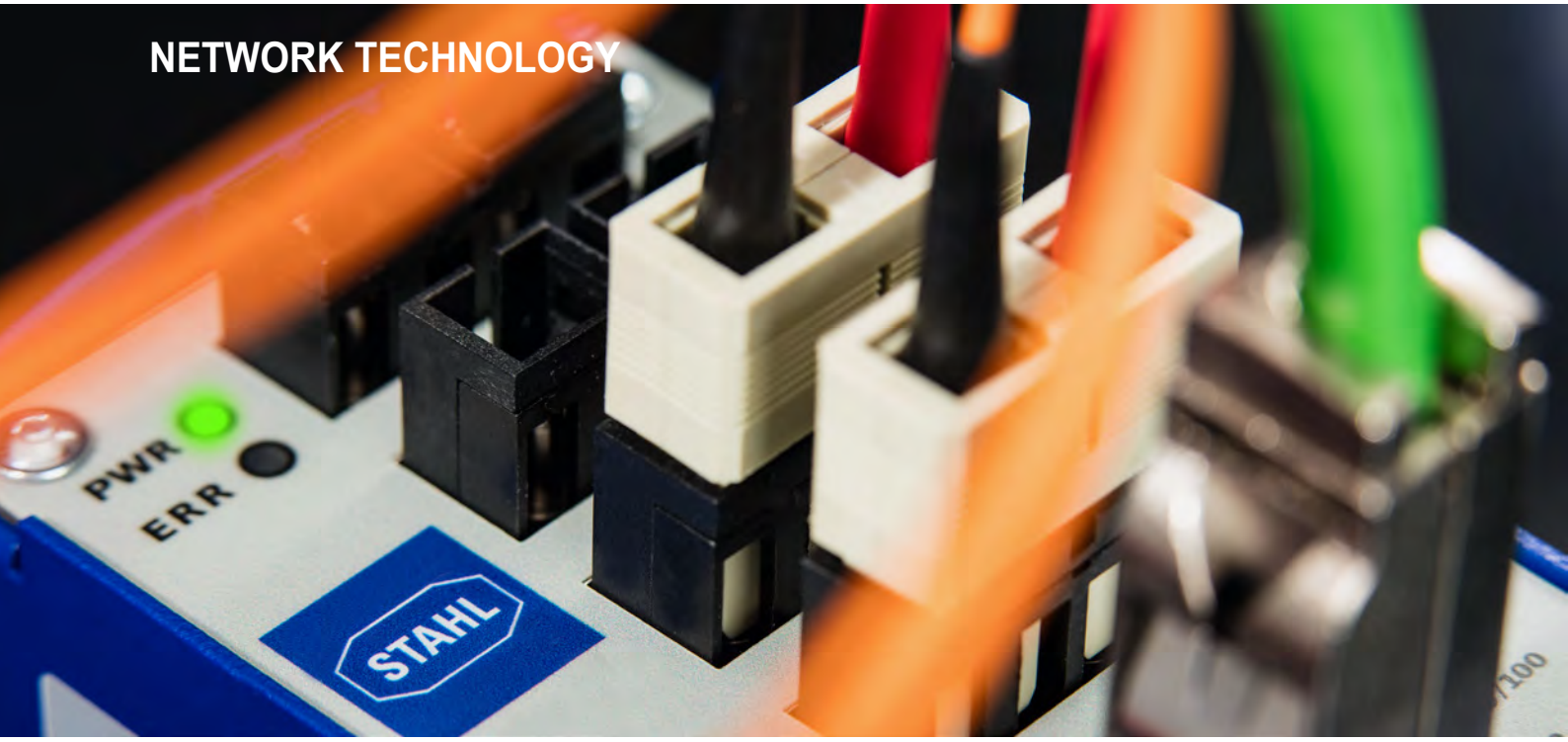
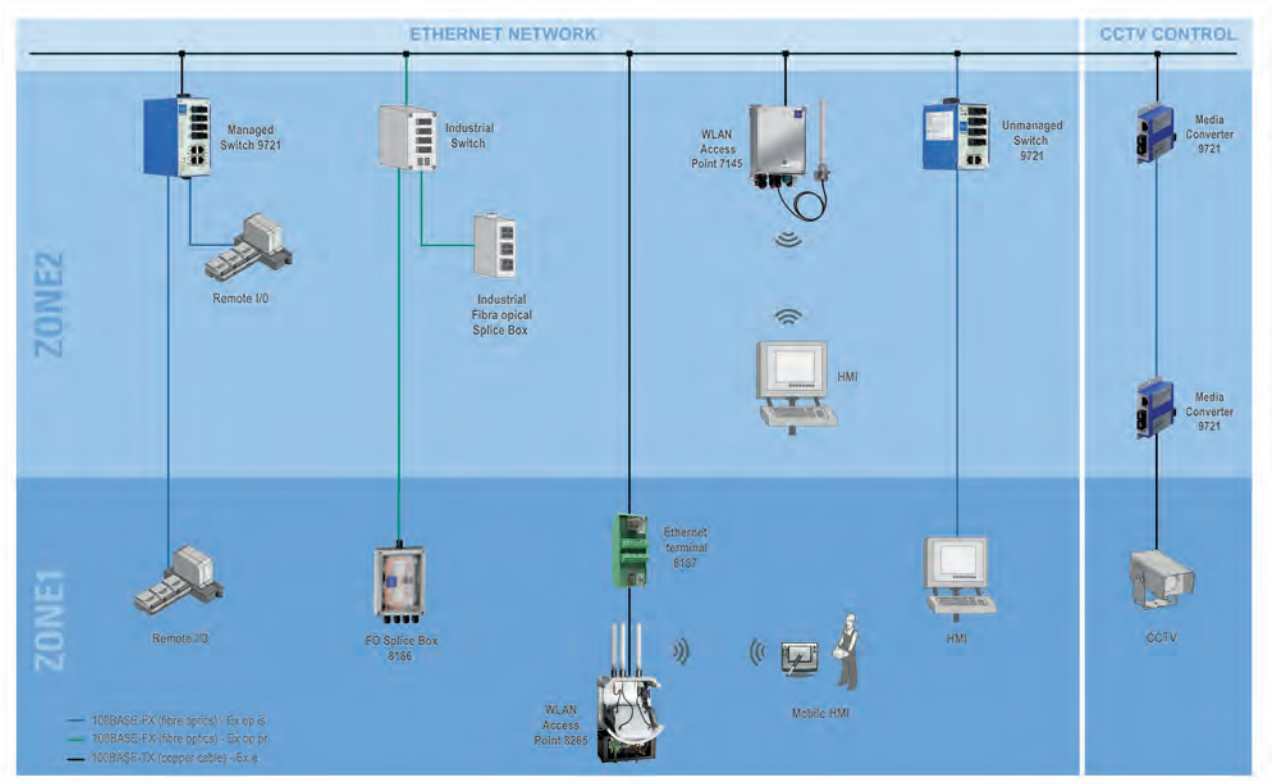
NETWORK TECHNOLOGY



Product	Installation in Zone 0	1	2	20	21	22	Series	Page	WebCode
Coax Bushing									
Coax Bushing		•	•		•	•	9731	169	9731A
Connection Technology for Data Networks									
Ethernet Terminal		•	•				8187	190	8187A
Optical Fibre Splice Cassette		•	•				8186	188	8186A
General									
Communication Protocols Modbus RTU and Profibus DP								164	
Overview of the Portfolio for Ethernet Networks								163	
HFisolator									
HFisolator inclusive Ex d Bushing		•	•		•	•	9730	165	9730A
HFisolator separately			•			•	9730	167	9730B
Isolating Repeater for Profibus / Modbus RTU									
Fibre Optics Fieldbus Isolating Repeater for Use in Zone 2			•			•	9186/.5	185	9186B
Fieldbus Isolating Repeater			•			•	9185/12	183	9185B
Fieldbus Isolating Repeater with an Intrinsically Safe Interface			•			•	9185/11	181	9185A
Media Converter									
Media Converter			•			•	9721	175	9721A
Unmanaged Switch			•			•	9721	177	9721B
USB Converter									
USB RS485 Converter for Zone 2			•			•	9787	179	9787A
WLAN Access Point									
WLAN Access Point for Use in Zone 1		•	•		•	•	8265	171	8265C
WLAN Access Point for Use in Zone 2			•			•	7145/5	173	7145D

For additional products and information please refer to r-stahl.com

Overview of the Portfolio for Ethernet Networks



Wireless Technology in Process Automation

Application of wireless technology in the process industry offers new possibilities for plant operators to optimize production processes and to follow entirely new paths. This opens up a wide field of applications with a variety of solutions for the operator. R. STAHL takes this trend into account in various ways.
You have a wireless modem without Ex-approval and you want to use it in a hazardous area? Based on components like the HFisolator, we will take your wireless solution into the hazardous area. The HFisoator converts common wireless signals into explosion-protected, intrinsically safe wireless signals. The signals are galvanically separated and transmitted between input and output. Furthermore, R. STAHL offers a number of standard products. This includes: WLAN Access Point for Zone 1 and Zone 2.

Ethernet in Process Automation

Increased safety 'e' type of protection in accordance with IEC/EN 60079-7 can be used to install your equipment in hazardous areas. A certified 8187 series Ethernet terminal for transmission rates of up to 1 Gbit/sec (1000Base-T) is available for convenient connection in a Zone 1 Ex e enclosure. For Ethernet installations over long distances and/or in environments where there may be significant interference or other influences, fibre optic cables are the best choice. R. STAHL offers a number of solutions for hazardous areas in this regard: By using the 'op is' type of protection in accordance with IEC/EN 60079-28, fibre optic cables can be routed into Zone 0 areas in a similar way to intrinsically safe circuits, which means that cables can be connected and disconnected during operation. The 9721 series media converters and switches are certified for installation in Zone 2 with up to four fibre optic cable connections for Zone 0. You can choose between multi-mode or, for distances of up to 30 km, single-mode connections. Alternatively, the 'op pr' type of protection – which is based on increased safety 'e' – can also be used in Zone 1. The Zone 1-certified 8186/1 series splice cassette is installed in an Ex e enclosure and can be equipped with up to 12 fibre optic cables.

Communication Protocols Modbus RTU and Profibus DP

The Modbus RTU and Prodibus DP communication protocols are proven technologies in the world of process automation. Both technologies are ideal for transmitting data in bandwidths that exceed the capacity of fieldbuses such as Profibus PA or FF H1.

For use in hazardous areas (especially Zone 1): The explosion protection type intrinsic safety 'i' is ideal for transmission over copper conductors and the explosion protection type inherently safe optical radiation 'op' is ideal for transmission over fibre optics.

The advantage of both intrinsic safety and inherently safe optical radiation is that the plug connectors can be connected or disconnected without deactivating the communication nodes. In addition, plug connectors that largely correspond to proven plug connectors in industrial areas. R. STAHL offers a series of isolating repeaters that lets you create network topologies, based on either copper conductors or fibre optics. If necessary, we can even offer solutions for radio transmission areas.

All solutions feature easy installation and operation. The fibre optic isolating repeaters can be used to create redundant point-to-point, line or ring structures to ensure high availability of communication.

- Allows you to use standard industrial antennas and standard coaxial plug connectors in hazardous areas
- Flexible, can be used in a very wide temperature range
- Enables project-specific wireless solutions

WebCode 9730A

The 9730 series HFisolator converts standard radio signals into intrinsically safe radio signals so that standard industrial antennas and coaxial plug connectors can be used in hazardous areas. This allows for the development of project-specific solutions with Ex d encapsulation of radio devices, which differ only slightly from standard industrial solutions in terms of the way they are used.

	ATEX / IECEx					
Zone	0	1	2	20	21	22
Ex interface	•	•	•	•	•	•
Installation in		•	•		•	•

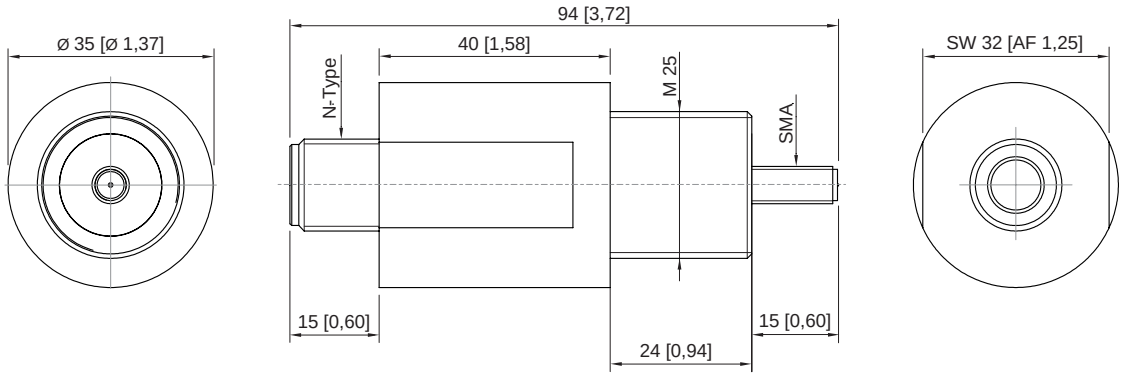
Selection Table				
Frequency	500 MHz ... 6 GHz			
Thread size	Product Type	Art. No.	PS	Weight kg
M25	9730/37-25	258159▲	75	0.400

Technical Data	
Explosion Protection	
IECEx gas explosion protection	Ex db mb [ia Ga] IIA/IIB/IIC T5/T6 Gb
IECEx dust explosion protection	Ex mb tb [ia Da] IIIC T100 °C ... T80 °C Db
IECEx firedamp protection	Ex db mb [ia Ma] I Mb
ATEX gas explosion protection	II 2 (1) G Ex db mb [ia Ga] IIA/IIB/IIC T5/T6 Gb
ATEX dust explosion protection	II 2 (1) D Ex mb tb [ia Da] IIIC T100 °C ... T80 °C Db
ATEX firedamp protection	I M2 (M1) Ex db mb [ia Ma] I Mb
EAC gas explosion protection	1 Ex d mb [ia Ga] IIC T6...T5 Gb X
EAC dust explosion protection	Ex mb tb [ia Da] IIIC T80 °C ... T100 °C Db X
EAC firedamp protection	PB Ex d mb [ia Ma] I Mb X
Certificates	ATEX (EXA), EAC (Oboront), IECEx (EXA)

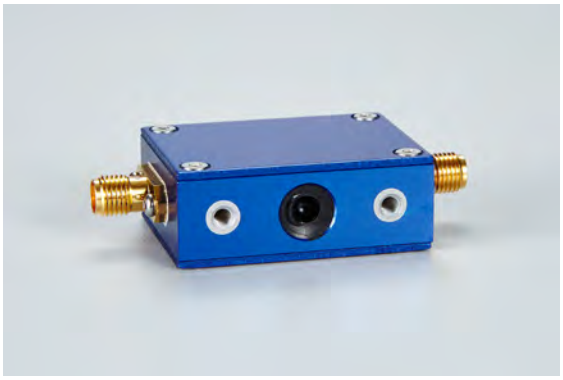
HFisolator
Series 9730 inclusive Ex d Bushing

Technical Data	
Electrical Data	
	typical **Frequency band** Universal **Frequency** 500 MHz 1.3 dB 1.4 GHz 0.6 dB 1.7 GHz 0.6 dB 2.5 GHz 0.6 dB 3.9 GHz 1.2 dB 4.9 GHz 1.2 dB 5.4 GHz 0.8 dB 6 GHz 2 dB
Inside plug connector	RP-SMA plug
Outside plug connector	N-type socket
Ambient Conditions	
Ambient temperature	-40 °C ... +85 °C (T5/T6)
Storage temperature	-40 °C ... +85 °C
Mechanical Data	
Degree of protection (IP)	IP65
Material	Stainless steel

Dimensional Drawings (All Dimensions in mm [inches]) – Subject to Alterations



Type 9730/37-25



- Enables standard industrial antennas and coaxial plug connectors to be used in hazardous areas
- Can be used flexibly across an extremely wide temperature range
- Enables project-specific wireless solutions

WebCode 9730B

The 9730 series HFisolator converts standard radio signals into intrinsically safe radio signals so that standard industrial antennas and coaxial plug connectors can be used in hazardous areas. This allows for the development of project-specific solutions with Ex d encapsulation of radio devices, which differ only slightly from standard industrial solutions in terms of the way they are used.

	ATEX / IECEx					
Zone	0	1	2	20	21	22
Ex interface	•	•	•	•	•	•
Installation in			•			•

Selection Table

Product Description	HFisolator			
Frequency	Product Type	Art. No.	PS	Weight kg
150 MHz ... 8 GHz	9730/26-11	256497 ▲	75	0.100

Technical Data

Explosion Protection	
IECEx gas explosion protection	Ex nA [Ex ia Ga] IIC T6 Gc
IECEx dust explosion protection	Ex ic [Ex ia Da] IIIC T85 °C Dc
IECEx firedamp protection	Ex [Ex ia Ma] I
ATEX gas explosion protection	Ⓔx II 3 (1) G Ex nA [Ex ia Ga] IIC T6 Gc
ATEX dust explosion protection	Ⓔx II 3 (1) D Ex ic [Ex ia Da] IIIC T85 °C Dc
ATEX firedamp protection	Ⓔx I (M1) Ex [Ex ia Ma] I
Certificates	ATEX (EMT), IECEx (EMT)
Electrical Data	
	(at 20 °C ambient conditions) **Frequency band** 150 MHz ... 1 GHz 0.3 dB 1 GHz ... 3.5 GHz 0.46 dB 3.5 GHz ... 6 GHz 1.09 dB 6 GHz ... 8 GHz 1.41 dB **Frequency** 400 MHz 0.12 dB 900 MHz 0.16 dB 2.45 GHz 0.48 dB 5.5 GHz 1.28 dB

▲ Preferred products – in stock or available at short notice

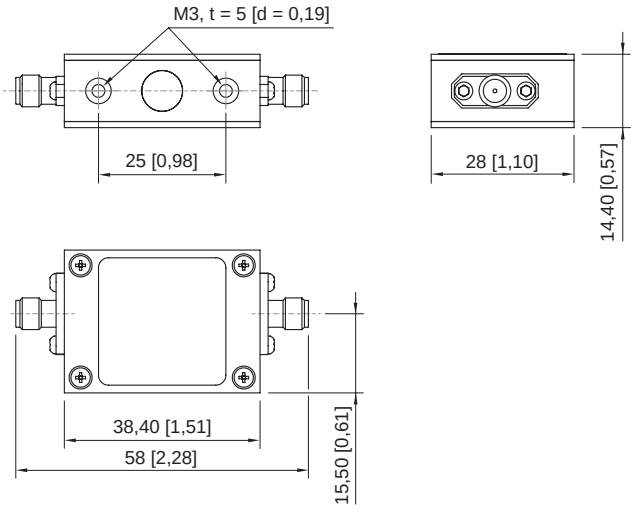
HFisolator
Series 9730 separately

Technical Data	
Ambient Conditions	
Ambient temperature	-40 °C ... +80 °C
Storage temperature	-40 °C ... +80 °C
Relative humidity max.	< 95%
Mechanical Data	
Degree of protection (IP)	IP40
Material	Anodized aluminium
Mounting / Installation	
Connection type	SMA female

Accessories

Figure	Description	Art. No.	PS	Weight kg
Coax bushing				
	Thread: M20 Connector Inside: SMA female Outside: N-type socket	249456▲	75	0.400

Dimensional Drawings (All Dimensions in mm [inches]) – Subject to Alterations



- Connection of standard antennas in Zones 1, 2, 21 and 22 (in conjunction with 9730/26-11)
- Quick and easy installation
- Suitable for extreme industrial environments – IP66 degree of protection, temperature range -60 to +150 °C

WebCode 9731A

The 9731 series coaxial bushing perfectly complements our HF isolator (9730/26-11), as it enables standard antennas to be connected in Zone 1, 2, 21 and 22 hazardous areas with its standard type N plug connector. It can be installed quickly and easily, is compact and robust, and can also be used for offshore applications.

	ATEX / IECEx					
Zone	0	1	2	20	21	22
Installation in		•	•		•	•

	NEC 500					
	Class I		Class II		Class III	
Division	1	2	1	2	1	2
Installation in	•		•			

Selection Table

Product Description		Coax bushing					
Frequency	Inside plug connector	Outside plug connector	Thread size	Product Type	Art. No.	PS	Weight kg
150 MHz ... 8 GHz	SMA female	N-type socket	M20	9731/110-1	249456▲	75	0.400

Technical Data

Explosion Protection	
IECEx gas explosion protection	Ex d IIC Gb
IECEx dust explosion protection	Ex tb IIIC Db
IECEx firedamp protection	Ex d I Mb
ATEX gas explosion protection	Ⓔx II 2 G Ex d IIC Gb
ATEX dust explosion protection	Ⓔx II 2 D Ex tb IIIC Db
ATEX firedamp protection	Ⓔx I M2 Ex d I Mb
Certificates	ATEX (TRC), Canada / USA (MET), IECEx (TRC)
Electrical Data	
	Frequency band Universal **Frequency** 150 MHz 0.1 dB 450 MHz 0.22 dB 900 MHz 0.25 dB 2.4 GHz 0.5 dB 5 GHz 0.8 dB
Ambient Conditions	
Ambient temperature	-60 °C ... +150 °C
Storage temperature	-60 °C ... +150 °C
Relative humidity max.	0 to 95%, non-condensing
Mechanical Data	
Degree of protection (IP)	IP65

Coax Bushing
Series 9731

Technical Data

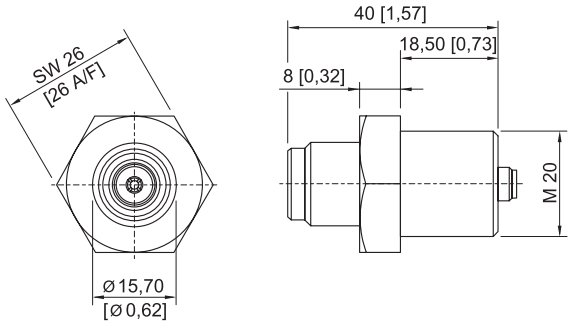
Mechanical Data	
Material	Stainless steel

Accessories

Figure	Description	Art. No.	PS	Weight kg
HFisolator				
	Converts a standard wireless signal into an intrinsically safe signal . Frequency range; 150 MHz ... 8 GHz	256497 ▲	75	0.100

A6

Dimensional Drawings (All Dimensions in mm [inches]) – Subject to Alterations



- Provides Wi-Fi functionality for Zones 1 or 2
- Project-specific built-in components for Wi-Fi or other wireless technologies of your choice
- Robust field enclosure suitable for industrial applications

WebCode 8265C

The 8265 series WLAN access point enables wireless data transmission via WLAN in Zone 1, for instance in order to retrieve data or control processes via smartphone, tablet or notebook. The WLAN access point is easy to install and can also be used over a large temperature range and in virtually all conditions thanks to its robust enclosure.

	ATEX / IECEx					
Zone	0	1	2	20	21	22
Installation in		•	•		•	•

Selection Table

Version / Product Description					
	8265/5 Ex d enclosure WLAN access point According to specification				
Grid-bound interface	Antenna cable interface	Product Type	Art. No.	PS	Weight kg
Ethernet 100BASE-T, 1000BASE-T	N-type socket, intrinsically safe Ex ia	8265/5.-....	137325▲	27	–

The radio interface uses the licence-free, 2.4 GHz and 5 GHz frequency bands.
Please note that local regulations may limit the use of the device.

Technical Data

Explosion Protection	
IECEx gas explosion protection	Ex d e [ia Ga] IIC T6 Gb
IECEx dust explosion protection	Ex tb [ia Da] IIIC T130 °C Db
ATEX gas explosion protection	Ⓔx II 2 (1) G Ex d e [ia Ga] IIC T6 Gb
ATEX dust explosion protection	Ⓔx II 2 (1) D Ex tb [ia Da] IIIC T130 °C Db
Certificates	ATEX (PTB), EAC (CCVE)
Electrical Data	
Antenna diversity	MIMO
Radio standards	802.11
Configuration	Like single device
Ambient Conditions	
Ambient temperature	-20 °C ... +60 °C Depending on the built-in device
Mechanical Data	
Degree of protection (IP)	IP66
Min. dimensions	236 x 236 x 227 mm
Max. dimensions	335 x 505 x 281 mm

▲ Preferred products – in stock or available at short notice
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WLAN Access Point
Series 8265 for Use in Zone 1

Technical Data	
Mechanical Data	
Dimensions note	Depending on the built-in device
Components	
Available for Aruba	AP92, AP-324
Available for Cisco	Cisco 2702e, Cisco 2802e
Available for ProSoft	RLX2-IHNF
Available for Siemens	SCALANCE W1788,W780,W770,W760

Accessories

Figure	Description	Art. No.	PS	Weight kg
Antennas				
	Omnidirectional, 2.4 / 5 GHz ISM band 6/8 dBi antenna gain	207407	75	0.370
Mounting kit				
	Mounting kit for antenna	207408	Z2	0.160

Antennas for use in the offshore applications are available on request.

- Provides WLAN functionality with up to 300 Mbit/s for Zones 2 and 22
- Robust and suitable for industrial applications: IP66 degree of protection, temperature range -40 to +60 °C
- Project-specific adaptations possible

WebCode 7145D

R. STAHL's 7145/5 series WLAN access point enables WLAN communication with mobile devices such as smartphones, tablets or notebooks in Zones 2 and 22. The WLAN access point is located in a compact stainless steel enclosure with IP66 degree of protection and can be used across a wide range of temperatures and in industrial conditions thanks to its robust design.

	ATEX / IECEx					
Zone	0	1	2	20	21	22
Installation in			•			•

Selection Table					
Product Description	WLAN access point According to the order				
Version	Field enclosure	Product Type	Art. No.	PS	Weight kg
Installed in enclosure	Made of stainless steel	7145/5-...	207124 ▲	75	2.400

The radio interface uses the licence-free, 2.4 GHz and 5 GHz frequency bands.
Please note that local regulations may limit the use of the device.

Technical Data	
Explosion Protection	
IECEx gas explosion protection	Ex nA IIC T5 Gc
IECEx dust explosion protection	Ex tb IIIC T130 °C Dc
ATEX gas explosion protection	II 3 G Ex nA IIC T5 Gc
ATEX dust explosion protection	II 3 D Ex tb IIIC T130 °C Dc
EAC gas explosion protection	2 Ex nA e * IIA ... IIC T6 ... T3 Gc X
Certificates	ATEX (PTB), ATEX (TUR), Brazil (ULB), EAC (LPE), IECEx (PTB), IECEx (TUR), India (PESO), Taiwan (ITRI)
Electrical Data	
Rated operational voltage DC max.	24 V
Antenna diversity	Yes
Radio standards	802.11a 802.11b 802.11g 802.11i 802.11n (optional)

▲ Preferred products – in stock or available at short notice
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WLAN Access Point

Series 7145/5 for Use in Zone 2

Technical Data

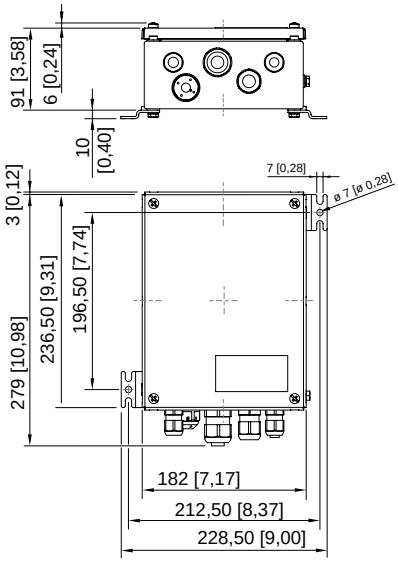
Electrical Data	
Security/encryption	Adminstrator password Legacy WPA TKIP MAC ID filter WEP support WPA TKIP WPA2-802.11i with 128-bit AES-CCM
Configuration	Using the integrated web server
Ambient Conditions	
Ambient temperature	-40 °C ... +60 °C
Mechanical Data	
Degree of protection (IP)	IP66

Accessories

Figure	Description	Art. No.	PS	Weight kg
Antennas				
	Omnidirectional, 2.4 / 5 GHz ISM band 6/8 dBi antenna gain	207407	75	0.370
Coaxial cable				
	Antenna - RP-SMA device / N-plug 1.5 m	207411	Z2	0.110
	Antenna - RP-SMA device / N-plug 3 m	207410	Z2	0.110
	Antenna - RP-SMA device / N-plug 6 m	207409	Z2	0.110
Mounting kit				
	Mounting kit for antenna	207408	Z2	0.160

Antennas for use in the offshore applications are available on request.

Dimensional Drawings (All Dimensions in mm [inches]) – Subject to Alterations



- For 100 Mbit/s Ethernet with inherently safe "op is" fibre optic in Zone 0, 1 or 2
- Range up to 5 km (multi-mode) or up to 30 km (single-mode)
- Increased temperature range of -30 to +75 °C
- Easy commissioning, no configuration required
- Installation in Zone 2 or in the safe area

WebCode 9721A

The Media Converter is used to convert electrical Ethernet signals (TX) into optical Ethernet signals (FX).
The optical Ethernet signals are used for operation in hazardous areas of Zone 0, 1 and 2 with the type of protection Ex “op is”.
Therefore, conventional fibre optic cables can also be used in hazardous areas and may be connected and disconnected during operation (hot-swap).
The Media Converter (multi mode) is particularly suitable for operation of Remote I/O systems IS1+ in Zone 1.

	ATEX / IECEx					
Zone	0	1	2	20	21	22
Ex interface	•	•	•	•	•	•
Installation in			•			•

	NEC 505 Class I			NEC 506		
Zone	0	1	2	20	21	22
Ex interface	•	•	•	•	•	•
Installation in			•			

	NEC 500					
	Class I		Class II		Class III	
Division	1	2	1	2	1	2
Ex interface	•	•	•	•	•	•
Installation in		•				

Selection Table

Product variant		Media converter FX op is / TX SC for Zone 2					
FO fibre type	FO transmission distance	Interface 1	Interface 2	Product Type	Art. No.	PS	Weight kg
Multi mode	5 km 4 km	1 Port, 100 Base-FX MM SC	1 Port, 100 Base-TX Cu, RJ45	9721/13-11-14	220381▲	75	0.240

Single mode version is not suitable for direct connection to Remote I/O IS1+.

Technical Data

Explosion Protection	
IECEx gas explosion protection	Ex nA [op is T6 Ga] IIC T4 Gc
IECEx dust explosion protection	[Ex op is Da] IIIC
ATEX gas explosion protection	Ⓔx II 3 (1) G Ex nA [op is T6 Ga] IIC T4 Gc
ATEX dust explosion protection	Ⓔx II (1) D [Ex op is Da] IIIC
EAC gas explosion protection	2 Ex nA [op is T6 Ga] Iic T4 Gc X
EAC dust explosion protection	[Ex op is Da] IIIC X
Certificates	ATEX (TUR), Canada (FM), EAC (STV), IECEx (TUR), India (PESO), USA (FM)
Ship approval	ABS, CCS, ClassNK, DNVGL, RINA
Electrical Data	
Connection Ethernet Interface	RJ 45 plug connector
FO wavelength	1310 nm
FO attenuation	1 dB / km

▲ Preferred products – in stock or available at short notice
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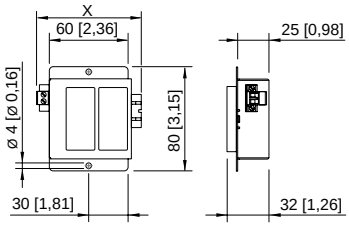
Technical Data

Electrical Data	
FO bandwidth	800 MHz * km 500 MHz * km
FO connection type	SC plug connector
Transfer rate	10/100 Mbit/s Auto-negotiation
FO fibre cross-section	50/125 µm [OS3, OS4] (62.5/125 µm [OM1])
FO optical budget	12 dB
Operating mode	Half duplex, Full duplex Auto-MDI(X)
Auxiliary Power	
Power consumption max.	2.5 W
Nominal voltage	24 V DC
Polarity reversal protection	Yes
Current consumption max.	200 mA
Ambient Conditions	
Ambient temperature	-30 °C ... +75 °C
Mechanical Data	
Degree of protection (IP)	IP20
Enclosure material	Stainless steel, powder-coated

Accessories

Figure	Description	Art. No.	PS	Weight kg
FO patch cable				
	Patch cable for connection of IS1+ Ethernet CPU 9441 and 9442 with media converter 9721; plug LC / SC; lenght 3 m	220911▲	Z2	–

Dimensional Drawings (All Dimensions in mm [inches]) – Subject to Alterations



	Dimension X
with fibre optic sockets and an auxiliary power connection	81 mm [3.19]
as described above with an installed fibre optic plug	116 mm [4.57]

- For operation of up to four inherently safe fibre optic cables „op is“ according to IEC 60079-28
- For 100 Mbit/s Industrial Ethernet
- Transmission range up to 5 km (multi mode) or up to 30 km (single mode)
- Extended temperature range -30 ...+70 °C
- Redundant supply
- Installation in Zone 2 or in the safe area

WebCode 9721B

The 9721 unmanaged switch is designed for linking electrical Ethernet networks (TX) and fibre optic (FX) based networks. The fibre optics are used for operation in hazardous areas of Zone 0, 1, 2, 20, 21 and 22 with the type of protection "Ex op is" (IEC/EN 60079-28). Therefore, conventional fibre optic cables can also be used in hazardous areas and may be connected and disconnected during operation (hot-swap). The unmanaged switch has 2 TX ports and 4 FX op is ports. Redundant supply can be provided. Compatible with: Remote I/O IS1+, HMI Series ET/MT-xx6-A-FX and ET/MT-4x8, as well as for IP network cameras.

	ATEX / IECEx					
Zone	0	1	2	20	21	22
Ex interface						
Installation in			•			•

	NEC 505 Class I			NEC 506		
Zone	0	1	2	20	21	22
Ex interface	•	•	•	•	•	•
Installation in			•			

	NEC 500					
	Class I		Class II		Class III	
Division	1	2	1	2	1	2
Ex interface	•	•	•	•	•	•
Installation in		•				

Selection Table

Product variant		Unmanaged Switch FX op is / TX SC					
FO fibre type	FO transmission distance	Interface 1	Interface 2	Product Type	Art. No.	PS	Weight kg
Multi mode	5 km 4 km	4 Port, 100 Base-FX MM SC	2 Port, 100 Base-TX Cu, RJ45	9721/13-42-14	243427▲	75	0.500

Single mode version is not suitable for direct connection to Remote I/O IS1+.

Technical Data

Explosion Protection	
IECEx gas explosion protection	Ex nA [op is T6 Ga] IIC T4 Gc
IECEx dust explosion protection	[Ex op is Da] IIIC
ATEX gas explosion protection	II 3 (1) G Ex nA [op is T6 Ga] IIC T4 Gc
ATEX dust explosion protection	II (1) D [Ex op is Da] IIIC
EAC gas explosion protection	2 Ex e [op is T6 Ga] IIC T4 Gc X
EAC dust explosion protection	[Ex op is Da] IIIC X
Certificates	ATEX (TUR), Canada (FM), EAC (Sertium), IECEx (TUR), India (PESO), USA (FM)
Electrical Data	
Connection Ethernet Interface	RJ 45 plug connector
FO wavelength	1310 nm
FO attenuation	1 dB / km

▲ Preferred products – in stock or available at short notice
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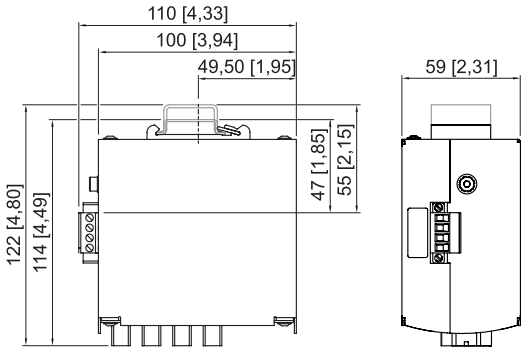
Technical Data

Electrical Data	
FO bandwidth	800 MHz * km 500 MHz * km
FO connection type	SC plug connector
FO fibre cross-section	(62.5/125 µm [OM1]) 50/125 µm [OS3, OS4]
Transfer rate	10/100 Mbit/s Auto-negotiation
FO optical budget	12 dB
Operating mode	Half duplex, Full duplex Auto-MDI(X)
Auxiliary Power	
Max. power consumption	6.4 W
Nominal voltage	24 V DC
Polarity reversal protection	Yes
Current consumption max.	500 mA
Ambient Conditions	
Ambient temperature	-30 °C ... +70 °C
Mechanical Data	
Degree of protection (IP)	IP20
Enclosure material	Stainless steel, powder-coated
Mounting / Installation	
Mounting type	On 35 mm DIN rail

Accessories

Figure	Description	Art. No.	PS	Weight kg
FO patch cable				
	Patch cable for connection of IS1+ Ethernet CPU 9441 and 9442 with media converter 9721; plug LC / SC; lenght 3 m	220911▲	Z2	–

Dimensional Drawings (All Dimensions in mm [inches]) – Subject to Alterations



- Reliable, bidirectional conversion from USB to RS485
- LED status displays
- Not very susceptible to interference
- Extended temperature range -40 to +75 °C
- Power supply via USB port

WebCode 9787A

The USB RS485 converter for Zone 2 is designed to convert USB data into serial data for the RS485 bus. The USB RS485 converter is intended for installation in Zone 2 and can be used for various applications. RS485 is a widespread fieldbus often used for service purposes. Since computers and other devices very rarely have an RS485 interface but frequently have USB ports, the missing interface can be produced with this device.

	ATEX / IECEx					
Zone	0	1	2	20	21	22
Ex interface			•			
Installation in			•			•

Selection Table

Product Description	Networking technology USB RS485 converter For Zone 2				
Number of USB ports	Number of RS485 ports	Product Type	Art. No.	PS	Weight kg
1	1	9787/15-11-11	266011	75	0.170

Technical Data

Explosion Protection	
IECEx gas explosion protection	Ex ec IIC T4 Gc
ATEX gas explosion protection	Ⓔx II 3 G Ex ec IIC T4 Gc
Certificates	ATEX (TUR)
Electrical Data	
USB connection	Type B socket X2, 5-pole
RS485 connection	D-SUB DE-9 socket X1, 9-pole
Data rate RS	max. 1.5 Mbit/s
Auxiliary Power	
Power supply connection	Via USB port
Auxiliary power nominal voltage	5 V DC (4.5 ... 5.5 V)
Max. power consumption	250 mW
Current consumption	50 mA
Max. power dissipation outputs	150 mW
Mechanical Data	
Degree of protection IP (IEC 60529)	IP30
Width	17.6 mm

USB RS485 Converter

Series 9787 for Zone 2

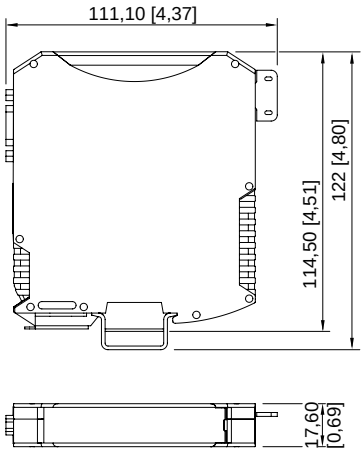
Technical Data

Mechanical Data	
Depth	114.5 mm
Length	111.1 mm

Accessories

Figure	Description	Art. No.	PS	Weight kg
USB cable Type A to Type B				
	Cable type: USB 2 5-pole with shielding Colour (sheath): black Connector plug USB A to USB B; Length: 3000 mm	266833	Z2	0.090
Cable for PROFIBUS DP, RS485				
	Cable type: BUS 4000-C-PVC 2x0,64mm 02YS(St) CY Colour (sheath): violet Application area: Indoor Standard type for indoor installation	105438	Z2	0.300
Cable for PROFIBUS DP, RS 485, RS485-IS				
	Cable type: BUS 4000-C-PE 2x0,64mm 02YS(St) CY2Y Colour (sheath): black Application area: Outdoor Installation outdoors and directly in the ground, UV-resistant	105444	Z2	0.300
Cable for PROFIBUS DP, RS485				
	Cable type: 02YS(St) CHSH Colour (sheath): violet Application area: Offshore Halogen-free, steel wire braid armoured cable	209430	Z2	–
Sub-D plug + PG interface				
	9-pin for connection of the fieldbus or ServiceBus to the CPU & power module Series 9440/15 and fieldbus-isolating repeater 9185. Integrated terminator can be switched on or off. For non-intrinsically safe RS-485.	105715▲	Z2	0.001

Dimensional Drawings (All Dimensions in mm [inches]) – Subject to Alterations



- Simple, front-end parameterization
- Bit refresh function improves signal quality
- Adjustable transmission speeds of 1.2 kbit/s and 1.5 Mbit/s - automatic with PROFIBUS DP
- Field interface Ex i

WebCode 9185A

9185/11 series fieldbus isolating repeaters are the interface between intrinsically safe and non-intrinsically safe PROFIBUS DP segments, Modbus RTU segments and other similar fieldbus segments. These devices galvanically separate intrinsically safe bus interfaces (RS-422/RS-485) from non-intrinsically safe interfaces (RS-232, RS-422 or RS-485).

	ATEX / IECEx					
Zone	0	1	2	20	21	22
Ex interface		•	•		•	•
Installation in			•			•

	NEC 505 Class I			NEC 506		
Zone	0	1	2	20	21	22
Ex interface		•	•			
Installation in			•			•

	NEC 500 Class I		Class II		Class III	
Division	1	2	1	2	1	2
Ex interface	•	•	•	•	•	•
Installation in		•		•		•

Selection Table

Product Description	Fieldbus isolating repeater ISpac				
Field side of interfaces	Safe interface area	Product Type	Art. No.	PS	Weight kg
RS-485 IS (PNO)	RS 232, RS 422, RS 485	9185/11-35-10s	227598▲	21	0.350

Technical Data

Explosion Protection	
IECEx gas explosion protection	Ex nA [ib Gb] IIC T4 Gc
IECEx dust explosion protection	[Ex ib Db] IIIC
ATEX gas explosion protection	II 3 (2) G Ex nA [ib Gb] IIC T4 Gc
ATEX dust explosion protection	II (2) D [Ex ib Db] IIIC
EAC gas explosion protection	2 Ex nA [ib Gb] IIC T4 Gc X
EAC dust explosion protection	[Ex ib Db] IIIC
Certificates	ATEX (BVS), Canada (FM), EAC (STV), IECEx (BVS), India (PESO), USA (FM)
Ship approval	CCS, DNVGL
Electrical Data	
Connections	Sub-D socket X3, 9-pole (Interface field area)
Interface settings	Fixed transmission speed or automatic detection > 9.6 kbit/s (only with Profibus DP)
Electrical interface data rate	1.2 kbit/s - 1.5 Mbit/s
Auxiliary Power	
Auxiliary power	24 V AC / DC

Fieldbus Isolating Repeater

Series 9185/11 with an Intrinsically Safe Interface

Accessories

Figure	Description	Art. No.	PS	Weight kg
Cable for PROFIBUS DP, RS 485, RS485-IS				
	Cable type: BUS 4000-C-PE 2x0,64mm 02YS(St) CY2Y Colour (sheath): black Application area: Outdoor Installation outdoors and directly in the ground, UV-resistant	105444	Z2	0.300
Cable for PROFIBUS DP, RS485-IS				
	Cable type: 02YS(St) CHSH Colour (sheath): blue Application area: Offshore Halogen-free, steel wire braid armoured cable	105400	Z2	0.001
	Cable type: BUS 4000-C-PVC 2x0,64mm 02YS(St) CY Colour (sheath): blue Application area: Indoor Standard type for indoor installation	105437	Z2	0.001
SUB-D socket				
	9-pin for connection of the fieldbus or ServiceBus to the CPU & power module Series 9440/22 and fieldbus-isolating repeater 9185. Integrated terminator can be switched on or off. For RS 485 IS to PNOstandard.	162693 ▲	Z2	0.100
Sub-D plug + PG interface				
	9-pin for connection of the fieldbus or ServiceBus to the CPU & power module Series 9440/15 and fieldbus-isolating repeater 9185. Integrated terminator can be switched on or off. For non-intrinsically safe RS-485.	105715 ▲	Z2	0.001
Sub-D plug, angled				
	9-pin, for connection of fieldbus or ServiceBus to CPU & Power Module Type 9440/12 and fieldbus isolating repeater Type 9185. The termination resistance is built-in. Suitable for RS-485 IS (PNO standard).	201805	Z2	0.050

Dimensional Drawings see page 75

- Simple, front-end parameterization
- Bit refresh function improves signal quality
- Adjustable transmission speeds of 1.2 kbit/s and 1.5 Mbit/s - automatic with PROFIBUS DP
- Field interface non-Ex i

WebCode 9185B

The 9185/12 series fieldbus isolating repeater can be used for the galvanically separated transmission of communication signals. It prevents any compensating currents and protects easily damaged terminal equipment from transient coupling, thereby ensuring undisturbed signal transmission for R. STAHL PROFIBUS DP, Modbus RTU and service bus. The RS-232 interface allows a PC to be connected.

	ATEX / IECEx					
Zone	0	1	2	20	21	22
Ex interface		•	•		•	•
Installation in			•			•

	NEC 505 Class I			NEC 506		
Zone	0	1	2	20	21	22
Ex interface		•	•			
Installation in			•			•

	NEC 500 Class I		Class II		Class III	
Division	1	2	1	2	1	2
Ex interface	•	•	•	•	•	•
Installation in		•		•		•

Selection Table

Product Description	Fieldbus isolating repeater ISpac				
Field side of interfaces	Safe interface area	Product Type	Art. No.	PS	Weight kg
RS 485 / RS 422 (switchable)	RS 232, RS 422, RS 485	9185/12-45-10s	227600 ▲	21	0.350

Technical Data

Explosion Protection	
IECEx gas explosion protection	Ex nA IIC T4 Gc
ATEX gas explosion protection	Ⓔx II 3 G Ex nA IIC T4 Gc
EAC gas explosion protection	2 Ex nA IIC T4 Gc X
Certificates	ATEX (BVS), Canada (FM), EAC (STV), IECEx (BVS), India (PESO), USA (FM)
Ship approval	CCS, DNVGL
Electrical Data	
Interface field area level	EIA RS 485, EIA RS 422
Connections	Sub-D socket X3, 9-pole (Interface field area)
Interface settings	Fixed transmission speed or automatic detection > 9.6 kbit/s (only with Profibus DP)
Line length interface field area	Depends on transmission rate and cable
Data transmission indication	LED green "RxD2"
Electrical interface data rate	1.2 kbit/s - 1.5 Mbit/s
Terminating resistor interface field area	to be set in external plug
Auxiliary Power	
Auxiliary power	24 V AC / DC
Nominal current	66 mA

Fieldbus Isolating Repeater
Series 9185/12

Accessories

Figure	Description	Art. No.	PS	Weight kg
Cable for PROFIBUS DP, RS 485, RS485-IS				
	Cable type: BUS 4000-C-PE 2x0,64mm 02YS(St) CY2Y Colour (sheath): black Application area: Outdoor Installation outdoors and directly in the ground, UV-resistant	105444	Z2	0.300
Cable for PROFIBUS DP, RS485-IS				
	Cable type: 02YS(St) CHSH Colour (sheath): blue Application area: Offshore Halogen-free, steel wire braid armoured cable	105400	Z2	0.001
	Cable type: BUS 4000-C-PVC 2x0,64mm 02YS(St) CY Colour (sheath): blue Application area: Indoor Standard type for indoor installation	105437	Z2	0.001
Sub-D plug + PG interface				
	9-pin for connection of the fieldbus or ServiceBus to the CPU & power module Series 9440/15 and fieldbus-isolating repeater 9185. Integrated terminator can be switched on or off. For non-intrinsically safe RS-485.	105715▲	Z2	0.001

Dimensional Drawings see page 75

- For redundant FO network structures (PROFIBUS DP, Modbus RTU) in Zone 2 hazardous areas
- "Ex op is" interface make for easy installation and maintenance
- Diagnostic function for early error detection and signalling

WebCode **9186B**

The 9186 series FO fieldbus isolating repeater transmits PROFIBUS DP and Modbus RTU signals over distances of up to 2 km as part of redundant fibre optic network structures. Standard plug connectors can be connected to the inherently safe optical interfaces “Ex op is”. The diagnostic functions detect critical signal conditions early and report them to the control room.

	ATEX / IECEx					
Zone	0	1	2	20	21	22
Ex interface			•			•
Installation in			•			•

	NEC 505 Class I			NEC 506		
Zone	0	1	2	20	21	22
Ex interface			•			
Installation in			•			•

	NEC 500 Class I		Class II		Class III	
Division	1	2	1	2	1	2
Ex interface		•		•		•
Installation in		•		•		•

Selection Table

Installation	Zone 2 and in the safe area			
Network structure	Product Type	Art. No.	PS	Weight kg
Line Ring Point-to-point	9186/15-12-11	160624 ▲	25	0.244
Point-to-point End of line	9186/25-12-11	160625	25	0.244

Technical Data

Explosion Protection	
IECEx gas explosion protection	Ex nA nC [op is T6 Ga] IIC T4 Gc
IECEx dust explosion protection	[Ex op is Da] IIIC
ATEX gas explosion protection	Ⓔx II 3 (1) G Ex nA nC [op is T6 Ga] IIC T4 Gc
ATEX dust explosion protection	Ⓔx II (1) D [Ex op is Da] IIIC
EAC gas explosion protection	[Ex] 2 Ex nA nC [op is T6 Ga] IIC T4 Gb X
EAC dust explosion protection	[Ex] [Ex op ia Da] IIIC
Certificates	ATEX (BVS), Brazil (ULB), Canada / USA (UL), EAC (STV), IECEx (BVS), India (PESO)
Ship approval	ABS, CCS, ClassNK, DNVGL
Electrical Data	
Electrical interface data rate	9.6 kbit/s - 1.5 Mbit/s
Protocols	HART Modbus PROFIBUS DP ServiceBus R.STAHL (IS1)

▲ Preferred products – in stock or available at short notice

Fibre Optics Fieldbus Isolating Repeater

Series 9186/.5 for Use in Zone 2

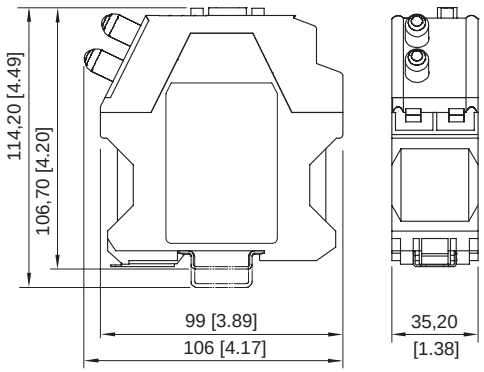
Technical Data

Electrical Data	
Electrical interface version	RS 485
Connection electrical interfaces	Sub-D socket X1, 9-pole
Protocols optical interface	Protocol transparent for RS-485 interface
Connection optical interface	ST®, BFOC/2.5 socket
FO wavelength	850 nm
Transmission distance optical Interface	≤ 2000 m
Fault control	Power supply failure: Fault-contact is open Transmission level is good: LED green and yellow "FO signal", fault-contact is closed Transmission level reduced (-1,5 dBm): LED yellow "FO ERR", fault-contact is open Fibre breakage or transmission level is too low (-3 dBm): LED red "FO ERR", fault-contact is open
Auxiliary Power	
Auxiliary power	24 V DC

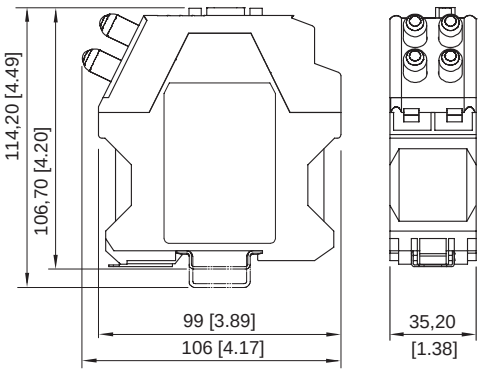
Accessories

Figure	Description	Art. No.	PS	Weight kg
Cable for PROFIBUS DP, RS 485, RS485-IS				
	Cable type: BUS 4000-C-PE 2x0,64mm 02YS(St) CY2Y Colour (sheath): black Application area: Outdoor Installation outdoors and directly in the ground, UV-resistant	105444	Z2	0.300
Cable for PROFIBUS DP, RS485				
	Cable type: 02YS(St) CHSH Colour (sheath): violet Application area: Offshore Halogen-free, steel wire braid armoured cable	209430	Z2	–
	Cable type: BUS 4000-C-PVC 2x0,64mm 02YS(St) CY Colour (sheath): violet Application area: Indoor Standard type for indoor installation	105438	Z2	0.300
Cable for PROFIBUS DP, RS485-IS				
	Cable type: 02YS(St) CHSH Colour (sheath): blue Application area: Offshore Halogen-free, steel wire braid armoured cable	105400	Z2	0.001
	Cable type: BUS 4000-C-PVC 2x0,64mm 02YS(St) CY Colour (sheath): blue Application area: Indoor Standard type for indoor installation	105437	Z2	0.001
Sub-D plug + PG interface				
	9-pin for connection of the fieldbus or ServiceBus to the CPU & power module Series 9440/15 and fieldbus-isolating repeater 9185. Integrated terminator can be switched on or off. For non-intrinsically safe RS-485.	105715▲	Z2	0.001

Dimensional Drawings (All Dimensions in mm [inches]) – Subject to Alterations



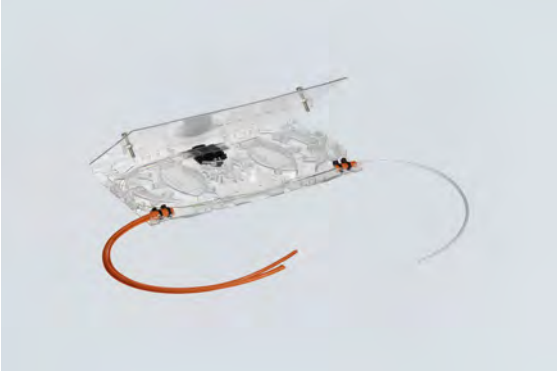
Type 9186/25



Type 9186/15

A6

Optical Fibre Splice Cassette
Series 8186



- For installation in a protective enclosure in accordance with DIN EN 60079-0
- Standard and customised enclosure versions available
- For professional and time-saving FO installation in Zone 1 and 2
- With one or two splice protector holders for installation of 6 or 12 fibre optics
- Integrated crossover field for a bending radius-limited crossover of fibres
- FO can provide power supply to all four sides
- Easy mounting

A6

WebCode **8186A**

The 8186 series FO splice cassette for Zone 1 enables the proper and time effective connection of fibre optic cables in hazardous areas. Overall, the splice cassette provides space for 2 splice protection holders. When using one splice protection holder a max. of 6 fibre optics can be installed or max. 12 fibre optics with two splice protection holders. The splice cassette is used, for example, in connection chamber enclosures as a transfer point between the flameproof control panels and network or as a connection point between the fibre optics. The splice cassette is available for use in areas prone to gas or dust explosions, for installation in a protective enclosure in accordance with DIN EN 60079-0, and which is suitable for the provided operating location. Pre-assembled and customised enclosure solutions for various applications are available.

	ATEX / IECEx					
Zone	0	1	2	20	21	22
Installation in		•	•			

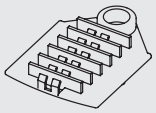
Selection Table				
Product Description	Splice cassette Fibre optic			
Product Type	Description	Art. No.	PS	Weight kg
8186/1	max. 12 fibre optics	203633▲	75	0.105

The splice Cassette is available installed in Ex e enclosure, see accessories. Enclosure versions on request.

Technical Data	
Explosion Protection	
IECEx gas explosion protection	Ex op pr IIC Gb
ATEX gas explosion protection	Ⓔx II 2 G Ex op pr IIC Gb
Certificates	ATEX (PTB), IECEx (PTB)
Electrical Data	
Frequency	10 GHz 1 GHz 100 MHz 10 MHz
Ambient Conditions	
Ambient temperature	-40 °C ... +60 °C

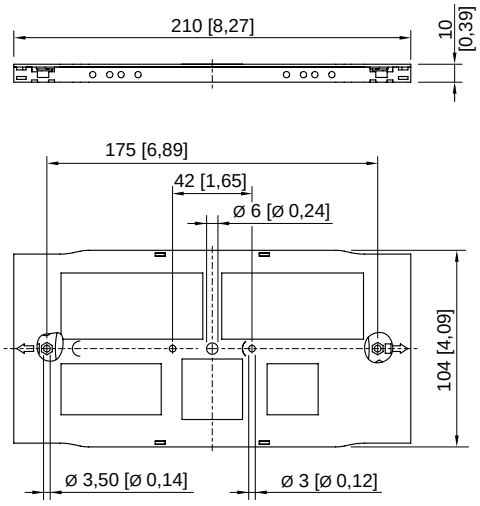
▲ Preferred products – in stock or available at short notice

Accessories

Figure	Description	Art. No.	PS	Weight kg
Control panel With fibre optic Splice cassette				
	Enclosure 8146/5071+ 8186 (1 x Splice cassette) Polyester resin, Glass fibre reinforced	257034	75	1.700
	Enclosure 8150/5-0360-0176-091-3311+ 8186 (1 x Splice cassette) 1.4404 stainless steel, (AISI 316L), brush finished	241704	75	3.800
Accessories set, splice protector holder 6-way				
	for max. 6 FO 8186 Accessories Set FO Splice Box 1x splice protector holder 6-way 6x shrink splice protectors 2x cable ties	203682	Z2	0.006

A6

Dimensional Drawings (All Dimensions in mm [inches]) – Subject to Alterations



Ethernet Terminal
Series 8187

- For use in Zone 1 and Zone 2
- In type of protection Ex e
- Easy connection thanks to spring clamp terminals
- Data rate up to 1000 Mbit/s

A6

WebCode 8187A

This terminal is designed for connection of Ethernet cables in hazardous areas. The connection technology commonly used for data transmission such as RJ45 plug connector can be used directly only in the safe area, while the Ethernet terminal with type of protection Ex e allows for the economical use in Ex enclosures and simple mounting.

	ATEX / IECEx					
Zone	0	1	2	20	21	22
Installation in		•	•			

Selection Table				
Product Description	Networking technology Ethernet terminal For Zone 1			
Product Type		Art. No.	PS	Weight kg
8187/10-0		214286▲	75	0.175

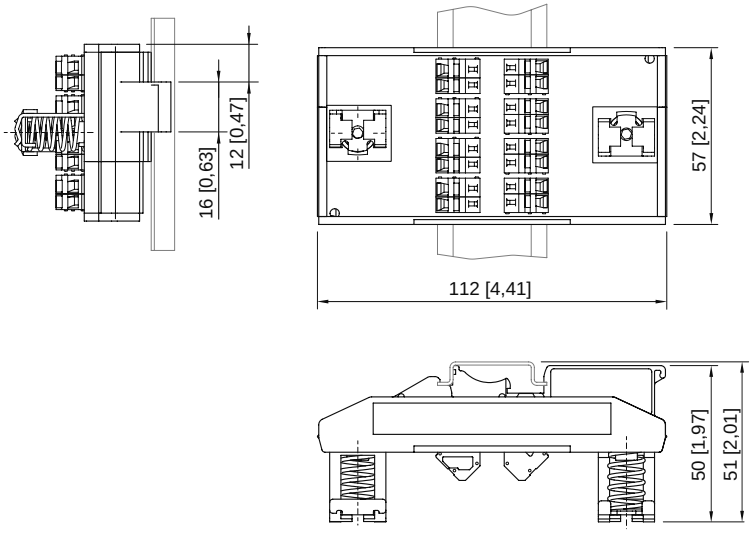
The Ethernet terminal is available installed in Ex e enclosure, see accessories. Enclosure versions on request.

Technical Data	
Explosion Protection	
IECEx gas explosion protection	Ex e IIC Gb
ATEX gas explosion protection	Ⓔx II 2 G Ex e IIC Gb
Certificates	ATEX (IBE), IECEx (IBE)
Electrical Data	
Transfer rate	10/100/1000 BaseT
Rated operational voltage DC	60 V
Rated operational current	0.5 A
Ambient Conditions	
Ambient temperature	-40°C ... +60°C
Mechanical Data	
Degree of protection IP (IEC 60529)	IP20
Mounting / Installation	
Mounting type	on DIN rail NS 35 (DIN EN 60715)

Accessories

Figure	Description	Art. No.	PS	Weight kg
Ex e enclosure with Ethernet terminal				
	8146/5041+ 8187 (1 x Ethernet terminal) Polyester resin, Glass fibre reinforced	257033	75	–
	8150/5-0176-0116-091-3311+ 8187 (1 x Ethernet terminal) 1.4404 stainless steel, (AISI 316L), brush finished	241703	75	2.500

Dimensional Drawings (All Dimensions in mm [inches]) – Subject to Alterations



A6