



# Operating Instructions



## Diagnosis Communication Module

> 9415



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## 2 General Information

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### 2.1 Manufacturer

R. STAHL Schaltgeräte GmbH  
Am Bahnhof 30  
74638 Waldenburg  
Germany

Tel: +49 7942 943-0  
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### 2.2 Operating Instructions Information

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Subject to alterations.

### 3 General Safety Instructions

The devices must be used only for the permitted purpose. Incorrect or impermissible use or non-compliance with these instructions invalidates our warranty provision. Any alterations and modifications to the device impairing its explosion protection are not permitted. Use the device only if it is undamaged and clean.

**⚠ WARNING**

Installation, maintenance, overhaul and repair may only be carried out by appropriately authorised and trained personnel.

**Observe the following information during installation and operation:**

- ▶ National and local safety regulations
- ▶ National and local accident prevention regulations
- ▶ National and local assembly and installation regulations (e.g. IEC/EN 60079-14)
- ▶ Generally recognized technical regulations
- ▶ Safety instructions in these operating instructions
- ▶ Any damage can invalidate the explosion protection
- ▶ Operate the device according to its performance data only.
- ▶ Servicing/maintenance work or repairs which are not described in the operating instructions must not be performed without prior consultation of the manufacturer.
- ▶ Do not use the device outdoors without a suitable enclosure
- ▶ When using the device in Zone 2, the device must be built into an enclosure which corresponds at least to the requirements of IEC/EN 60079-15.
- ▶ When operating the device in hazardous areas, connection work on the FF-H1 connection terminal and removing/attaching the auxiliary power source are not permitted!
- ▶ The RS232 interface (X2) is intended for firmware updates by the service personnel of R. STAHL or instructed personnel of the system operator.

**If you have questions:**

- ▶ Contact the manufacturer.

### 4 Conformity to Standards

The relevant standards are listed in the EC Declaration of Conformity or IECEx Certificate of Conformity. These documents are available for download in the download area on the internet page [www.stahl-ex.com](http://www.stahl-ex.com).

## 5 Intended Field of Application

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 **WARNING**

**Use the device in accordance with its designated use only!**

- ▷ Otherwise, the manufacturer's liability and warranty will expire.
- ▶ The device may only be used according to the operating conditions described in these operating instructions.
- ▶ The device must be used in areas subject to explosion hazards only according to these operating instructions.

The diagnosis communication module is electrical equipment with degree of protection Ex nA, approved for use in hazardous areas of Zone 2 or in the safe area.

The diagnosis communication module may only be mounted on the mounting position of a bus-Carrier of Series 9419 and supplied with auxiliary power by the bus-Carrier via the provided connecting cable.

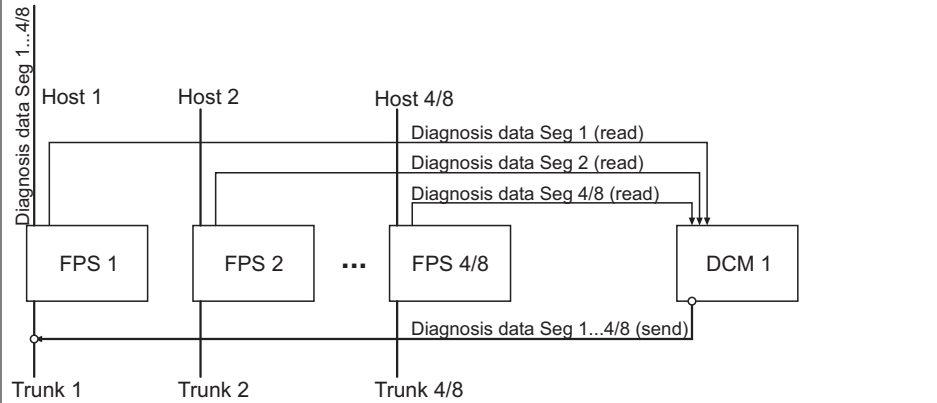
The diagnosis communication module collects the diagnosis information of the fieldbus segments connected to the Fieldbus Power Supplies via the bus-Carrier and transmits it to the control system via one of the connected fieldbus segments or via a separate diagnosis segment.

The connection to the control system is effected via an FF H1 interface galvanically isolated from the non-intrinsically safe electric circuits. This interface must be supplied with power from the connected fieldbus and designed in accordance with the requirements of an "ic" FISCO field device according to EN 60079-27.

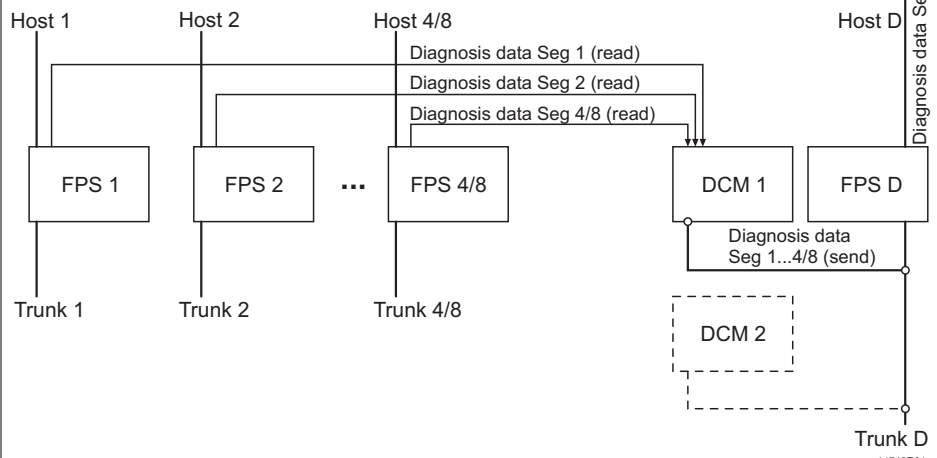
## 6 Technical Data

Global (IECEX) Gas	IECEX BVS 11.0054x Ex nA [ic] IIC T4 Gc
Europe (ATEX) Gas	BVS 11 ATEX E 104X ⊕ II 3 G Ex nA [ic] IIC T4 Gc
Certificates and Approvals Certificates	ATEX, IECEX
Further parameters Installation	in Zone 2, Div. 2 and in the safe area
Safety data Max. permissible voltage $U_i$	32 V
Internal capacitance $C_i$	negligible
Internal inductance $L_i$	10 $\mu$ H
<b>Electrical data</b> Power supply Connection	from the bus-Carriers Series 9419 24 V DC
Nominal voltage $U_N$	18 ... 32 V DC
Voltage range	40 mA at 24 V DC
Current consumption	
Galvanic isolation Fieldbus to Power Supply	1500 V AC (test voltage)
Indication Indication	LED "PWR", green
Function Indication	LED "ERR", red (flashes = DCM maintenance required, ON = failure DCM)
Segment status	LED "ERR", red (flashes = segment maintenance required, ON = failure segment)
Diagnostics interface For connection to	ISbus Fieldbus Power Supplies 9412 (via bus-Carrier 9419)
Physical layer measurement (acc. to NAMUR NE 123)	via Fieldbus Power Supplies 9412: Segment: voltage / current, jitter, signal level, noise, balance, current and voltage Fieldbus devices: jitter, signal level
Further Data	Serial number, type, version revision for DCM, Fieldbus Power Supplies and bus-Carrier.
Fieldbus interface For connection to	Host and Asset Management Systems with H1 interface
Specification	FOUNDATION™ fieldbus H1 (IEC 61158-2)
Data transmission	Via segment 1 ... 4 / 8 (depends on bus-Carrier), selectable Alternative: via dedicated diagnosis segment
Voltage range	9 ... 32 V DC
Current consumption	13 mA
Functions FF stack	Softing
Technology	EDD
Parameter data	Resource Block for device data DCM, Fieldbus Power Supply and bus-Carrier
Cyclic data transmission	10 DI function blocks for status information / common error per segment
Acyclic data transmission	9 Transducer blocks for detailed information: physical layer values, HI-alarm, HIHI-alarm, LO-alarm, LOLO-alarm, status DCM, status segment, status fieldbus devices
Alerts and status	FF H1 events acc. to FF-912 / NAMUR NE 107 (Field Diagnostics Alarms)
Firmware update	RS232 via PC
Ambient conditions Ambient temperature	- 20 ... + 70 °C
Storage temperature	- 40 ... + 80 °C
Relative humidity (no condensation)	< 95 %
Electromagnetic compatibility	Tested to the following standards and regulations: EN 61326 (IEC/EN 61000-4-1...6 und 11), NAMUR NE 21

Electrical connection  
Connection diagram



**Data transmission via segments 1 ... 4 / 8**



**Data transmission via diagnosis segment (optional)**

**Mechanical data**

Terminals	one wire	two wires
	Screw terminals	Screw terminals
rigid	0.2 ... 2.5 mm <sup>2</sup>	0.2 ... 1 mm <sup>2</sup>
flexible	0.2 ... 2.5 mm <sup>2</sup>	0.2 ... 1,5 mm <sup>2</sup>
flexible, end covering sleeves	0.25 ... 2.5 mm <sup>2</sup>	0.25 ... 1 mm <sup>2</sup>
Assembly	in bus-Carrier Series 9419	
Installation position	vertical or horizontal	
Degree of protection		
Enclosure	IP30	
Terminals	IP20	
Enclosure material	PA 6.6	
Fire protection class (UL-94)	V0	
Connecting cable	26 poles, for connection DCM with bus-Carrier	

## 7 Transport, Storage and Disposal

### Transport

- ▶ Shock-free in its original carton, do not drop, handle carefully.

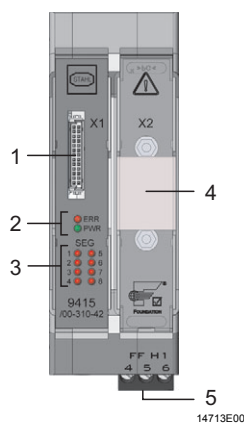
### Storage

- ▶ Store in a dry place in its original packaging



**Disposal**

- ▶ Ensure environmentally friendly disposal of all components according to the legal regulations.

**8 Main Components**

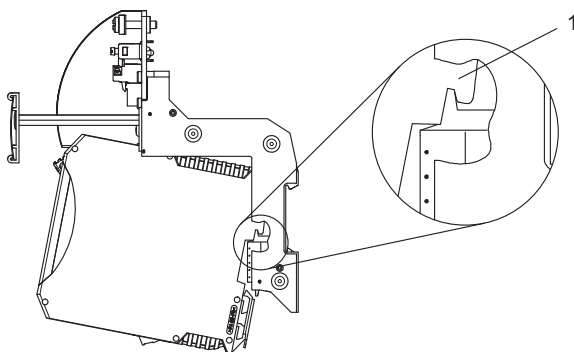
1	Connection terminal "X1" for connection of auxiliary power (from bus-Carrier 9419)
2	LED "PWR" and "ERR" status indication of the diagnosis communication module
3	LED "SEG 1" ... "SEG 8" status indication of the particular fieldbus segment
4	RS232 interface "X2" for firmware update
5	FF H1 connection terminal for transmitting the diagnosis data (passive, Fieldbus Power Supply required)

**9 Assembly and Installation**

<b>⚠ WARNING</b>	
<b>EX</b>	<p><b>Incorrectly installed components!</b></p> <ul style="list-style-type: none"> <li>▶ If the components are installed incorrectly, explosion protection is no longer guaranteed.</li> <li>▶ Carry out assembly strictly according to the instructions and national safety and accident prevention regulations (e.g. IEC/EN 60079-14).</li> </ul>

**9.1 Assembly**


	The diagnosis communication module is mounted on the mounting position of the bus-Carrier on the right from the Fieldbus Power Supplies.
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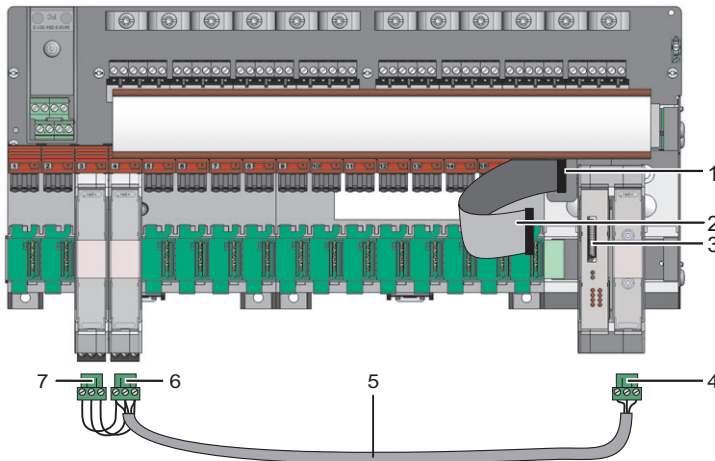


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- ▶ Hang the module with the upper groove (1) into the mounting rail profile at the mounting position.
- ▶ Swing module downward until the base bolt snaps into place.

## 9.2 Installation

<b>⚠ WARNING</b>	
	<p><b>Danger due to live parts!</b></p> <ul style="list-style-type: none"> <li>▷ Explosion protection is not guaranteed any longer.</li> <li>▶ In hazardous areas, connection work on the connection terminals and attaching/removing the connection terminals are not permitted!</li> <li>▶ Before carrying out work on the connection terminals, the fieldbus and the auxiliary power source of the bus-Carrier must be disconnected from the supply.</li> </ul>



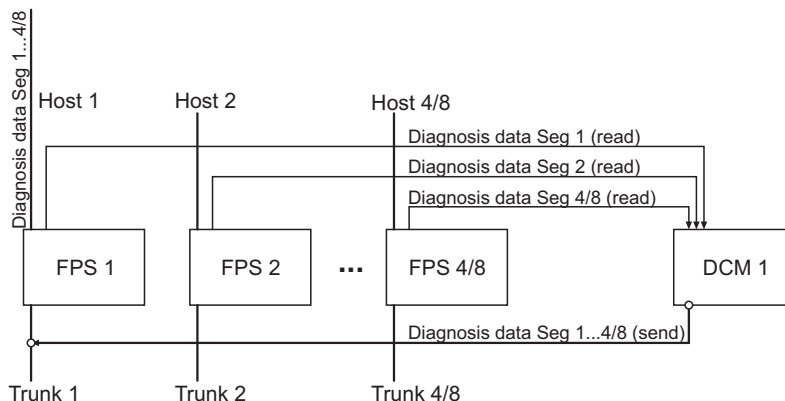
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### Connection for auxiliary power and diagnosis data


<b>⚠ WARNING</b>	
	<p><b>Danger due to using impermissible accessories!</b></p> <ul style="list-style-type: none"> <li>▶ The DCM may only be connected to the carrier using the provided connecting cable! Using other connecting cables is not permitted!</li> </ul>

- ▶ Connect socket "X1" (3) to the socket (1) of the bus-Carrier using the provided connecting cable (2).


### Fieldbus connection for transmitting the diagnosis data to the host



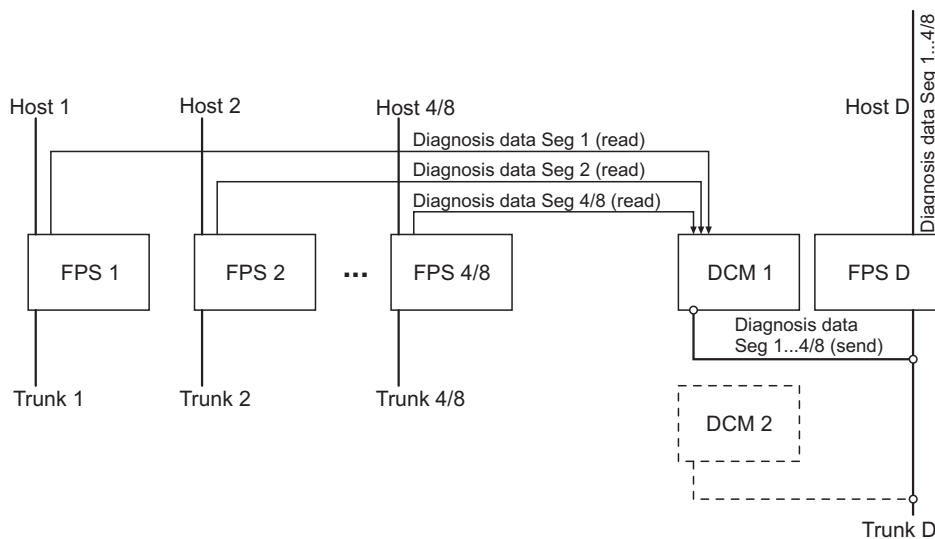
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	<p>The diagnosis data is transmitted to the host via the FF H1 interface using one of the segments of a bus-Carrier, of which there are at most 8. The user can freely select the segment for transmitting the diagnosis data by connecting the connecting cable (5) to the FPS 1...8 or 1.. 16, respectively.</p>
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- ▶ Connect fieldbus cable (5) to the screw terminal of the DCM (4) and one "TRUNK" screw terminal of the FPS (6) such that in each case the "+" and "-" terminals are connected to each other.
- ▶ Connect each shield of the fieldbus cable to the "S" terminal.

 For transmission of the diagnosis data to the control system, the DCM must be connected to a Fieldbus Power Supply. The diagnosis data is sent to the control system via the fieldbus segment connected there. With redundant fieldbuses, only one FPS must be connected to the DCM. To guarantee transmission of the diagnosis data even during a failure of the connected FPS, the two "TRUNK" screw terminals (6, 7) can be connected to each other.

### Connection to a diagnosis segment (optional)



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 Optionally, the DCM can also be connected to an FPS on a different bus-Carrier or an FPS mounted separately on a DIN rail. It must be guaranteed that the properties of the segment match the values of the FF H1 interface of the DCM.

## 10 Putting into Service

### Before putting into service

- ▶ Test the device for correct function and installation in accordance with the operating instructions and other applicable regulations.
- ▶ Check whether cables and lines are clamped properly.

### Putting into Service



- ▶ Observe the national regulations when putting into service.
- ▶ Observe the directives in accordance with IEC/EN 60079-17 when performing functional checks.

### LED displays, description of function

		Description
PWR, green	On	Auxiliary power source via bus-Carrier okay
	Flashes	Internal error
		H1 interface not connected to FPS or FPS failure
Off	No auxiliary power supply via bus-Carrier	
ERR, red	Off	DCM okay
	Flashes	DCM maintenance required
	On	DCM fault
SEG 1 ... SEG 4/8, red	Off	Segment okay or segment deactivated via software
	Flashes	Segment diagnosis
	On	Segment outside specification or faulty, no FPS mounted on relevant module slot of the bus-Carrier

## 11 Maintenance

### 11.1 Regular Maintenance Work



 <b>WARNING</b>	
	<p><b>Danger due to live parts!</b></p> <ul style="list-style-type: none"> <li>▷ Explosion protection is not guaranteed any longer.</li> <li>▶ In hazardous areas, connection work on the connection terminals and attaching/removing the connection terminals are not permitted!</li> <li>▶ Before carrying out work on the connection terminals, the fieldbus and the auxiliary power source of the bus-Carrier must be disconnected from the supply.</li> </ul>

- ▶ Consult the relevant national regulations (e.g. IEC/EN 60079-17) to determine the type and extent of inspections.
- ▶ Plan the intervals such that any expected defects in the equipment are detected promptly.

#### To check as part of maintenance:

- × Check if the cables are clamped properly.
- × Check if the connection terminals are clamped properly.
- × Check for compliance with the permissible temperatures.
- × Make sure that the device is used according to its designated use.

### 11.2 Repair work

 <b>WARNING</b>	
	<p><b>Danger due to improper maintenance/repairs</b></p> <ul style="list-style-type: none"> <li>▷ Explosion protection is not guaranteed any longer.</li> <li>▶ Repair work to the device must only be performed by R. STAHL.</li> </ul>

The devices are maintenance-free.

When repair is required, send the module to the responsible sales organization (for the address, go to [www.stahl.de](http://www.stahl.de)).

### 11.3 Cleaning

To avoid electrostatic charges, the device may only be cleaned by wiping it with a moist cloth.

## 12 EC Declaration Of Conformity

**EG-Konformitätserklärung**  
*EC-Declaration of Conformity*  
*Déclaration de Conformité CE*



**R. STAHL Schaltgeräte GmbH • Am Bahnhof 30 • 74638 Waldenburg, Germany**  
 erklärt in alleiniger Verantwortung, *declares in its sole responsibility, déclare sous sa seule responsabilité,*

dass das Produkt  
*that the product*  
*que le produit*

Diagnose Kommunikationsmodul  
*Diagnosis Communication Module*  
*Module Pour Communication De Diagnostic*

Typ, *type, type:*

9415/00-310-4g (g = 0, 2)

Kennzeichnung, *marking, marquage:*

II 3 G Ex nA [ic] IIC T4 Gc

mit der EG-Baumusterprüfbescheinigung:  
*under EC-Type Examination Certificate:*  
*avec Attestation d'examen CE de type:*

BVS 11 ATEX E 104X  
 (DEKRA EXAM GmbH,  
 Dinnendahlstraße 9, 44809 Bochum)

auf das sich diese Erklärung bezieht, mit den folgenden Normen oder normativen Dokumenten übereinstimmt  
*which is the subject of this declaration, is in conformity with the following standards or normative documents*  
*auquel cette déclaration se rapporte, est conforme aux normes ou aux documents normatifs suivants*

Bestimmungen der Richtlinie <i>Terms of the directive</i> <i>Prescription de la directive</i>	Nummer sowie Ausgabedatum der Norm <i>Number and date of issue of the standard</i> <i>Numéro ainsi que date d'émission de la norme</i>
1994/9/EG: ATEX-Richtlinie 1994/9/EC: ATEX Directive 1994/9/CE: Directive ATEX	EN 60079-0: 2009 EN 60079-11: 2007 EN 60079-15: 2010 EN 60079-27: 2008
2004/108/EG: EMV-Richtlinie 2004/108/EC: EMC Directive 2004/108/CE: Directive EMC	EN 61326-1: 2006
Allgemeine Normen ohne Bezug auf eine Richtlinie <i>General standards without reference to a directive</i> <i>Normes générales sans référence à une directive</i>	EN 50178: 1997 EN 61010-1: 2001 + Corrigendum / Errata

Waldenburg, 11.10.2011

Ort und Datum  
*Place and date*  
*Lieu et date*

J.-P. Rückgauer  
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