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

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, F9xx 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.

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.

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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.

### Power Supply Transducer Block Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Alarms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Feed A voltage</td>
<td>Low/high</td>
</tr>
<tr>
<td>Power Feed B voltage</td>
<td>Low/high</td>
</tr>
<tr>
<td>Module Temperature</td>
<td>High</td>
</tr>
</tbody>
</table>

### Segment Transducer Block Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Alarms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Segment Tag, 32 character text string*</td>
<td></td>
</tr>
<tr>
<td>LAS Tag</td>
<td></td>
</tr>
<tr>
<td>LAS Address (Hex)</td>
<td></td>
</tr>
<tr>
<td>LAS Signal Level</td>
<td></td>
</tr>
<tr>
<td>Lowest Signal Level Device’s Tag</td>
<td></td>
</tr>
<tr>
<td>Lowest Signal Level Device’s Address (Hex)</td>
<td></td>
</tr>
<tr>
<td>Lowest Device’s Signal Level (mV)</td>
<td></td>
</tr>
<tr>
<td>Total Retransmissions On Segment</td>
<td></td>
</tr>
<tr>
<td>Retransmission Rate on Segment</td>
<td></td>
</tr>
<tr>
<td>Segment voltage</td>
<td>Low/high</td>
</tr>
<tr>
<td>Short to shield</td>
<td>+/- to shield</td>
</tr>
<tr>
<td>Average low frequency noise</td>
<td>High</td>
</tr>
<tr>
<td>Average in-band frequency noise</td>
<td>High</td>
</tr>
<tr>
<td>Average high frequency noise</td>
<td>High</td>
</tr>
<tr>
<td>Peak low frequency noise</td>
<td>High</td>
</tr>
<tr>
<td>Peak in-band frequency noise</td>
<td>High</td>
</tr>
<tr>
<td>Peak high frequency noise</td>
<td>High</td>
</tr>
<tr>
<td>Live device count</td>
<td>Low/high</td>
</tr>
</tbody>
</table>
F809F-Plus
Fieldbus diagnostic module
February 2017

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

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
  - F8x8D 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/certificates

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<td>EU (Eaton ATEX Category 3)</td>
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<td>MTL13ATEX809FPLUSX</td>
<td>II 3 G Ex nA IIC T4 (-40°C≤Ta≤+70°C)</td>
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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.

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

Parameter | Alarms
--- | ---
32 Sets of Device Data | 
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.

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ORDERING INFORMATION

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