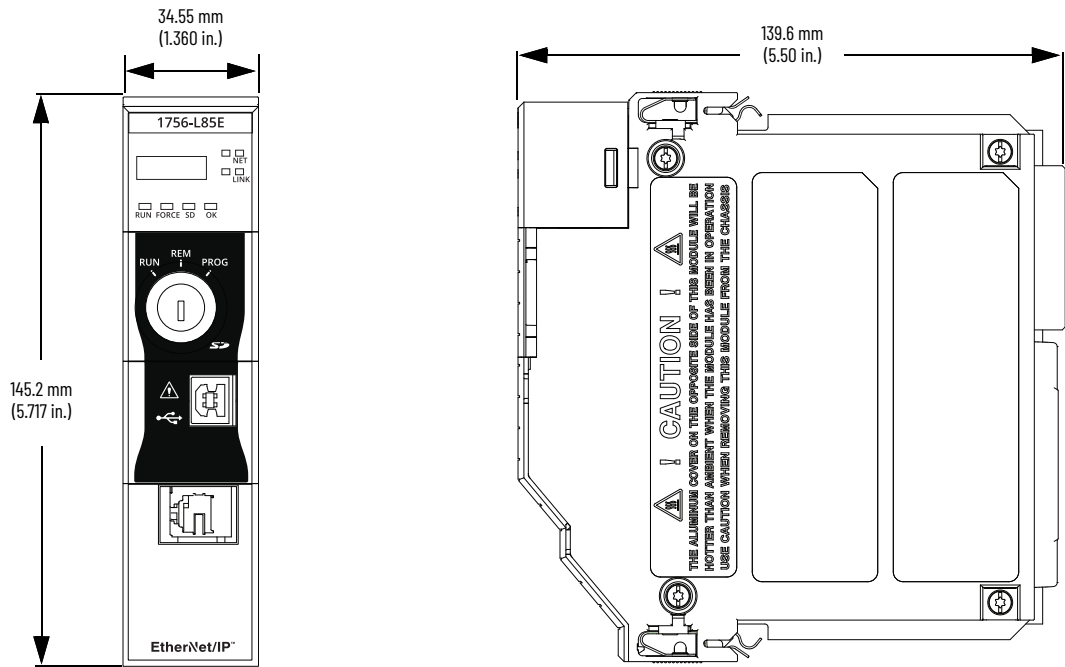
- A key for the mode switch (1756-KY1)
- 4 GB Secure Digital Card (1784-SD4), preinstalled in ControlLogix standard controllers
- 4 GB Secure Digital Card (1784-SD4XT), preinstalled in ControlLogix-XT controllers

Required System Components

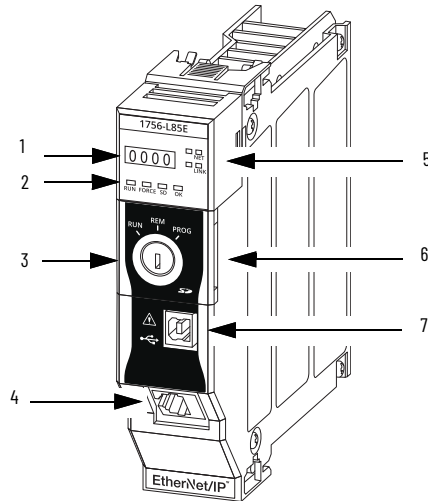
To use the controller, a chassis and power supply are required. For controller and chassis operating specifications, see the 1756 ControlLogix Controller Specifications Technical Data, publication [1756-TD001](#).

Component	Catalog Number
ControlLogix Chassis, series C and series B	1756-A4, 1756-A4K, 1756-A7, 1756-A7K, 1756-A10, 1756-A10K, 1756-A13, 1756-A13K, 1756-A17, 1756-A17K
ControlLogix Power Supply	1756-PA72, 1756-PA72K, 1756-PA75, 1756-PA75K, 1756-PB72, 1756-PB72K, 1756-PB75, 1756-PB75K, 1756-PC75, 1756-PH75 1756-PA50, 1756-PA50K, 1756-PB50, 1756-PB50K 1756-PA75R, 1756-PA75RK, 1756-PB75R, 1756-PB75RK, 1756-PSCA2, 1756-PSCA2K
ControlLogix-ZXT Chassis or ControlLogix-XT Chassis, series C	1756-A7ZXT, 1756-A10ZXT 1756-A7XT, 1756-A10XT
ControlLogix-XT Power Supply	1756-PAXT, 1756-PBXT 1756-PA30XT, 1756-PB30XT 1756-PAXTR, 1756-PBXT 1756-PA75XT, 1756-PB75XT

Product Dimensions



Connectors and Status Indicators



Item	Description
1	4-character display
2	Status Indicators
3	Mode switch (Remote, Run, Program)
4	Ethernet Port
5	Ethernet Status Indicators
6	SD card slot and Reset Button are behind the door.
7	USB Port

Install the Controller



ATTENTION: If you are using a ControlLogix 5580 Standard or NSE controller to the maximum temperature of 60 °C (140 °F), you must use a ControlLogix chassis, series C. If you're using a ControlLogix-XT or ControlLogix Process controller to the maximum temperature of 70 °C (158 °F), you must use a ControlLogix-ZXT chassis or a ControlLogix-XT chassis, series C.



WARNING: When you insert or remove the controller while backplane power is on, an electric arc can occur. This could cause an explosion in hazardous location installations. Be sure that power is removed or the area is nonhazardous before proceeding. Repeated electrical arcing causes excessive wear to contacts on both the controller and its mating connector. Worn contacts can create electrical resistance that can affect controller operation.



ATTENTION: The ControlLogix 5580 controllers listed on [page 1](#) that end with a 'K', 'NSE', 'P', or 'XT' are shipped with port protection plugs/covers installed to provide a layer of protection from corrosive atmospheres. Once the factory packaging seal is broken, the port plugs/covers must remain installed in unused ports at all times for the product to maintain its corrosive atmosphere rating. If temporary access is required, plugs can be removed, but should be reinserted after temporary access is complete.

Before you install the controller, make sure to see these ControlLogix® Chassis and Power Supply Installation Instructions:

- ControlLogix Chassis Installation Instructions, publication [1756-IN621](#)
- ControlLogix Power Supply Installation Instructions, publication [1756-IN619](#)
- ControlLogix Redundant Power Supply Installation Instructions, publication [1756-IN620](#)

When installing a ControlLogix controller, you can do the following:

- Place the controller in any slot.
- Use multiple controllers in the same chassis.

You can install or remove a ControlLogix controller while chassis power is on and the system is operating.



ATTENTION: This equipment is sensitive to electrostatic discharge, which can cause internal damage and affect normal operation.

Follow these guidelines when you handle this equipment:

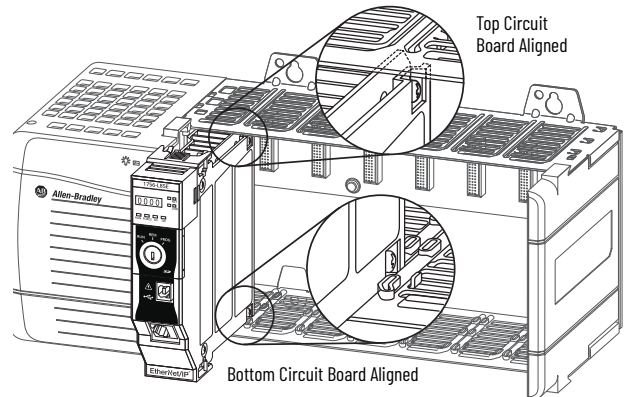
- Touch a grounded object to discharge potential static.
- Wear an approved grounding wriststrap.
- Do not touch connectors or pins on component boards.
- Do not touch circuit components inside the equipment.
- Use a static-safe workstation, if available.
- Store the equipment in appropriate static-safe packaging when not in use.

- If you're using a ControlLogix-ZXT chassis, remove the backplane connector cover from the slot into which you're installing the controller.

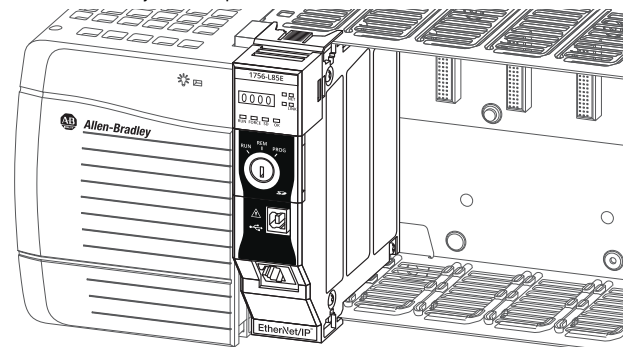


ATTENTION: ControlLogix-ZXT chassis are shipped with backplane connector covers installed to provide a layer of protection from corrosive atmospheres. Once the factory packaging seal is broken, these covers must remain installed in unused slots at all times for the chassis to maintain its corrosive atmosphere rating. If the controller is later removed, reinstall a backplane connector cover in the vacated slot to maintain the corrosive atmosphere rating of the chassis.

- Align the circuit board with the top and bottom guides in the chassis.



- Slide the controller into the chassis until it snaps into place.
- Verify that the controller is flush with the power supply, modules, or other installed system components.



Specifications - ControlLogix 5580 Process Controllers

Attribute	1756-L81EP, 1756-L83EP, 1756-L85EP	1756-L81EPXT, 1756-L83EPXT, 1756-L85EPXT	
Temperature, operating IEC 60068-2-1 (Test Ae, Operating Cold), IEC 60068-2-2 (Test Be, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	-25 °C ≤ Ta ≤ +60 °C (-13 °F ≤ Ta ≤ +140 °F) for Standard Chassis, Series C -25 °C ≤ Ta ≤ +50 °C (-13 °F ≤ Ta ≤ +122 °F) for Standard Chassis, Series B -25 °C ≤ Ta ≤ +70 °C (-13 °F ≤ Ta ≤ +158 °F) for XT Chassis, Series C -25 °C ≤ Ta ≤ +70 °C (-13 °F ≤ Ta ≤ +158 °F) for ZXT Chassis	-25 °C ≤ Ta ≤ +70 °C (-13 °F ≤ Ta ≤ +158 °F) for XT Chassis, Series C	-25 °C ≤ Ta ≤ +70 °C (-13 °F ≤ Ta ≤ +158 °F) for ZXT Chassis
Temperature, Surrounding Air max	60 °C (140 °F) for Standard Chassis, Series C 50 °C (122 °F) for Standard Chassis, Series B 70 °C (158 °F) for XT Chassis, Series C 70 °C (158 °F) for ZXT Chassis	70 °C (158 °F) for XT Chassis, Series C	70 °C (158 °F) for ZXT Chassis
Conformal Coated	Yes		
Corrosive Atmosphere • ASTM B845-97 Method K Accelerated Test (20-Day Exposure)	Severity Level G3 ⁽¹⁾⁽²⁾ per ANSI/ISA 71.04-2013, Airborne Contaminants—Gases Severity Level CX ⁽¹⁾ per IEC 60721-3-3:2019, Chemically Active Substances		—
Corrosive Atmosphere • ASTM B845-97 Method K Accelerated Test (30-Day Exposure) plus additional Rockwell Automation proprietary accelerated corrosive environment test protocol for specific industries with sources of gaseous sulfur compounds.	—		Severity Level GX ⁽³⁾⁽⁴⁾ per ANSI/ISA 71.04-2013, Airborne Contaminants—Gases Severity Level CX ⁽³⁾ per IEC 60721-3-3:2019, Chemically Active Substances
Enclosure type rating	None (open-style)		
Voltage and current ratings	1200 mA @ 5.1V DC 5.0 mA @ 1.2V DC		
Isolation Voltage	50V (continuous), Basic Insulation type, USB port to Backplane, Ethernet port to Backplane, and USB Port to Ethernet port. Type tested at 1000V AC for 60 seconds		
Weight, approx	394 g (0.868 lb)		
Wire size	Ethernet cabling and installation according to IEC 61918 and IEC 61784-5-2		
Temperature code	T4		

(1) Port plugs/covers must remain installed in unused ports at all times during storage and operation for the product to maintain its corrosive atmosphere rating.

(2) Up to 86.4 g/(m²-yr), mass loss of copper due to corrosion.

(3) Port plugs/covers must remain installed in unused ports at all times, once the XT packaging seal is broken, for the product to maintain its corrosive atmosphere rating.

(4) Up to 2100 angstroms of film growth per 30 days of copper and/or silver reactivity.