technical datasheet

F809F-*Plus*

Fieldbus diagnostic module

- Monitors health of 8 fieldbus segments
- Provides early indication of possible network failure
- Communicates over FOUNDATION™ fieldbus H1 segment
- Easily integrates into any fieldbus control system
- Registered to Fieldbus Foundation ITK 6.0, including support for Resource Block diagnostic bits
- Network status and parameters displayed in instrument management software
- Updated EDDL and FDT/DTM user interfaces, with Namur NE107 compatible alarm categories

FOUNDATION

The F809F-*Plus* Fieldbus Diagnostic Module continuously monitors the performance of eight fieldbus segments, providing information on the health of the network physical layer. It mounts on a range of MTL 918x, F8xx or F6x8 power supply carriers, and collects diagnostic information without interruption to normal fieldbus communications.

As a Foundation Fieldbus™ device the F809F-*Plus* easily integrates with the chosen host control system via a fieldbus segment, allowing the network status and measured parameters to be displayed in the control system's instrument management software.

The F809F-*Plus* builds on the success of the F809F, the industry's first fieldbus-connected diagnostic module. New features of the *Plus* version include superior immunity to noise on the 'communicating' segment, enhanced short-to-shield detection, and extended power supply voltage measurement range for compatibility with new MTL power supply types. It may be used as a direct replacement for F809F in existing installations; when installed using appropriate DD files the full feature set of F809F-*Plus* become available with immediate effect.

The F809F-*Plus* is launched with fully updated versions of eEDDL and FDT/DTM user interfaces that are free to download from the MTL website. Improvements include faster operation and clearer screen layouts, leading to an enhanced user experience. The user interfaces comply with NAMUR specification NE107 'Self-Monitoring and Diagnosis of Field Devices', providing clear standardised diagnostic alerts using three of the four categories; maintenance required, out of specification, and failure.

The parameters measured include bulk power supply input voltages, module temperature, segment voltages, retransmissions and signal levels of all devices. Average and peak noise are measured in each of three frequency bands. Additionally the monitor checks for short-circuits between the fieldbus signal wires and cable shields. General parameters are presented in the System Transducer Block, and those specific to the segments are presented in each of eight Segment Transducer Blocks. An alarm is set if any parameter is outside the normal range, and corrective action is recommended using the device description help screen.

The measured physical layer parameters are used to predict the corrective action required. This allows problems to be rectified before poor network health results in devices being removed from the 'live list', which could affect the operation of the plant. Measurements may alternatively be captured and sent to off-site experts for interpretation.

The F809F-*Plus* fieldbus device description file enables all the fieldbus physical layer diagnostic data and alarms to be easily integrated into the chosen fieldbus control system. The default alert limits for the F809F-*Plus* are based on the fieldbus specification. The basic DD, enhanced EDDL and DTM all provide an alarm optimisation wizard which sets pre-alert limits close to the actual value. The pre-alerts are categorised as maintenance required and alerts are categorised as out of specification. This ensures that an instrument technician who knows is familiar with diagnostic data from a conventional fieldbus device can enjoy the full benefits of fieldbus physical layer diagnostics without additional training.

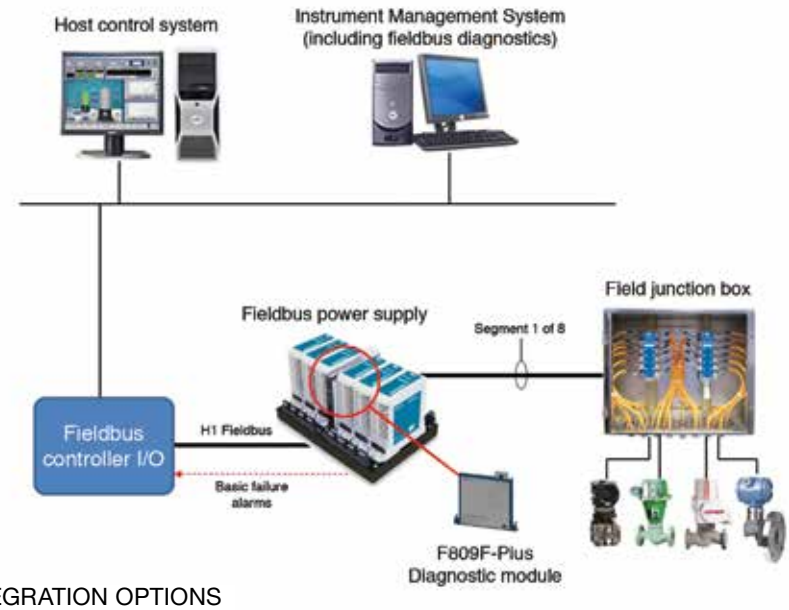
When monitoring a fieldbus segment the F809F-*Plus* draws less than 1mA current from the segment. As it only monitors the communication on the segments, its effect does not need to be considered in the segment design. Segment scanning is configurable to scan any combination of the eight segments. The default is to scan all eight segments.

The segment used for fieldbus communication is easily configured using the plug-in connector supplied. The options are: communicating on segment 1 or 8 on the power supply carrier or on a separate fieldbus segment. The F809F-*Plus* requires a voltage in the range 9–32V and draws a current of 15mA on the communicating fieldbus segment.

COOPER Crouse-Hinds

The Fieldbus Diagnostic Module is designed to place a minimal communication load on the communicating segment. In most applications, the control system is configured to monitor the BLOCK_ERR parameter in the nine transducer blocks (one power supply transducer block and eight segment blocks) in each F809F-*Plus*. If any transducer block parameter is in alarm the Needs Maintenance Soon bit is set that sets an alarm in the instrument management system. The instrument technician then opens the transducer block and can immediately see which alarm parameter is set and the current values of the monitored parameters. Help screens built into the fieldbus Device Description recommend corrective action for the parameter in alarm. This approach has no effect on the segment cyclic communication macrocycle loading.

Alternatively the control system can be configured to monitor the F809F-*Plus* discrete input block each macrocycle and if any transducer block parameter is in alarm the DI block is set which then sets an alarm in the instrument management system. This approach has a minimal effect on the segment cyclic communication macrocycle loading as the DI block communication takes only a few milliseconds.



INTEGRATION OPTIONS

Power Supply Transducer Block Parameters

Parameter	Alarms
Power Feed A voltage	Low/high
Power Feed B voltage	Low/high
Module Temperature	High

Segment Transducer Block Parameters

Parameter	Alarms
Segment Tag, 32 character text string*	
LAS Tag	
LAS Address (Hex)	
LAS Signal Level	
Lowest Signal Level Device's Tag	
Lowest Signal Level Device's Address (Hex)	
Lowest Device's Signal Level (mV)	
Total Retransmissions On Segment	
Retransmission Rate on Segment	
Segment voltage	Low/high
Short to shield	+/- to shield
Average low frequency noise	High
Average in-band frequency noise	High
Average high frequency noise	High
Peak low frequency noise	High
Peak in-band frequency noise	High
Peak high frequency noise	High
Live device count	Low/high

32 Sets of Device Data

The Fieldbus Diagnostic Module supports a maximum of 32 devices within each Segment Transducer Block. For typical fieldbus applications, two fieldbus I/O cards and up to 12 fieldbus devices are connected to each segment, so only 14 device data sets will be used.

If any of the transducer block parameters are in alarm, the "Device needs maintenance soon" bit is set in that transducer block's 16-bit BLOCK_ERR parameter.

The F809F-*Plus* provides default alarm limits. Alarm limits are user configurable.

Parameter	Alarms
Device address	
Device Tag, 32 character text string*	
Device signal levels	Low/High
Retransmissions	High
Retransmission rate = Re-transmissions/Total pass token requests from LAS	High
Inverted signal	

SPECIFICATION

Location of equipment
Safe area, Zone 2 or Division 2 hazardous area

ELECTRICAL

Monitored segments

Monitored segment voltage	9 to 32V DC
Monitored segment current draw	<1mA

Isolation

Segment to segment:	Functional 250Vac withstand
Power input to fieldbus communication port:	Functional 250Vac withstand
Power input to monitored segments:	Functional 250Vac withstand

EMC compliance
To EN61326:2006 Electrical equipment for measurement, control and laboratory use - EMC requirements

INPUT

Redundant power feeds from carrier
Input voltage
19.2 - 30.0V DC
Current consumption
80mA @ 24 V DC input (max.)
Fieldbus communication segment
Input voltage
9.0 to 32.0V DC
Current consumption
15mA maximum
Power dissipation
2.4W max

LED indicators

Power status (green)

On	power on
Off	power fail

Segment status (yellow)

On	segment monitored
Off	segment not monitored
Flashing	active segment alarm

* the segment tag and device tag data need to be entered into the F809F-*Plus* device description after the system has assigned addresses to the FF devices and downloaded to the F809F.

ENVIRONMENTAL

Ambient temperature

Operating - optimum orientation †	–40°C to +70°C
Operating - non-optimum orientation	–40°C to +50°C
Storage	–40°C to +85°C

† *optimum orientation is when mounted in a vertical position as defined on carrier datasheets*

Ingress protection
IP20 to BS EN 60529 (Additional protection by means of enclosure)
Corrosive atmospheres
Designed to meet ten year service in Class G3 corrosive environment, as defined by ISA Standard SP71.04.

MECHANICAL

Mountable on the following carriers:
F918x power supply carriers
F8xx power supply carriers
F6x8D power supply carriers
F8x8 diagnostic module carriers
Fieldbus communication segment used
The following options are selectable using the top connector:
Segment 1 of monitored segments
Segment 8 of monitored segments
A separate fieldbus segment
Dimensions (including top cover)
162(l) x 20(w) x 148(height from circuit board)
Weight
400g approx.

USER INTERFACE

Fieldbus device description
Fieldbus enhanced EDDL
Fieldbus FDT/DTM

PHYSICAL NETWORKS

IEC61158-2
FOUNDATION™ fieldbus H1

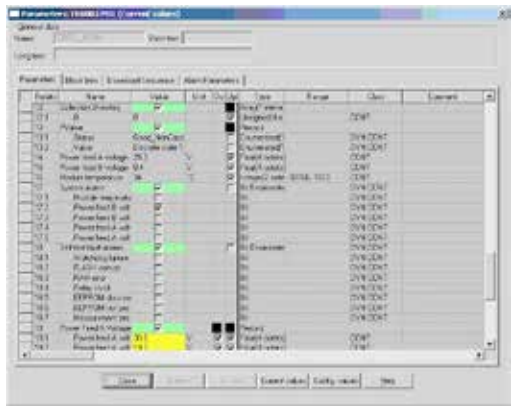
APPROVALS - *for the latest certification information visit www.mtl-inst.com/support/certificates/*

Region (Authority)	Standards	Certificate	Approved for
EU (MTL ATEX Category 3)	EN 60079-0 EN 60079-15	MTL13ATEXF809FPLUSX	Ⓔx II 3 G Ex nA IIC T4 (-40ºC≤Ta≤+70ºC)
EU (IECEx)	IEC 60079-0 IEC 60079-15	IECEx BAS 11.0110U	Ex nA IIC T4 Gc (-40ºC≤Ta≤+70ºC)
US (FM)	3600, 3611, 3810 ANSI/ISA 60079-15	Pending	NI/1/2/ABCD T4 (-40ºC≤Ta≤+70ºC) 1/2/AEx nA/IIC/T4 (-40ºC≤Ta≤+70ºC)
Canada (cFM)	CSA C22.2 No. 213 CSA-C22.2 No.60079-15	Pending	NI/I/2/ABCD/T4 (-40ºC≤Ta≤+70ºC) I/2/ExnA/IIC/T4 (-40ºC≤Ta≤+70ºC)

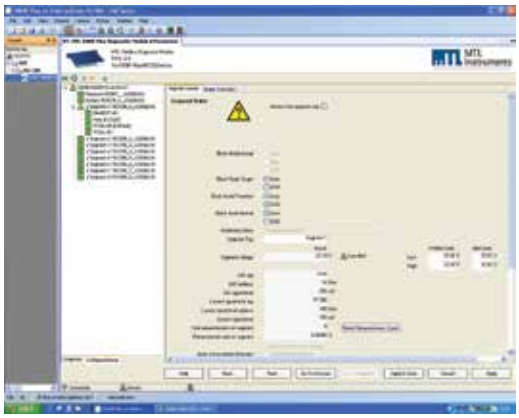
SCREEN IMAGES

eEDDL Homepage

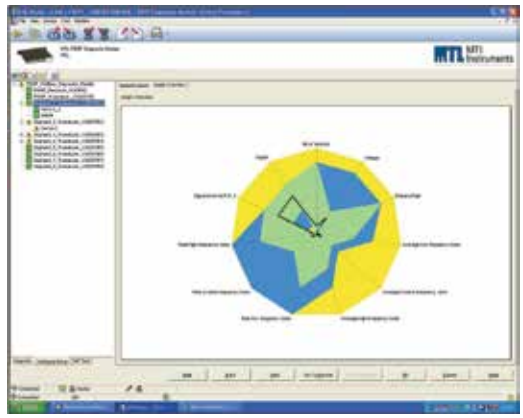
System Data



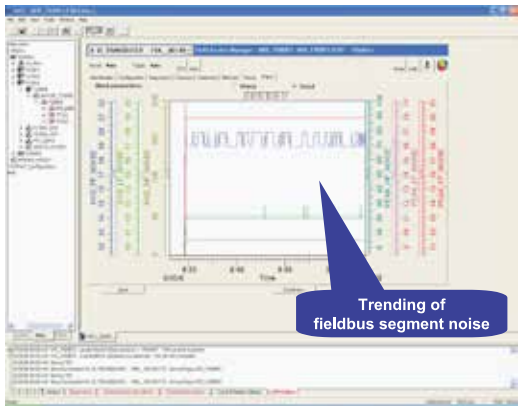
DTM Segment View



DTM Graphical View



Trending of Segment Noise



ORDERING INFORMATION

Part No	Configuration
F809F-*Plus*	Fieldbus diagnostics module