Technical Description

S900 I/O Application-Guide CI920S/CI920B replaced by CI920AS/CI920AB

Products Concerned

Installed Products

Item	Article number	Item Description
CI920B V1.5.9	3BDS014112	Communication Interface for Zone 2
CI920S V1.5.9	3BDS014111	Communication Interface for Zone 1
BP910S	3KDE175831L9100	Intrinsically Safe PROFIBUS DP connector

Replaced by

Item	Article number	Item Description
CI920AB V2.1.0	3BDH000691R1	Communication Interface for Zone 2
CI920AS V2.1.0	3BDH000690R1	Communication Interface for Zone 1
BP914S	3BSE067082R1	Intrinsically Safe PROFIBUS DP connector

Reference Documents

Reference	Document number	Title
[1]	2PAA107377	S900 I/O Release Notes PROFIBUS DP Communication Interface CI920A V2.1.0
[2]	2PAA107376	S900 I/O System - CI920S / CI920B replaced by CI920AS / CI920AB
[3]	3BDD015032R0101	I/O System S900 PROFIBUS Interface CI920 V1.5.9 Release Notes
[4]	3BDD010432R0103	I/O System S900 Assembly and Installation Guide, S- and N-System with power supply SA910
[5]	3BDD010421R0303	I/O System S900 Assembly and Installation Guide, S- and N-System with power supply SA920
[6]	3BDD010421R0201	800xA – Control and I/O S900 I/O System Version 5.0 Installation Guide S- and N-System with Power Supply SA910
[7]	3BDD010421R0401	800xA – Control and I/O S900 I/O System Version 5.0 Installation Guide S- and N-System with Power Supply SA920
[8]	3BDD010432R0103	I/O System S900 Assembly and Installation Guide, B-version with power supply SA910
[9]	3BDD010432R0303	I/O System S900 Assembly and Installation Guide, B-version with power supply SA920
[10]	3BDD010432R0201	800xA – Control and I/O S900 I/O System Version 5.0 Installation Guide B-System with Power Supply SA910
[11]	3BDD010432R0401	800xA – Control and I/O S900 I/O System Version 5.0 Installation Guide B-System with Power Supply SA920
[12]	3BDD010421R0501	S900 I/O Manual Installation Guide S-N-System SA920 CI920A
[13]	3BDD010421R0503	S900 I/O Manual Installation Guide S-N-System SA920 CI920A
[14]	3BDD010432R0501	S900 I/O Manual Installation Guide B-System SA920 CI920A
[15]	3BDD010432R0503	S900 I/O Manual Installation Guide B-System SA920 CI920A

2. Compatibility with existing systems

2.1.1 Hardware compatibility with existing systems

The following installations of the intrinsically safe PROFIBUS segment can be found in existing plants:

	Start of bus (master side)	S900 at center of bus		S900 at end of bus	
Installation type	PROFIBUS isolating repeater/ coupler	PROFIBUS connector	S900 communication interface	PROFIBUS connector	S900 communication interface
1	BI912S	BP910S (bus termination: off)	CI920S or CI910B	BP910S (bus termination: on)	CI920S or CI910B
2	BI913S				
3	BI914S				
4	BI933S				
5	BI934S				

The existing installation types can be converted as follows using the new CI920AS or CI920AB.

2.1.2 Communication interface update without updating the physical layer

Only the S900 communication interfaces are replaced (highlighted grey), the network components are not changed. The intrinsically safe physical layer according to manufacturer specification in accordance with R. STAHL remains unchanged.

	Start of bus (master side)	S900 at center of bus		S900 at end of bus	
Installation type	PROFIBUS isolating repeater/ coupler	PROFIBUS connector	S900 communication interface	PROFIBUS connector	S900 communication interface
1	BI912S	BP910S (bus termination: off)	**CI920AS or CI910AB**	BP910S (bus termination: on)	**CI920AS or CI910AB**
2	BI913S				
3	BI914S				
4	BI933S				
5	BI934S				

When converted during operation, it is possible to temporarily use a mixed configuration consisting of CI920* and CI920A* on the same intrinsically safe bus segment.

The network components should not be replaced during operation. All S900 stations connected to the intrinsically safe bus segment should be switched off.

2.1.4 Communication interface update and physical layer update according to PROFIBUS International Guideline RS485-IS during operation

Network components can only be replaced during operation if:

- A redundant PROFIBUS network,
- Redundant S900 communication interfaces and
- Redundancy mode 1 (ABB redundancy)

are used.

A seamless update during normal operation is only possible from CI920* V1.5.9 to CI920A* V2.1. Installations using older versions of communication interfaces such as CI920* V1.4.1 or V1.4.2 cannot be converted seamlessly, in such cases the relevant plant segment should be shut down. If invalid measured values are tolerated during redundancy switch over from the old (CI920* V1.4.2) to the new (CI920A* V2.1) communication interface, conversion is possible without disconnection.

Conversion must be made taking utmost care and according to the procedure described below.

(1) Check the firmware version of the communication interfaces. All ‘old’ communication interfaces CI920* must correspond to version 1.5.9, if a seamless update is required.

(2) Check the availability of redundancy. All slaves of the active and passive PROFIBUS line of the master must be available. No such diagnostic message must be pending.

(3) Disconnect the PROFIBUS connector of one line (preferably line B or 2) from the master. Slaves that have been active on this PROFIBUS line are now switched over to the redundant intact PROFIBUS line.

(4) Uninstall / disconnect passive communication interfaces CI920* of all S900 stations of the affected segment. The passive communication interface can be identified by a not lighted PB LED.

(5) Switch off the PROFIBUS network of the passive line by cutting off the power supply for PROFIBUS isolating repeaters (e.g.: BI913S).

(6) Replace PROFIBUS connector BP910S of passive line with PROFIBUS connector BP914S. Configure the termination according to the position in the intrinsically safe segment (see Figure 1). Plug the connection again to the Termination Unit (TU921*) and fix the screws.

(7) Replace the PROFIBUS isolating repeater:

- Replace BI912S or BI913S with BI914S
- Replace BI933S with BI934S.

3. Compatibility of existing systems with communication interfaces CI920* FW 1.4.x

The communication interfaces CI920A* FW 2.1 can also be used to replace the communication interfaces CI920* FW 1.4.1 or CI920* 1.4.2. You should power down and de-energize the relevant S900 station (TU921*) for the time of the communication interface replacement. A seamless replacement cannot be guaranteed when using the intermediate step via CI920* 1.5.9 (CI920* 1.4.x -> CI920* 1.5.9 -> CI920A* 2.1).

In addition to the already described differences (chapter 1) and modified behavior (chapter 2.2.2.3) of CI920A* FW2.1 and CI920* FW1.5.9, also observe the functional differences of the communication interfaces CI920* FW1.5.9 and CI920* FW1.4.x according to Release Notes BDD015032R0101 [3].

4. Interconnection at the intrinsically safe fieldbus system RS485

Two types of fieldbus installations are differentiated for the interconnection of the communication interfaces CI920AS and CI290AB on an intrinsically safe fieldbus system:

(1) Manufacturer-specific, intrinsically safe fieldbus system RS485 previously used for S900 (acc. to R. STAHL)

(2) Intrinsically safe fieldbus system RS485-IS according to PROFIBUS int. Guideline

4.1 Manufacturer-specific, intrinsically safe fieldbus system RS485 previously used for S900 (acc. to R. STAHL)

For an existing fieldbus system, the CI920AS or CI920AB are interconnected as replacement for CI920S or CI920B.

	Start of bus (master side)	S900 at center of bus		S900 at end of bus	
Installation type	PROFIBUS isolating repeater/ coupler	PROFIBUS connector	S900 communication interface	PROFIBUS connector	S900 communication interface
1	BI912S	BP910S (bus termination: off)	CI920S, CI920B, **CI920AS, CI920AB**	BP910S (bus termination: on)	CI920S, CI920B, **CI920AS, CI920AB**
2	BI913S				
3	BI914S				
4	BI933S				
5	BI934S				

The existing fieldbus installations have thus been built up according to one of the following Manual Installation Guides: [4], [5], [6], [7], [8], [9], [10] or [11]. The interconnection of the intrinsically safe fieldbus system performed according to the indicated chapter: ‘Intrinsically Safe Fieldbus System’.

The electrical connection data of the new communication interfaces CI920AS/CI920AB (ATEX ...) and of the installed communication interfaces CI920S/CI920B (ATEX …) are comparable. It is therefore not mandatorily necessary to once more calculate the interconnection in case the