Data sheet

Symphony Plus Combustion Instruments
Uvisor™ FAU 810 – Flame Analysis Unit

Flexible and Reliable Device for use with all ABB Flame Detectors.

The Flame Analysis Unit, or FAU810, is ABB's latest leading-edge flame analysis device.
The FAU810 is designed from the ground up for maximum flexibility, usability and reliability. It takes advantage of the latest technologies available to make flame analysis as cost-efficient as possible, while retaining ABB's rock-solid reputation as the most reliable instruments in the industry. The FAU810 is easy to install and configure, flexible to operate, and uses redundant Profibus DP-V1 or standard Modbus interfaces for easy and safe data exchange and tuning. You can connect any type of ABB Flame sensing device to the FAU810. This makes the FAU810 the standard module for all ABB Flame Scanner application and the preferred solution for retrofitting existing installation.
It determines if the current signal value is within the programmed limits as defined by Functions. A variety of limits can be defined in the FAU810 to account for any situation that may occur in utility or industrial boilers.

Collects Signal Values from the Flame Detector

The FAU810 analyzes the signals generated from the Flame Detector.

Calculates Signal Quality

The FAU810 measures the quality of the signal to provide an indication of changes in the burner flame.
Quality values act as a barometer, forecasting when a burner flame-out is likely to occur. This can help you to anticipate changes and problems.

Continuously Detect Faults

The instrument automatically monitors the electronic components of the Flame Detector and FAU810 unit to detect system problems or faults.

Signals Unsafe Conditions

A no-flame condition occurs when the FAU810 logic determines that an unsafe condition exists.

Remote supervisory

Extended set-up, parameter files archiving, groups view, advanced diagnostic including flame raw data, real time and historical trends of up to 254 scanner heads networked is possible either through the PC based package Flame Explorer™ or with DTM through any Profibus DP-V1 master remote.

FAU810 Specifications

Each Flame Analysis Unit consists of two independent channels. Each channel can receive and process a Flame Detector signal. The two Detectors may be in any combination of the following designs:

- SF810 Flame scanner heads
- All DFS Flame scanner heads
- Flame Rods (Ionic Flame Monitoring)

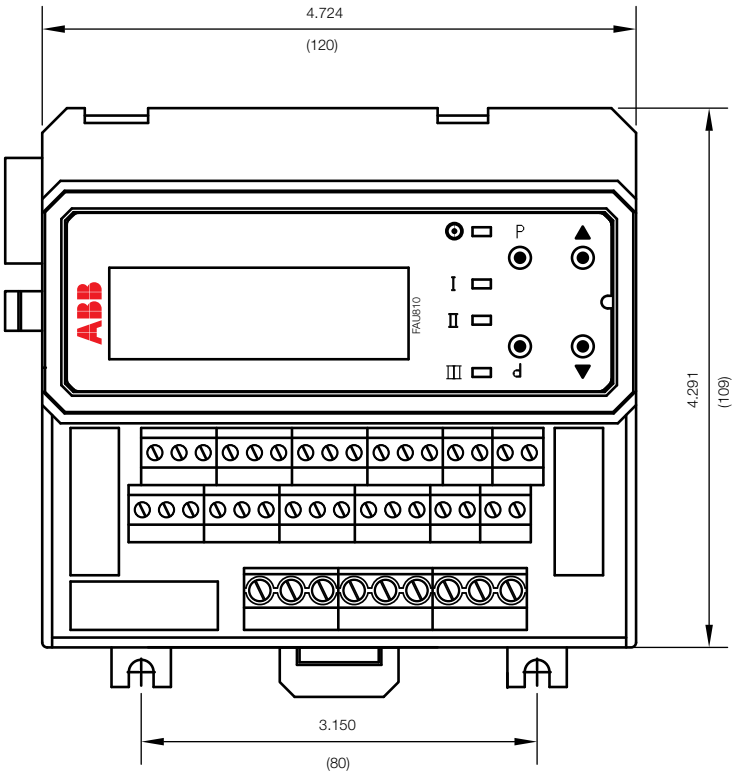
Each Detector is independently configurable from the FAU810 pushbuttons and display, with Flame Explorer engineering tool or via Profibus
The FAU810 can be powered by a single or redundant 24 VDC source (+/- 20%).
The FAU810 has built-in diode auctioneering for power source isolation.
Two digital input channels are available for remote parameter switching. One digital input per sensor.
(Example: Parameters for a dedicated Flame Detector may be tailored to monitor either coal or oil firing)
The FAU810 can be upgraded on site with any official release of new product features by the proprietary Firmware Download Utility.

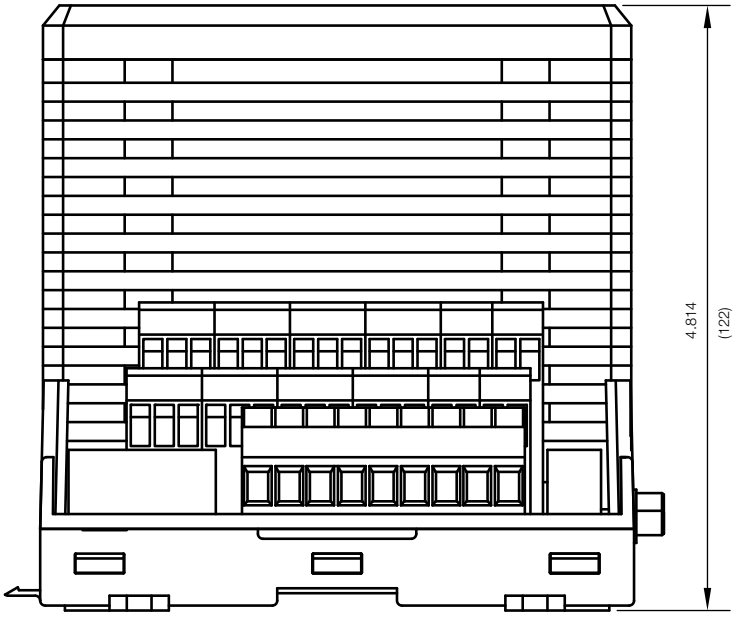
FAU810 Specifications	
Flame Failure Relay Drop-Out	Configurable 0.2 to 4 seconds
Flame Relay(s)	Three total, each with Form C contacts
Flame Relay Contact Ratings	250 Vac, 3A, 750 VA; 220Vdc, 300 ma, 66 watts
Fault Relay Contact Ratings	250 Vac, 3A, 750 VA; 220Vdc, 300 ma, 66 watts
Analog Flame Signal Outputs	Two channels of 4-20 ma signals. Each channel may independently monitor Intensity, Frequency, Quality, or AC Amplitude
Serial Data Communication	Two Galvanically isolated RS-485 interfaces (fully independent for redundancy)
Serial Data Format	MODBUS (default), PROFIBUS DP-V1 (selectable)
Self Checking Time Cycle	Electronics shall be checked every 0.1 seconds
Ambient Temperature	0° to 60° C (32°F to 140°F), 95% non-condensing atmosphere
Case Dimensions	13 cm height, 12 cm long, 11 cm wide
Electrical Connections	Screw terminals, compression type, accepting 12 to 20 wire gage
Module Mounting	Din Rail Mounted
Power Consumption:	4 watts Minimum, 10 watts Maximum, Typical 6 watts
Stacking Limitation	4 modules with power entry on the end module or 7 modules with power entry on the middle module
Power supply voltage	$24V_{DC}$ (-25%, +20% = 18 ÷ $29V_{DC}$)
Inrush current	6A peak, 2ms settling time

Customer Interface Specifications	
LCD Display	Graphic LCD Display Module displaying 4 lines of 20 characters and multiple bar graphs
Programming Push-Buttons	4 (Program, Display, Up, and Down)
Status Lights	4 (Power, Flame #1, Flame #2, and Flame #3 or Fault)
Program Lock-Out	Local, DIP switch select
Flame/No Flame Bypass Key	None on board
Remote Programming	Remote programming of functions via RS-485 link and Flame Explorer software
RS 485	2 RS-485 interfaces, one for each channel for redundancy (each interface has access to both channels)
Relay Outputs	3 – Flame #1, Flame #2, and Flame #3 or Fault
Analog Outputs	Two 4-20 ma analog outputs for Trending or Monitoring of Frequency, Intensity, Quality, or AC Amplitude 4÷20 mA (R load <= 500Ω) Galvanically isolated Precision: +/-5% f.s.
Module Set-Up Menus	Module Set-Up is divided into two menus, “Configuration” and ”Program”. Edit mode is protected against occasional mistyping
Recommended ABB standard cable:	Single Sensor scanner P/N EC-DWG-G041ELE803 Dual Sensor scanner P/N EC-DWG-GO41ELE802 Maximum distance between SF810 scanner and FAU810, Flame Analysis Unit 500 meters (1500 feet)
Compatible scanner	Refer to the table below for the compatibility of the FAU810 with the associated flame scanner
Ordering code	C10-12010 “FAU810 - Flame Analysis Unit, Dual Channel Complete Assembly with Dual Profibus DPV1”

Scanner Models	Analysis Units		
	DFS	**FAU800**	**FAU810**
SF810-IR Series (=/> Rev.E)	X	X	X
SF810-IR Series (< Rev.E)	X	X	X
SF810-UV Series (=/> Rev.E)			X
SF810-UV Series (< Rev.E)	X	X	X
SF810-UVIR Series (=/> Rev.E)			X
SF810-UVIR Series (< Rev.E)		X	X
SF810-VL Series (=/> Rev.E)	X	X	X
SF810-VL Series (< Rev.E)	X	X	X
Safe Flame VL assembly round board (C10-24112)	X	X	X
Safe FlameIR assembly round board (C10-24113)	X	X	X
Safe Flame Full Spectrum assembly round board (C10-24114)	X	X	X
1.5 Deg. PC board (C87-97308)	X	X	X
4 Deg. PC board (C87-97342)	X	X	X
IFM (Ionization Flame Rod)		X	X

FAU810 Dimensions





FAU810 Single channel wiring (Typical)

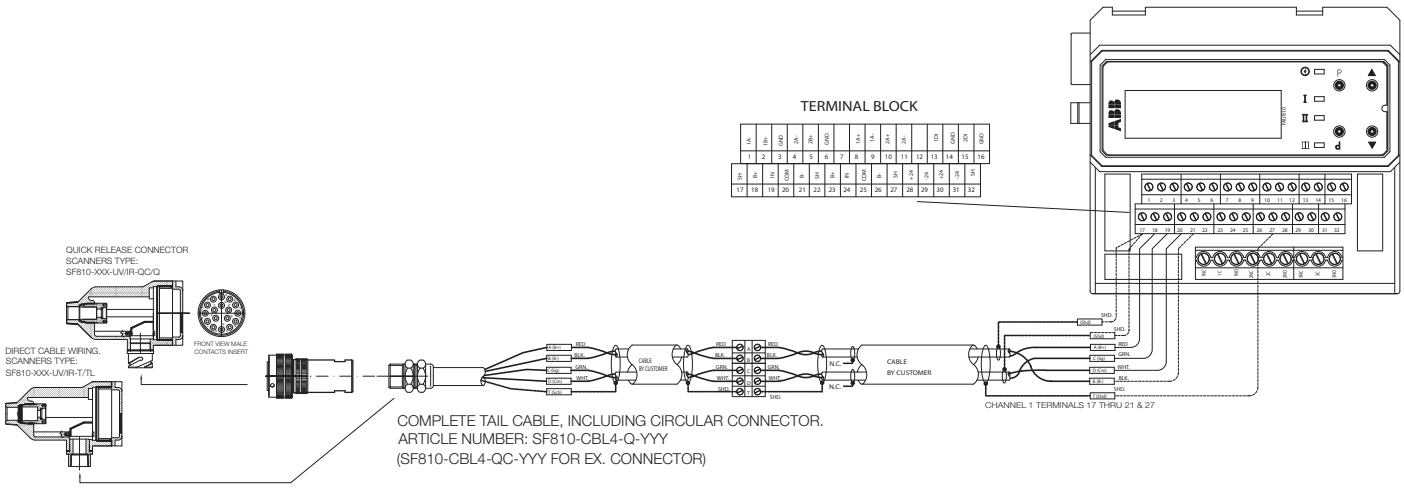


Table 1 - Singles Sensor Connector pin assignment

Quick connect pin	SF810 UVIR Term. Board	Signal Name	Internal wiring colour	Pig tail fly end label	Functional description
A	1	+15V	Gr/Cy	A (+B)	Power supply +15V from FAU810/DFS
B	2	-15V	Ye/Re	B (-B)	Power supply -15V from FAU810/DFS
C	3	SIG	Ye/Bl	C (SIG)	Live flame signal
D	4	GND	Ye/Br	D (Comm)	Power supply return Ground reference
E					Not used
F					Not used
G					Not used
H					Not used
J					Not used
K					Not used
L					Not used
M					Not used
N					Not used
P					Not used
R					Not used
S					Not used
T		Shield	Grey	T (Sh)	Cable screen grounding

FAU810 Dual channel wiring (Typical)

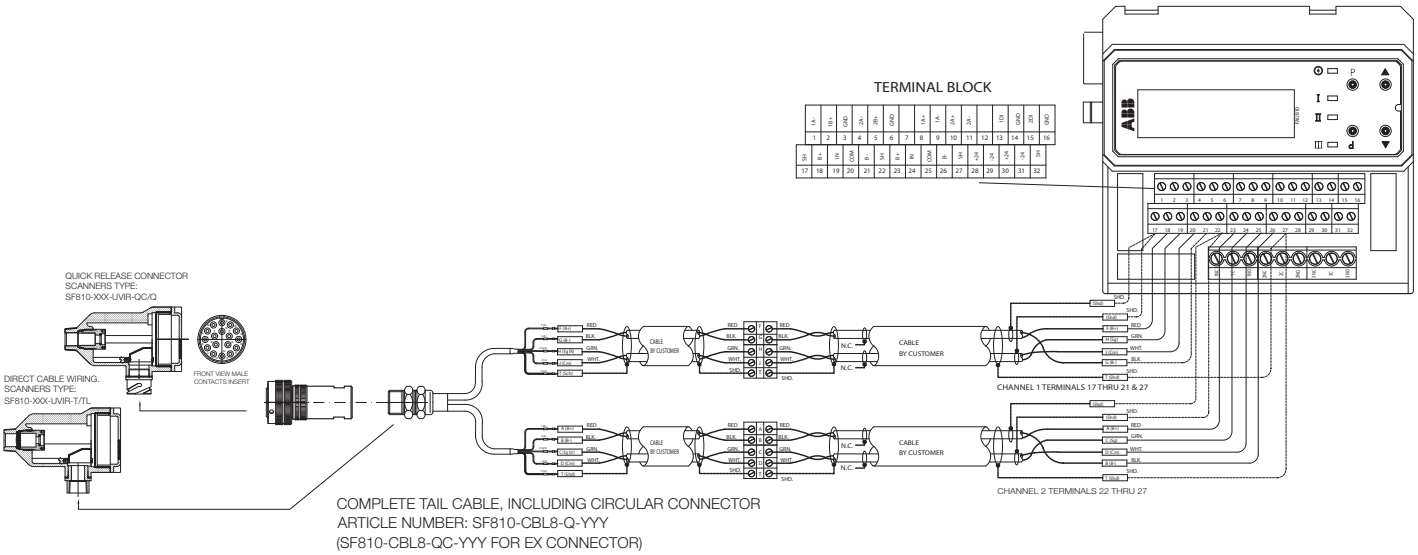


Table 2 - Dual Sensor Connector pin assignment

Quick connect pin	SF810 UVIR Term. Board	Signal Name	Internal wiring colour	Pig tail fly end label	Functional description
F	1	+15V	Gr/Cy	A (+B)	Power supply +15V from FAU810/DFS
G	2	-15V	Ye/Re	B (-B)	Power supply -15V from FAU810/DFS
H	3	IR SIG	Ye/Bl	C (SIG.IR)	Live flame signal IR
J	4	GND	Ye/Br	D (Comm)	Power supply return Ground reference
E					Not used
A	6	+15V	Gr/Or	F (+B)	Power supply +15V from FAU810/DFS
B	7	-15V	Gr/Mg	G (-B)	Power supply -15V from FAU810/DFS
C	8	UV SIG	Gr/Bl	H (SIG.UV)	Live flame signal UV
D	9	GND	Gr/Bk	J (Comm)	Power supply return Ground reference
K					Not used
L					Not used
M	5		Wt/Re		Not used
N	10		Wt/Bk		Not used
P					Not used
R					Not used
S					Not used
T		Shield	Grey	T (Sh)	Cable screen grounding

FAU810 Dual channel wiring with Ionization Flame Rod (Typical)

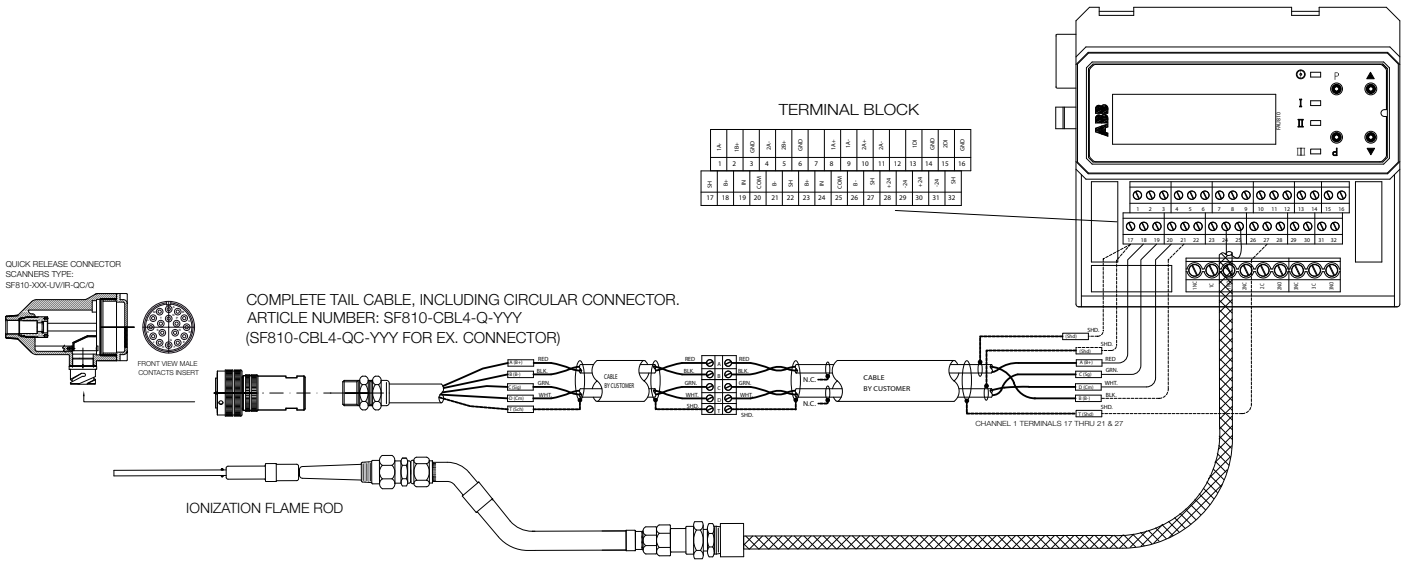


Table 3 - Singles Sensor Connector pin assignment

Quick connect pin	SF810 UVIR Term. Board	Signal Name	Internal wiring colour	Pig tail fly end label	Functional description
A	1	+15V	Gr/Cy	A (+B)	Power supply +15V from FAU810/DFS
B	2	-15V	Ye/Re	B (-B)	Power supply -15V from FAU810/DFS
C	3	SIG	Ye/Bl	C (SIG)	Live flame signal
D	4	GND	Ye/Br	D (Comm)	Power supply return Ground reference
E					Not used
F					Not used
G					Not used
H					Not used
J					Not used
K					Not used
L					Not used
M					Not used
N					Not used
P					Not used
R					Not used
S					Not used
T		Shield	Grey	T (Sh)	Cable screen grounding

FAU810 Dual channel wiring with UV "Cam-lock" (Typical)

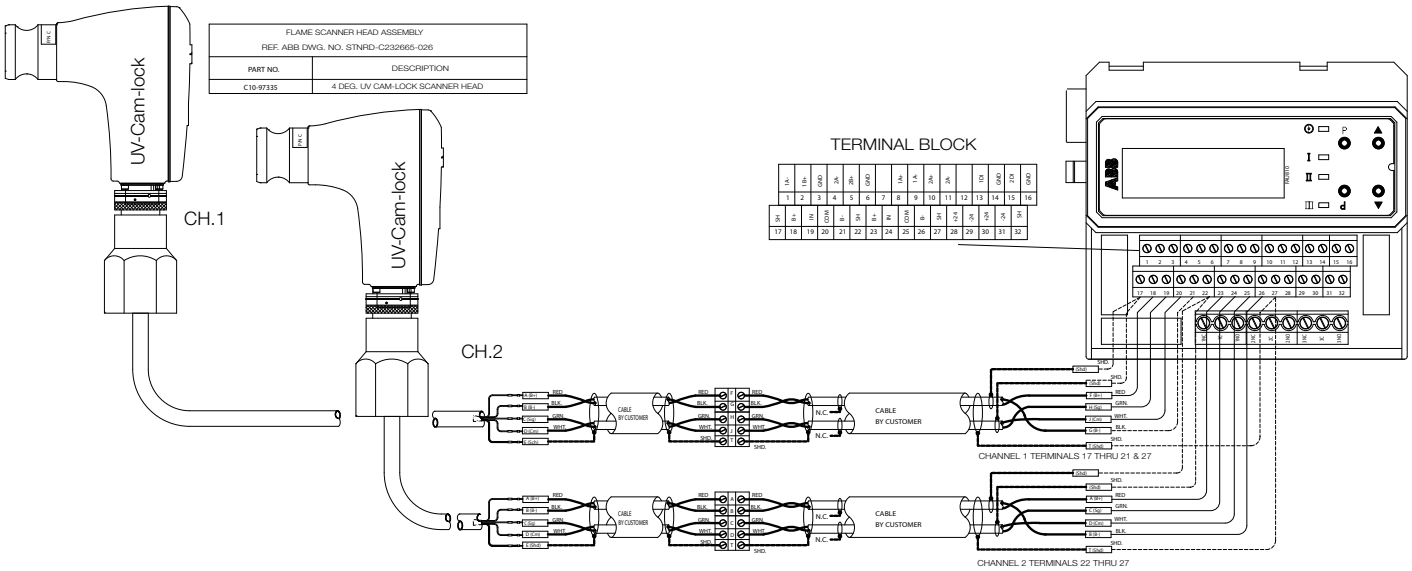
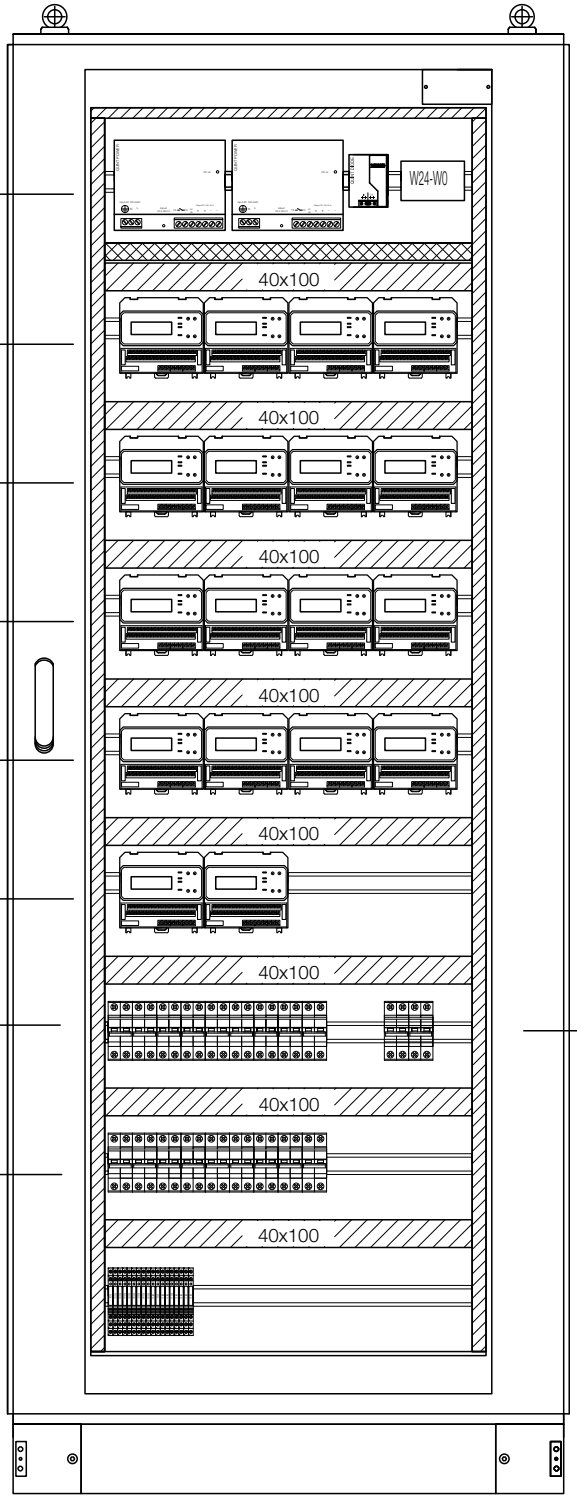


Table 4 - Adapter Cable Assembly ref. ABB DWG No. C-982-0242

Assembly part no.	Length	Description
C10-97252	8 FT.	Adapter Cable Assembly
C10-97252-25	25 FT.	Adapter Cable Assembly
C10-97252-50	50 FT.	Adapter Cable Assembly
C10-97252-100	100 FT.	Adapter Cable Assembly

FAU810 Cabinet layout with redundant power supply (Typical)



Redounded Power Supply modules
PSA , PSB , DD

Elevation 1 Main Burner Flame Scanners
RF1 (BRN1) - RF2 (BRN2) -RF3 (BRN3) RF4 (BRN4)

Elevations 1 and 2 Main Burner Flame Scanners
RF5 (BRN5) - RF6 (BRN6) -RF7 (BRN7) RF8 (BRN8)

Elevation 2 Main Burner Flame Scanners
RF9 (BRN9) - RF10 (BRN10) -RF11 (BRN11) RF12 (BRN12)

Elevation 3 Main Burner Flame Scanners
RF13 (BRN13) - RF14 (BRN14) -RF15 (BRN15) RF16 (BRN16)

Elevation 3 Main Burner Flame Scanners
RF17(BRN17) - RF18 (BRN18)

Main Burner flame scanners power supply circuit breakers
I1 (BRN1) - I2 (BRN2) - I3 (BRN3) - I4 (BRN4)
I5 (BRN5) - I6 (BRN6) - I7 (BRN7) - I8 (BRN8) - I9 (BRN9)

Main Burner flame scanners power supply circuit breakers
I10 (BRN10) - I11 (BRN11) - I12 (BRN12) - I13 (BRN13)
I14 (BRN14) - I15 (BRN15) - I16 (BRN16) - I17 (BRN17) - I18 (BRN18)

I24A , I24B

Tail cable for Single and Dual Sensor scanners

Single Sensor Connector pin assignment with standard ABB cable

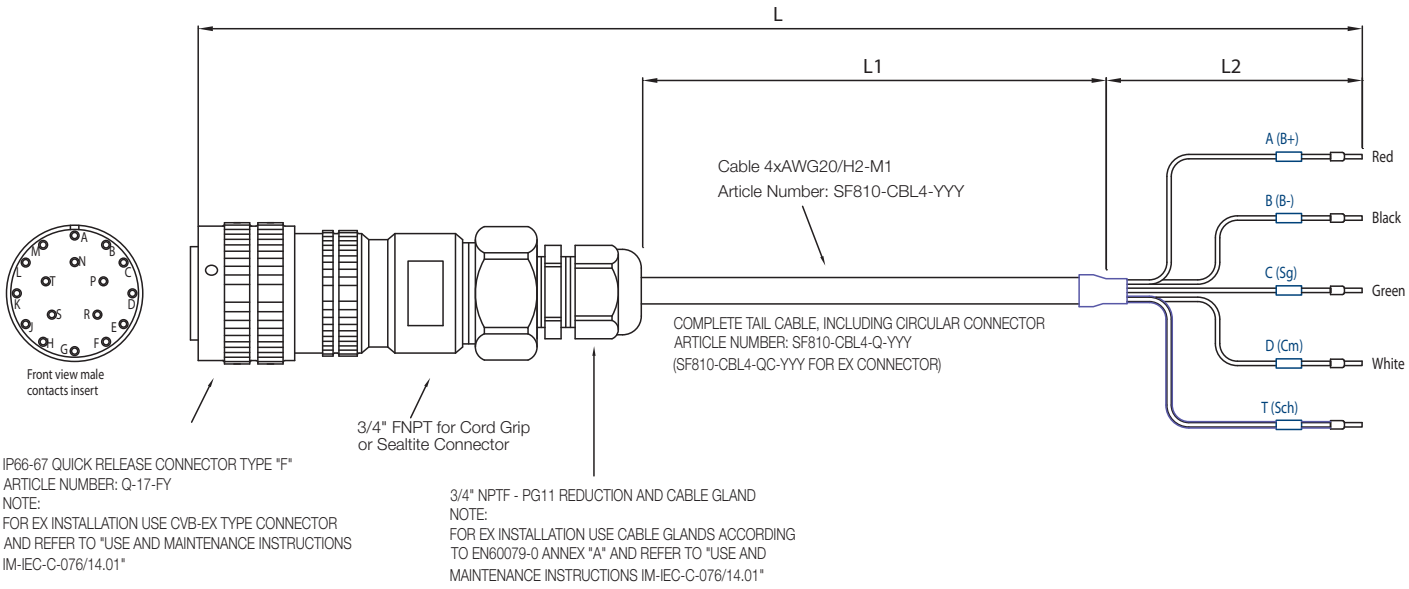


Table 5 - Single Sensor Connector pin assignment

Tail cable connector pin out (Female)	SF810 T.B. Signal name	Tail cable wire color	Pig tail fly end label	Functional description
A	+15V	Red	A (+B)	Power supply +15V from FAU810/DFS
B	-15V	Black	B (-B)	Power supply -15V from FAU810/ DFS
C	SIG	Green	C (SIG)	Live flame signal
D	GND	White	D (Comm)	Power supply return Ground reference
E				Not used
F				Not used
G				Not used
H				Not used
J				Not used
K				Not used
L				Not used
M				Not used
N				Not used
P				Not used
R				Not used
S				Not used
T	Shield	Grey	T (Sh)	Cable screen grounding

Tail cable for Single and Dual Sensor scanners

Dual Sensor Connector pin assignment with standard ABB cable

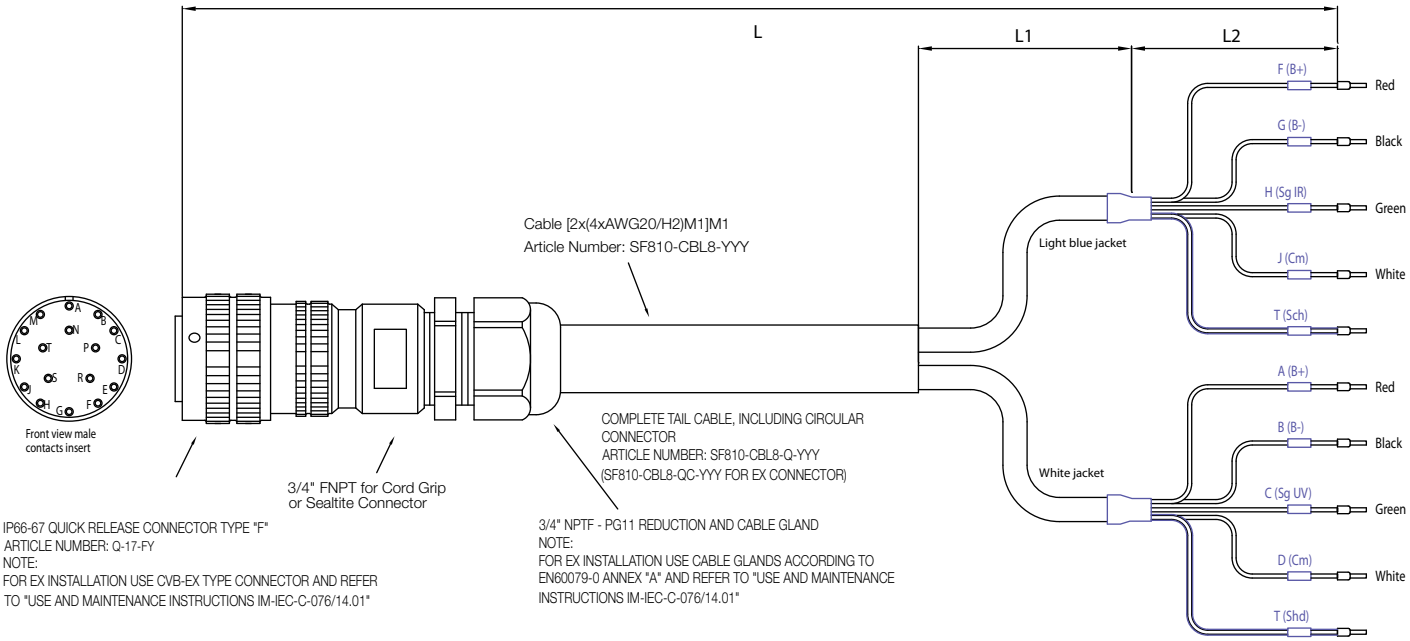
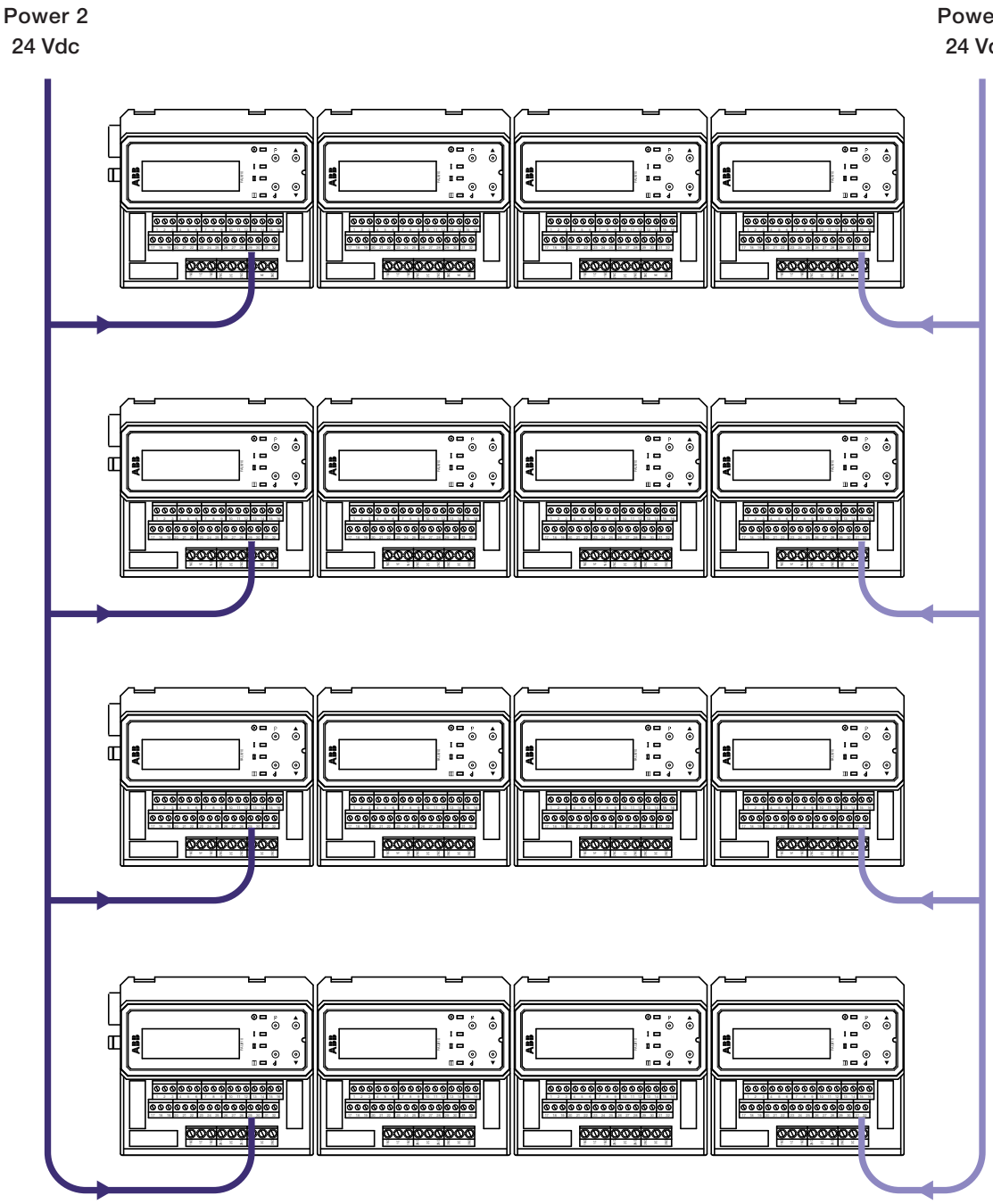


Table 6 - Dual Sensor Connector pin assignment

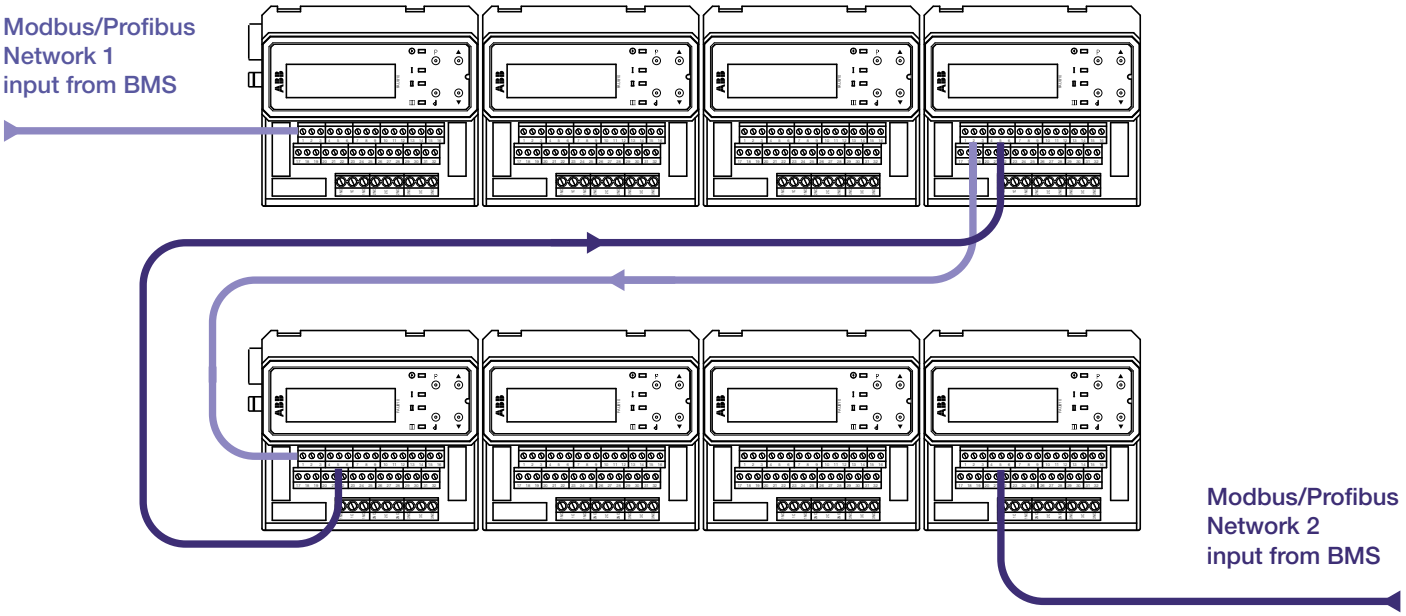
Quick connect pin	SF810 UVIR Term. Board	Signal name	Wires colour	Pig tail fly end label	Functional description
F	1	+15V	Red	F (+B)	Power supply +15V from FAU810/DFS
G	2	-15V	Black	G (-B)	Power supply -15V from FAU810/DFS
H	3	IR SIG	Green	H (SIG.IR)	Live flame signal IR
J	4	GND	White	J (Comm)	Power supply return Ground reference
E	5				Not used
A	6	+15V	Red	A (+B)	Power supply +15V from FAU810/DFS
B	7	-15V	Black	B (-B)	Power supply -15V from FAU810/DFS
C	8	UV SIG	Green	C (SIG.UV)	Live flame signal UV
D	9	GND	White	D (Comm)	Power supply return Ground reference
K	10				Not used
L					Not used
M					Not used
N					Not used
P					Not used
R					Not used
S					Not used
T		Shield	Grey	T (Sh)	Cable screen grounding

FAU810
Typical Redundant Power Distribution



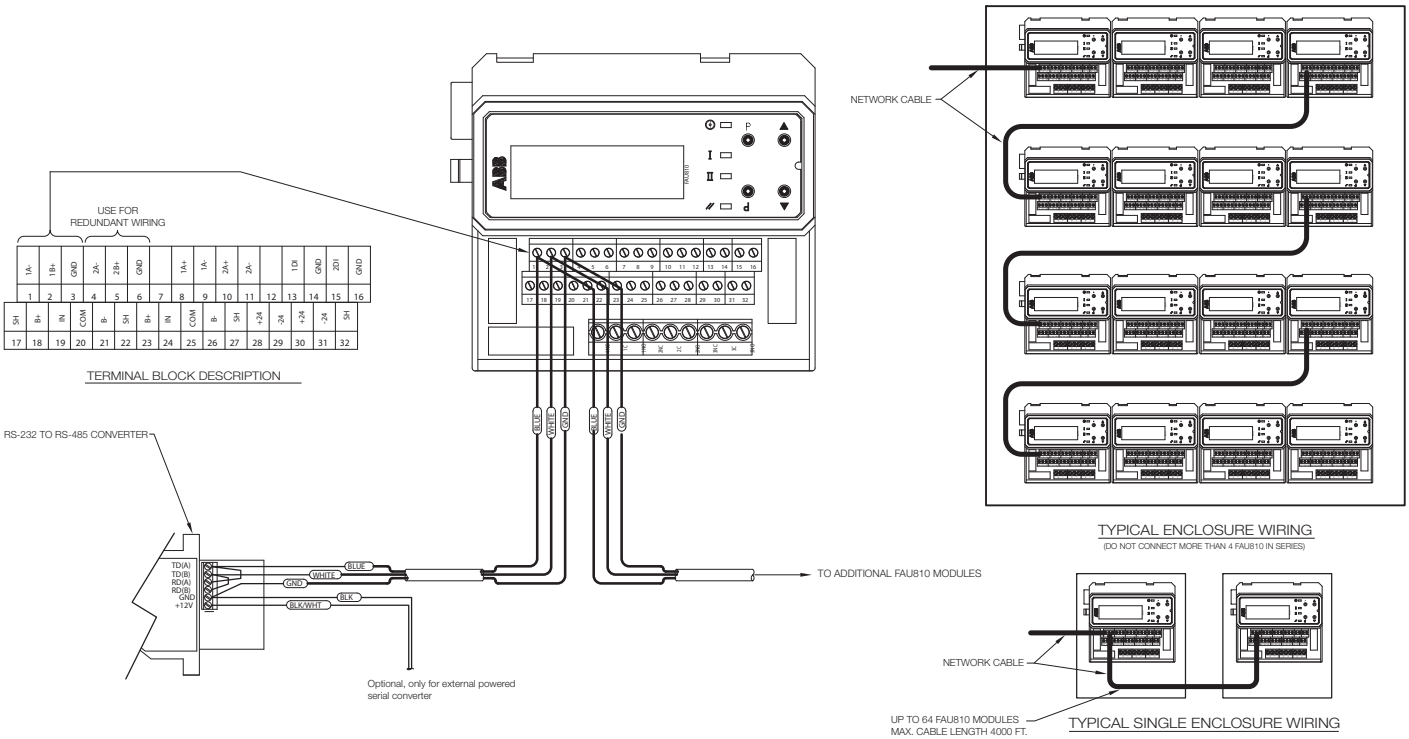
Split the 24Vdc power supply distribution to improve the system availability

FAU810
Typical Safety Network Configuration

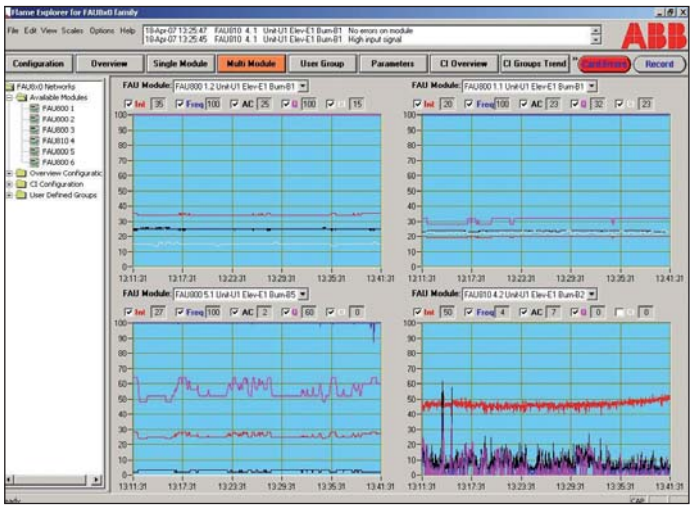


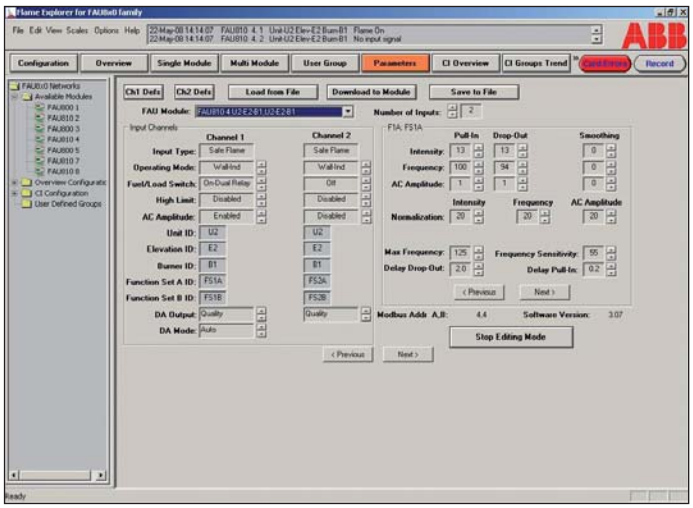
Modbus or Profibus DPV1 network can be redounded to improve monitoring and configuration reliability

FAU810
Typical Network Configuration for Flame Explorer™ configuration and monitoring tool



Flame Explorer configuration and monitoring tool





FAU810 flame analysis units share the flame quality data and diagnostic informations over a Modbus or Profibus DP-V1 high-speed network. Flame Explorer™ with OPC Server and DTM (Device Type Manager) allow for run-time and off-line data management and remote tuning.

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