

CERTIFICATE OF CONFORMITY



- HAZARDOUS (CLASSIFIED) LOCATION ELECTRICAL EQUIPMENT PER US REQUIREMENTS**
- Certificate No:** FM20US0009X
- Equipment:
(Type Reference and Name)** Advanced Diagnostic Motherboard System consisting of
MB-FB-GT.AD.FF.IO* Motherboard
MB-FB-GT.AD.FF* Motherboard
HD2-GT-2AD.FF.IO*** Diagnostic Gateway
- Name of Listing Company:** Pepperl+Fuchs SE
- Address of Listing Company:** Lilienthalstrasse 200
Mannheim D-68307
Germany
- The examination and test results are recorded in confidential report number:
PR455691 dated 7th November 2022
- FM Approvals LLC, certifies that the equipment described has been found to comply with the following Approval standards and other documents:
FM Class 3600:2022, FM Class 3610:2021, FM Class 3611:2021, FM Class 3810:2021,
ANSI/ISA 60079-0:2020, ANSI/UL 60079-7:2021, ANSI/UL 60079-11:2018, ANSI/ISA 60079-15:2013
ANSI/UL 121201:2019, ANSI/ISA 61010-1:2012

Certificate issued by:



J.E. Marquedant
VP, Manager - Electrical Systems

7 November 2022

Date

To verify the availability of the Approved product, please refer to www.approvalguide.com

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FM Approvals LLC. 1151 Boston-Providence Turnpike, Norwood, MA 02062 USA
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US Certificate Of Conformity No: FM20US0009X

8. If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to specific conditions of use specified in the schedule to this certificate.
9. This certificate relates to the design, examination and testing of the products specified herein. The FM Approvals surveillance audit program has further determined that the manufacturing processes and quality control procedures in place are satisfactory to manufacture the product as examined, tested and Approved.

10. Equipment Ratings:

See Annex for Equipment Ratings

11. The marking of the equipment shall include:

See Annex for Equipment Ratings

12. **Description of Equipment:**

General – The Advanced Diagnostic Motherboard System provides standard input and output interfaces for Fieldbus systems. They are designed to analyse signal and segment parameters for monitoring and measuring specific system, segment and field device values. The Advanced Diagnostic Motherboard System can be operated in hazardous areas which require devices for Zone 2 or Division 2. The motherboard system does not provide intrinsically safe circuits and is not intrinsically safe itself, but parts of the system are capable of being connected to circuits which are voltage limited according to level or protection 'ic'. Therefore, an assessment to ANSI/UL 60079-11 is included as part of the assessment for the equipment

**Construction –
Motherboards**

The plastic housing for the motherboards contains a printed circuit board (PCB) that is fixed by screws. This PCB contains all connections necessary for the modules and for the circuits that should be connected to the motherboard. The PCB forms the upper part of the housing.

Both Motherboards must be mounted on a DIN rail according to DIN EN 60715 in a suitable cabinet with a minimum type of protection of IP54 according to IEC 60529.

For the connections of the motherboards print terminals are used. For the FF-H1 bus, pluggable terminals are inserted. On the board MB-FB-GT.AD.FF*, also pluggable terminals are used for the Diagnostic Bus.

The terminals for the power supply and the relays are separated. The terminals for all other signals are combined in one terminal block

The terminals used may be screw- or spring-cage terminals.

The Diagnostic Gateway can be plugged in and locked with two latches.

Diagnostic Gateway

The Diagnostic Gateway consists of two printed circuit boards (PCB), which are stacked inside a plastic housing.

On the bottom of the device, there are three multi pin connectors which establish the electrical connection to the motherboard the Diagnostic Gateway is plugged onto. Furthermore, there are coding pins, which ensure,

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that the module is only plugged onto compatible motherboards. The locking latches on the side of the module can be used to fix the module in its position when it is plugged onto a motherboard. On the top side of the module, there is a RJ-45 socket for establishing the Ethernet connection.

See Annex for Ratings and Model Codes

13. **Specific Conditions of Use:**

1. The Advanced Diagnostic Motherboard System has to be erected in such a way, that corresponding to ANSI/UL 60079-7 a degree of protection of at least IP 54 is achieved.
2. The operation of the switches and the connection and disconnection of the modules and energized non-intrinsically safe circuits is only permitted if no explosive atmosphere exists.
3. The Advanced Diagnostic Motherboard System has to be erected in such a way that a pollution degree 2 or less, according to IEC 60664-1 is achieved, if the devices are connected to an intrinsically safe limited voltage according to ANSI/UL 60079-11:2018.

14. **Test and Assessment Procedure and Conditions:**

This Certificate has been issued in accordance with FM Approvals US Certification Requirements.

15. **Schedule Drawings**

A copy of the technical documentation has been kept by FM Approvals.

16. **Certificate History**

Details of the supplements to this certificate are described below:

Date	Description
7 th November 2022	Original Issue.

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ANNEX

MB-FB-GT.AD.FF.IO* Motherboard

Equipment ratings

Nonincendive for use in Class I, Division 2 Groups A, B, C, D, hazardous (classified) locations T4, Ta = -40°C to +60°C
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Increased safety protection utilizing a sealed relay for Class I, Zone 2, AEx ec nC IIC T4 Gc; Ta = -40°C to +60°C

Equipment markings

Class I, Division 2, Groups A, B, C, D; T4 Ta = -40°C to +60°C

Class I, Zone 2, AEx ec nC IIC T4 Gc; Ta = -40°C to +60°C

Electrical Ratings

Power Supply

(PWR connector: -,+)

Only for connection to protected circuits (SELV/PELV).

$U_N = 19.2 \text{ V to } 35 \text{ V d.c.}$

FF-H1 connection

(FF-H1 connector: +, -, S)

For connection to circuits with a rated voltage.

$U_N \leq 35 \text{ V}$

Relays Output 1 + 2

(connector: Out1/Out2:)

$U_N \leq 250 \text{ V a.c.}$

Namur inputs

(Terminal Block CN1:

Namur / Frequency: {1+, 2-}, {3+, 4-}

Namur: {5+, 6-}, {7+, 8-}

Relays-In: {22+, 23-}, {28+, 29-}

Temperature: {9+, 10, 11, 12-}, {14+, 15, 16, 17-})

Only for connection of passive loads.

$U_N \leq 35 \text{ V}$

Error Output

(Terminal Block CN1: {34, 35})

Only for connection to protected circuits (SELV/PELV).

$U_N = 50 \text{ V}$

$I_N = 1 \text{ A}$

RS485 input

(Terminal Block CN1: {19+, 20-},

{25+, 26-}, {31+, 32-})

Only for connection to protected circuits (SELV/PELV).

$U_N \leq 35 \text{ V}$

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Earth connection
(connector: Shield GND Screen)
Internally directly connected to terminal 13, 18, 24, 30, 33 and 36 of terminal block CN1 and to terminal S of FF-H1 connection.

MB-FB-GT.AD.FF* Motherboard

Equipment ratings

Nonincendive for use in Class I, Division 2 Groups A, B, C, D, hazardous (classified) locations

T4, Ta = -40°C to +60°C

Increased safety protection for Class I, Zone 2, AEx ec IIC T4 Gc;

Ta = -40°C to +60°C

Equipment markings

Class I, Division 2, Groups A, B, C, D; T4 Ta = -40°C to +60°C

Class I, Zone 2, AEx ec IIC T4 Gc; Ta = -40°C to +60°

Electrical Ratings

Power Supply

(PWR connector: -, +, GND)

Only for connection to protected circuits (SELV/PELV).

U_{supply} = 19.2 V to 35 V d.c.

FF-H1 connection

(FF-H1 connector: +, -, S)

For connection to circuits with safe limited voltage according to IEC 60079-11:2012 level of protection "ic".

U_i ≤ 35 V or

For connection to circuits with a rated voltage.

U_N ≤ 35 V

RS485 input

(Serial +, -)

Only for connection to protected circuits (SELV/PELV).

U_N ≤ 35 V

Alarm Output

(Common)

Only for connection to protected circuits (SELV/PELV).

U_N = 50 V

I_N = 1 A

RS485 input

(Channel 1 +, -; Channel 2 +, -)

Only for connection to protected circuits (SELV/PELV).

U_N ≤ 35 V

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US Certificate Of Conformity No: FM20US0009X

Alarm
(Channel 1; Channel 2)
Only for connection to protected circuits (SELV/PELV).
 $U_N \leq 50 \text{ V}$

HD2-GT-2AD.FF.IO* Diagnostic Gateway**

Equipment ratings

Nonincendive for use in Class I, Division 2 Groups A, B, C, D, hazardous (classified) locations
T4, $T_a = -40^\circ\text{C}$ to $+60^\circ\text{C}$

Increased safety protection for Class I, Zone 2, AEx ec IIC T4 Gc;
 $T_a = -40^\circ\text{C}$ to $+60^\circ\text{C}$

Equipment markings

Class I, Division 2, Groups A, B, C, D; T4 $T_a = -40^\circ\text{C}$ to $+60^\circ\text{C}$
Class I, Zone 2, AEx ec IIC T4 Gc; $T_a = -40^\circ\text{C}$ to $+60^\circ\text{C}$

Electrical Ratings

Ethernet Interface
(RJ-45 socket, 8-pin)
Only for connection to protected circuits (SELV/PELV).
 $U_N \leq 35 \text{ V}$

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