

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.

General info	
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 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

Program Language Support	
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

Detailed data

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

Environment and certification

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

Dimensions

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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