FREELANCE 2019

Freelance DCS

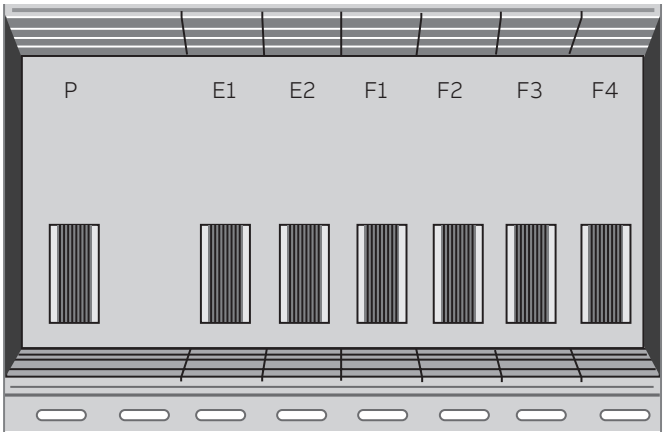
Product Catalog



3.4.3 AC 800F redundancy concept

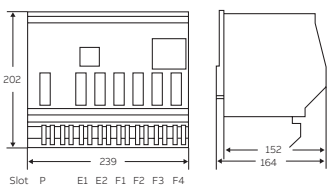
Name	Short description	Article no.
AC 800F – 16 MB, 115 / 230 VAC	With Ethernet 10BaseT, PROFIBUS module and Base Unit PM 803F Incl. standard system test, battery SB 808F, mains cable TK 807F (open end). Slot assignment: P = SA 811F, E1 = EI 813F, F3 = FI 830F, E2, F1, F2, F4 = Front panel. Compliant to cULus by using mains cable TK 809F (3BDM000212R1). Freelance V7.1SP2a or higher is mandatory.	3BDH000103R1
AC 800F – 16 MB, prepared for redundancy, 24 VDC	With Ethernet 10BaseT, PROFIBUS module and Base Unit PM 803F Incl. standard system test, 2 batteries SB 808F, 2 mains cable TK 802F (open end). Slot assignment: P = SD 812F, E1, E2 = EI 813F, F3 = FI 830F, F1, F2, F4 = Front panel. Freelance V7.1SP2a or higher is mandatory.	3BDH000133R1

AC 800F Housing with slot assignment



3.4.4 AC 800F, base unit PM 803F

Name	Short description	Article no.
PM 803F	Base Unit 16 MB, battery-buffered RAM Without operating system. The operating system has to be loaded during software installation. With special Contact Ledge RW 855F. Software V7.1SP2a or higher is mandatory. Restrictions: The performance of PM 803F is 5 - 10% below the performance of PM 802F (Classic).	3BDH000530R1



The basic unit PM 803F, cyclically scans signals from the fieldbus lines via the corresponding fieldbus modules, processes these signals according the application programs installed by the user and sends appropriate signals to the fieldbus actuators via the fieldbus modules.

Controller redundancy can be achieved by using two AC 800F, see also “3.4.2 AC 800F redundancy concept” on page 36. To ensure quick and smooth takeover in milliseconds by the secondary AC 800F in case the primary AC 800F fails, a dedicated redundancy communications link through the second Ethernet module makes sure that both AC 800F are always synchronized. All inputs and outputs are designed to support redundant operation.

Data communication between AC 800F, the engineering and operator stations runs via the

control network. Engineering station communications can involve new or updated configuration files being downloaded to the controller, or information about the connected modules being reported back. When fieldbus modules are installed or exchanged, the required configuration information is automatically updated.

Configuration and real-time process data is stored in the controllers. To safeguard this data in case of power loss, the RAM power is backed up with batteries located either on the Ethernet modules or on battery modules.

Features:

- Super Scalar RISC microprocessor (up to 150 MIPS)
- 16 K internal CPU cache RAM
- RAM memory with error detection and correction
  - 16 MB synchronous dynamic
- Flash-EPROM
  - 8 MB, 32-bit words
- EEPROM, serial, 16 kbit
- Monitoring of the temperature inside the device
- Watchdog
- 4 slots for fieldbus modules
- 2 slots for Ethernet communications modules, 32-bit data bus, 10 Mbits/s
- Battery backup incl. battery watchdog
- G3 compliant Z variant available

Technical data

Technical data PM 803F	
CPU	CPU Intel® 32-bit RISC Super Scalar processor up to 150 MIPS
RAM	16 MB synchronous dynamic read / write memory, battery back up
I/O scan cycle time	Selectable by configuration. Depends on the capabilities of the fieldbus module
Processing time for 1000 instructions	0.78 ms for binary instructions 0.78 ms for word instructions 1.09 ms for floating point instructions
Power consumption	Basic unit only: max. 7.8 W depending on CPU usage and cycle time
Power supply	SA 811F: 115 - 230 VAC SD 812F: 24 VDC
Max. power output	See power supply modules
Weight	1.6 kg / 3.3 lbs max. 5 kg / 11 lbs (fully assembled)
Dimensions	Width: 239 mm (9.4 inch) Height: 202 mm (8 inch) Depth: 164 mm (6.5 inch)

3.4.5 Power supply

Ethernet modules

Name	Short description	Article no.
SA 811F	Power Supply 115 / 230 VAC To use together with PM 802F or PM 803F. Freelance V7.1SP2a or higher is mandatory.	3BDH000013R1



The AC 800F modules are supplied with 5 VDC / 5.5 A and 3.3 VDC / 6.5 A by SA 811F. The power supply has open-circuit, overload and sustained short-circuit protection. The electronically controlled output voltage provides high stability and low residual ripple.

In case of power loss ≥ 5 ms, the power supply module generates a power-fail signal. This signal is used by the CPU module to shut down operations and enter to a safe state of connected outputs of Remote I/Os. This is required for a controlled restart of the system and the user application when power is restored. The output voltage remains within its tolerance limits for at least another 15 ms. Altogether a mains voltage drop of 20 ms will be managed.

Features:

- Input voltage 115 - 230 VAC (self adjusting), output is electrically isolated
- Power supply outputs provide: 5 VDC / 5.5 A and 3.3 VDC / 6.5 A
- Enhanced power-fail prediction and shutdown procedures
- LED indication for power supply status and operating status of the AC 800F
- Short circuit proof, current limited
- 20 ms backup energy for use in the event of primary power failure, according to NAMUR
- G3 compliant Z variant available.

Technical data

Technical data SA 811F	
Input voltage	Alternating current 115 - 230 VAC Permissible range 90 - 260 VAC Frequency: 50 - 60 Hz (47 - 63 Hz)
Input current at nominal load	230 VAC: 275 mA 115 VAC: 541 mA
Rated input power	63 VA
Backup energy for the event of power failure	> 20 ms
Fuse	Subminiature fuse 2.5 AT, soldered
Output voltage	3.3 VDC (± 3%) typical 5 VDC (± 3%) typical
Output current	0.5 - 6.5 A to 3.3 V 0.5 - 5.5 A to 5.0 V
Current limit	Approx. 7.5 A Automatic return to normal operation after short circuit
Total output power	Max. 35 W
Weight	0.460 kg, 1.014 lbs

LED displays

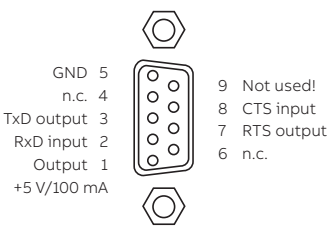
LED	Status	Description
Power		Internal supply voltage is available
Failure	Off	Normal status
	Orange	Self test
	Flashing orange	Overtemperature occurred during operation
	Red	Hardware failure of the basic unit
	Flashing red	Software failure of the system
Run/Stop	Green	Processing active
	Flashing green	Process was stopped and is now started again
	Red	Processing inactive
	Flashing red	Process was active and is stopped now
	Orange	Self test
	Off	Software initialization
Prim/Sec	In case of redundancy please see the LEDs description in the manual “Mounting and Installation Instruction AC 800F”. For non-redundancy the states are:	
	Orange	Self test
	Off	Normal status

Operator controls

Control	Description
Run/Stop switch	Internal supply voltage is available
Toggle Prim/Sec	For redundancy. Toggles between primary and secondary AC 800F (operational on primary AC 800F only, and only if a secondary AC 800F is available)
Reset	Reset button press and hold > 4 s for coldstart

Front panel connections

Control	Description
Power supply	One connector for 115 - 230 VAC input
Diag	For diagnostics and optional radio-controlled clock 9-pin male connector



SD 812F

Name	Short description	Article no.
SD 812F	Power Supply 24 VDC To use together with PM 802F or PM 803F. Freelance V7.1SP2a or higher is mandatory.	3BDH000014R1



The AC 800F modules are supplied with 5 VDC / 5.5 A and 3.3 VDC / 6.5 A by SD 812F. The power supply has open-circuit, overload and sustained short-circuit protection. The electronically controlled output voltage provides high stability and low residual ripple.

In case of power loss ≥ 5 ms, the power supply module generates a power-fail signal. This signal is used by the CPU module to shut down operations and enter to a safe state. This is required for a controlled restart of the system and the user application when power is restored. The output voltage remains within its tolerance limits for at least another 15 ms. Altogether an input voltage drop of 20 ms will be managed..

Features:

- Redundant input voltage 24 VDC, provides operation in accordance with NAMUR
- Power supply outputs provide: 5 VDC / 5.5 A and 3.3 VDC / 6.5 A
- Enhanced power-fail prediction and shutdown procedures
- LED indication for power supply status and operating status of the AC 800F
- Short circuit proof, current limited
- 20 ms backup energy for use in the event of primary power failure, according to NAMUR
- G3 compliant Z variant available

Technical data

Technical data SD 812F	
Input voltage	24 VDC, 2 redundant inputs permissible range 19.2 - 32.5 VDC
Input current at nominal load	1.7 A at 24 VDC
Rated input power	41 W
Backup energy for the event of power failure	> 20 ms
Fuse	For each supply: subminiature fuse 3.15 AT, soldered
Output voltage	3.3 VDC (± 3%) typical 5 VDC (± 3%) typical
Output current	0.5 - 6.5 A to 3.3 V 0.5 - 5.5 A to 5.0 V
Current limit	Approx. 7.5 A Automatic return to normal operation after short circuit
Total output power	Max. 35 W
Weight	0.460 kg, 1.014 lbs

LED displays

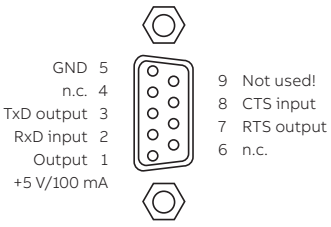
LED	Status	Description
Power		Internal supply voltage is available
Failure	Off	Normal status
	Orange	Self test
	Flashing orange	Overtemperature occurred during operation
	Red	Hardware failure of the basic unit
	Flashing red	Software failure of the system
Run/Stop	Green	Processing active
	Flashing green	Process was stopped and is now started again
	Red	Processing inactive
	Flashing red	Process was active and is stopped now
	Orange	Self test
	Off	Software initialization
Prim/Sec	In case of redundancy please see the LEDs description in the manual “Mounting and Installation Instruction AC 800F”. For non-redundancy the states are:	
	Orange	Self test
	Off	Normal status

Operator controls

Control	Description
Run/Stop switch	Connected to LED
Toggle Prim/Sec	For redundancy. Toggles between primary and secondary AC 800F (operational on primary AC 800F only, and only if a secondary AC 800F is available)
Reset	Reset button press and hold > 4 s for coldstart

Front panel connections

Control	Description
Power supply	Two connectors for 24 VDC, automatic input selection when used with single power supply
Diag	For diagnostics and optional radio-controlled clock 9-pin male connector



3.4.6 Ethernet interface

EI 813F, 10BaseT

Name	Short description	Article no.
EI 813F	Ethernet Module 10BaseT (Twisted pair) To use together with PM 802F or PM 803F. Battery not included. Freelance V7.1SP2a or higher is mandatory.	3BDH000022R1

These communication modules provide Ethernet communications to the control network compliant with IEEE802.3 standard.

Communications module, compliant with 10 BaseT shielded Twisted Pair (STP, cable category 3, 4 or 5 advanced)

Features:
- IEEE802.3 Ethernet standard
- Provides 10BaseT compliant communication (10Mbit)
- 32-bit data bus
- Transmission rate 10 Mbit/s
- Direct memory access to main memory, < 4% CPU overhead for operation
- Optional battery for redundant battery backup of main memory
- G3 compliant Z variant available

Technical data

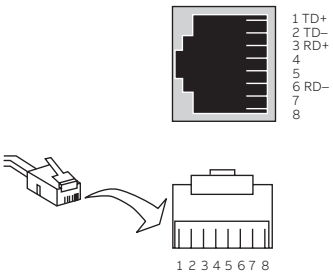
Technical data EI 813F	
Rated voltage	3.3 V / 5 V, ±3%, from CPU board
Power consumption	Max. 1.2 W
STP	10BaseT cable category 3, 4 or 5 advanced
RAM and real-time-clock buffering time New battery inserted After “Low” warning	PM 803F: ≥ 10 days ≥ 5 hours
Battery	3.6 V lithium battery, 950 mAh (has to be ordered separately
Weight	Approx. 0.150 kg, 0.33 lbs (without battery)

LED displays

LED	Status	Description
Status	Off	No supply voltage, module is isolated
	Green	Power supply on, module identified and ready to operate as configured
	Orange	Power supply on, module identified and either: • Normal transitory state after module startup • Configuration mode of Boot Loader
	Orange flashing	Power supply on, module identified; module not connected to proper bus structure
	Red	Power supply on and either: • Module not yet identified (normal for short time during module startup) • Error occurred during module test
Battery (PM 803F)	Off	AC 800F is active, EI 812F not active => buffering from power supply module
		AC 800F is off (no watchdog of the batteries voltage) => buffering from battery
	Orange	During battery recovery or start-up phase
	Red	Warning: battery low, no battery inserted, insufficient electrical contact etc.
	Green	Battery inserted and data protection provided

Front panel connections

Control	Description	
RJ-45 female connector (shielded) There are two integrated LED's indicating the current communication status. The LEDs are not labeled but can be identified by their color. The upper yellow LED indicates the link state; the lower green LED indicates active communication.		
LED 10BaseT link	Off	No active link. No communication possible.
	Static yellow	Active link. communication possible.
LED 10BaseT active	Off	No communication.
	Flashing green	Communication



3.4.7 Fieldbus interface modules

CAN-3 module FI 810

Name	Short description	Article no.
FI 810F	Fieldbus Module, 3 channel CAN modules. To use together with PM 802F or PM 803F for rack I/O.	3BDH000030R1

The FI 810F module provides connectivity to the Freelance rack I/O - up to 5 racks can be connected. It provides functionality according CAN 2.0 specification and supports baud rates up 1 MBd. All interfaces are electrically isolated and support redundant operation in conjunction with a second AC 800F.

Only one FI 810F module may be plugged per AC 800F. The slot of the FI 810F module has to be F1

Features:
- 3-channel CAN modules
- Transmission rate: up to 1 MBd
- Module can be removed or inserted during operation
- Redundant operation, with redundant AC 800F
- G3 compliant Z variant available

Technical data

Technical data FI 810F	
Rated voltage	5 V, ± 3% from basic unit
Power consumption	1.6 W - 2.6 W, appending from communication
Channel supply: • Raged voltage • Power consump. • per channel	 • 5 V, ± 10% • 0.15 W, when idling • 0.30 W, during communication
Weight	Approx. 0.145 kg, 0.32 lbs

LED displays

LED	Status	Description
Status	Off	No supply power, module is isolated
	Green	Module is active and working properly
	Orange	Module has been identified by AC 800F, but has not yet been activated
	Red	Module powered up, but not yet identified, or an error has occurred
RxD0	Green	Receive data on channel 0
TxD0	Green	Transmit data on channel 0
RxD1	Green	Receive data on channel 1
TxD1	Green	Transmit data on channel 1
RxD2	Green	Receive data on channel 2
TxD2	Green	Transmit data on channel 2