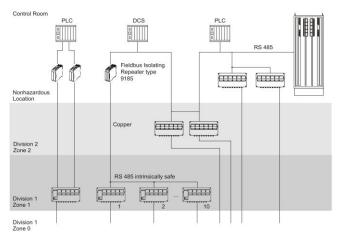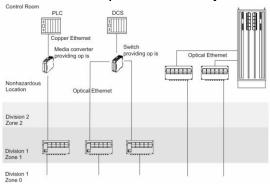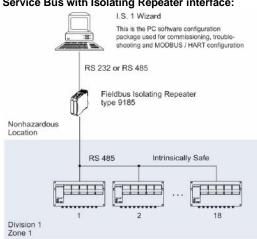F 4830 503

Example for Fieldbus System Topology with Bus Isolators interfacing Automation control systems with DIV 1 / Zone 1 installation of IS1 resp. IS1+ Remote I/O System:
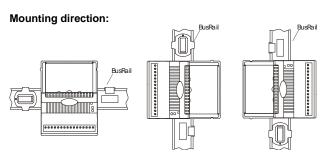

Example for Ethernet System Topology with Isolators interfacing Automation control systems with DIV 1 / Zone 1 installation of IS1 resp. IS1+ Remote I/O System:

Service Bus with Isolating Repeater interface:

I.S. 1 Wizard

This is the PC software configuration package used for commissioning, trouble-shooting and MODBUS / HART configuration

RS 232 or RS 485

Fieldbus Isolating Repeater type 9185

Nonhazardous Location

RS 485   Intrinsically Safe

Division 1 Zone 1

Mounting direction:

The IS1 resp. IS1+ Remote I/O is a DIN rail mounted system designed to record and output process control signals between hazardous location transducers, sensors and a nonhazardous location automation system. It consists of electrical apparatus in Class I, Division 1 or Class I, Zone 1 hazardous locations linked by an intrinsically safe field bus installed per the National Electrical Code, ANSI/NFPA 70 Article 500 or Canadian Electrical Code, CSA C22.

The intrinsically safe field bus circuit is achieved with the use of the Fieldbus Isolating Repeater type 9185 (copper to copper interface) or 9186 (fiber optic to copper interface). The Ethernet interface is achieved with the use of media converters and switches providing optical inherently safe Ethernet.

These devices reside in the nonhazardous location or in Division 2 or Zone 2 and provide a connection to the IS1 resp. IS1+ Remote I/O System. See examples to the left.

The apparatus located in the Division 1 or Zone 1 hazardous location are referred to as Remote I/O and consist of the following major subsystems.

1. <u>CPU & Power Module, Type 9440</u>
   The CPU and Power Module contains a power supply unit for its own power supply, as well as for the supply to the I/O Modules and the field circuits. The power supply to the I/O Modules is implemented via the BusRail. For the configuration with a redundant CPU and Power Module the power supply to the I/O Modules is decoupled with diodes. The power supply unit has an undervoltage monitoring circuit. The CPU fulfils the function of a gateway between the internal bus of an IS1 field station and the fieldbus, which connects the field station with the automation system. The gateway is constructed as a dual processor system. The I/O processor controls the data exchange with the I/O Modules and, when plugged-in, with the redundant CPU & Power Module. The communication processor controls the data exchange on the fieldbus, the redundant fieldbus and on the Service Bus.

   The communication with the I/O Modules is implemented via the address and data lines on the BusRail. The interface of the CPU & Power Module with the internal data bus on the BusRail is designed with redundancy.

2. <u>CPU Module Type 9441 and Power Module Type 9444</u>
   The IS1 System for Ethernet uses a separate Power Module and CPU Module plugged onto an associated Socket instead of the CPU & Power Module Type 9440. Except for the external communication, which is achieved via optical fibre interface, the Power Module and the CPU Module provide similar functions as the CPU & Power Module type 9440.
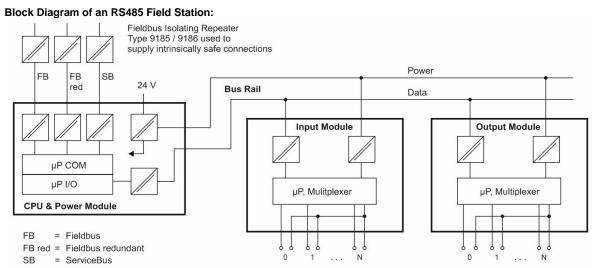
   <u>Components of Remote I/O System</u>
   All I/O Modules are manufactured in a unique DIN rail mount package, which then mount onto the Remote I/O system BusRail.

GENERAL NOTES:
1. Installation should be in accordance with Article 504/505 of the National Electrical Code, ANSI/NFPA 70 and ANSI/ISA RP12.06.01.
2. Installation in Canada should be in accordance with the Canadian Electrical Code, CSA C22.1, Part 1
3. Use a general purpose enclosure meeting the requirements of ANSI/ISA 61010-1 for use in nonhazardous or Class I, Division 1 or Class I, Zone 1 hazardous (classified) locations.
4. Use an FM Approved or NRTL listed Dust-Ignition proof enclosure appropriate for environment protection in Class II and III, Division 1, Groups E, F and G, hazardous (classified) locations.
5. All I/O Modules may be detached from the BusRail or plugged onto it during operation in hazardous areas.
6. Mount the device in a vertical direction, with the reading of the marking from below, left or right, or in a horizontal direction with the terminals nearest the bottom of the enclosure. Never mount the IO modules upside down (terminals towards the top of the enclosure). As shown to the left.
7. Installation in Division 2 or Zone 2 is also allowed according to NEC Article 504/505 or Canadian Electrical Code, CSA C22. Therefore see drawing No. 9400 6 031 004 1.

WARNING: Substitution of components may impair Intrinsic Safety.
AVERTISSEMENT: Substitution de composants peut compromettre la sécurité intrinsèque.

			2016	Date	Name	Certification drawing		Scale
			Drawn by	03.03.	Bagusch	**IS1 resp. IS1+ Remote I/O System**		none
			Checked		Kaiser	**For CL I, DIV 1 / Zone 1**		Sheet
						Overview		1 of 2
					STAHL			Agency
Version	Date	Name				9400 6 031 003 1		FM
						Rep. f.	Rep. t.	A4

F 4830 503

Block Diagram of an RS485 Field Station:

Fieldbus Isolating Repeater
Type 9185 / 9186 used to
supply intrinsically safe connections

FB   FB red   SB   24 V

Bus Rail

Power
Data

Input Module

µP, Mulitplexer

Output Module

µP, Multiplexer

µP COM
µP I/O

CPU & Power Module

0   1   . . .   N

0   1   . . .   N

FB   = Fieldbus
FB red = Fieldbus redundant
SB   = ServiceBus

I.S. Inputs and Outputs
Class I, II, III, DIV 1, Groups A-G; Class I, Zone 0, IIC/IIB

or Non I.S. or Nonincendive circuits,
Class I, II, III, DIV 2, Group A-G; Class I, Zone 2, Group IIC/IIB

Block Diagram of an Ethernet Field Station:

Media converter or switch
providing op is

Fieldbus Isolating Repeater
Type 9185 / 9186 used to
supply intrinsically safe connections

OE   SB   24 V

Bus Rail

Power
Data

Input Module

µP, Mulitplexer

Output Module

µP, Multiplexer

µP COM
µP I/O

CPU & Power Module

0   1   . . .   N

0   1   . . .   N

OE   = Optical Ethernet
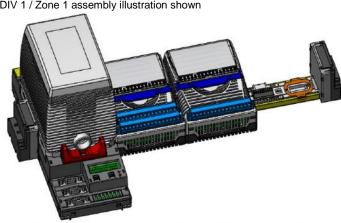SB   = ServiceBus

I.S. Inputs and Outputs
Class I, II, III, DIV 1, Groups A-G; Class I, Zone 0, IIC/IIB

or Non I.S. or Nonincendive circuits,
Class I, II, III, DIV 2, Group A-G; Class I, Zone 2, Group IIC/IIB

Construction example for assembly of an IS1 resp. IS1+ System:
DIV 1 / Zone 1 assembly illustration shown

			2016	Date	Name	*Certification drawing*		Scale
			Drawn by	03.03.	Bagusch	**IS1 resp. IS1+ Remote I/O System**		none
			Checked		Kaiser	**For CL I, DIV 1 / Zone 1**		Sheet
						Overview		2 of 2
				STAHL		9400 6 031 003 1		Agency FM
Version	Date	Name				Rep. f.	Rep. t.	A4