

# System 800xA 5.1 AC 800M Controller

AC 800M is a family of rail-mounted modules, consisting of CPU:s, communication modules, power supply modules and various accessories. There are 8 CPU modules to choose from, ranging from medium processor power and low cost to high processor power and support for full redundancy.

The AC 800M family does also include an IEC 61508-SIL3 certified controller (PM865), which supports controller configurations for:

- Safety application
- Combined Process Automation and Safety application



Features / CPUs	PM851A	PM856A	PM860A	PM861A	PM864A	PM865	PM866	PM891
Processor Unit	<b>PM851K01</b> incl: 1 PM851 CPU and required optional items	<b>PM856K01</b> incl: 1 PM856 CPU and required optional items	<b>PM860K01</b> incl: 1 PM860 CPU and required optional items	<b>PM861AK01</b> incl: 1 PM861A CPU and required optional items <b>PM861AK02</b> incl: 2 PM861AK01	<b>PM864AK01</b> incl: 1 PM864A CPU and required optional items <b>PM864AK02</b> incl: 2 PM864AK01	<b>PM865K01</b> incl: 1 PM865K01 CPU and required optional items <b>PM865K02</b> incl: 2 PM865K01	<b>PM866K01</b> incl: 1 PM866 CPU and required optional items <b>PM866K02</b> incl: 2 PM866K01	<b>PM891K01</b> incl: 1 PM891 CPU and required optional items <b>PM891K02</b> incl: 2 PM891K01
Optional items (partly included in Processor Units, see Price List)	TP830 Baseplate, TP850 CEX-bus term., TK850 CEX-bus cable, TB807, Modulebus term, Battery RAM backup, TB852/TB853 RCU-link term, TB851/TB855/TB856 RCU-link cable, SB822 External Battery Unit, TK212A Tool cable, TC562 Short Distance Modem, TK853V020 Modem cable, BC810K02 CEX-bus Interconnection unit; TK851V010 Connection cable, SD831/SD832/SD833 Power Supply, SS832 Voting Unit, Mains Breaker Kit, SM811 Supervisory Module.							
High Integrity Controller	No	No	No	No	No	Yes	No	No
Clock frequency	24 MHz	24 MHz	48 MHz	48 MHz	96 MHz	96 MHz	133 MHz	450 MHz
Memory (RAM)	12 MB*	16 MB*	16 MB*	16 MB	32 MB	32 MB	64 MB	256 MB
RAM available for application	2.622 MB	2.622 MB	2.622 MB	7.864 MB	24.237 MB	24.242 MB 23.850 MB w SM810 23.804 MB w SM811	51.672 MB	199.650 MB
Processor type	MPC860	MPC860	MPC860	MPC860	MPC862	MPC862P	MPC866	MPC8270
Flash memory for storage of application and data	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
CPU redundancy support	No	No	No	Yes	Yes	Yes	Yes	Yes
Switch over time in red. conf.	-	-	-	max 10 ms	max 10 ms	max 10 ms	max 10 ms	max 10 ms
Performance, 1000 boolean operations (a:=b and c)	0.46 ms	0.46 ms	0.23 ms	0.23 ms	0.15 ms	0.15 ms	0.09 ms	0.043 ms

\* Available with 5.1 FP3 Firmware (or newer)

Features / CPUs	PM851	PM856	PM860	PM861A	PM864A	PM865	PM866	PM891
No. controllers per control projects	32							
No. of applications per control project	1024							
No. of applications per controller	32							
No. of programs per application	64							
No. of tasks per controller	32							
Number of different cycle times	32							
Cycle time per application programs	Down to 1 ms							
Flash PROM for firmware storage	2 MB					4 MB	4 MB	16 MB
Power supply	24 V DC (19.2-30 V DC) max 5 % ripple acc. to IEC 61131-2							
Power consumption +24 V	typ/max 180/300 mA	typ/max 180/300 mA	typ/max 180/300 mA	typ/max 250/430 mA	typ/max 287/487 mA	typ/max 287/487 mA	typ/max 287/487 mA	typ/max 660/750 mA
Power dissipation	typ 5.0 W	typ 5.0 W	typ 5.0 W	typ 6.0 W	typ 6.9 W	typ 6.9 W	typ 6.9 W	typ 15.8 W
Power Reservoir	Internal 5 ms power reservoir, sufficient for the CPU to make a controlled power down							
Power supply connector	Detachable 4-pole screw terminal block							
Redundant power supply status inputs	Yes: 2 inputs designated SA, SB (Max 30 V, high level >15 V, low level < 8 V)							
Built-in back-up battery	Type: Lithium, 3.6 V, 0.95 Ah, size 1/2 AA, 0.3 g Lithium content							No
Real-time clock stability	100 ppm (approx. 1 h/year)							50 ppm
Clock synchronization	1 ms between AC 800M controllers by CNCP protocol							
OPC Server subscriptions	Five (5) OPC clients with five (5) OPC groups each can be connected to the OPC Server and have subscriptions on 40,000 different dintvariables with a cycle time of 500 ms							
OPC Server update rate	0.1 s - 1 hour (1 s default)							
OPC Servers per controller	Max 3							
OPC clients per OPC server	Max 5							
Event queue in controller per OPC client	Up to 3000 events							
AC 800M transm. speed to OPC server	36-86 events/sec ,113-143 data messages/sec (PM864, 50 % load, 1 500 subscription queue)							
Comm. modules on CEX bus	1	12	12	12	12	12	12	12
Supply current on CEX bus	Supply current: Max 24 V - 2.4 A (fuse 3.15 A fast, PM891 has an embedded auto fuse)							
I/O clusters on Modulebus with non-redundant CPU	1 el. + 1 opt.	1 el. + 7 opt.	1 el. + 7 opt.	1 el. + 7 opt.	1 el. + 7 opt.	1 el. + 7 opt.	1 el. + 7 opt.	0 el. + 7 opt.
I/O clusters on Modulebus with redundant CPU	NA	NA	NA	0 el. + 7 opt.	0 el. + 7 opt.	0 el. + 7 opt.	0 el. + 7 opt.	0 el. + 7 opt.
I/O capacity on Modulebus with non-redundant/redundant CPU	max 24/NA I/O modules	max 96/NA I/O modules	max 96/NA I/O modules	max 96/84 I/O modules	max 96/84 I/O modules	max 96/84 I/O modules	max 96/84 I/O modules	max 84/84 I/O modules
Modulebus scan rate	0 - 100 ms (actual time depending on number of I/O modules)							
Supply current on Electrical Modulebus	Supply current: Max 24 V - 1.0 A (short circuit proof, fuse 2.0 A), Max 5 V - 1.5 A (short circuit proof)							Not supported
I/O capacity on PROFIBUS (remote I/O)	Max 99 I/O stations (max 62 redundant I/O stations), max 24 I/O modules per I/O station (max 12 redundant I/O pairs)							
Ethernet channels	1	2	2	2	2	2	2	2
Ethernet interface	Ethernet (IEEE 802.3), 10 Mbit/s, RJ-45, female (8-pole)							10/100 Mbit/s
Control Network protocol	MMS (Manufacturing Message Service) and IAC (Inter Application Communication)							
Control Network capacity	Up to 23 000 Boolean/s (< 475 boolean/message) with 50 % CPU application load Up to 140 000 Boolean/s (< 475 boolean/message) with < 5 % CPU application load							
Recommended Control Network backbone	100 Mbit/s switched Ethernet							
No of controllers per 800xA System	max 75							
No of controllers on Control Network	max 50							
No of controllers per connectivity server	max 12, (max 24 using optimized rules)							
RS-232C interface	2 (one general, 1 for service tool)							1 for service tool (COM 4)
RS-232C interface (COM3) (non red.conf. only)	RS-232C, 75-19 200 baud, RJ-45 female (8-pole), not opto isolated, full RTS-CTS support							Not supported
RS-232C interface (COM4) (non red.conf. only)	RS-232C, 9 600 baud, RJ-45 female (8-pole), opto isolated, no RTS-CTS support							
Temperature								
– Operating	+5 to +55 °C (+41 to +131 °F)							
– Storage	-40 to +70 °C (-40 to +158 °F)							
Temperature changes	3 °C/minutes according to IEC/EN 61131-2							
Altitude	2000 m according to IEC/EN 61131-2							
Pollution degree	Degree 2 according to IEC/EN 61131-2							
Corrosion protection	G3 compliant to ISA 71.04							

Features / CPUs	PM851	PM856	PM860	PM861A	PM864A	PM865	PM866	PM891	
Vibration	10 < f < 50 Hz: 0.0375 mm amplitude, 50 < f < 150 Hz: 0.5 g acceleration, 5 < f < 500 Hz: 0.2 g acceleration								
Emitted noise	< 55 dB (A)								
Shock, no package	150 m/s <sup>2</sup> in 11 ms, 20 g in 3 ms								
Relative humidity	5 to 95 %, non-condensing								
Isolation voltage	Type test voltage: 500 V AC (corresponding to 700 V DC)								
Environmental conditions	Industrial								
Protection class	IP20 according to EN 60529, IEC 529								
Certificates and Standards	CE- marking: Meets EMC directive 2004/108/EC acc. to EN 61000-6-4, EN 61000-6-2 and Low Voltage Directive acc. to EN 61131-2. Electrical Safety: EN 50178, IEC 61131-2, UL 508. Hazardous location: UL 60079-15.								
TÜV Approval	No	No	No	No	No	IEC 61508 SIL3	No	No	
Emission	Tested according to EN 61000-6-4 EMC – Generic Emission Standard, Part 2 – Industrial Environment								
Immunity	Tested according to EN 61000-6-2 EMC – Generic Immunity Standard, Part 2 – Industrial Environment								
Dimensions	W 119 x H 186 x D 135 mm (4.7 x 7.3 x 5.3 in.)							W 174 x H 186 x D 94 mm	
Weight (including base)	1100 g (2.4 lb)	1100 g (2.4 lb)	1100 g (2.4 lb)	1200 g (2.6 lb)	1200 g (2.6 lb)	1200 g (2.6 lb)	1200 g (2.6 lb)	1600 g (3.5 lb)	

Supported Communication modules	PROFIBUS DP	FOUNDATION FIELDBUS	RS-232 C	MB300	INSUM	Drivebus	S100 I/O	Genius TRIO I/O	Satt I/O	MODBUS TCP	IEC 61850
Module	CI854A	CI860	CI853	CI855	CI857	CI858	CI856	CI862	CI865	CI867	CI868
Protocol	DP-V1 (PA via Linking Device)	FF HSE (H1 via Linking Device)	MODBUS RTU master, COMLI master/slave, Siemens 3964R master, User defined protocols	MasterBus 300	IEEE 802.3	ABB's DriveBus	ABB's S100 I/O	Genius	ABB's Satt I/O	MODBUS TCP	IEC 61850
Master or slave	Master	Master	Master/slave	Master/slave	Master	Master	Master	Master	Master	Master/Slave	Master
Number of channels	2	1	2	2	1	1 main, 2 aux	1	1	1	2	1
Max units on CEX bus	12	12	12	12	6	2	12	12	4	12	4
Transmission speed	9.6 - 12,000 kbit/s	10/100 Mbit/s	75 - 19 200 b/s	10 Mbit/s, 200 Data-sets/s	10 Mbit/s	4 Mbit/s	-	38.4 - 153.6 kbit/s	-	10/100 Mbit/s (Ch1), 10 Mbit/s (Ch2)	10/100 Mbit/s
Cable redundancy	Yes	No	No	Yes	No	No	No	No	No	No	No
Module redundancy	Yes	Yes	No	No	No	No	No	No	No	Yes	No
Hot Swap	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Used together with High Integrity Controller	Yes	No	Yes	Yes	Yes	No	Yes	No	No	Yes	Yes
Connectors	DB female (9-pin)	RJ-45 female (8-pin)	RJ-45 female (8-pin)	RJ-45 female (8-pin)	RJ-45 female (8-pin)	Fiber-optic	Miniribbon (36-pin)	Phoenix (4-pin)	BNC	RJ-45 female (8-pin)	RJ-45 female (8-pin)
24 V current consumption	typ 190 mA	typ 100 mA	typ 100 mA	typ 150 mA	typ 150 mA	typ 200 mA	typ 200 mA	typ 190 mA	typ 120 mA	typ 160 mA	typ 160 mA
Protection class	IP20 according to EN60529, IEC 529										
Certification											
- CE-marked	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
- UL 508	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
- UL 60079-15 (Class 1 Zone 2)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Dimensions	W 58 x H 186 x D 135 mm (2.3 x 7.3 x 5.3 in.)										
Weight (including base)	700 g (1.5 lb.)	455 g (0.9 lb.)	520 g (1.2 lb.)	700 g (1.5 lb.)	600 g (1.3 lb.)	700 g (1.5 lb.)	600 g (1.3 lb.)	600 g (1.3 lb.)	600 g (1.3 lb.)	700 g (1.5 lb.)	700 g (1.5 lb.)

PM891



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Supported Communication modules	AF100	PROFINET IO	EtherNet/IP DeviceNet
Module	CI869	CI871	CI873
Protocol	Advant Fieldbus 100	PROFINET IO	EtherNet/IP DeviceNet (via LD800DN)
Master or slave	Master/Slave	Master	Master
Number of channels	2	1	1
Max units on CEX bus	4	12	4
Transmission speed	Up to 500 Kbit/s	10/100 Mbit/s	10/100 Mbit/s
Cable redundancy	Yes	No	No
Module redundancy	Yes	No	No
Hot Swap	Yes	Yes	Yes
Used together with High Integrity Controller	No	No	No
Connectors	Phoenix (4-pin)	RJ-45 female (8-pin)	RJ-45 female (8-pin)
24 V current consumption	typ 160 mA	typ 160 mA	typ 160 mA
Protection class	IP20 according to EN60529, IEC 529		
UL 508	Yes	Yes	Yes
UL 60079-15 (Class 1 Zone 2)	Yes	Yes	Yes
Dimensions	W 58 x H 186 x D 135 mm (2.3 x 7.3 x 5.3 in.)		
Weight (including base)	700 g (1.5 lb.)	700 g (1.5 lb.)	700 g (1.5 lb.)