

# ControlLogix and GuardLogix Controller Specifications

Bulletin 1756

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## ControlLogix-XT 5590 Process Controllers

The ControlLogix-XT 5590 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-XT 5590 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-XT 5590 Process Controllers

Feature	1756-L905TPSXT	1756-L915TPSXT	1756-L950TPSXT	1756-L980TPSXT	1756-L9SPXT
Controller tasks	32 tasks, including a combination of one continuous, periodic, and event tasks 1000 programs/task				—
Built-in communication ports <sup>(1)</sup>	1 port USB <sup>(2)</sup> 2 Embedded Ethernet ports				—
USB port communication	USB 2.0 Type-C (does not support powering external devices) 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 <sup>(3)(4)</sup>	<ul style="list-style-type: none"> <li>164,000 without CIP Security</li> <li>60,000 with integrity</li> <li>30,000 with integrity and confidentiality</li> </ul>				—
Message Rate Capacity HMI/MSG (Class 3) - messages/second <sup>(3)(4)(5)</sup>					
front port without safety partner	<ul style="list-style-type: none"> <li>4000 without CIP Security</li> <li>3000 with integrity</li> <li>2700 with integrity and confidentiality</li> </ul>				—
front port with safety partner	<ul style="list-style-type: none"> <li>2000 without CIP Security</li> <li>1500 with integrity</li> <li>900 with integrity and confidentiality</li> </ul>				—
backplane without safety partner <sup>(6)</sup>	<ul style="list-style-type: none"> <li>7000 with multiple 1756-EN4TR modules</li> </ul>				—
backplane with safety partner <sup>(6)</sup>	<ul style="list-style-type: none"> <li>2000</li> </ul>				—
backplane in Logix redundancy <sup>(6)</sup>	<ul style="list-style-type: none"> <li>2000</li> </ul>				—
Communication options	EtherNet/IP, ControlNet, DeviceNet, SERCOS, and third-party process and device networks				—
EtherNet/IP nodes supported max <sup>(7)(8)</sup>	100 nodes	300 nodes	500 nodes	600 nodes <sup>(9)</sup>	—
OPC UA nodes supported max <sup>(10)</sup>	1000 nodes	5000 nodes	50,000 nodes	100,000 nodes	—
Network connections per network module located in the local chassis	<ul style="list-style-type: none"> <li>ControlLogix 5590 Controllers front EtherNet/IP ports. See 'EtherNet/IP nodes supported, max' in this table.</li> <li>1000 I/O; 528 EtherNet/IP; 512 TCP (1756-EN4TR variant rated for harsh environments)</li> <li>256 EtherNet/IP; 128 TCP (1756-EN2x variant rated for harsh environments)</li> <li>128 EtherNet/IP; 64 TCP (1756-ENBT variant rated for harsh environments)</li> <li>128 ControlNet (1756-CN2/B variant rated for harsh environments)</li> <li>100 ControlNet (1756-CN2/A variant rated for harsh environments)</li> <li>40 ControlNet (1756-CNB/D, 1756-CNB/E variant rated for harsh environments)</li> </ul>				—
Integrated motion	<ul style="list-style-type: none"> <li>SERCOS interface</li> <li>Analog options (encoder input, LDT input, SSI input)</li> <li>Integrated Motion on the EtherNet/IP network</li> </ul>				—
Controller redundancy	Full support <sup>(1)</sup>				—
Programming languages	<ul style="list-style-type: none"> <li>Relay Ladder Logic (RLL)</li> <li>Structured Text</li> <li>Function Block Diagram</li> <li>Sequential Function Chart (SFC)</li> </ul>				—

(1) When the controller is enabled for redundancy, the safety partner is not supported, the Ethernet ports are limited to front port crossload, Integrated motion is not supported, and DeviceNet and ControlNet networks are not supported. For more information, see the ControlLogix 5590 High Availability Systems User Manual, publication [1756-UM901](#).

(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) An EtherNet/IP node is a 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 5590 Controllers User Manual, publication [1756-UM900](#).

(8) Includes any/all nodes connected using the embedded Ethernet port or via 1756-ENxTRXT or 1756-ENxTXT modules.

(9) Additional EtherNet/IP nodes maybe possible depending on remaining controller resources.

(10) 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](#).

## Technical Specifications - ControlLogix-XT 5590 Process Controllers

Attribute	1756-L905TPSXT	1756-L915TPSXT	1756-L950TPSXT	1756-L980TPSXT	1756-L9SPXT
Standard memory	5 MB	15 MB	50 MB	80 MB	—
Safety memory	5 MB	12 MB	12 MB	12 MB	Configured to match primary controller
Digital I/O, max		128,000			—
Analog I/O, max		4000			—
Total I/O, max		128,000			—
Nonvolatile memory storage	8 GB microSD card (1784-MSD8XT), ships pre-installed in the controller				—
Energy storage module	Embedded in controller, non-removable				
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 slot immediately to the right of the primary controller
Chassis	1756-A7XT, 1756-A10XT, Series C 1756-A7ZXT, 1756-A10ZXT				
Power supply, standard	1756-PAXT, 1756-PBXT, 1756-PA30XT, 1756-PB30XT				
Power supply, redundant	—				
Wire category <sup>(1)</sup>	3 - on USB port 2 - on Ethernet ports				—
Wire size	Ethernet cabling and installation according to IEC 61918 and IEC 61784-5-2. Where the operating temperature exceeds 60 °C, the maximum cable length is 20 meters.				—
Temperature code	T4				
Enclosure type rating	None (Open style)				

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

## Environmental Specifications - ControlLogix-XT 5590 Process Controllers

Attribute	1756-L905TPSXT, 1756-L915TPSXT, 1756-L950TPSXT, 1756-L980TPSXT, 1756-L9SPXT
Temperature, operating (SIL 2/PLd) IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	-25 °C ≤ Ta ≤ +70 °C (-13°F ≤ Ta ≤ +158 °F)
Temperature, operating (SIL 3/PLe) IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	-25 °C ≤ Ta ≤ +70 °C (-13°F ≤ Ta ≤ +158 °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
Conformal coated	Yes
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 <sup>(1)(2)</sup> per ANSI/ISA 71.04-2013, Airborne Contaminants—Gases Severity Level CX <sup>(1)</sup> per IEC 60721-3-3:2019, Chemically Active Substances
Vibration	IEC 60068-2-6 (Test Fc, Operating)
Shock, operating	IEC 60068-2-27 (Test Ea, Unpackaged Shock)
Shock, nonoperating	IEC 60068-2-27 (Test Ea, Unpackaged Shock)
Emissions	IEC 61000-6-4 <sup>(3)</sup>
ESD immunity	IEC 61000-4-2
Radiated RF immunity	IEC 61000-4-3
EFT/B Immunity <sup>(4)</sup>	IEC 61000-4-4
Surge Transient Immunity	IEC 61000-4-5
Conducted RF Immunity	IEC 61000-4-6

(1) Once the factory packaging seal is broken, plugs or covers must remain or be reinstalled in all unoccupied ports or slots for the product to maintain its corrosive atmosphere rating.

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

(3) ControlLogix 5590 controllers require a NEMA 1 or equivalent, windowless, metal enclosure.

(4) Shielded cable is recommended for a coarse Update Rate (CUR) / Requested Packet Interval (RPI) of 6ms or less. To use unshielded cable, the CUR/RPI must be at least 8ms.

## Certifications - ControlLogix-XT 5590 Process Controllers

Certification <sup>(1)</sup>	<b>1756-L905TPSXT, 1756-L915TPSXT, 1756-L950TPSXT, 1756-L980TPSXT, 1756-L9SPXT</b>
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.
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
CE and UKCA	European Union 2014/30/EU EMC Directive, compliant with: • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B)
RCM	Australian Radiocommunications Act, compliant with EN 61000-6-4; Industrial Emissions
ATEX	European Union 2014/34/EU ATEX Directive, compliant with: • EN IEC 60079-0; General Requirements • EN IEC 60079-7; Potentially Explosive Atmospheres, Protection "e" • II 3 G Ex ec IIC T4 Gc • UL 22 ATEX 2817X
IECEx	IECEx System, compliant with: • IEC 60079-7; Potentially Explosive Atmospheres, Protection "e" • IEC 60079-0; General Requirements • II 3 G Ex ec IIC T4 Gc • IECEx UL 22.0062X
UKCA	In conformity with the following UK Statutory Instruments and their amendments: • 2016 No. 1091, Electromagnetic Compatibility Regulations • 2016 No. 1107, Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations • 2012 No. 3032, Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with Article 58-2 of Radio Waves Act, Clause 3
CCC	CCC 2020122309111998 CNCA-C23-01 强制性产品认证实施规则 防爆电气 CNCA-C23-01 CCC Implementation Rule Explosion-Proof Electrical Products
EtherNet/IP	ODVA conformance tested to EtherNet/IP specifications
CIP Security	ODVA conformance tested to CIP Security specifications
Product safety function (MD)	• Suitable for applications up to Cat. 3/PLd according to EN ISO 13849-1 and SIL CL 2 according to EN/IEC 62061 • Suitable for applications up to Cat. 4/PLe according to EN ISO 13849-1 and SIL CL 3 according to EN/IEC 62061 when used in combination with the 1756-L9SPXT safety partner
TÜV certified for functional safety	• Capable of Cat. 4/PLe according to EN ISO 13849-1 and SIL 3 according to EN 62061/IEC 61508 when used as described in the ControlLogix 5590 Controllers User Manual, publication <a href="#">1756-UM900</a> • Capable of Cat. 3/PLe according to EN ISO 13849-1 and SIL 3 according to EN 62061/IEC 61508 when used as described in the ControlLogix 5590 High Availability Systems User Manual, publication <a href="#">1756-UM901</a> • TÜV 01/205/6058
TÜV certified for security	IEC 62443-4-2 SL1
Morocco	In conformity with the following regulations: • Arrêté ministériel n° 6404-15 du 1 er muharram 1437 (15 octobre 2015) Équipements électriques destinés à être utilisés sous certaines limites de tension • Arrêté ministériel n° 6404-15 du 29 ramadan 1436 (16 juillet 2015) Compatibilité électromagnétique des équipements

(1) See the Product Certification website at [rok.auto/certifications](#) for Declarations of Conformity, Certificates, and other certification details.

## ControlLogix 5590 Controller Accessories

You can use these accessories with ControlLogix 5590 controllers.

### Memory Cards

Memory cards offer nonvolatile memory to store a user program and tag data on a controller.

The ControlLogix 5590 controllers come with a 1784-MSD8 or 1784-MSD8XT microSD™ card installed inside. Through the programming software, you can manually trigger the controller to save to, or load from, nonvolatile memory or configure the controller to load from nonvolatile memory on powerup.

#### Technical Specifications - 1784 Memory Cards Compatible with ControlLogix 5590 Controllers

Attribute	1784-MSD8	1784-MSD8XT
Type	microSD card	
Memory	8 GB	
Supported controllers	1756-L902TS, 1756-L905TS, 1756-L908TS, 1756-L915TS, 1756-L925TS, 1756-L950TS, 1756-L980TS	1756-L902TSXT, 1756-L905TSXT, 1756-L908TSXT, 1756-L915TSXT, 1756-L925TSXT, 1756-L950TSXT, 1756-L980TSXT, 1756-L905TPSXT, 1756-L915TPSXT, 1756-L950TPSXT, 1756-L980TPSXT
Weight, approx	0.4g (0.01 oz)	

### Ethernet and USB Port Protection Plugs

ControlLogix-XT 5590 and ControlLogix-XT 5590 Process controllers are shipped with port protection plugs installed to provide a degree of protection from corrosive atmospheres.

Rockwell Automation Part Number	Description	Supplier	Supplier Part Number
PN-579024	Plug for Ethernet Port	Würth Elektronik	726154101
PN-725450	Plug for USB Port	Würth Elektronik	726144002