

Technical Information

Series 8 Controller and I/O Specification



S803-150-530

Release 530

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2. Platform Environmental Specifications

2.1. General Environmental Characteristics

This section relates to the physical characteristics applicable to Series 8 C300 controller and all Series 8 I/O components. Where applicable, specifications state limits within an approved cabinet and to the cabinet skin.

| Consideration | Operating Limit ¹ | Transportation and Storage Limits ^{1a} |
|---------------------------------|--|---|
| Ambient Temp Range | External: 0 to 50°C ² Internal : 0 to 60°C ³ | -40 to 85°C |
| Temp. Rate of Change | <= 1°C/min | <=5°C/min |
| Relative Humidity ³ | 5 to 95% (non-condensing) ⁴ | 5 to 95% (non-condensing) ⁴ |
| Barometric Pressure Altitude | -300 to +3000 m | Any |
| Corrosives | G3 Standard (ISA S71.04) - Denoted by "8C-" model number in this doc | G3 Standard (ISA S71.04) - Denoted by "8C-" model number in this doc |
| Vibration (3 axes) | Sinusoidal (5 to 10 Hz) 2.54mm/0.100in Max (10 to 150 Hz) 0.5 g max. (0-Pk) | Random Vertical Shipping Axis 5 to 300 Hz 1.07 g (rms) Longitudinal and Transverse 10 to 500 Hz, 0.74 g (rms) 60 Minutes each axis |
| Mechanical Shock (3 Axes) | Site Induced: Terminal Peak Sawtooth waveform 4g max. @25ms | N/A |

Note 1 – Operating Limits define the range of operating conditions within which the system is designed to operate. Performance characteristics are defined when operating in this state. Please see ANSA/ISA D 51.1 Process Instrumentation Terminology for more information.

Note 1a – Transportation and Storage Limits define the range of conditions to which the system may be subjected without permanent damage to the equipment. Performance is not guaranteed in this state. Please see ANSA/ISA D 51.1 Process Instrumentation Terminology for more information.

Note 2 – This rating applies to the external ambient temperature of the Standard 2000mm enclosure with doors closed.

Note 3 – This rating applies to the internal ambient temperature of the Standard 2000mm enclosure with the doors closed. New version of the C300 controller(8C-PCNT05) and Memory Backup Assembly module (50182539-001) support an extended temperature range from 0°C to 70°C.

Note 4 – The maximum relative humidity spec applies up to 40°C. Above 40°C the RH spec is de-rated to 55% to maintain constant moisture content.

A note on the transportation of Batteries:

Some Government agencies have regulations that may prohibit air transport of Lithium Batteries.

3.2. Model Numbers

The Model Numbers of C300 controller are shown as below:

| Model Number | Description |
|---|--|
| 8C-PCNT03 | Series 8 C300 Controller, Coated ^{1,3,4} |
| 8C-PCNT05 | Series 8 C300 Controller, V5, Coated ^{5,6} |
| 8C-TCNTA1 | Series 8 C300 Controller I/O Termination Assembly(IOTA), Coated ¹ |
| 51305980-836 | Cable, Redundant C300 Controller ² |
| <p>Note 1 – Conformal coating applied on the module and the IOTA</p> <p>Note 2 – Redundancy is implemented with two modules/IOTAs and a redundancy cable (51305980-836)</p> <p>Note 3 – Optional rechargeable battery pack for C300 Memory Backup is available, details are provided in section 5.4</p> <p>Note 4 – 8C-PCNT02 part number is replaced by 8C-PCNT03. The new controller (8C-PCNT03) is compatible with all current and previous PC/LX releases.</p> <p>Note 5 – 8C-PCNT05 is the new S8 C300 controller, and only supports Experion R520 and later releases. Both 8C-PCNT03 and 8C-PCNT05 supports Experion R520 releases. While 8C-PCNT03 also supports all previous Experion releases. 8C-PCNT05 is not interoperable with 8C-PCNT03 controller.</p> <p>Note 5 – 8C-PCNT05 uses the same S8 C300 IOTA, i.e. 8C-TCNTA1 and controller redundancy cable.</p> | |

3.3. C300 Controller Specifications

3.3.1. C300 Control Execution Environment (CEE)

The C300 CEE provides an execution and scheduling environment in which Control Modules (CMs) and Sequential Control Modules (SCMs) execute user-configured control strategies. The CEE also support peer to peer communications with other C300 controllers and communication modules like Foundation Fieldbus and Profibus. The C300 CEE is configured using the Control Builder Engineering environment. The Control builder provides a graphical engineering environment where engineers can configure the Experion system and create control strategies by using the various function blocks available in the Library. The C300 CEE based control strategies can be configured with minimum execution rates of 50 msec.

3.3.2. C300 Hardware Specifications

| Specifications | 8C-PCNT03 | 8C-PCNT05 |
|--------------------|---|---------------------------|
| Power requirement | 24 V (provided through cables by the Series 8 power system) | |
| IOTA Dimension | 220 mm (9 ") height, 120 mm (4,75 ") width | |
| Program Memory | 16MB | 32MB |
| Processor core | Single | Dual |
| Supported Releases | Experion R110, 120, R500, R51x and R520 | Experion R520 and onwards |

| Specifications | 8C-PCNT03 | 8C-PCNT05 |
|--|---|--|
| Features | | |
| Module Removal and Insertion Under Power | Supported | |
| Conformal Coated | Yes, G3 level of Harsh Environment (ANSI/ISAS71.04-1985 corrosion standard) | |
| Redundancy | IOTA based design, no single point of failure for IOM, Termination, and Communication links (Downlink and Uplink) | |
| RAM Retention | 50 hour through rechargeable battery backup pack (Optional) | |
| Switchover | Bump less, Internal parameters, variables and outputs are maintained during transition | |
| Programing Language | Function Block Design (FBD) via Experion Control Builder | |
| Supported I/Os and Uplink Communication | | |
| Supported I/O type | Series 8 | |
| Supported I/O Links | 2 I/O Links, each I/O Link configurable for Series 8 I/Os | |
| Supported I/O Link Speed | 750 kbps | |
| Supported number of I/O Modules per Controller | 80 I/O Units (Redundant or Non-Redundant IOMs) | |
| Supported number of I/O Modules per I/O Link | 40 I/O Units (Redundant or Non-Redundant IOMs) | |
| Maximum number of I/Os per Controller | 2560 ¹ | |
| Number of Uplink (FTE) Connection | Dual uplink FTE ports, 100Mbps speed | |
| Control Capacity | | |
| Execution Units | 5500 Execution Units (single or redundant) | 9000 Execution Units (single or redundant) |
| Tagged Objects | 4095 objects | |
| Memory Units | 16384 Memory Units | 32768 Memory Units |
| Execution Period | 50 msec – 60000 msec (adjustable per control strategy, configurable) | |
| Minimum Reserved CPU to be maintained During Runtime | 20% for each CPU | |
| Controller Communication | | |
| CEE-based Platforms | Native peer to peer with other Series 8 C300s, C200 and ControlEdge UOC controllers ² | |
| Supervisory Control Network | Fault Tolerant Ethernet (FTE) | |

| Specifications | 8C-PCNT03 | 8C-PCNT05 |
|--|--|--------------|
| Third party devices | Modbus Master | |
| Modbus TCP devices | PCDI function block | |
| Modbus RTU or ASCII | Via Modbus TCP/IP conversion gateway | |
| Ethernet/IP | Native peer to peer | |
| Foundation Fieldbus | Via Fieldbus Interface Module (FIM) gateway | |
| Profibus DP | Via Profibus Gateway Module (PGM) | |
| Max number of PGM connections per C300 | 4 | 8 |
| Optional C300 Memory Backup | | |
| RAM Charger Module ³ | 51454475-100 | 50182539-001 |
| Cable, Battery RAM charger | 30 inches, 51202330-300 84 inches, 51202330-200 | |
| Note 1 – When using full capacity with 32 channel digital IO module | | |
| Note 2 – C200 and ControlEdge UOC support available from Experion LX/PlantCruise R510 and onwards. | | |
| Note 3 – The RAM charger (Battery backup module) is different for 8C-PCNT03 and 8C-PCNT05 controllers. | | |

3.3.3. C300 Supported Function Blocks

| Function Block | Function Block | Function Block | Function Block |
|----------------------------------|----------------------------------|-------------------------------------|--|
| General Purpose (Utility) | Timer | Lead / Lag | Override Selector (4 inputs) |
| Alarm Window | Type Convert | Rate of Change | PID (Proportional, Integral, Derivative) |
| Annpanel | PV Algorithms (Auxiliary) | Signal Selector | PID with External Reset |
| Dig Acq | PV Calculator | Totalizer | PID with Feed Forward |
| EXECTIMER | Summer | PV Handling | Profit Loop |
| First Out | Counter | Data Acquisition | Positional Proportional |
| Flag | Dead Time | Regulatory Control | Pulse Count |
| Flag Array | Enhanced PV Calculator | Auto Manual | Pulse Length |
| Operator Message | Enhanced General Linearization | Regulatory Calculator | Ramp / Soak |
| Numeric | Flow Compensation | Enhanced Regulatory Calculator | Ratio Bias |
| Numeric Array | General Linearization | Fan Out (1 input / up to 8 outputs) | |
| Push | | | |
| Text Array | | | |

5.4. C300 Controller memory backup

A RAM charger assembly provides memory backup power for S8 C300 controller module. RAM charger is used to back up the program memory of the S8 C300 controller. It supports connecting up to 4 physical S8 C300 controllers. Multiple units can be considered based on system cabinet design and number of controllers required.

5.4.1. Notable Features

- Support up to 4 C300 controllers in one module
- Supports redundant power supply inputs through combo cable
- Supports Experion soft failure alarm for RAM charger battery status
- Typically mounted adjacent to its associated C300 IOTA(s)



Ram Charger Assembly, Part# 51454475-100

5.4.2. Model Number

| Description | Model or Part Number |
|---|----------------------|
| RAM Charger Assembly (8C-PCNT03) | 51454475-100 |
| RAM Charger Assembly (8C-PCNT05) | 50182539-001 |
| Cable, MBA to one C300 Controller, 30 inches (0.7 m) long | 51202330-300 |
| Cable, MBA to one C300 Controller, 84 inches (2 m) long | 51202330-200 |

5.4.3. Detailed Specification – RAM Charger Assembly

| RAM Charger Assembly Parameter | Specifications |
|--------------------------------|--|
| Form Factor | 3 inch IOTA |
| Combo Cable Connector | 1 pair, 6 pins |
| Standby Power Output | 4 |
| Memory Backup Hold-up Times | 110 Hours (4.58 Days) for 1 C300 55 Hours (2.23 Days) for 2 C300s 36.6 Hours (1.52 Days) for 3 C300s 27.5 Hours (1.14 Days) for 4 C300s |

Fuse on RAM Charger Assembly (50182539-001) is 51506438-001, 1A Fast acting, 5x20mm.

Use for Division 2/Zone 2 Hazardous Location Installation



WARNING - DO NOT REMOVE OR REPLACE FUSE WHEN ENERGIZED;
WARNING - DO NOT CONNECT OR DISCONNECT WHEN ENERGIZED;
AVERTISSEMENT – NE PAS RETIRER OU REMPLACER LE FUSIBLE SOUS TENSION;
AVERTISSEMENT – NE PAS CONNECTER OU DECONNECTER SOUS TENSION