

**Remote I/O System I.S. 1 Line Redundancy**

The flexibility of the Remote I/O System I.S. 1 has been further improved. To substantially **enhance** its **availability** even if a transmission path has been broken, the **Line Redundancy** has been implemented. The function is suitable for non-redundant Profibus Masters.

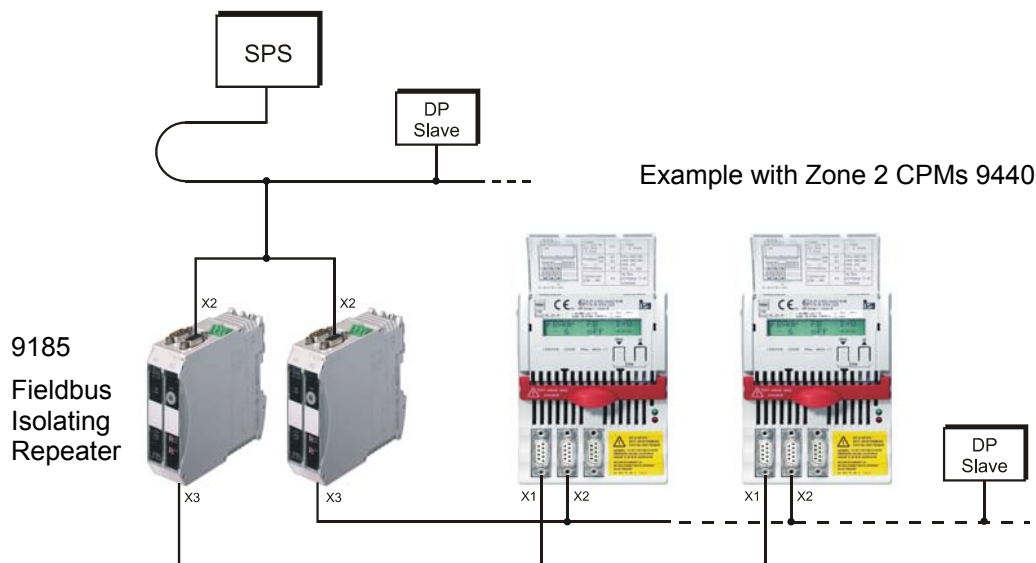
In order to do this, the two fieldbus isolating repeaters, Type 9185, are interconnected at the X<sub>2</sub> interface with a Profibus DP cable via Sub D connectors and connected to the PROFIBUS Master (PLC, process control system (DCS)). One Profibus DP cable with Sub D connector is connected to each X<sub>3</sub> interface of the 9185, and connected to the two X<sub>1</sub> and X<sub>2</sub> interfaces of the CPU & Power Module (CPM), Type 9440.

The Profibus line between the fieldbus isolating repeaters and the I.S. 1 field stations (CPM, Type 9440) thus has a redundant structure.

Data is exchanged via both channels and is evaluated in the CPM, Type 9440, with an internal logic. Data arriving first is prioritised and the other data is rejected. If one line suffers a fault, data transmission continues undisturbed between automation system and I.S.1 field station. If the disturbed channel is operational again, redundant data traffic resumes automatically. The outputs in the connected I/O modules revert to safety position after the hold time configured user-specifically only if both transmission paths between PLC and the CPM, Type 9440, are broken. If a disturbed channel is operational again or if both disturbed channels are operational again, data communication resumes automatically. Faults on the two redundant transmission paths are signalled in the PROFIBUS diagnosis telegram and optionally in the I.S. Wizard.

Devices supporting Line Redundancy:

Zone	Type	Power supply	Protocol	as of Release		Interface	
						CPM / FB-TÜ	PLC
1	9440/22-01-11	24 V DC	Profibus	A	01-32 02-32	X <sub>1</sub> / X <sub>2</sub>	
1	9940/22-01-21	90-250 V AC	Profibus	B	01-32 02-32	X <sub>1</sub> / X <sub>2</sub>	
2	9440/15-01-11	24 V DC	Profibus	G	01-32 02-32	X <sub>1</sub> / X <sub>2</sub>	
1 (bus)	9185/11-35-10	24 V DC		D	01-02	X <sub>3</sub>	X <sub>2</sub>
2	9185/12-45-10	24 V DC		D	01-02	X <sub>3</sub>	X <sub>2</sub>

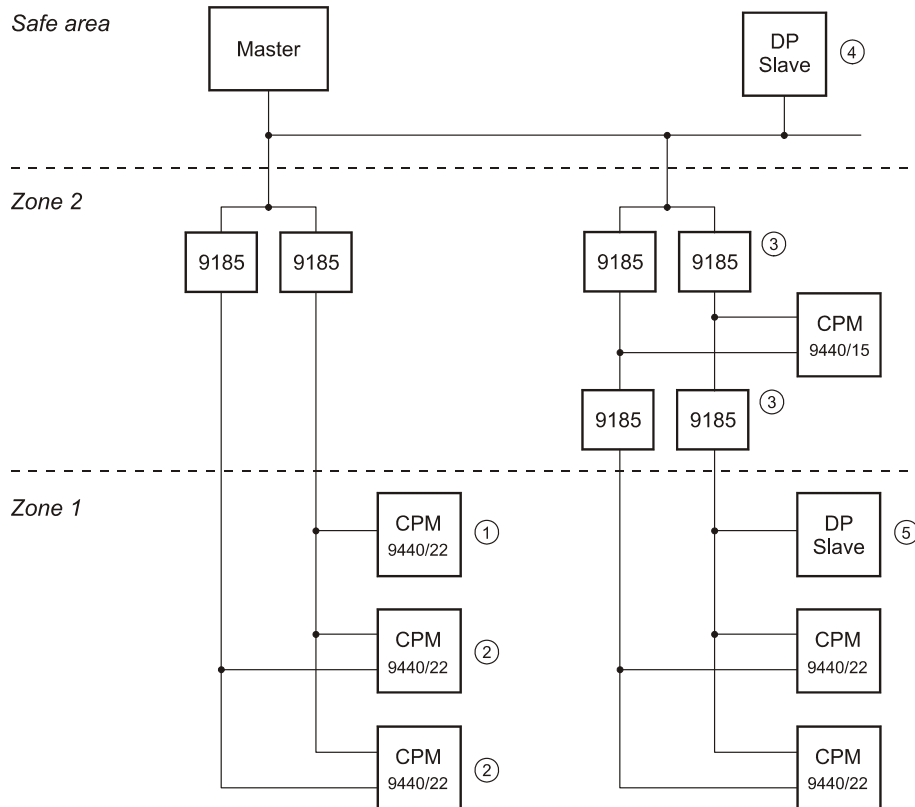


## System data 'Line Redundancy'

**Protocol:** Profibus DP

**Baudrates:** 9,6 K; 19,2 K; 93,75 K; 187,5 K; 500 K; 1,5 M

**Bus structure:**



- ① CPM without Line Redundancy
- ② CPM with Line Redundancy
- ③ max. 2 repeater 9185 in series allowed
- ④ DP Slave on non redundant bus
- ⑤ mixed operation of CPM with Line Redundancy + DP Slave without Line Redundancy

### Bus data

- CPM with and without Line Redundancy can be used on one redundant bus segment.
- Number of devices per bus segment  $\leq 32$
- Max 2 repeater 9185 can be used in series. ③
- Cable length per bus segment according PNO standard
- Operation of any PROFIBUS slaves on redundant and on non redundant bus segment allowed (④ and ⑤). For all DP slaves on the redundant bus segment ⑤ the parameter  $T_{sdr-min}$  must be set to  $\geq 33$  t-bit in the PROFIBUS DP master !

### Settings in PROFIBUS master

Protocol: Profibus DP  
 Siemens PLC: Profile Universal (DP / FMS) or similar  
 Retry:  $\geq 3 - 5$  (recommended 5)  
 $T_{sdr-min}$   $\geq 33$  t-bit for all DP slaves on the redundant bus segment

## Guideline for PROFIBUS master settings:

Baudrate in kBit/s	1500	500	187,5	93,75	19,2	9,6
$T_{\text{slot\_init}} \geq [T_{\text{bit}}]$	3000	1000	400	240	120	100
$T_{\text{sdr-min}} \geq [T_{\text{bit}}]$	150	80	80	45	33 *	33 *
$T_{\text{id1}} \geq [T_{\text{bit}}]$	515	195	195	125	65	55
$T_{\text{id2}} \geq [T_{\text{bit}}]$	380	360	360	200	65	55

\*  $T_{\text{sdr-min}} \geq 11$  for all slaves on non redundant Bus segment ④

\*  $T_{\text{sdr-min}} \geq 33$  for all slaves on redundant Bus segment ⑤

### CPM parameter:

The CPM-Parameter „I.S. 1 Line Redundancy “ must be set to „ON“ for all I.S.1 field stations on redundant bus segments.

### settings on Fieldbus Isolating Repeater 9185

Baudrate: - Autobaudrate  
- fixed Baudrates 1,5 Mbit, 500 kBit, 187,5 kBit, 93,75 kBit  
(The fixed Baudrates 9,6...57,6 kBit are not allowed using Line Redundancy)

Isolating Repeater types: 9185/11-35-10 (RS485 IS to zone 1)  
9185/12-45-10 (Standard PROFIBUS in zone 2)

Revisions: as of Release D, V01-02

## Support address

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