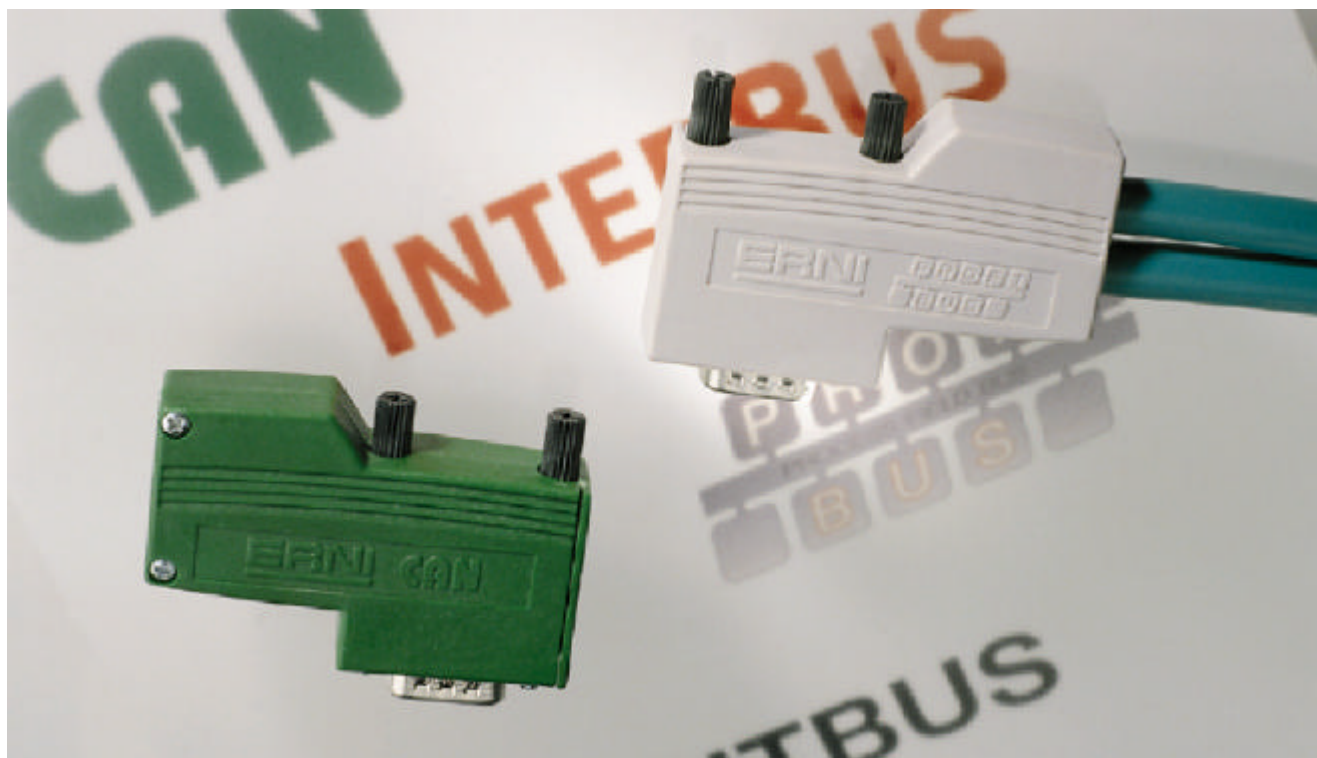


# **ER***bic*

## Bus Interface Connector System

Versions for Bitbus, CAN-Bus, Interbus-S (field bus) and Profibus



### General

The ER*bic* line of universal bus interface connector systems is versatile, compact and easy to service.

It is available for Bitbus, CAN-Bus, Interbus-S (Fieldbus) and Profibus. This versatile bus interface system features an integral metal strain relief in a backshell, that is built around the 9-pin D-Subminiature connector - making this a compact bus interface connector system.

The ER*bic* features colour-coded plastic backshell housing and the molded-in bus configuration name (i. e. CAN, Profibus, etc.). For easy installation the connector's colour-coded backshell housing also distinguishes between the specific bus node and termination versions (for example: black for CAN-Bus node and green for CAN-Bus termination). ER*bic* termination connectors feature integral termination resistors for the appropriate bus termination.

The Bitbus IN/OUT, CAN-Bus and Profibus node connectors enables hot swapping for servicing or changing a defective device. The ER*bic* keeps the bus still running.

The CAN-Bus and the Profibus ER*bic* node connectors are also available with an additional D-Subminiature connector for servicing or programming reasons.

For different built-in conditions a horizontal or a vertical cable entry is available. A reversed version has been designed specially for the fieldbus interface of IPC's and PC Interface Cards. To facilitate wiring termination, the ER*bic* offers PCB mounted terminal blocks (screw-clamp).

### Main features

- Off-the shelf interface connectors for Bitbus, CAN-Bus, Interbus-S (Fieldbus) and Profibus (other bus connectors available upon request)
- Uniform bus connector design for systems integrating different bus systems
- Colour-coding of individual termination and node bus type for easy identification
- ER*bic* offers integrated resistors for appropriate bus termination
- CAN-Bus and Profibus node connectors offer secondary D-Subminiature connector for servicing/programming (for other bus systems upon request)
- Profibus version with integrated SMT inductances for 12 MBit/s data transmission rate
- CAN-Bus version with shield decoupling capacitor to separate cable shield from D-Subminiature connector ground
- High ESD protection due to fully insulated housing
- EMI/RFI shielding upon request
- Horizontal or vertical cable entry
- Reversed versions with D-Sub mating area 180° turned round compared to the standard version
- Reliable solid metal strain relief
- Standard #4/40 UNC knurled, plastic thumbscrews with slotted head ensure secure connector attachment and captive (special pre-assembled locking screw for the ER*bic* with secondary D-Subminiature connector)
- Complete kit in one piece-carton box with assembly instruction

## Field bus systems

The field bus systems are being used more and more frequently in automation. The main reasons for this are the dramatically reduced cable and cable installation costs based on simple twisted wire pairs instead of thick cable harnesses, as well as the ease of troubleshooting and diagnosis. A further benefit is remote network control of the units, enabling easy calibration and parameter setting. Modular structure and the use of standard components complete the convincing arguments for the use of field buses.

But there is a downside: for example, the decision on which system to choose from a large number of bus systems. Today the focus is on four field bus systems which are mainly used:

- Bitbus
- CAN-Bus
- Interbus-S
- Profibus

The main areas of application of field bus systems are:

- **Factory Automation**, e.g. vehicle assembly; assembly and materials handling systems; packaging automation
- **Railway Systems**, e.g. express trains and subways
- **Process Engineering**, e.g. power stations, chemical, paper and textile industries
- **Medical Equipment**, e.g. diagnostic systems and operation technology

## Brief descriptions of Bitbus, CAN-Bus, Interbus, Profibus

### Bitbus

Bitbus was specified in 1984 for information interchange between programmable logic controllers and industrial computers. Bitbus is standardized internationally by IEEE 1118, and so is in widespread use in production engineering.

### CAN-Bus

CAN-Bus was developed in 1983 for interconnection in automobiles. CAN stands for **C**ontroller **A**rea **N**etwork, and is standardized in ISO 11989. The users' organization CiA (CAN in Automation) was established for users in the automation field in 1992.

### Interbus

Interbus was developed in 1987 as an open field bus system. Interbus is standardized in DIN 19258 as the field bus for the sensor/actuator level. There are various bus versions:

- Long-distance bus: up to 12.8 km; RS 485 D-Sub, 9-pin
- Installation bus: up to 50 m: RS 485 (for devices with enclosure rating higher than IP 65/67)

The interests of manufacturers and users are represented in the Interbus-S-Club users' organization. The Drivcom and Encom user groups exist for the definition of profiles for drive systems.

### Profibus

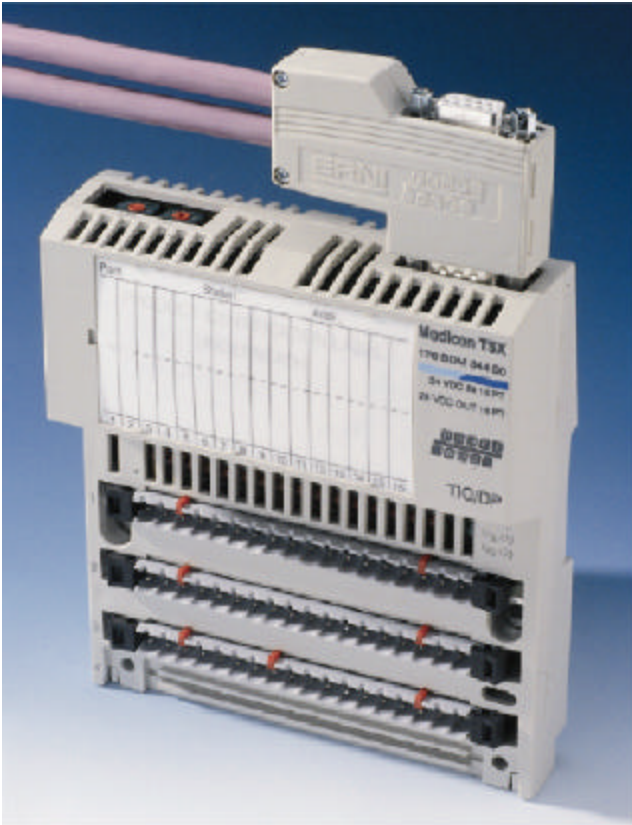
Profibus was launched in 1983 as a field bus joint venture project between 13 companies and 5 research institutes in Germany. Profibus was standardized in 1991 in DIN 19245, and in 1996 became a European standard in EN 50170. The Profibus includes three different bus types depending on application:

- Profibus-DP: Factory Automation, high speed data transfer for decentralized peripherals  
DIN 19245 parts 1 + 3; EN 50170: RS 485
- Profibus-FMS: Automation for general purpose  
DIN 19245 parts 1 + 2; EN 50170: RS 485
- Profibus-PA: Process Automation  
DIN 19245 part 4; IEC 1158-2

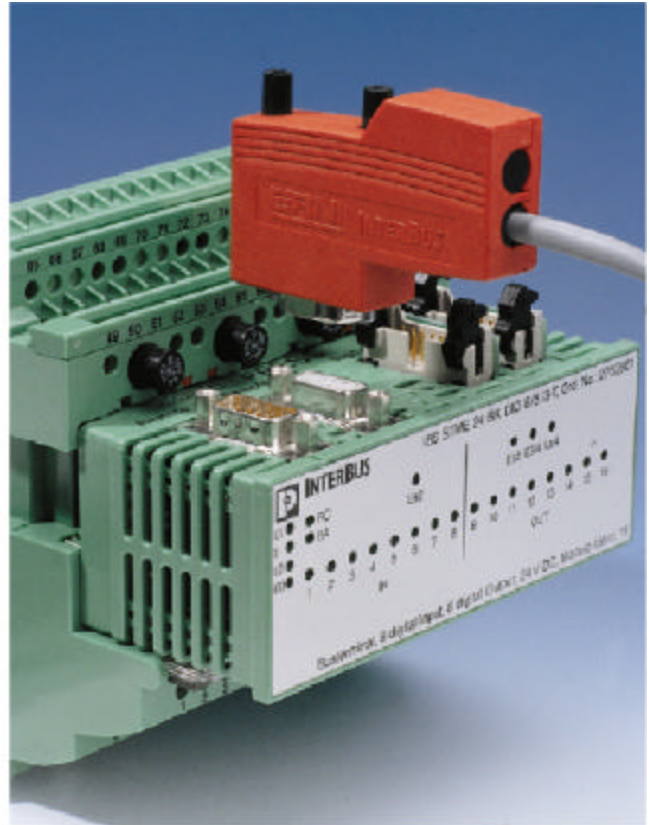
The interests of manufacturers and users are coordinated in national Profibus users' organizations, such as PNO in Germany.

## ERbic applications in field bus devices

Profibus I/O module with ERbic node, horizontal with PU connection



Interbus I/O module with ERbic node, horizontal



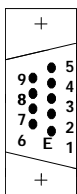
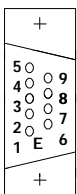
PLC with Profibus interface with ERbic Profibus version, horizontal



## Electrical and mechanical characteristics

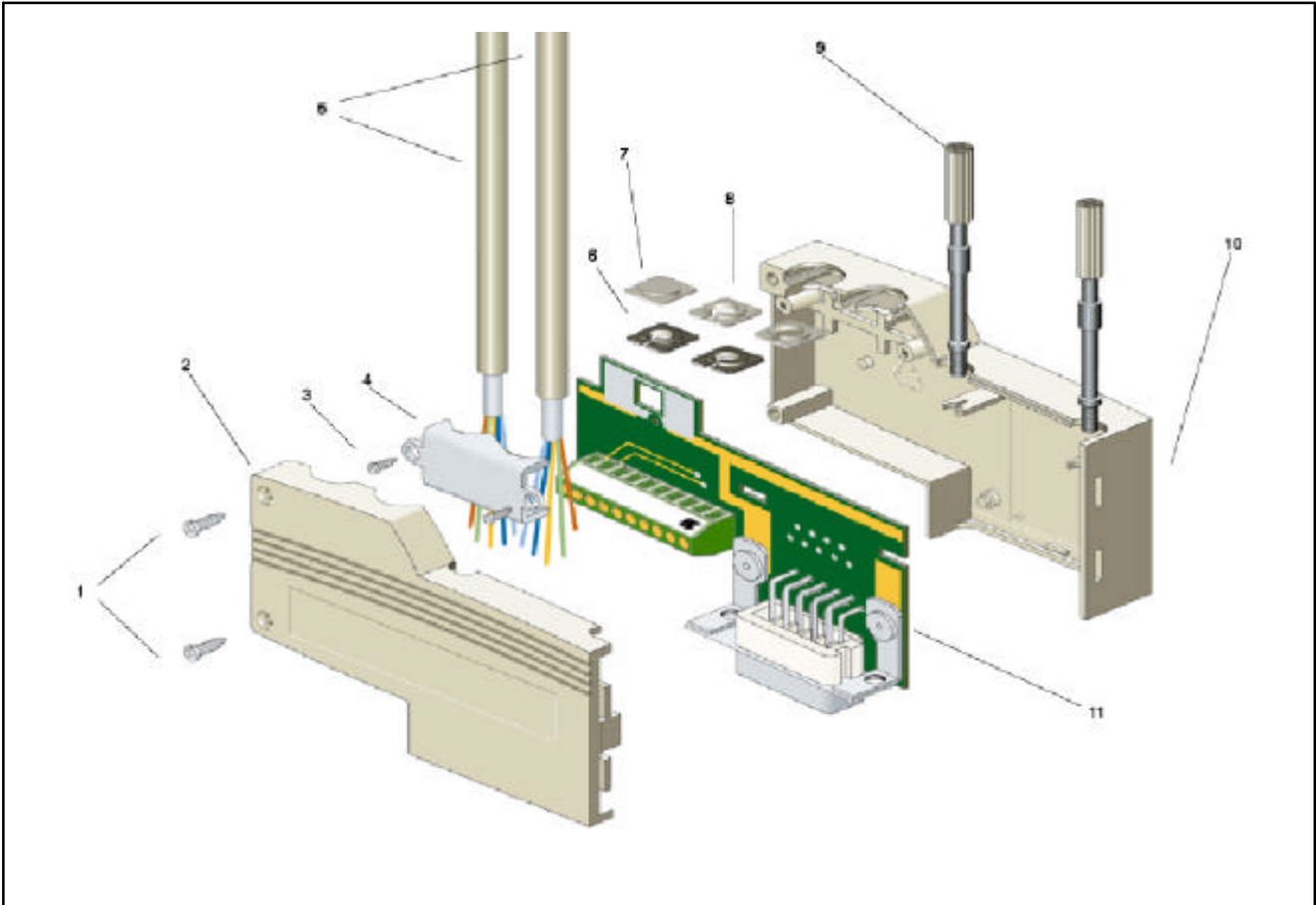
Interface connector	D-Sub, 9-pin (see configuration table below for the different bus systems)
Service or programming interface	D-Sub, 9-pin (optional)
Cable termination	2 x horizontal, 2 x vertical 1 cable outlet may be sealed with blind plate
Cable diameter	4.5 mm (0.177") - 8.0 mm (0.315")
Single wire cross-section	solid: max. 1.5 mm <sup>2</sup> ; flexible: max. 1.0 mm <sup>2</sup> CAN-Bus: max. 0.5 mm <sup>2</sup>
Termination mode	PCB mounted screw-clamp terminal block
Data transmission rate	according to the bus specification; Profibus up to 12 MBit/s
Temperature range	-20°C - +70°C
Permissible air humidity	max. 75% at +25°C
Degree of protection	IP 40
Dimensions in mm	64.6 mm x 47.5 mm x 16.0 mm (2.54" x 1.87" x 0.63")
Housing material	Thermoplast UL94V-1
D-Subminiature screw	#4/40 UNC, knurled and slotted (M 3 upon request)

## Pin configuration for the different bus systems

Bus types	Pin -Nr	Bitbus		CAN-Bus	Interbus		Profibus		
		Male/Female	IN/OUT Male	Female	Male	Female	Male		
		connected to	Signal	Signal	Signal	connected to	Signal	Signal	
<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Male</p>  </div> <div style="text-align: center;"> <p>Female</p>  </div> </div>	1	6	12V	-	-		DO	DO	-
	2	7	GND	-	CAN-L		$\overline{DI}$	$\overline{DI}$	-
	3		$\overline{DATA}$	$\overline{DATA}$	CAN-GND		COM	COM	RxD/TxD-P
	4		CLK/RTS	-	-		-	-	-
	5		-	GND	-	9			GND
	6		-	-	V+ GND		$\overline{DO}$	$\overline{DO}$	+ 5V
	7		-	-	CAN-H		DI	DI	-
	8		$\overline{DATA}$	$\overline{DATA}$	-		-	-	RxD/TxD-N
	9		CLK/RTS	-	V+		-	-	-

## ERbic separate parts

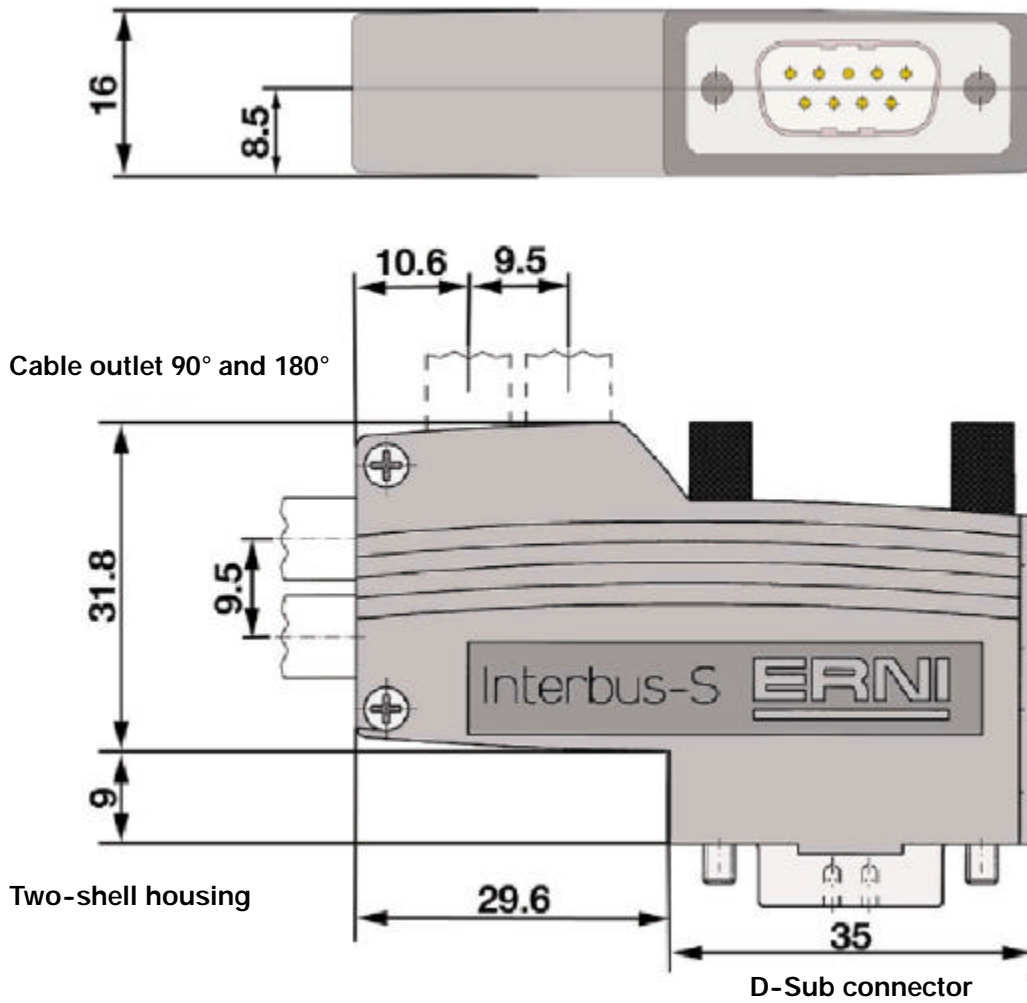
Illustration shows a CAN-Bus node vertical



### Components

Item	Description	Materials
1	Tapping screw ST 2.2 x 9.5 ISO 7049	Galvanized steel
2	Housing top section	PC
3	Tapping screw ST 2.2 x 6.5 ISO 7049 (to 5.5 dia.)	Galvanized steel
	Tapping screw ST 2.2 x 6.5 ISO 7049 (from 5.5 dia.)	Galvanized steel
4	Strain relief	Galvanized steel
5	Bus cable	
6	Bushing plate up to 5.5 mm dia.	TEEE
7	Blind plate	TEEE
8	Bushing plate > 5.5 mm dia.	TEEE
9	Knurled screws #4/40 (M3 on request)	Galvanized steel/PC
10	Housing bottom section	PC
11	Bus-specific PCB	

**ERbic dimensions**

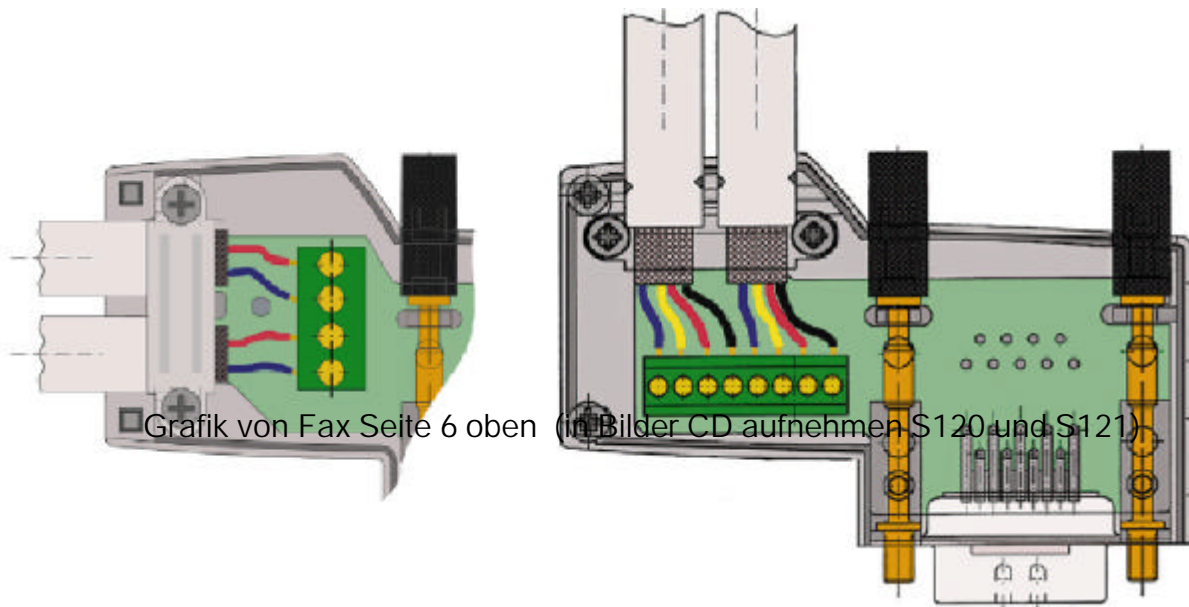


**ERbic with two versions for cable entry:**

**horizontal or vertical (shown without housing cover)**

**Profibus nodes horizontal**

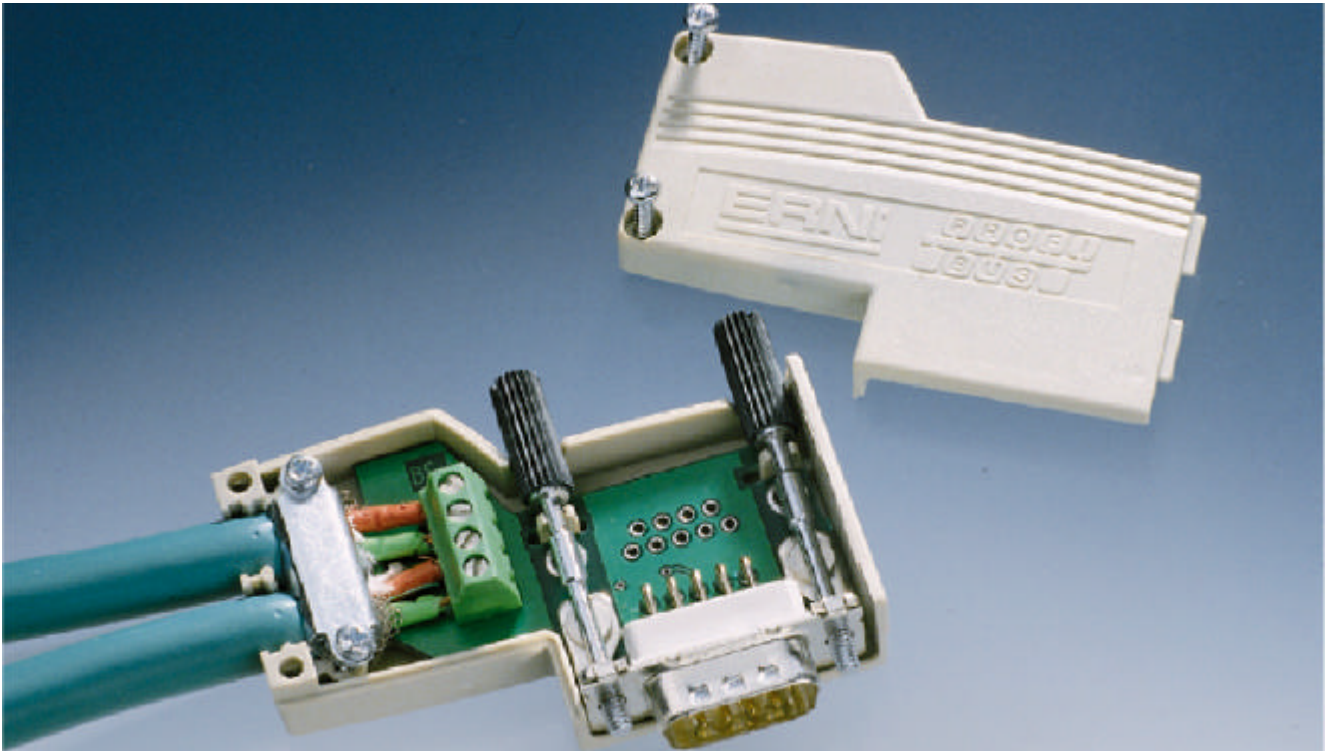
**CAN-Bus nodes vertical**



Grafik von Fax Seite 6 oben (in Bilder CD aufnehmen S120 und S121)

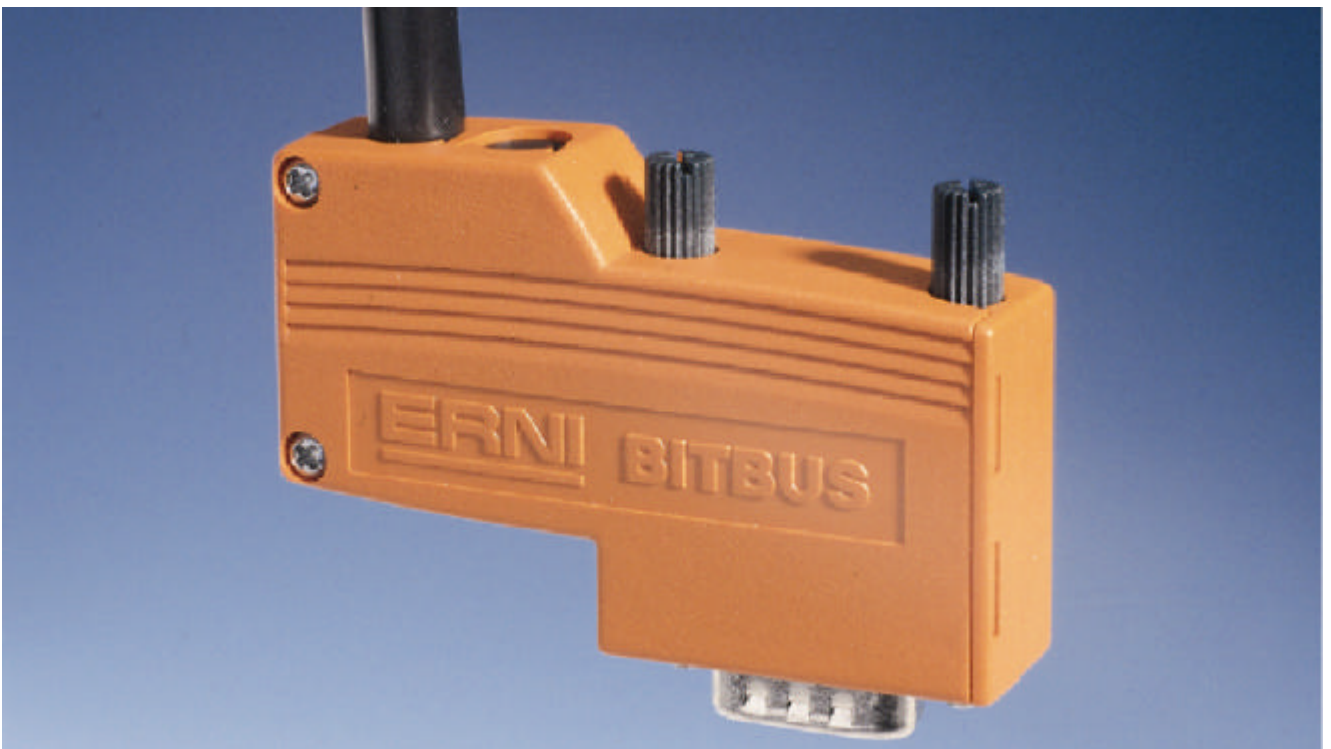
**Safe strain relief and reliable shielding transfer**

Illustration shows a Profibus node, horizontal



**Safe ESD protection due to fully insulated Thermoplast housing and captive knurled screws with Thermoplast head**

Illustration shows a Bitbus termination, vertical



**Non-interchangeable installation based on clearly distinctive colors for the node and the termination versions**

Profibus node, horizontal

Profibus termination, horizontal



CAN-Bus node, horizontal

CAN-Bus termination, horizontal





### For any assembly condition

Standard or reversed versions with horizontal or vertical cable entry

The standard version has been designed for the application in fieldbus interfaces of PLC's and I/O modules, see on the picture below as upper ERbic version with vertical (180° to D-Sub) cable entry.

The reversed version has been developed for IPC's and PC Interface Cards with a fieldbus interface, where the standard version cannot be used, because of the housing edge or other components close to the D-Sub interface. This is why the reversed ERbic types have a D-Sub mating area turned by 180°, compared to the standard types, and the cable entry on the opposite side. A reversed ERbic with horizontal (90° D-Sub) cable entry is shown as lower part in the picture below.

### For PLC's the standard version and for IPC's the reversed version

Illustration shows a Profibus node with vertical cable entry as upper part and a Profibus node reversed with horizontal cable entry as lower part



### Horizontal or vertical cable entry for different assembly conditions

Profibus node with horizontal cable entry



Profibus termination with vertical cable entry



**Integral PU connection with second D-Sub connector for connecting a programming unit or a service tester**

Illustration shows a Profibus node horizontal, with the female D-Sub as PU connection

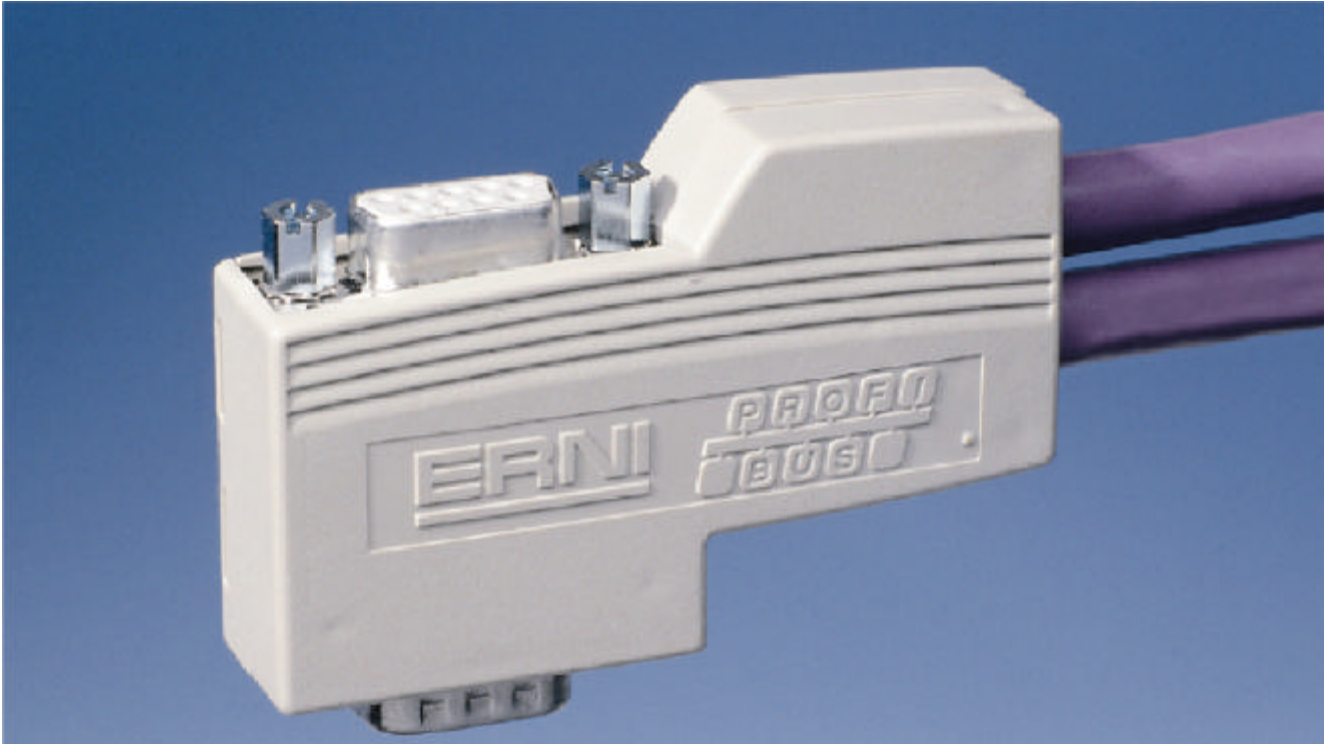

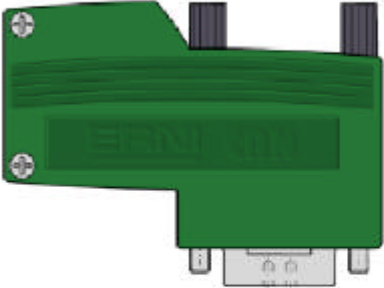




Illustration shows a CAN-Bus node horizontal, with the male D-Sub as PU connection

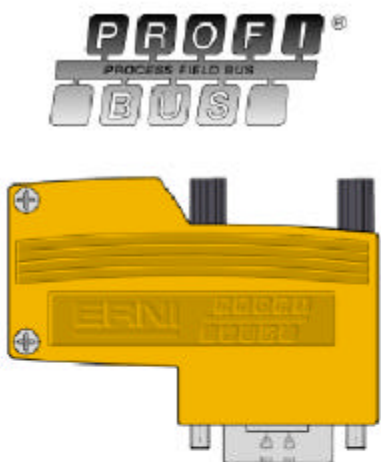
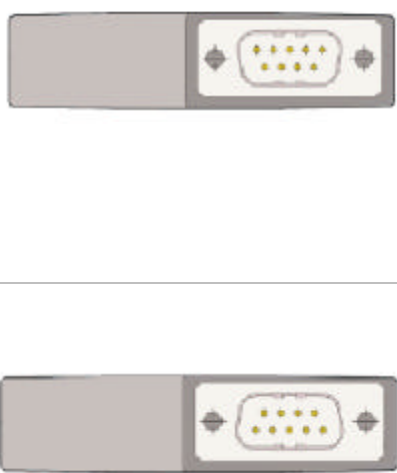


## Ordering information

Bus type	ERbic type	Colour	Cable outlet	D-Sub 9-pin	Screw	Part no.		
 	Node	anthracite	horizontal	Female	#4/40 UNC	<b>103 668</b>		
			vertical	Female		<b>103 669</b>		
	Node with shield decoupling capacitor		horizontal	Female		<b>103 642</b>		
			vertical			<b>103 652</b>		
	Node with service/programming interface (PU connection)		horizontal	Female and male (PU connection)		<b>103 662</b>		
			vertical			<b>on request</b>		
			Termination	green	horizontal	Female	#4/40 UNC	<b>103 643</b>
					vertical			<b>103 653</b>
			Termination with shield decoupling capacitor		horizontal	Female		<b>103 644</b>
					vertical			<b>103 654</b>
Termination with shield decoupling capacitor	green	vertical	Female	#4/40 UNC	<b>103 654</b>			
	Node reversed	anthracite	horizontal	Female	#4/40 UNC	<b>114 220</b>		
	Node reversed with shield decoupling capacitor	anthracite	horizontal	Female	#4/40 UNC	<b>104 320</b>		
	Termination reversed with shield decoupling capacitor	green	horizontal	Female	#4/40 UNC	<b>104 321</b>		

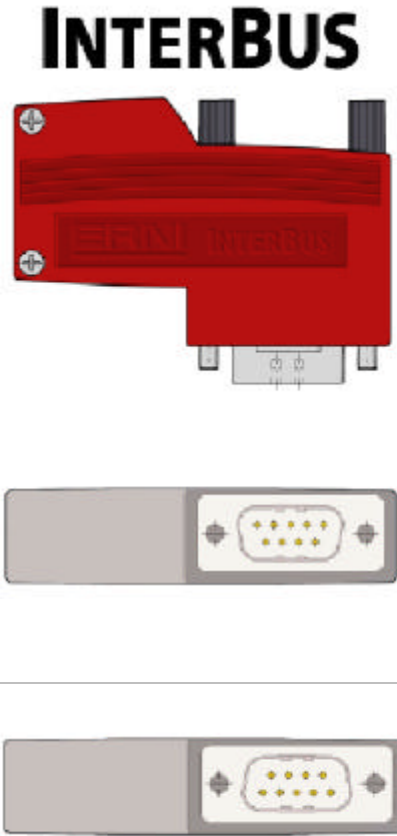
Packaging: Single box with enclosed assembly instruction

## Ordering information

Bus type	ERbic type	Colour	Cable outlet	Sub-D 9-pin	Screw	Part no.		
	Node	slat gray	horizontal	Male	#4/40 UNC	103 648		
			vertical			103 658		
	Node with service/programming interface (PU connection)		horizontal	Male and female (PU connection)		103 663		
			vertical			on request		
	Termination		yellow	horizontal		Male	103 649	
				vertical			103 659	
	Termination with service/programming interface (PU connection)		yellow	horizontal		Male and female (PU connection)	104 329	
				vertical			on request	
		Node reversed	slat gray	horizontal		Male	#4/40 UNC	104 577
		Termination reversed	yellow	horizontal		Male	#4/40 UNC	104 322

Packaging: Single box with enclosed assembly instruction

## Ordering information

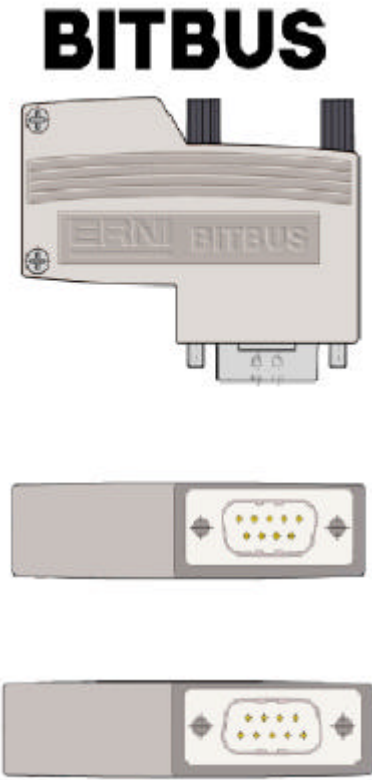
Bus type	ERbic type	Colour	Cable outlet	Sub-D 9-pin	Screw	Part no.
		red		Female	#4/40 UNC	103 650
	Programming/ service interface		horizontal	Female and male (PU connection)		on request
	-			Male		103 651
	Programming/ service interface		horizontal	Male and female (PU connection)		on request
	-		vertical	Female		103 660
				Male		103 661
	Reversed	horizontal	Male	104 319		

Packing: Single box with enclosed assembly instruction

Illustration shows a Interbus-S version with horizontal cable entry

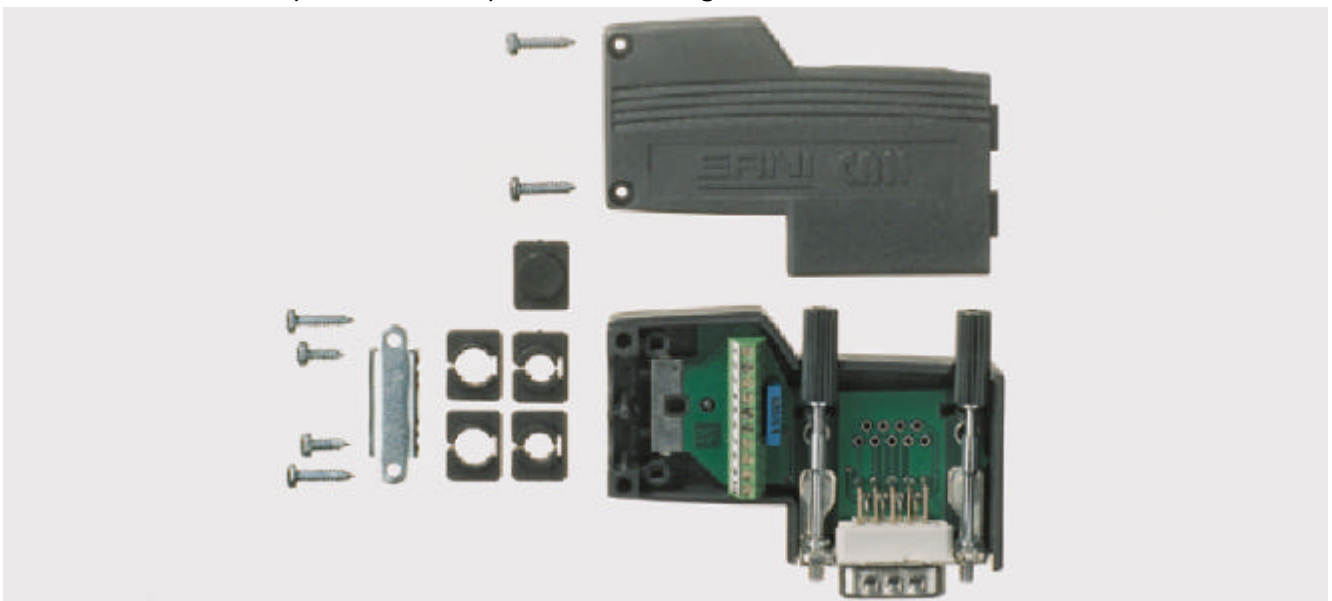


## Ordering information

Bus type	ERbic type	Colour	Cable outlet	Sub-D 9-pin	Screw	Part no.
	Node	light gray	horizontal	Male	#4/40 UNC	103 646
			vertical			103 656
	Node		horizontal	Female		103 645
			vertical			103 655
	Node IN/OUT		horizontal	Male		104 089
			vertical	Male		104 131
	Node IN/OUT with programming/service interface (PU connection)	horizontal	Male and female (PU connection)	on request		
	Termination	orange	horizontal	Male		103 647
			vertical			103 657
	Termination IN/OUT		horizontal	Male		104 090
			vertical	Male		104 132

Packing: Single box with enclosed assembly instruction

Illustration shows separate ERbic parts of the single box for a CAN-Bus node horizontal

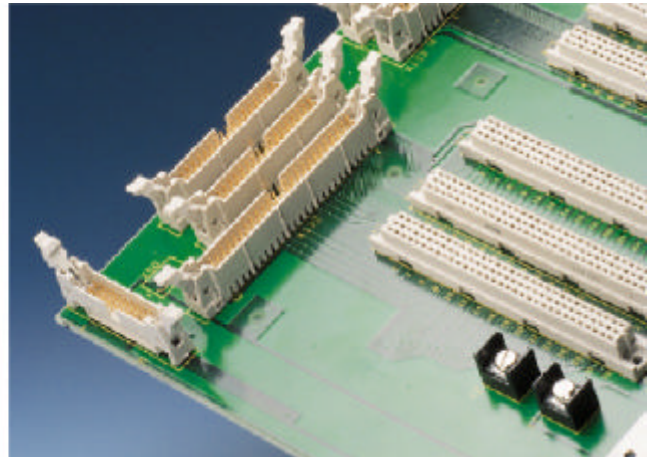


**For industrial automation and industrial bus applications**

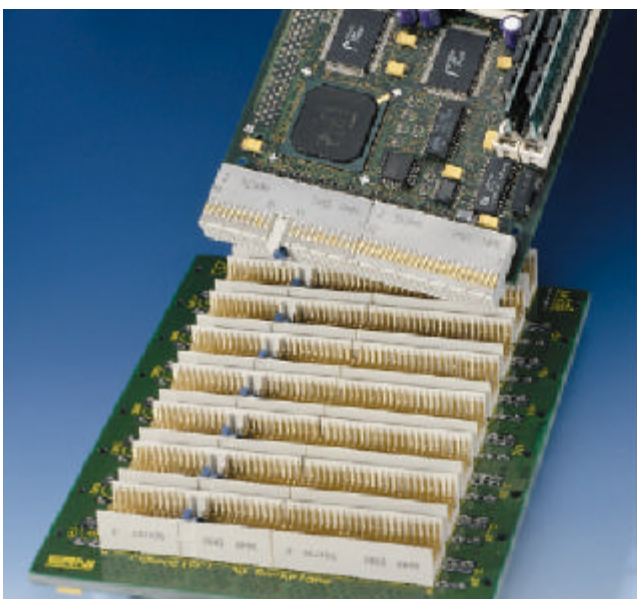
**D-Sub press-fit connectors,  
straight and right angle termination**



**Press-fit pin header for ribbon cable  
connectors acc. to IEC 603-13/MIL-C-35 308**



**CompactPCI connectors  
2.0 mm modular metric system  
acc. to IEC 1076-4-101**



**Subminiature connectors in 1.27 mm grid  
Termination: SMT, press-fit or solder pin  
and IDC for ribbon cable  
Board to board heights: 8.0, 9.4, 10.8 or 12.2 mm**

