

# Ethernet

<b>System Description . . . . .</b>	<b>450</b>
<b>Products . . . . .</b>	<b>452</b>

## Introduction

Where faster communication speeds are required, for example, for transmission of large amounts of data, Ethernet is the physical media of choice. For hazardous areas, solutions with explosion protection are required. Open standards such as PROFINET and FOUNDATION Fieldbus HSE may well become the base for manufacturers to develop and offer solutions.

Combining proven and well-known technologies, intrinsically safe Ethernet offers an alternative solution for network topologies in the hazardous area.

The benefits of Ethernet in this environment are manifold:

- Easy to apply without special knowledge
- No configuration necessary
- Cost-effective because standard technology keeps the costs low
- Can be installed quickly and flexibly, e.g., for temporary installations or maintenance tasks

To provide our customers with intrinsically safe Ethernet according to proven Pepperl+Fuchs quality standards, we have designed a handy, intrinsically safe solution: the FieldConnex® Ethernet Isolator.

## For Intrinsically Safe Ethernet: Ethernet Isolator

The FieldConnex® Ethernet Isolator is a compact device that combines intrinsically safe energy limitation and galvanic isolation into one product, making Ethernet connections plug-and-play in Zone 0.

Galvanic isolation eliminates the need for equipotential bonding and solid grounding between the safe area and the connection point in the hazardous area. Intrinsically safe energy limitation and galvanic isolation are possible at 100 Mbit/sec. For installation, flexible Ethernet cable can be used, which is simple to install, cost-effective, and plug-and-play.

As an important component of fieldbus infrastructure for an open and integrated architecture, the Ethernet Isolator offers all the benefits for long-lasting and reliable process plants regarding planning, installation, operation, and asset management.

Based on cost-effective standard components, the Ethernet Isolator can be applied "flexibly" in the hazardous area. System designers, installation teams, and maintenance personnel can use the Ethernet Isolator without the need for special knowledge on Ethernet technology.

This way, construction and operation of temporary installations become easy, as does the operation of mobile apparatus. For example, machinery and equipment can be frequently connected and disconnected during normal operation or can be installed on a temporary basis.

With the Ethernet Isolator, costly and inflexible installation is a thing of the past. The energy-efficient design produces low heat dissipation, a definite advantage when cabinet space is tight and costly.

Long lasting performance is ensured through the superior electric circuitry – a fundamental benefit of all Pepperl+Fuchs products and a basic requirement for any process plant today.

Pepperl+Fuchs is an expert in fieldbus infrastructure and explosion protection. Working with OEMs, our knowledge enables the integration of our intrinsically safe Ethernet Isolator technology into virtually any component requiring Ethernet as physical layer.

The Ethernet Isolator can also be applied in non-hazardous locations where a galvanic isolation is required, for example, between two sites.

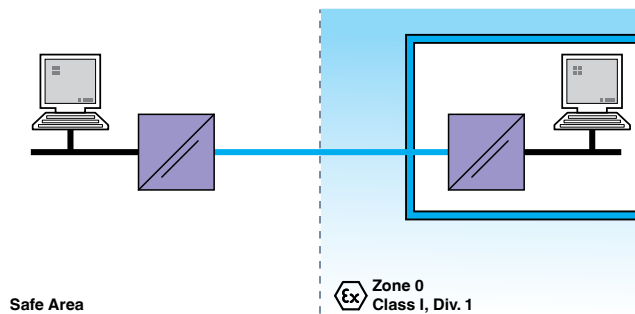


Figure 1 Application options for the intrinsically safe Ethernet Isolator in the fieldbus topology



## Features

- Galvanic Isolation I.S. to non-I.S. Port
- 10/100 MBit/s according to IEEE 802.3/3u
- Installation in Zone 2, Ethernet in Zone 1 or Zone 0
- Standard Ethernet patch or crossover cable
- DIN-Rail mounted and OEM Version

## Function

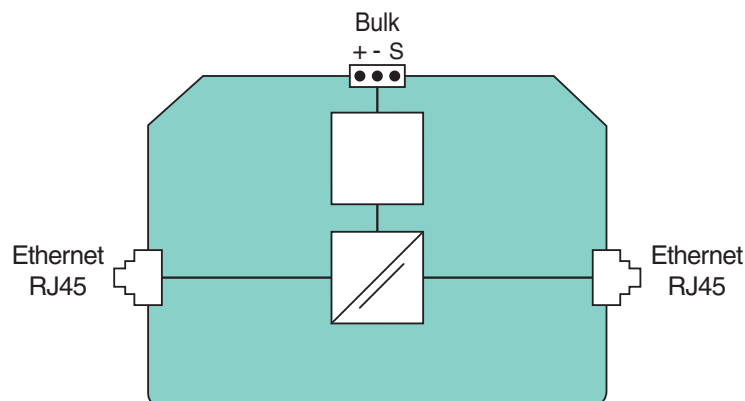
The Ethernet Isolator is an intrinsically safe isolated barrier. It enables cost effective and simple installation in hazardous areas up to Zone 0. It supports high-speed Ethernet and can be mounted in Zone 2.

At each end of the trunk, an Ethernet Isolator is installed. In combination, they provide the intrinsically safe energy limitation. The Ethernet Isolator offers a wire-based alternative to wireless LAN, fiber optic solutions, and Ex e installations. In safe area applications, a single Ethernet Isolator can be used for galvanic isolation. The Ethernet Isolator is compatible with all IEEE standards. It provides high noise immunity and low heat dissipation in a compact housing.

## Assembly



## Connection



Zone 2/Div. 2

**Technical data****Supply**

Rated voltage	19.2 ... 35 V DC
Rated current	150 ... 100 mA
Power loss	3 W

**Ethernet Interface**

Intrinsically safe port	10 BASE-T/100 BASE-TX
Non-intrinsically safe port	10 BASE-T/100 BASE-TX
Connection type	2 x RJ-45, IEC 60603-7
Connector pinout	female connector; TIA/EIA-568-B
Transfer rate	10/100 Mbit/s, Auto-Negotiation
Operating mode	Half/Full Duplex
Cable type	CAT5e S/FTP AWG 24, Installation cable, L/R ratio max. 10 µH/Ω of all strand combinations
I.S. cable length	typ. 100 m/20 °C
Total cable length	typ. 200 m/20 °C
Number of isolators	≤ 2 in series connection

**Directive conformity**

Electromagnetic compatibility	
Directive 2004/108/EC	EN 61326-1:2006

**Standard conformity**

Electrical isolation	EN 50020
Protection degree	IEC 60529
Climatic conditions	DIN IEC 721
Shock resistance	EN 60068-2-27
Vibration resistance	EN 60068-2-6
Ethernet	IEEE 802.3, IEEE 802.3u

**Ambient conditions**

Ambient temperature	-40 ... 60 °C (-40 ... 140 °F)
Storage temperature	-40 ... 85 °C (-40 ... 185 °F)
Relative humidity	≤ 95 % non-condensing
Shock resistance	15 g 11 ms
Vibration resistance	1 g 10 ... 150 Hz
Pollution Degree	max. 2, according to IEC 60664

**Mechanical specifications**

Connection type	Terminals
Core cross-section	up to 2.5 mm <sup>2</sup>
Housing material	Polyamide PA 66
Protection degree	IP20 according to EN 60529
Mass	195 g
Mounting	DIN rail mounting

**Data for application in connection with Ex-areas**

EC-Type Examination Certificate	PTB 07 ATEX 2025 X
Group, category, type of protection, temperature class	⊕ II (1) GD [Ex ia] IIB, ⊕ II 3 (1GD) G Ex nA [ia IIB] II T4, ⊕ I (M1) [Ex ia] I
Supply	
Maximum safe voltage U <sub>m</sub>	253 V AC
Directive conformity	
Directive 94/9/EC	EN 60079-0:2004+Corr.2004, EN 60079-11:2007, EN 60079-15:2005