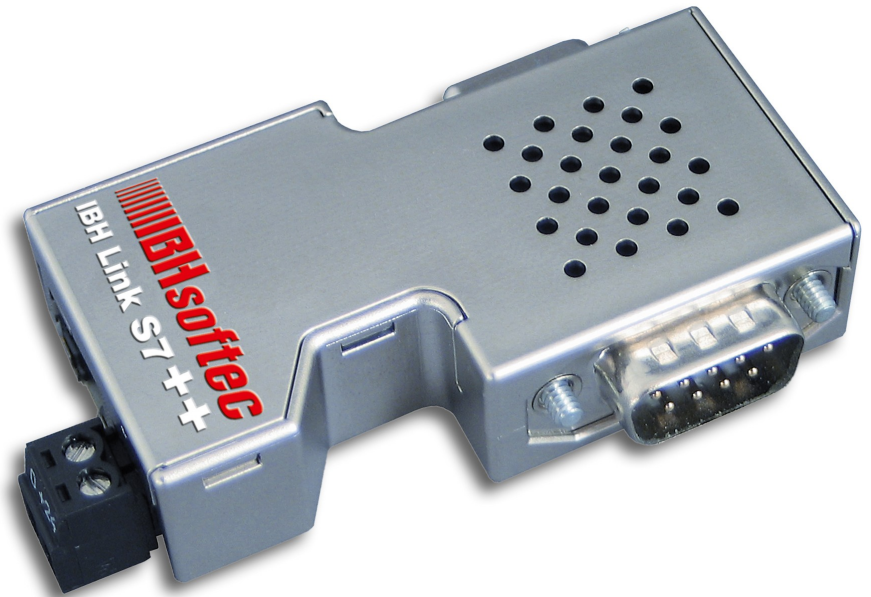


IBHLink S7++ Ethernet / MPI / PROFIBUS Gateway

PLC-PLC Communication

>>> Distribucion: **ER-Soft, S.A.** www.er-soft.com info@er-soft.com Tel: +34 916-408-408 <<<

IBH *softec*
Gesellschaft für
Automatisierungstechnik mbH
Turmstr. 77
D-64743 Beerfelden



Networking possibilities

(IBHLink S7++ without configuration)

- Ethernet to MPI / PROFIBUS
 - Connection to one PLC
 - Connection to multiple PLCs
 - over multiple Ethernet connections
 - over one Ethernet connection

- MPI / PROFIBUS to Ethernet
 - S7 Basic Communication
 - Configured S7 Connections

- Communication with
 - SFC 67/68 (X_GET / X_PUT)
 - FB/SFB 14/15 (GET / PUT)

Ethernet to MPI / PROFIBUS

- Connection to one PLC
 - IBHLink S7++ is directly connected to PLC



Ethernet to MPI / PROFIBUS

Configuration with
S7 Connection (unspecified)

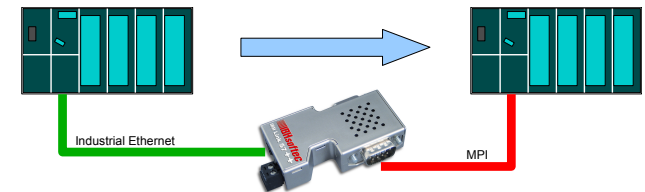
Data exchange using
FB/SFB 14/15
(GET/PUT)

Eigenschaften - S7-Verbindung		
Allgemein Statusinformationen		
Lokaler Verbindungsendpunkt		
<input type="checkbox"/> Fest projektierte dynamische Verbindung		
<input checked="" type="checkbox"/> Einseitig		
<input checked="" type="checkbox"/> Aktiver Verbindungsaufbau		
<input type="checkbox"/> Betriebszustandsmeldungen senden		
Bausteinparameter		
Lokale ID (Hex):	W#16#1	
1	ID	
Vorgabe		
Verbindungsweg		
	Lokal	Partner
Endpunkt:	IM153/ IM151-8 PN/DP CPU	MPI-Adr. 12
Schnittstelle:	IM151-8 PN/DP CPU, PN-IO-1(R0/S;)	unbekannt
Subnetz:	Ethernet(2) [Industrial Ethernet]	[Industrial Ethernet]
Adresse:	192.168.0.244	192.168.0.24
Adressendetails...		

IP address
IBHLink S7++

Adressendetails	
Lokal	Partner
Endpunkt:	MPI-Adr. 12
IM153/ IM151-8 PN/DP CPU	
Rack / Steckplatz:	0 12
0 2	
Verbindungsressource (hex):	03
10	
TSAP:	03.0C
10.02	
S7-Subnetz-ID:	
00BD - 003D	

MPI address
Destination PLC



Ethernet to MPI / PROFIBUS

- Connection to one PLC
 - IBHLink S7++ is connected to PROFIBUS-CP



Ethernet to PROFIBUS

Configuration with
S7 Connection (unspecified)

Eigenschaften - S7-Verbindung

Allgemein | Statusinformationen

Lokaler Verbindungsendpunkt

Fest projektierte dynamische Verbindung

Einseitig

Aktiver Verbindungsaufbau

Betriebszustandsmeldungen senden

Bausteinparameter

Lokale ID (Hex): W#16#1

1

Vorgabe

Verbindungsweg

	Lokal	Partner
Endpunkt:	IM153/ IM151-8 PN/DP CPU	MPI-Adr. 12
Schnittstelle:	IM151-8 PN/DP CPU, PN-IO-1(R0/S;)	unbekannt
Subnetz:	Ethernet(2) [Industrial Ethernet]	[Industrial Ethernet]
Adresse:	192.168.0.244	192.168.0.24

Adressendetails...

OK Abbrechen Hilfe

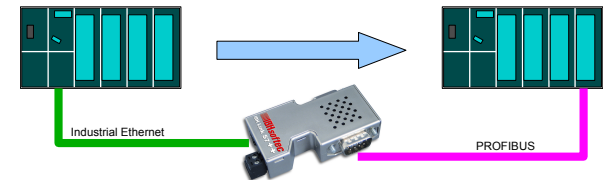
IP address
IBHLink S7++

Adressendetails

	Lokal	Partner
Endpunkt:	IM153/ IM151-8 PN/DP CPU	unbekannt
Rack / Steckplatz:	0 2	7 31
Verbindungsressource (hex):	10	03
TSAP:	10.02	03 FF
S7-Subnetz-ID:	00BD - 003D	.

OK Abbrechen Hilfe

Identifier:
„IBHLink Routing“



Ethernet to PROFIBUS

Connection initialization by calling FB/SFB 15 (PUT)
handover of the connection parameters (UDT68)

```
CALL FB 15 , DB15
REQ :=M100.3
ID :=W#16#1
DONE :=M101.1
ERROR :=M101.2
STATUS:=MW2
ADDR_1:=P#DB65535.DBX 224.0 BYTE 8
SD_1 :="PLC_CONNECTION_RECORDS".Connection[0] P#DB100.DBX0.0
```

UDT68:

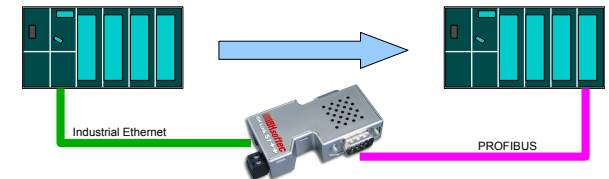
Adresse	Name	Typ	Anfangswert	Kommentar
0.0		STRUCT		
+0.0	bIpAddr	ARRAY[0..3]		IP-Address
+1.0		BYTE		
+4.0	bMpiAdr	BYTE	B#16#0	MPI-Address
+5.0	bRack	BYTE	B#16#0	CPU Rack [0..7]
+6.0	bSlot	BYTE	B#16#0	CPU Slot [0..31]
+7.0	bReserved	BYTE	B#16#0	reserved
=8.0		END_STRUCT		

IP address
irrelevant

MPI address
PROFIBUS-CP

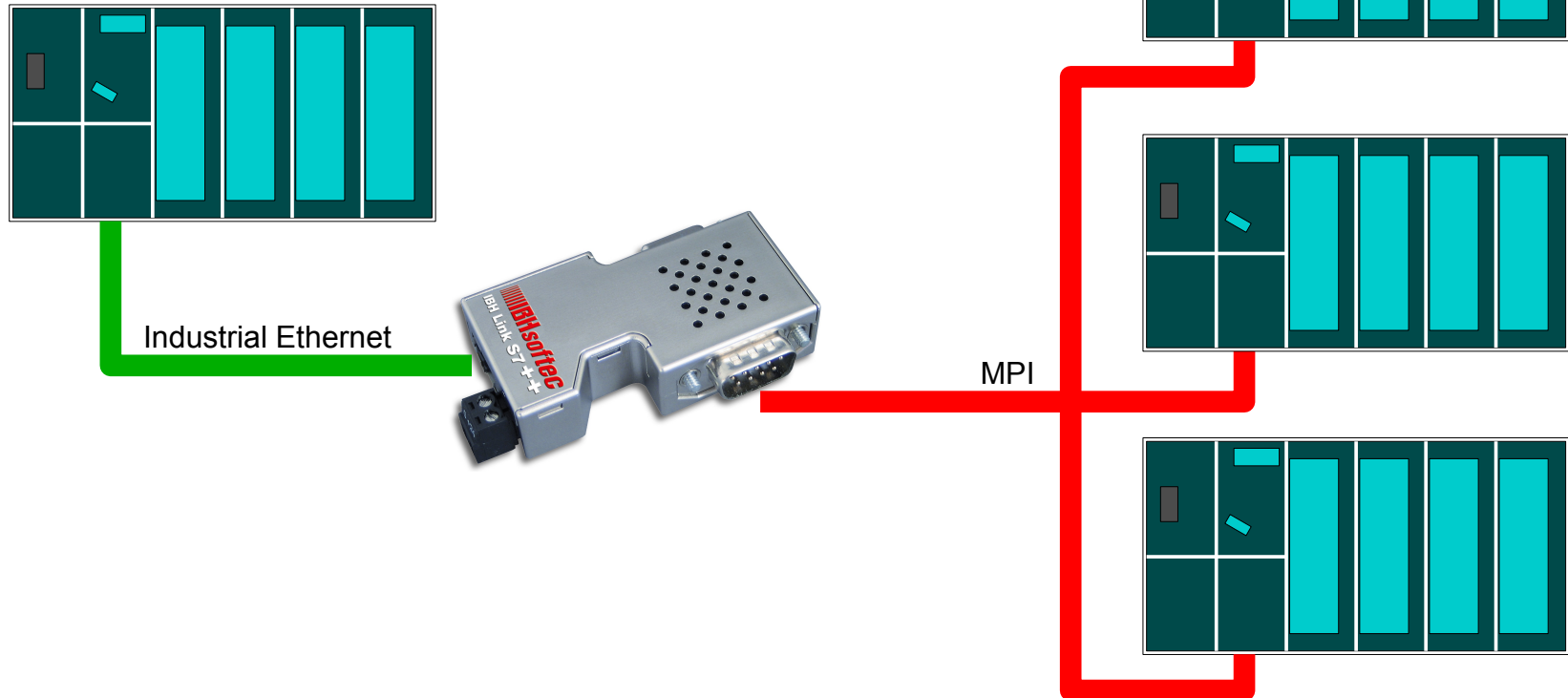
Rack/Slot
Destination PLC

Further data exchange via
FB/SFB 14/15 (GET/PUT)



Ethernet to MPI / PROFIBUS

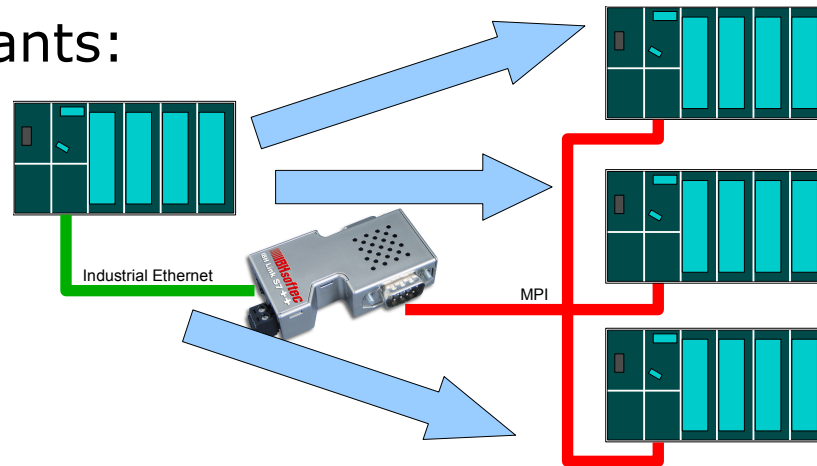
- Connection to multiple PLCs
 - IBHLink S7++ is connected directly to PLC



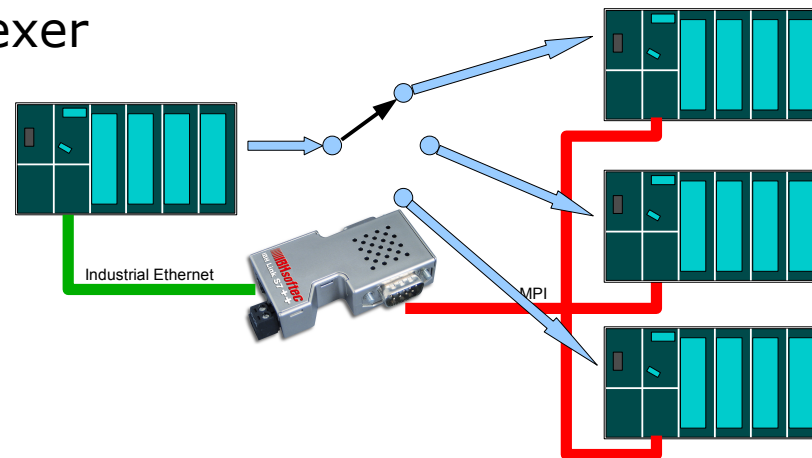
Ethernet to MPI / PROFIBUS

- Multiple connection variants:

- Variant 1:
parallel connections



- Variant 2:
IBHLink S7++ as multiplexer

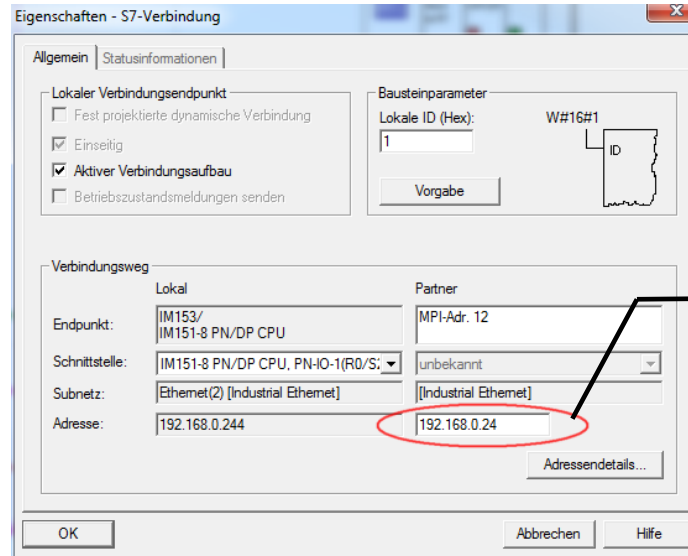


Ethernet to MPI / PROFIBUS

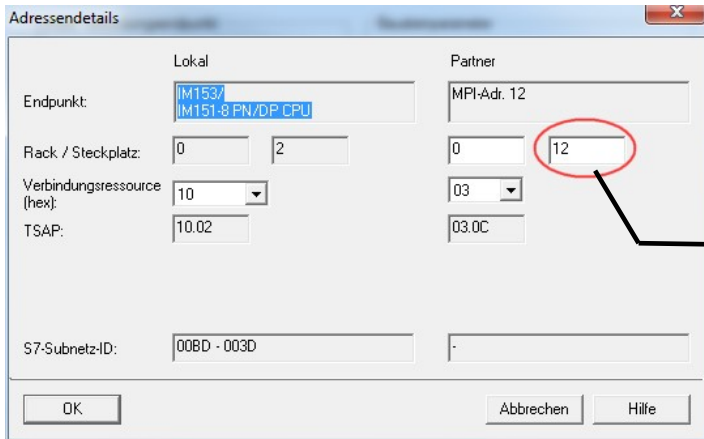
Variant 1

parallel connections

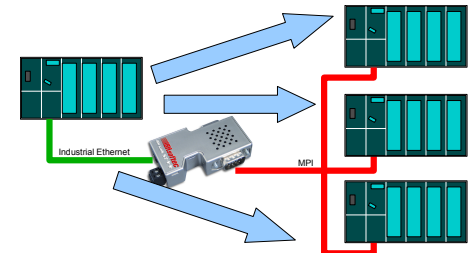
- Configuration with S7 Connection (unspec.)
- Data exchange via FB/SFB 14/15 (GET/PUT)



IP address
IBHLink S7++



MPI address
Destination PLC



Ethernet to MPI / PROFIBUS

Variant 2

Configuration with
S7 Connection (unspecified)

Eigenschaften - S7-Verbindung

Allgemein | Statusinformationen

Lokaler Verbindungsendpunkt

Fest projektierte dynamische Verbindung

Einseitig

Aktiver Verbindungsaufbau

Betriebszustandsmeldungen senden

Bausteinparameter

Lokale ID (Hex): W#16#1

1

Vorgabe

Verbindungsweg

	Lokal	Partner
Endpunkt:	IM153/ IM151-8 PN/DP CPU	MPI-Adr. 12
Schnittstelle:	IM151-8 PN/DP CPU, PN-IO-1(R0/S;)	unbekannt
Subnetz:	Ethernet(2) [Industrial Ethernet]	[Industrial Ethernet]
Adresse:	192.168.0.244	192.168.0.24

Adressendetails...

OK Abbrechen Hilfe

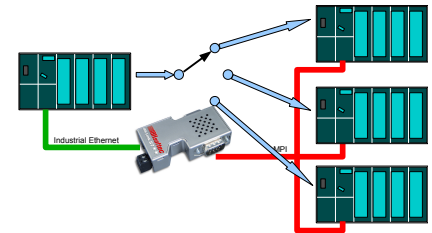
IP address
IBHLink S7++

Adressendetails

	Lokal	Partner
Endpunkt:	IM153/ IM151-8 PN/DP CPU	unbekannt
Rack / Steckplatz:	0 2	7 31
Verbindungsressource (hex):	10	03
TSAP:	10.02	03 FF
S7-Subnetz-ID:	00BD - 003D	.

OK Abbrechen Hilfe

Identifer:
„IBHLink Routing“



Ethernet to MPI / PROFIBUS

Variant 2

Connection selection by calling FB/SFB 15 (PUT)
handover of the connection parameters (UDT68)

```
CALL FB 15 , DB15
REQ :=M100.3
ID :=W#16#1
DONE :=M101.1
ERROR :=M101.2
STATUS:=MW2
ADDR_1:=P#DB65535.DBX 224.0 BYTE 8
SD_1 :="PLC_CONNECTION_RECORDS".Connection[0] P#DB100.DBX0.0
```

IP address
irrelevant

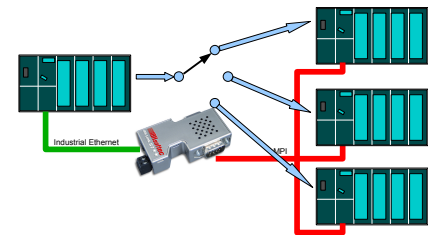
MPI address
Destination PLC

Rack/Slot
Destination PLC

UDT68:

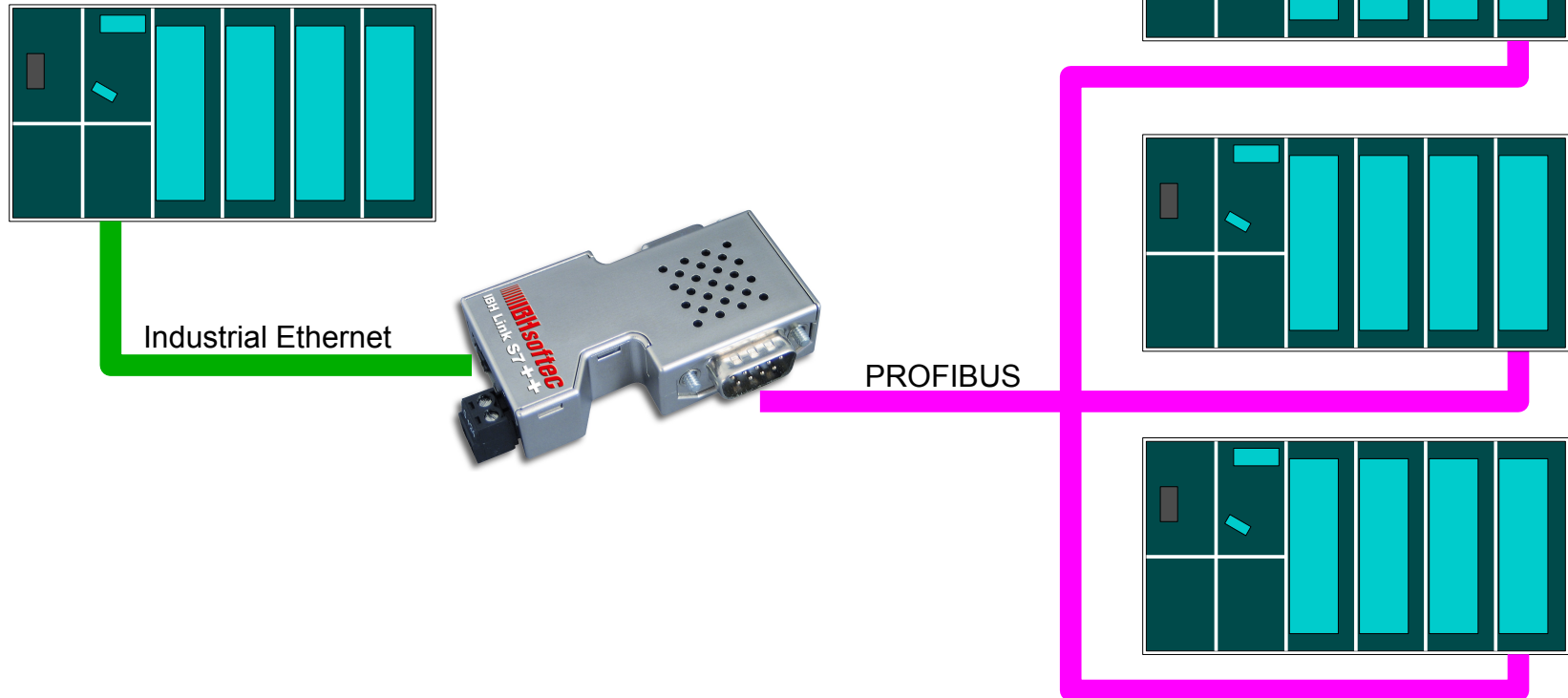
Adresse	Name	Typ	Anfangswert	Kommentar
0.0		STRUCT		
+0.0	bIpAddr	ARRAY[0..3]		IP-Address
+1.0		BYTE		
+4.0	bMpiAdr	BYTE	B#16#0	MPI-Address
+5.0	bRack	BYTE	B#16#0	CPU Rack [0..7]
+6.0	bSlot	BYTE	B#16#0	CPU Slot [0..31]
+7.0	bReserved	BYTE	B#16#0	reserved
=8.0		END_STRUCT		

further data exchange via
FB/SFB 14/15 (GET/PUT)



Ethernet to MPI / PROFIBUS

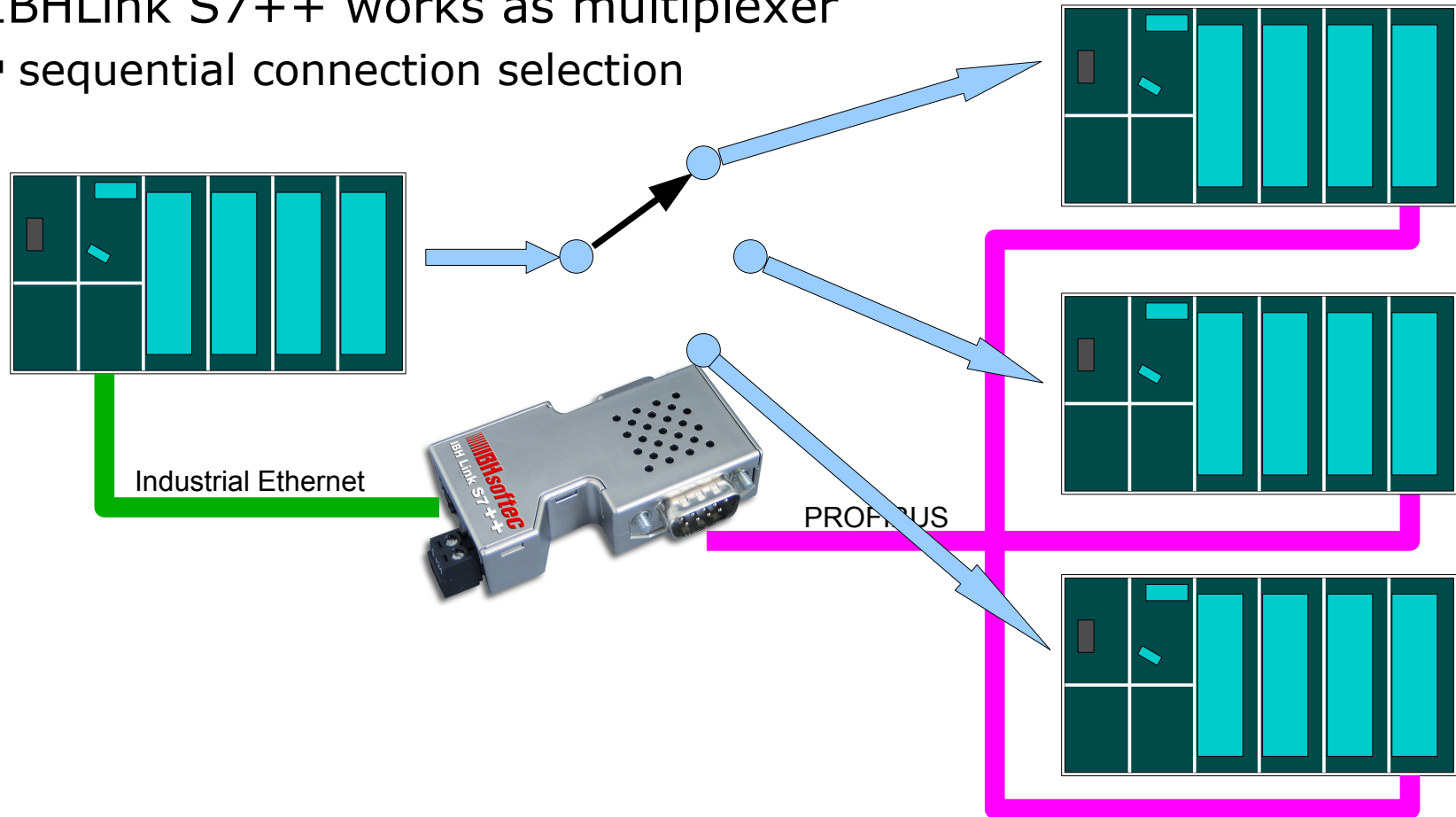
- Connection to multiple PLCs
 - IBHLink S7++ connected to PROFIBUS-CP



Ethernet to MPI / PROFIBUS

IBHLink S7++ works as multiplexer

- sequential connection selection



Ethernet to MPI / PROFIBUS

Configuration with
S7 Connection (unspecified)

Eigenschaften - S7-Verbindung

Allgemein | Statusinformationen

Lokaler Verbindungsendpunkt

Fest projektierte dynamische Verbindung

Einseitig

Aktiver Verbindungsaufbau

Betriebszustandsmeldungen senden

Bausteinparameter

Lokale ID (Hex): W#16#1

1

Vorgabe

Verbindungsweg

	Lokal	Partner
Endpunkt:	IM153/ IM151-8 PN/DP CPU	MPI-Adr. 12
Schnittstelle:	IM151-8 PN/DP CPU, PN-IO-1(R0/S;)	unbekannt
Subnetz:	Ethernet(2) [Industrial Ethernet]	[Industrial Ethernet]
Adresse:	192.168.0.244	192.168.0.24

Adressendetails...

OK Abbrechen Hilfe

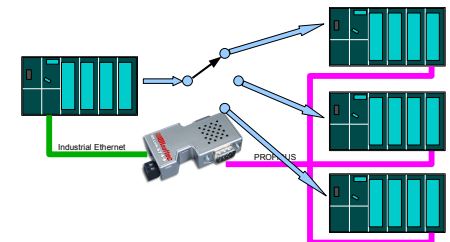
IP address
IBHLink S7++

Adressendetails

	Lokal	Partner
Endpunkt:	IM153/ IM151-8 PN/DP CPU	unbekannt
Rack / Steckplatz:	0 2	7 31
Verbindungsressource (hex):	10	03
TSAP:	10.02	03 FF
S7-Subnetz-ID:	00BD - 003D	.

OK Abbrechen Hilfe

Identifer:
„IBHLink Routing“



Ethernet to MPI / PROFIBUS

Connection selection by calling FB/SFB 15 (PUT)
handover of the connection parameters (UDT68)

```
CALL FB 15 , DB15
REQ :=M100.3
ID :=W#16#1
DONE :=M101.1
ERROR :=M101.2
STATUS:=MW2
ADDR_1:=P#DB65535.DBX 224.0 BYTE 8
SD_1 :="PLC_CONNECTION_RECORDS".Connection[0] P#DB100.DBX0.0
```

UDT68:

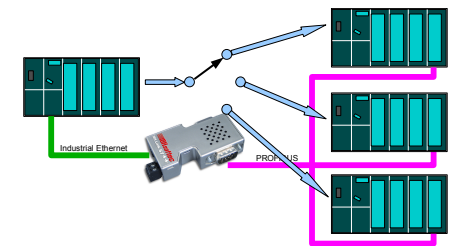
Adresse	Name	Typ	Anfangswert	Kommentar
0.0		STRUCT		
+0.0	bIpAddr	ARRAY[0..3]		IP-Address
+1.0		BYTE		
+4.0	bMpiAdr	BYTE	B#16#0	MPI-Address
+5.0	bRack	BYTE	B#16#0	CPU Rack [0..7]
+6.0	bSlot	BYTE	B#16#0	CPU Slot [0..31]
+7.0	bReserved	BYTE	B#16#0	reserved
=8.0		END_STRUCT		

IP address
irrelevant

MPI address
Destination PLC

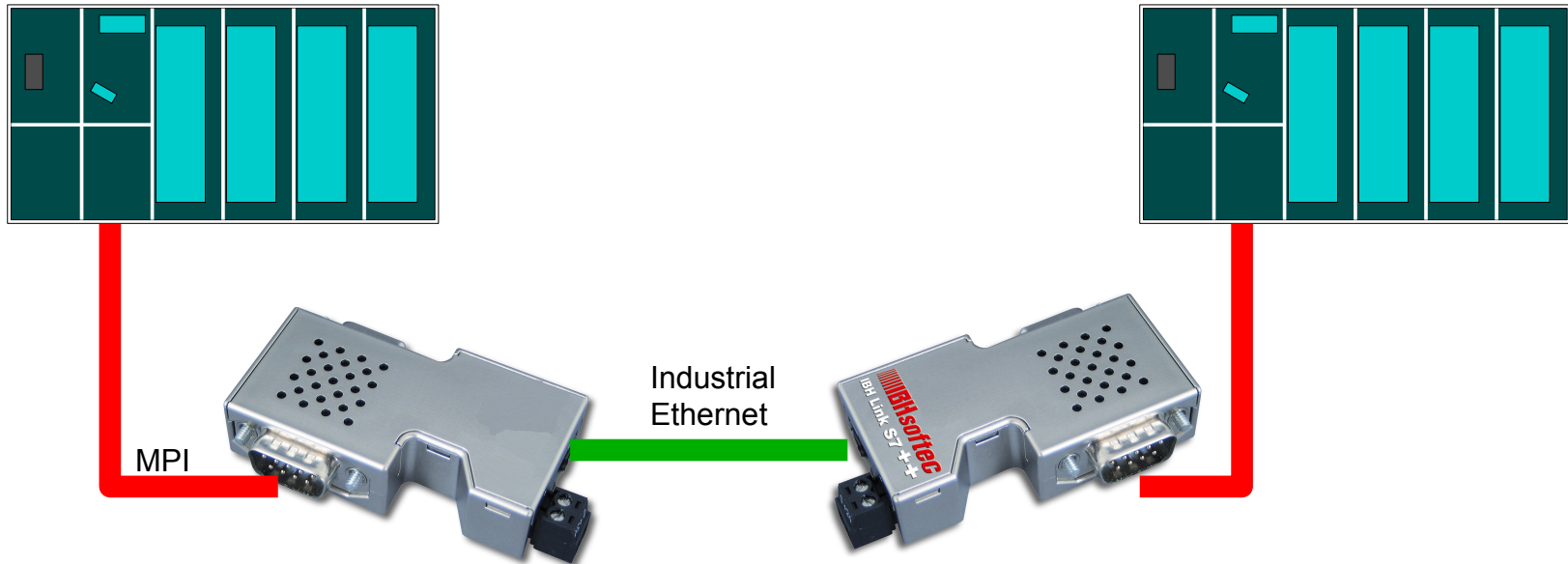
Rack/Slot
Destination PLC

further data exchange via
FB/SFB 14/15 (GET/PUT)



MPI to MPI over Ethernet

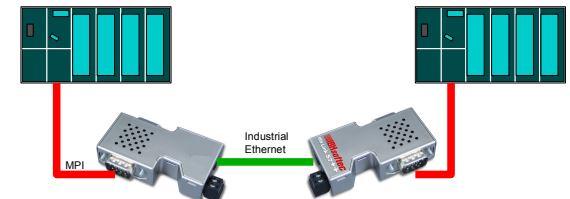
- Connection from MPI / PROFIBUS to MPI / PROFIBUS over Ethernet



MPI to MPI over Ethernet

Communication depending on PLC resources via:

- SFC 67 / 68 (X_GET / X_PUT) (S7 Basic Communication / MPI)
 - No connection configuration necessary
 - Example project using FB 67 / 68 available from IBHsoftec.
- FB 14/15 (GET / PUT) or
- SFB 14/15 (GET / PUT) (S7 Communication / PROFIBUS)
 - Connection configuration with NetPro necessary.



MPI to MPI over Ethernet

Variant 1 (S7 Basic Communication)

Blocks used in example: FB 67 / 68 (XGET_IBH / XPUT_IBH)

Connection
Index of UDT68 in Connection DB

DB number
DB containing connection data (UDT68)

MPI address
Source IBHLink S7++

```
CALL "XGET_IBH" , "DB_XGET_IBH"
REQ      :=M5.1
DEST_ID  :=0
DB_PARA  :=100
IBHLINK_ADDR:=B#16#8
SRC_ADDR :=P#DB20.DBX0.0 BYTE 50
DST_ADDR :=P#DB20.DBX0.0 BYTE 50
RESULT   :=#Result
BUSY     :=#Busy
```

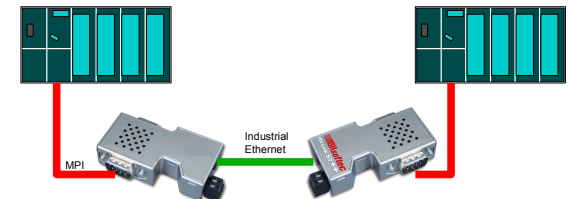
IP address
Destination IBHLink

MPI address
Destination PLC

Rack/Slot
When using MPI: 0

UDT68:

Adresse	Name	Typ	Anfangswert	Kommentar
0.0		STRUCT		
+0.0	bIpAddr	ARRAY[0..3]		IP-Address
+1.0		BYTE		
+4.0	bMpiAdr	BYTE	B#16#0	MPI-Address
+5.0	bRack	BYTE	B#16#0	CPU Rack [0..7]
+6.0	bSlot	BYTE	B#16#0	CPU Slot [0..31]
+7.0	bReserved	BYTE	B#16#0	reserved
=8.0		END_STRUCT		



MPI to MPI over Ethernet

Variant 2 (S7 Communication)

Configuration with
S7 Connection (unspecified)

Eigenschaften - S7-Verbindung

Allgemein | Statusinformationen

Lokaler Verbindungsendpunkt

Fest projektierte dynamische Verbindung

Einseitig

Aktiver Verbindungsaufbau

Betriebszustandsmeldungen senden

Bausteinparameter

Lokale ID (Hex): 1

Vorgabe

Verbindungsweg

	Lokal	Partner
Endpunkt:	SIMATIC 400(1)/CPU 414-2 DP	unspezifiziert
Schnittstelle:	CPU 414-2 DP, MPI/DP(R0/S2)	unspezifiziert
Subnetz:	MPI(CPU414-2DP) [MPI]	[MPI]
Adresse:	2	8

Adressendetails...

OK Abbrechen Hilfe

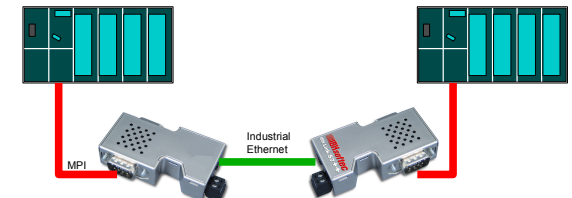
MPI address
Source IBHLink

Adressendetails

	Lokal	Partner
Endpunkt:	SIMATIC 400(1)/CPU 414-2 DP	unspezifiziert
Rack / Steckplatz:	0 2	0 0
Verbindungsressource (hex):	10	03
TSAP:	10.02	03.00
S7-Subnetz-ID:	00C7 - 0047	-

OK Abbrechen Hilfe

irrelevant



MPI to MPI over Ethernet

Variant 2 (S7 Communication)

Connection initialization by calling FB/SFB 15 (PUT)
handover of the connection parameters (UDT68)

```
CALL FB 15, DB15
REQ :=M100.3
ID :=W#16#1
DONE :=M101.1
ERROR :=M101.2
STATUS:=MW2
ADDR_1:=P#DB65535.DBX 224.0 BYTE 8
SD_1 :="PLC_CONNECTION_RECORDS".Connection[0] P#DB100.DBX0.0
```

IP address
Source IBHLink S7++

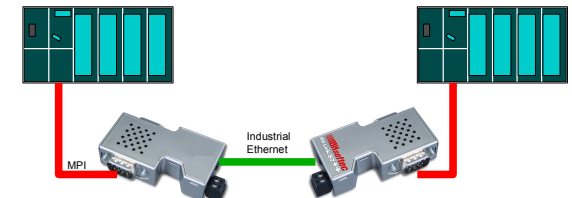
MPI address
Destination PLC

Rack/Slot
When using MPI: 0

UDT68:

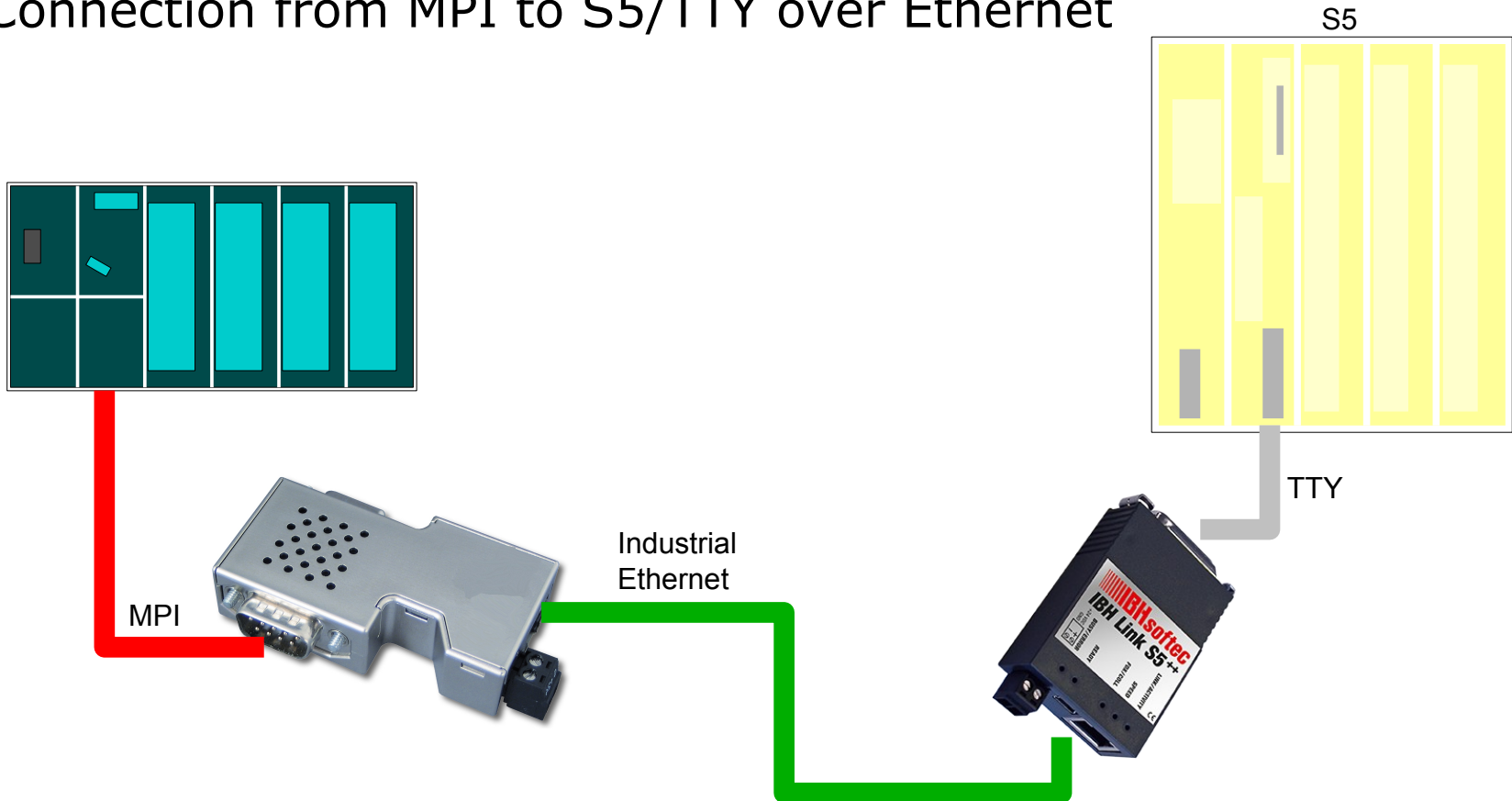
Adresse	Name	Typ	Anfangswert	Kommentar
0.0		STRUCT		
+0.0	bIpAddr	ARRAY[0..3]		IP-Address
+1.0		BYTE		
+4.0	bMpiAdr	BYTE	B#16#0	MPI-Address
+5.0	bRack	BYTE	B#16#0	CPU Rack [0..7]
+6.0	bSlot	BYTE	B#16#0	CPU Slot [0..31]
+7.0	bReserved	BYTE	B#16#0	reserved
=8.0		END_STRUCT		

further data exchange via
FB/SFB 14/15 (GET/PUT)



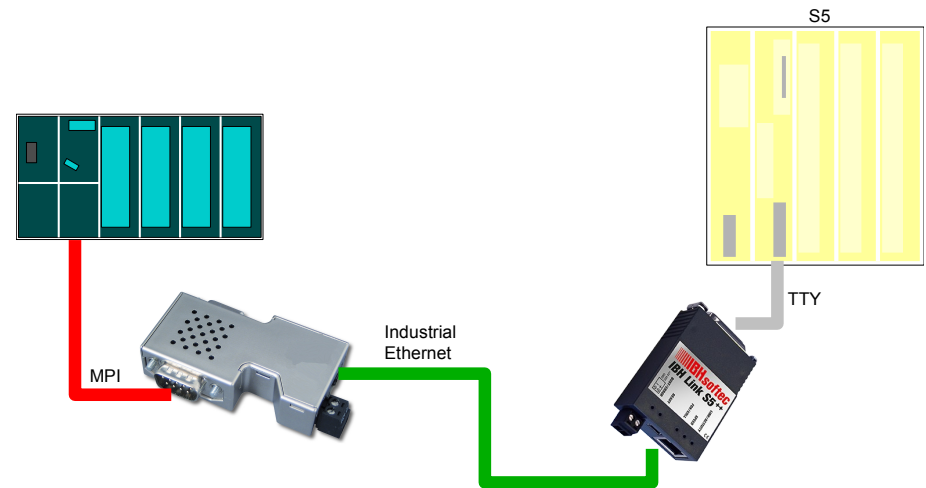
MPI to S5 over Ethernet

- Connection from MPI to S5/TTY over Ethernet



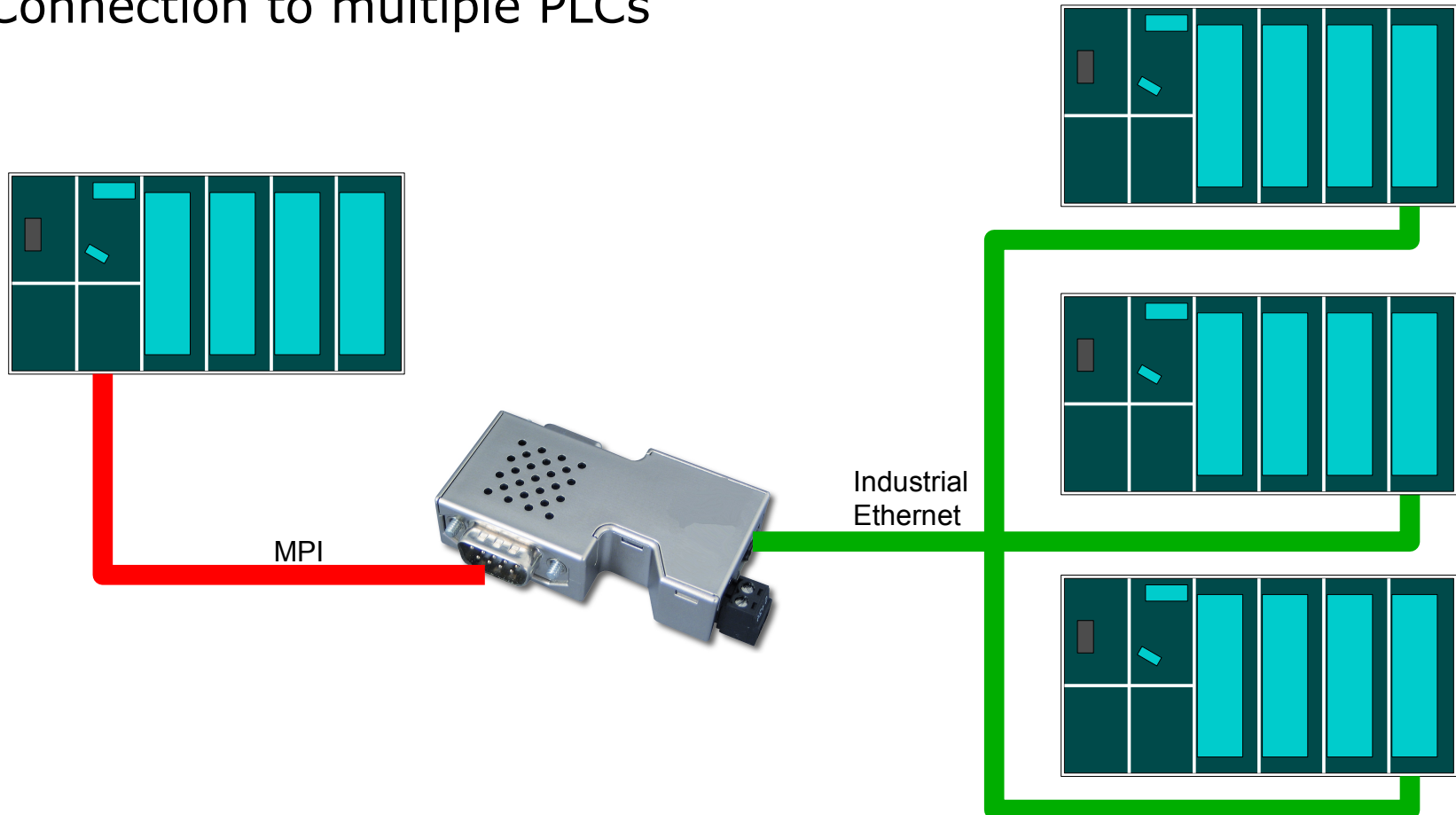
MPI to S5 over Ethernet

- IBHLink S5++ allows communication over S7 protocol
 - Connection initialization as described for connection S7 – S7
 - Parameters:
 - Destination IP address: IP of IBHLink S5++
 - Destination MPI address: 2
 - Destination Rack: 0
 - Destination Slot: 0



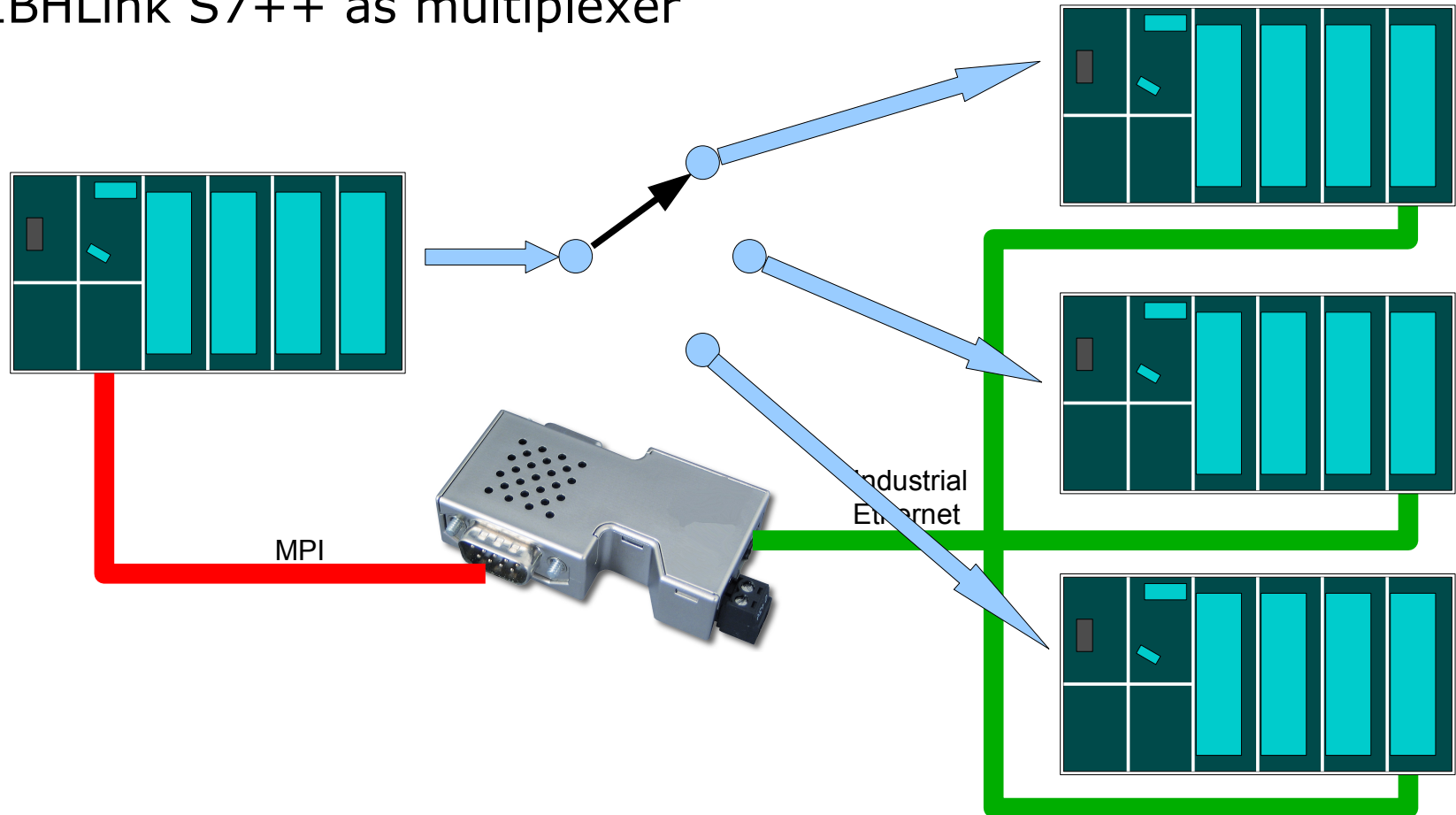
MPI / PROFIBUS to Ethernet

- Connection to multiple PLCs



MPI / PROFIBUS to Ethernet

- IBHLink S7++ as multiplexer



MPI / PROFIBUS to Ethernet

Blocks used in example: FB 67 / 68 (XGET_IBH / XPUT_IBH)

Connection
Index of UDT68 in Connection DB

DB number
DB containing connection data (UDT68)

MPI address
Source IBHLink S7++

```
CALL "XGET_IBH" , "DB_XGET_IBH"
REQ      :=M5.1
DEST_ID  :=0
DB_PARA  :=100
IBHLINK_ADDR:=B#16#8
SRC_ADDR :=P#DB20.DBX0.0 BYTE 50
DST_ADDR :=P#DB20.DBX0.0 BYTE 50
RESULT   :=#Result
BUSY     :=#Busy
```

IP address
Destination PLC

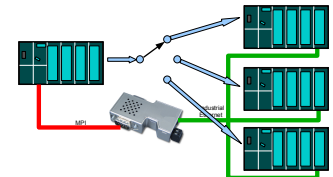
MPI address
Slot of Dest. PLC

Rack/Slot
always 0

UDT68:

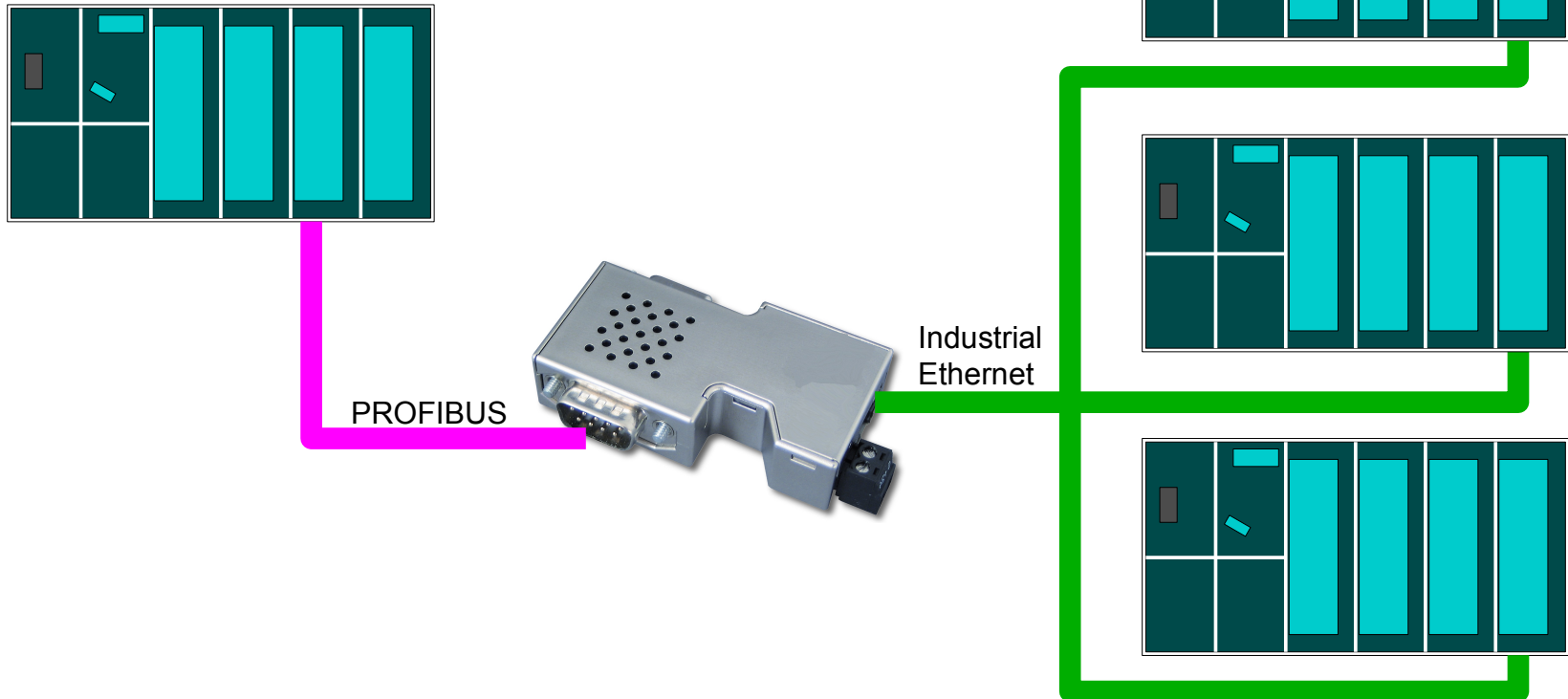
Adresse	Name	Typ	Anfangswert	Kommentar
0.0		STRUCT		
+0.0	bIpAddr	ARRAY[0..3]		IP-Address
+1.0		BYTE		
+4.0	bMpiAdr	BYTE	B#16#0	MPI-Address
+5.0	bRack	BYTE	B#16#0	CPU Rack [0..7]
+6.0	bSlot	BYTE	B#16#0	CPU Slot [0..31]
+7.0	bReserved	BYTE	B#16#0	reserved
=8.0		END_STRUCT		

Switching of connections by „DEST_ID“



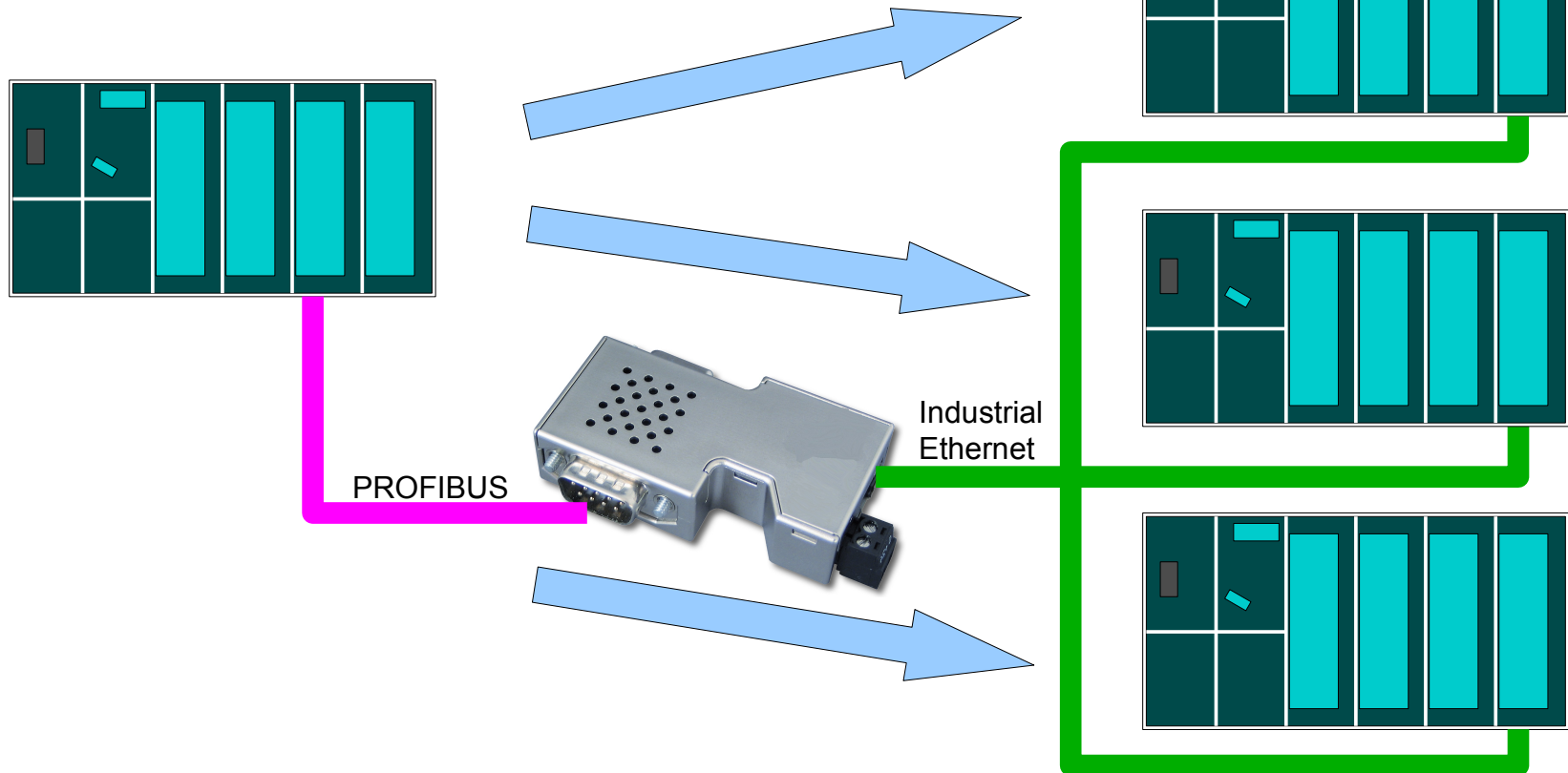
MPI / PROFIBUS to Ethernet

- Connection to multiple PLCs
 - IBHLink S7++ connected to PROFIBUS-CP



MPI / PROFIBUS to Ethernet

- Parallel connections
 - Configured with NetPro



MPI / PROFIBUS to Ethernet

Parallel connections

- Configuration with S7 Connections (unspecified)

Eigenschaften - S7-Verbindung

Allgemein | Statusinformationen

Lokaler Verbindungsendpunkt

Fest projektierte dynamische Verbindung

Einseitig

Aktiver Verbindungsaufbau

Betriebszustandsmeldungen senden

Bausteinparameter

Lokale ID (Hex): 1

W#16#1

Vorgabe

Verbindungsweg

	Lokal	Partner
Endpunkt:	SIMATIC 400(1)/CPU 414-2 DP	unspezifiziert
Schnittstelle:	CPU 414-2 DP, MPI/DP(R0/S2)	unspezifiziert
Subnetz:	MPI(CPU414-2DP) [MPI]	[MPI]
Adresse:	2	8

Adressendetails...

OK Abbrechen Hilfe

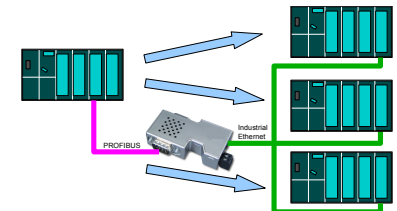
MPI address
IBHLink S7++

Adressendetails

	Lokal	Partner
Endpunkt:	SIMATIC 400(1)/CPU 414-2 DP	unspezifiziert
Rack / Steckplatz:	0	0
Verbindungsressource (hex):	10	03
TSAP:	10.02	03.00
S7-Subnetz-ID:	00C7 - 0047	-

OK Abbrechen Hilfe

irrelevant



MPI / PROFIBUS to Ethernet

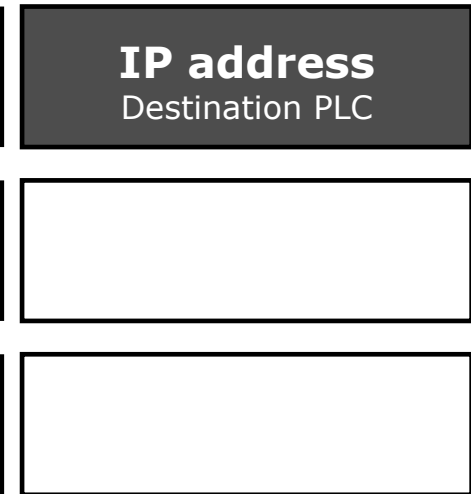
Connection initialization by calling FB/SFB 15 (PUT)
handover of the connection parameters (UDT68)

```

CALL FB 15 , DB15
REQ :=M100.3
ID :=W#16#1
DONE :=M101.1
ERROR :=M101.2
STATUS:=MW2
ADDR_1:=P#DB65535.DBX 224.0 BYTE 8
SD_1 :="PLC_CONNECTION_RECORDS".Connection[0] P#DB100.DBX0.0
    
```

UDT68:

Adresse	Name	Typ	Anfangswert	Kommentar
0.0		STRUCT		
+0.0	bIpAddr	ARRAY[0..3]		IP-Address
+1.0		BYTE		
+4.0	bMpiAdr	BYTE	B#16#0	MPI-Address
+5.0	bRack	BYTE	B#16#0	CPU Rack [0..7]
+6.0	bSlot	BYTE	B#16#0	CPU Slot [0..31]
+7.0	bReserved	BYTE	B#16#0	reserved
=8.0		END_STRUCT		



further data exchange via
FB/SFB 14/15 (GET/PUT)

