

# SPC810e

## ABB Ability™ Symphony® Plus Hardware Selector



The SPC810e is a Symphony Plus SDe Series controller module. It supports multiple mounting options to provide high-performance control functions in multiple use cases. In its first application, SPC810e mounts in an EMB910e base that is attached to an EMC Evolution Mounting Chassis. In this application, SPC810e drives SDe Series I/O modules (e.g. AI12e, AO02e, DI06e, DO01e, etc.) over the HN800 I/O bus. In its second application, SPC810e is mounted between an MMU carrier board and front plate as an embedded component of the SPC810ev controller assembly.

SPC810ev is a Form/Fit/Function replacement for MFPxx & BRCxxx controllers within a Harmony Rack Module Mounting Unit (IEMMUxx). In the third application, SPC810e is mounted in MB910e or VB910e (horizontal or vertical) DIN-Rail bases to support plant expansions or greenfield installations.

Controller features include; a modular high-density design, low energy consumption, extreme operating temperature range (-40 to +70 °C), and multiple deployment options of the SPC810e module.

The SPC810e controller is a high-performance process controller that supports all types of control requirements including discrete, continuous, sequential, and advanced control applications. The controllers are capable of executing control applications that are demanding in terms of both data and computations.

SPC810e controller has two (2) RJ45 Ethernet ports PN800A and PN800B (located on PBA811 Process Bus Adaptor or on the base when mounted in a DIN-Rail) for connection to the PN800 Plant Network, one (1) Ethernet port EN 2A for connection to an optional SNTP network that provides precise time synchronization, and one (1) Ethernet port EN 2B for connection to MODBUS TCP networks. Both EN 2A & 2B ports are located on the module front plate.

**SPC810e supports up to 30,000 Function Blocks, 5000 hardwired IO, and up to 8 remote IO links.** SPC810e is capable of executing closed-loop control logic for up to 5000 process IO in less than 250 msec.

## Features and benefits

- **SIMPLE:** SPC810e controller provides time-proven solutions optimized for processed control
- **SCALABLE:** SPC810e is optimized for large-sized control applications of up to 5000 process I/O
- **SEAMLESS:** SPC810e controller connects directly to SDe Series IO over HN800 IO BUS. PBA811 enables the controller to connect to PN800 Control Network as well as CW800 synchronous Peer-To-Peer Bus.
- **SECURE:** S+ systems using SPC810e controller have been designed to meet Security Level 1 as defined by IEC 62443
- SPC810e controller supports high speed, synchronous, PTP controller communications over the CW800 bus.

- SPC810e controller is configured by the S+ Engineering Tool Suite.
- SPC810e controller hardware is designed for the optimum evolution/replacement of MFPxx and BRCxxx HR Controllers as well as greenfield or expansion applications.

| <b>General info</b>             |   |
|---------------------------------|---|
| Article number                  | 7PAA001435R11   |
| Life cycle status               | Active  |
| Redundancy                      | No  |
| SIL                             | No  |
| Clock Frequency                 | 250 MHz   |
| FBs per controller              | 30 000  |
| Closed loop control performance | 5000 I/O in under 250 msec (70% Digital, 30% Analog)  |
| XR communications               | Up to 100 import + 1000 export XR messages per sec  |
| DRAM Memory                     | 128 MB RAM  |
| NVRAM                           | 2.0 MB MRAM   |
| Flash ROM                       | 4 MB Flash ROM  |
| Form factor                     | Compact (127mm)   |
| Mounting                        | EMB910e using 1-Slot in EMC, or DIN-Rail using either MB910e or VB910e  |
| HN800 bus length                | 190 mm  |
| MTBF (per MIL-HDBK-217-FN2)     | SPC810e PR D: 298,128 Hours @ 30 °C 226,849 Hours @ 40 °C 92,677 Hours @ 70 °C<br>EMB910e PR C: 8,568,246 Hours @ 30 °C 7,392,563 Hours @ 40 °C 4,825,271 Hours @ 70 °C |
| MTTR (Hours)                    | SPC810e MTTR = 1 hour EMB910e MTTR = 8 hours  |

| <b>Program Language Support</b>      |   |
|--------------------------------------|---|
| B90/UDF (Batch 90 & UDF Programming) | B90 (BSEQ, CSEQ, & PHASEX FBs), UDF Type 1 & 2  |
| SGS (Symphony Gateway Software)      | Up to 8 Servers, 128 Clients and 10,000 Total Points                                      |
| ANSI "C" programming                 | One (1) 'C' program per controller, One (1) instance per segment, up to eight(8) segments |

| <b>Detailed data</b>                      |  |
|---|--|
| Processor type                            | MCF54418 @ 250 MHz   |
| Module power requirements                 | 2.76 W = 115 mA (typical) @ 24 VDC per module  |
| Module power connection                   | +24 VDC TB on back of EMC Evolution Mounting Chassis   |
| Overvoltage category                      | Category 1 for power. Tested according to IEC/EN 61010-1   |
| Built-in back-up battery                  | No battery is required!  |
| Controller switch over time               | n/a  |
| No. of Segments (or Tasks) per controller | Configurable from 1 (min & typical) to 8 (max)   |
| Segment (or Task) cycle time              | Configurable from 1 msec (min), 250 msec (default / typical), 30 sec (max)   |
| No. of FBs per Segment (or Task)          | Min 2 FBs per segment, Max 30000 FBs per segment, 30000 FBs Total per controller   |
| Max no. of local SD Series IO modules     | 64   |
| Max no. of remote IO links per controller | 8  |
| Max no. of SD Series IO modules           | Up to 60 IO modules per remote IO link, 240 IO modules Total   |
| Max no. of HR Series IO modules           | n/a  |
| Max no. of local HN800 IO modules         | Up to 8 bus segments (EMC Rows), 64 I/O modules Total  |
| Max length of electrical HN800 bus        | Up to 30 meters (includes module bases + cables that connect segments)   |
| Max length of optical HN800 bus           | Up to 3000 meters using OM1 62.5/125 µm multi-mode fiber optic cable (1000 meters using OM4 50/125 µm) with cRBX01 F.O. repeater modules |
| PN800 Plant Network capacity              | Up to 250 network segments per system, up to 124 nodes per segment   |
| Controller PN800 node address             | SPC810e controller node address must be an even number between 2 and 248   |
| Control Network protocol                  | PN800 Plant Network a.k.a "INFI-Net over Ethernet" based on Ethernet TCP   |
| Recommended Control Network backbone      | 100 MBps or 1.0 Gbps Ethernet TCP  |
| Real-time clock stability                 | 50 ppm (clock is re-synchronized every 2 sec)  |
| Standard time precision                   | 10-20 msec via time master node on PN800 Plant Network   |
| Enhanced time precision                   | 1 msec via time master on dedicated SNTP network (EN 2A)   |
| PROFIBUS capability                       | 992 PROFIBUS Slaves via (2) pairs of PDP800 master modules   |
| HART (v5.4) capacity                      | 2000 HART signals via SD Series IO modules   |
| IEC 61850 capability                      | 16 IEDS via (8) CI850 modules  |
| IEC 60870-5-104                           | 128 Devices, 1500 Total Points via (8) SCI200 modules  |
| DNP 3.0                                   | Up to 128 Outstations via (8) SCI200 modules   |
| DeviceNet                                 | Ethernet IP (via SCI200) to DeviceNet adaptor  |
| MODBUS TCP                                | 8 Servers, 128 Clients, 10,000 Total Points  |

| <b>Environment and certification</b>   |  |
|--|--|
| Temperature, Operating                 | -40 to +70 °C Tested according to IEC/EN 60068-2-1, IEC/EN 60068-2-2                               |
| Temperature, Storage                   | -40 to +85 °C Tested according to MIL-STD-810G   |
| Relative humidity                      | 20 % to 95 % @ 40 °C non-condensing. Tested according to IEC/EN 60068-2-78, IEC/EN 61298-3         |
| Vibration (operational sinusoidal)     | 5 to 60 Hz 0.137 mm (0.0054 in.), 60 to 150 Hz 1.0 G. Tested according to IEC/EN 60068-2-6         |
| Vibration (transportation)             | 10 to 500 Hz. Tested according to MIL-STD-810G   |
| Shock (storage)                        | 15 G, 11 msec. Tested according to IEC/EN 60068-2-27   |
| Drop                                   | 100 mm. Tested according to IEC/EN 60068-2-31  |
| Protection class                       | IP20 according to EN 60529, IEC 529  |
| Altitude (operational)                 | Sea level to 3,048 meters (10,000 ft.) Tested according to MIL-STD-810G                            |
| Altitude (storage)                     | Sea level to 12,192 meters (40,000 ft.) Tested according to MIL-STD-810G                           |
| Air quality                            | ISA S71.04 G3 compliant  |
| ESD immunity                           | Tested according to IEC/EN 61000-6-2, IEC/EN 61000-4-2, Severity level 3                           |
| Surge immunity                         | Tested according to IEC/EN 61000-6-2, IEC/EN 61000-4-5, Severity level 3                           |
| Electrical fast transient immunity     | Tested according to IEC/EN 61000-6-2, IEC/EN 61000-4-4, Severity level 3                           |
| Radiated RFI immunity                  | Tested according to IEC/EN 61000-6-2, IEC/EN 61000-4-3, Severity level 3                           |
| Conducted Immunity                     | Tested according to IEC/EN 61000-6-2, IEC/EN 61000-4-6, Severity level 3                           |
| Magnetic field immunity                | Tested according to IEC/EN 61000-6-2, IEC/EN 61000-4-8, Severity level 4                           |
| Radiated emission                      | Tested according to IEC/EN 61000-6-4, CISPR 11 + A1, CISPR 16-1-1, Group 1, Class A, ISM equipment |
| Conducted emission                     | Tested according to IEC/EN 61000-6-4, CISPR 11 + A1, CISPR 16-1-1, Group 1, Class A, ISM equipment |
| Voltage dips and interruption immunity | Tested according to IEC/EN 61000-6-2, IEC/EN 61000-4-11  |
| CSA non-hazardous locations            | Certified for use as process control equipment in an ordinary (non-hazardous) location             |
| CSA hazardous, nonincendive locations  | Class I, Division 2, Groups A, B, C, D   |
| CE Mark                                | CE Mark EMC directive 2004/108/EC & Low Voltage Directive 2006/95/EC                               |
| RoHS compliance                        | RoHS Directive 2015/863  |
| WEEE compliance                        | DIRECTIVE/2012/19/EU   |

| <b>Dimensions</b>       |                                     |
|-------------------------|-------------------------------------|
| Width                   | 27 mm (1.06 in.)                    |
| Height                  | 127 mm (5.0 in.)                    |
| Depth                   | 27 mm (1.06 in.)                    |
| Weight (including base) | 181 grams (0.399 lbs) (module only) |

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