



05546E00

- > Backplane bus for the IS1 system, consisting of data bus, Ex i PowerBus and address circuits
- > For 2 or 4 modules
- > Installation on 35 mm DIN rails NS 35/15
- > The BusRail can be interconnected for up to 18 modules
- > Passive component with redundancy and high availability

Zone	0	1	2	20	21	22
Class	I			NEC 506		
Zone	0	1	2	20	21	22
Ex interface		X	X		X	X
Installation in		X	X		X ^{*)}	X ^{*)}

Class	I		II / III	
Division	1	2	1	2
Ex interface	X	X	X	X
Installation in	X	X	X ^{*)}	X ^{*)}

^{*)} suitable enclosure necessary

General Information

Manufacturer

R. STAHL Schaltgeräte GmbH
Am Bahnhof 30
74638 Waldenburg, Germany

Telephone: +49 7942 943-0
Fax: +49 7942 943-4333
Internet: www.stahl-ex.com
Service&Support: support.instrumentation@stahl.de

Further Information on the Module

Further information on the module you will find
X in the automation catalogue (168465 / 00 006 54 78 0) or
X on the internet at www.stahl-automatisierung.de

Symbols



Attention!

This symbol marks notes whose non-observance will endanger your health or functioning of the device.



Note

This symbol marks important additional information, tips and recommendations.

Safety Instructions

The most important safety instructions are summarised in this section. They supplement the corresponding regulations which the personnel in charge must study. When working in hazardous areas, safety of the personnel and plant depends on complying with all relevant safety regulations. Assembly and maintenance staff working on installations therefore have particular responsibility.

A precise knowledge of the applicable standards and regulations is required.



As the user, please note:

- X the national safety, accident prevention, assembly and installation regulations (e.g. IEC/EN 60079-14)
- X generally recognised technical regulations,
- X the safety instructions and information of this document, characteristic values of the type labels and the instruction plates
- X the EC Type Examination Certificate (according to ATEX) or conformity or partial certificate (after previous approval) and special conditions contained in it
- X that any damage may render explosion protection null and void.
- X that the BusRail can be operated only with IS1 CPU & Power Modules and IS1 I/O Modules.

- X that the BusRail of type 9494 is certified for use in hazardous areas of Zone1/Division 1, Zone 2/Division 2, Zone 21, Zone 22 or in the safe area. Actually certified application area depends on the installed modules.

The IS1 system consisting of the BusRail, CPU & Power Module and I/O Modules may only be used in the hazardous area for which the installed module with the lowest explosion protection is certified.

- X that at the beginning and end of every BusRail segment a termination must be assembled.
- X that every BusRail segment must be connected to every equipotential bonding of the hazardous area.

Use the component in accordance with its designated use and for its intended purpose only (see chapter "Function/Characteristics"). Incorrect and impermissible use or non-compliance with this document invalidates our warranty provision.

No modifications or alterations to the components, impairing their explosion protection, are permitted. The components are to be fitted only if they are undamaged and clean.

Conformity to Standards

The components comply with the following standards and directive:










- X Directive 94/9/EC
- X IEC/EN 60079-0, IEC/EN 60079-1, IEC/EN 60079-7, IEC/EN 60079-11, IEC/EN 60079-15

Function/Characteristics

The BusRail is inserted into a 35 mm DIN rail and serves for internal electrical intrinsically safe connection between the CPU & Power Modules and the I/O modules. The BusRail is designed in a passive way. It consists of internal data bus, PowerBus and the address lines for the I/O modules.

The internal data bus is designed redundantly. Thanks to special design features high availability of the PowerBus is provided.

Components

Version	Description	Order number	Weight kg
BusRail	 04829E00 for 4 modules	9494 / S1 - M4	0.100
	 07005E00 for 2 modules begin	9494 / S1 - B2	0.062
	 07005E00 for 2 modules end	9494 / S1 - E2	0.062
End cover BusRail	 04826E00 begin	9494 / A1 - B0	0.044
	 04810E00 end	9494 / A1 - E0	0.044
End cover with connection cable	 04769E00 0.7 m / 27.5 in	9494 / L1 - V7	0.210
	 04769E00 1.10 m / 43.3 in	9494 / L1 - V8	0.260
	 04769E00 length acc. specification	9494 / L1 - V9	--
DIN rail	 04768E00 For inserting the BusRail (> 0.5 m / 19.7 in and < 2 m / 78.7 in), 35 x 15 x 1.5 mm (EN 50022)	103714	1.410

Designing



The national installation instructions (e.g. IEC/EN 60079-14) must be observed. Intrinsically-safe and non-intrinsically safe circuits must not be used in a common cable duct! Ensure that there is a distance of at least 50 mm between connection facilities of intrinsically-safe and non-intrinsically safe circuits!

- x The BusRail serves for electric connection between the CPU & Power Module and the I/O Modules.
- x The BusRail can be installed in hazardous areas of Zone 1/ Division 1, Zone 2/Division 2, Zone 21 or Zone 22. Actually certified application area of IS1 system depends on the modules installed.
- x A mixed arrangement of the BusRail with different I/O modules is permitted. When assembling a Zone 1 module near Zone 2 module (94../15) it is required to assemble a partition (ID No.: 162740)!
- x Permitted assembly direction of the BusRail depends on the modules installed. The distance between the BusRail and enclosure walls or other equipment depends on the modules installed.
- x At the beginning or end of every BusRail segment a BusRail termination must be assembled in order to secure the BusRail against loosening and to protect the pins of extendable BusRail against soiling and unintended contact.
- x The DIN rail of every BusRail segment must be connected to the shield buses installed in the enclosure! In Zone 1 the Ex e terminal must be used for this purpose.
- x The maximum equipment of a BusRail segment is:
in Zone 1: 10 Modules (2 x CPM, 8 x IOM)
in Zone 2: 18 Modules (2 x CPM, 16 x IOM).
- x The number of effectively used I/O modules can be limited by the fieldbus protocol.
- x Subsequent extension of the BusRail to the maximum length is possible. For the simple extension the last BusRail part of the segment should be extendable (Type 9494/A 1-M4).

Assembly and Installation



The national installation instructions (e.g. IEC/EN 60079-14) must be observed. Intrinsically-safe and non-intrinsically safe circuits must not be used in a common cable duct! Ensure that there is a distance of at least 50 mm between connection facilities of intrinsically-safe and non-intrinsically safe circuits!



At the beginning or end of every BusRail segment a BusRail termination must be assembled in order to secure the BusRail against loosening and to protect the pins of extendable BusRail against soiling and unintended contact.



The DIN rail of every BusRail segment must be connected to the shield buses installed in the enclosure! In Zone 1 the Ex e terminal must be used for this purpose.



The maximum equipment of a BusRail segment is:
• in Zone 1: 10 Modules (2 x CPM, 8 x IOM)
• In Zone 2: 18 Modules (2 x CPM, 16 x IOM)

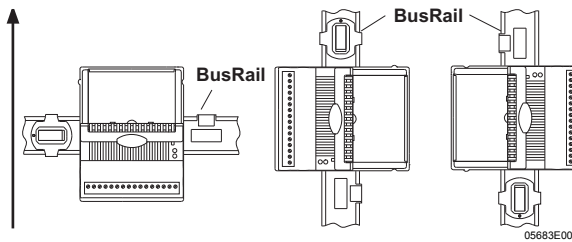


For assembly only DIN rails are certified similarly to EN 50022, Type NS35/15 (35 x 15 x 1.5). In order for the BusRail to be inserted correctly only screws with a maximum screw head height 4 mm can be used for the DIN rail assembly.

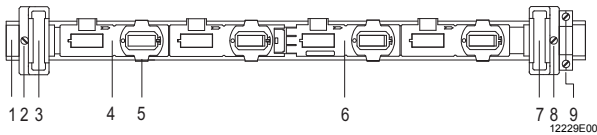


The assembly position of the DIN rail depends on the modules installed. During operation all modules must be assembled vertically or horizontally. The assembly position "lying" or "hanging upside down" is not permitted for all modules!

Assembly direction up:



BusRail assembly on the rail

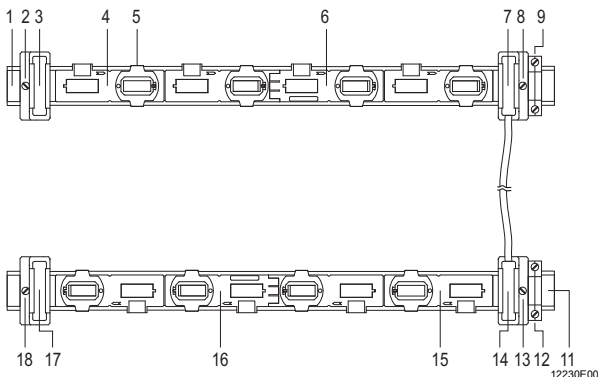


- Assemble the DIN rail (1).
- Place the termination "BusRail Begin" (3) onto the DIN rail (1) and fasten it with a mounting screw (2).
- Insert the BusRail part (4) into the DIN rail and push through up to the termination "BusRail Begin" (3).
- Snatch the ground clamp (5) at the DIN rail.
- If necessary, insert a further BusRail part (6) into the DIN rail and carefully push it to the BusRail part assembled previously until the ear of the plug connector latches.
- Snatch the ground clamp (5) at the DIN rail.
- If necessary, assemble further BusRail parts so that the planned length of the BusRail is achieved.
- Place the "BusRail End" (7) onto the DIN rail (1), push to the last BusRail part and fasten it with a mounting screw (8).
- Assemble the earthing terminal (9) on the DIN rail and connect it to the shield bus of the enclosure.

Assembly of the BusRail on two rails



The maximum length of the BusRail with connection cable is 3m!



- Assemble the DIN-rails (1, 11).
- Place the termination "BusRail Begin" (3) onto the DIN rail (1) and fasten it with a mounting screw (2).
- Insert the BusRail part (4) into the DIN rail (1) and push through to the termination "BusRail Begin" (3).
- Snatch the ground clamp (5) at the DIN rail.
- If necessary, insert a further BusRail part (6) into the DIN rail and carefully push it to the BusRail part (4) assembled previously until the ear of the plug connector latches.
- Snatch the ground clamp (5) at the DIN rail.
- If necessary, assemble further BusRail parts so that the planned length of the first BusRail segment is achieved.
- Place the termination of the connection cable (7) on the DIN rail (1), carefully push it to the last BusRail part (6) and fasten it with a mounting screw (8).
- Assemble the earthing terminal (9) on the DIN rail (1) and connect it to the shield bus of the enclosure.
- Place the second termination of connection cable (14) on the DIN rail (11), and fasten it with a mounting screw (13).
- Insert the BusRail part (15) into the DIN rail (11) and push it carefully to the termination of the connection cable.

- Snatch the ground clamp (5) at the DIN rail.
- If necessary, insert a further BusRail part (16) into the DIN rail (11) and carefully push it to the BusRail part (15) assembled previously until the ear of the plug connector latches.
- Place the "BusRail End" (17) on the DIN rail (11), push it to the last BusRail part and fasten it with a mounting screw (18).
- Assemble the earthing terminal (12) on the DIN rail (11) and connect it to the shield bus of the enclosure.

Maintenance and Servicing

The BusRail is maintenance-free.

- Observe the function according to designated use.
- Adhere to the directives according to IEC/EN 60079-17.
- Adhere to the permissible temperatures according to IEC/EN 60079-0.

Repair

For repair send the BusRail to the responsible sales organisation (address see www.stahl.de).

Repair is only to be performed by the manufacturer.

Transport and Storage

Transport and storage are permitted only in the original packaging.

Disposal

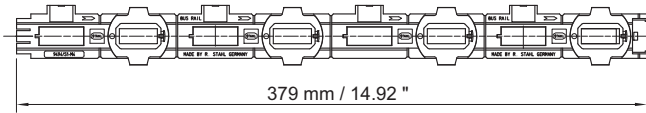


Observe the national standards for refuse disposal.

Technical Data

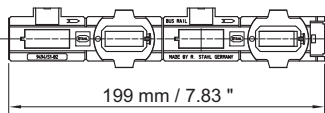
Types	9494/S1-M4	9494/S1-E2	9494/S1-B2
Certificates	see certificates for CPU & Power Module Type 9440	see certificates for CPU & Power Module Type 9440	see certificates for CPU & Power Module Type 9440
Explosion protection	acc. to II 2 G Ex ib IIC T4	acc. to II 2 G Ex ib IIC T4	acc. to II 2 G Ex ib IIC T4
Number of module slots	4	2	2
Extensible at the beginning	yes	yes	no
Extensible at the end	yes	no	yes
Internal data bus redundant	yes	yes	yes
High availability internal power	yes	yes	yes
Maximum length	3 m, BusRail including connection cable 9494/2.		
DIN rail	For installation of the BusRail, as per EN 50022 (material thickness 1.5 mm / 0.06 in), NS35 /15		
Engineering notes	The BusRail is available in lengths for 2 or 4 modules. End covers are required both at the beginning and at the end. The end covers are available as „BusRail begin“ and „BusRail end“ and with integrated connection cable. The use of the connection cable permits several BusRail segments to be built up in one enclosure.		

Dimensional Drawings (All Dimensions in mm / inches) - Subject to Alteration

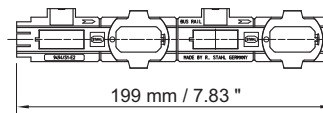


BusRail, middle

09890E00



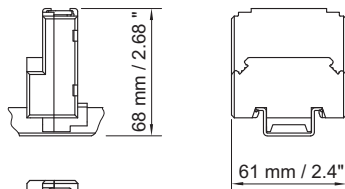
09093E00



10525E00

BusRail, begin

BusRail, end



End cover BusRail begin / end

Accessories and Spare Parts

Designation	Illustration	Description	Art. no.
Designation strips		For BusRail, for 1 BusRail with 16 I/O modules	162793

05871E00

EC Declaration of Conformity



Note

The BusRail has been checked and certified together with the CPU & Power Module and is included into the EC Type Examination Certificate of type 9440/22. You can find the current EC Type Examination Certificate with all addenda at www.stahl.de.

09891E00

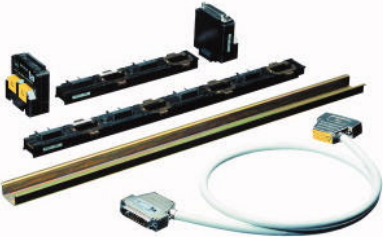
Rail for support similar to EN 50022 NS 35/15

09888E00



Certification Drawing

Class I, Div. 1 / Zone 1 Installation for connection of CPU & Power Module to Remote I/O modules located in Class I, II, III, Division 1, Group A-G, or Class I, Zone 1, Group IIC/IIB Hazardous (Classified) Locations (see note 3)




The Type 9494 BusRail is a passively constructed bus rail mounted into standard 35 mm DIN rail. It consists of an internal data bus, Power bus and the address lines for the interconnection of the I.S. 1 CPU & Power supply to Remote I/O modules. It is approved for installation in a Class I, II, III, Division 1, Group A-G or Class I, Zone 1, Group IIC/IIB hazardous location according to NEC Article 504/505.

Selection table:

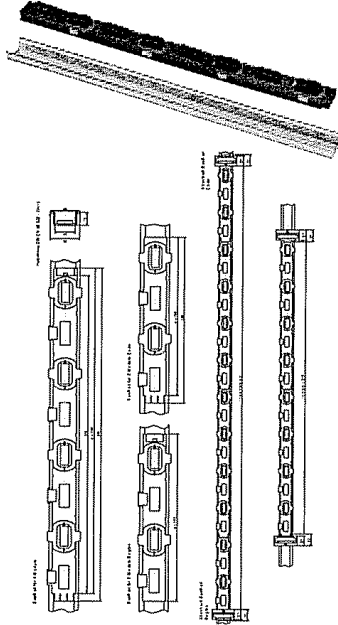
Version	Part Number
BusRail 4 modules	9494/S1-M4
BusRail 2 modules, begin	9494/S1-B2
BusRail 2 modules, end	9494/S1-E2
End Cap BusRail, begin	9494/A1-B0
End Cap BusRail, end	9494/A1-E0
End Cap BusRail, begin Sub-D	9494/A2-B0
End Cap BusRail, end Sub-D	9494/A2-E0
Connection cable BusRail	9491/Z0-VB

Notes:

- 1.) Installation should in accordance with [Article 504/505](#) of the [National Electrical Code, ANSI/NFPA 70](#) and [ANSI/ISA RP12.06.01](#).
- 2.) Use a general purpose enclosure meeting the requirements of [ANSI/ISA S82](#) for use in nonhazardous or Class I, Division 1 hazardous (Classified) Locations.
- 3.) Use an FMRC Approved or NRTL listed Dust-ignitionproof enclosure appropriate for environment protection in Class II, Division 1, Groups E, F and G; and Class III, hazardous (Classified) Locations.

Certification Drawing								
C	11/04	T. Stahl		I.S.1 Remote I/O System BusRail Type 9494	Date	Name	Drawing Number	
B	6/04	Toby			Drawn	01.02.01	Tobey	94 006 01 31 0
A	8/01	Feindel			Checked	01.02.01	Feindel	3 of 18
Revision	Date	Approved			Approved			Agency FM
				Div. 1				

Class I, Div. 2/Zone 2 Installation
for Connection of CPU & Power module to Remote I/O
modules located in Class I, II, III, Division 2
Group A-G, or Class I, Zone 2,
Group IIC/IIIB Hazardous (Classified) Locations
(see note 3)



The Type 9494 BusRail is a passively constructed bus rail mounted into standard 35mm DIN rail. It consists of an internal data bus, PowerBus and the address lines for the interconnection of the I.S.1 CPU & power supply to remote I/O modules. It is approved for installation in a Class I, II, III, Division 2, Group A-G, or Class I, Zone 2 Group IIC/IIIB hazardous location according to NEC Article 504/505.


Selection Table:

Version	Part Number
BusRail 4 modules	9494/S1-M4
BusRail 2 modules, begin	9494/S1-B2
BusRail 2 modules, end	9494/S1-E2
End Cap BusRail, begin	9494/A1-B0
End Cap BusRail, end	9494/A1-E0
End Cap BusRail, begin Sub-D	9494/A2-B0
End Cap BusRail, end Sub-D	9494/A2-E0
Connection cable BusRail	9491/Z0-VB

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.) Use a general purpose enclosure meeting the requirements of ANSI/ISA S82 for use in nonhazardous or Class I, Division 2 hazardous (Classified) Locations.
- 3.) Use an FMRC Approved or NRTL listed Dust-ignitionproof enclosure appropriate for environmental protection in Class II, Division 1, Groups E, F and G; and Class III, hazardous (Classified) Locations.

Certification Drawing

Revision			Title	Date	Name	Drawing Number
B	6/04	Tobey				 <p>I.S.1 Remote I/O System BusRail Type 9494</p>
A	2/13/01	Feindel	Sheet			
Revision	Date	Approved	3 of 15			
			Agency			
			Div. 2	Approved		FM





IS1 I/O-Modules

BusRail Series 9494
