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 <<<

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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)

IP address
IBHLink S7++

MPI address
Destination PLC

08.07.11 | IBH softec GmbH | Daniel Trautmann | 4
Ethernet to MPI / PROFIBUS

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

Configuration with S7 Connection (unspecified)

Identifier: “IBHLink Routing”

IP address IBHLink S7++
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 := #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]
= DB100.DB0.0

UDT68:

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

IP address irrelevant

MPI address PROFIBUS-CP

Rack/Slot Destination PLC
Ethernet to MPI / PROFIBUS

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

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Industrielle Ethernet

MPI
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)

MPI address
Destination PLC

IP address
IBHLink S7++
Ethernet to MPI / PROFIBUS
Variant 2

Configuration with S7 Connection (unspecified)

Identifier: „IBHLink Routing“

IP address
IBHLink S7++
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 := #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]
#DB100.DBX0.0

UDT68:

<table>
<thead>
<tr>
<th>Adresse</th>
<th>Name</th>
<th>Typ</th>
<th>Anfangswert</th>
<th>Kommentar</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0</td>
<td>STRUCT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+0.0</td>
<td>bIPAddr</td>
<td>ARRAY</td>
<td></td>
<td>IP-Address</td>
</tr>
<tr>
<td>+1.0</td>
<td></td>
<td>BYTE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>+4.0</td>
<td>bMPIAddr</td>
<td>BYTE</td>
<td>B#16#0</td>
<td>MPI-Address</td>
</tr>
<tr>
<td>+5.0</td>
<td></td>
<td>BYTE</td>
<td>B#16#0</td>
<td>CPU Rack [0..7]</td>
</tr>
<tr>
<td>+6.0</td>
<td>bSlot</td>
<td>BYTE</td>
<td>B#16#0</td>
<td>CPU Slot [0..1]</td>
</tr>
<tr>
<td>+7.0</td>
<td>bReserved</td>
<td>BYTE</td>
<td>B#16#0</td>
<td>reserved</td>
</tr>
<tr>
<td>+8.0</td>
<td>END_STRUCT</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

IP address irrelevant
MPI address Destination PLC
Rack/Slot Destination PLC
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)

Identifier: "IBHLink Routing"

IP address IBHLink S7++
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 := #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] # DB100.DBX0.0

UDT68:

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)

CALL "XGET_IBH", "DB_XGET_IBH"
REQ :=M5.1
DEST_ID :=0
DB_PARA :=100
IBHLINK_ADDR:=B16#8
SOURCE_ADDR :=P#DB20.DBX0.0 BYTE 50
DEST_ADDR :=P#DB20.DBX0.0 BYTE 50
RESULT :=#Result
BUSY :=#Busy

UDT68:

<table>
<thead>
<tr>
<th>Address</th>
<th>Name</th>
<th>Type</th>
<th>Start Value</th>
<th>Comment</th>
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<td>MPI-Address</td>
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<td>3.0</td>
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<td>BYTE</td>
<td>#16#0</td>
<td>CPU Slot [0..31]</td>
</tr>
<tr>
<td>7.0</td>
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<td>BYTE</td>
<td>#16#0</td>
<td>reserved</td>
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<tr>
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<td>RND type</td>
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<td>N/A</td>
<td>N/A</td>
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</table>
MPI to MPI over Ethernet
Variant 2 (S7 Communication)

Configuration with S7 Connection (unspecified)
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 := #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]
#DB100.DBX0.0

"Verbindung wählen"
UDT68

IP address
Source IBHLink S7++

MPI address
Destination PLC

Rack/Slot
When using MPI: 0

UDT68:

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>0.0</td>
<td>STRUCT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>bIPAddr</td>
<td>ARRAY[0..3]</td>
<td></td>
<td>IP-Address</td>
</tr>
<tr>
<td>+1.0</td>
<td>BYTE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+4.0</td>
<td>bMPIAddr</td>
<td>BYTE</td>
<td>#16#0</td>
<td>MPI-Address</td>
</tr>
<tr>
<td>+5.0</td>
<td>dRack</td>
<td>BYTE</td>
<td>#16#0</td>
<td>CPU Rack [0..7]</td>
</tr>
<tr>
<td>+6.0</td>
<td>dSlot</td>
<td>BYTE</td>
<td>#16#0</td>
<td>CPU Slot [0..9]</td>
</tr>
<tr>
<td>+7.0</td>
<td>bReserved</td>
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<td>#16#0</td>
<td>reserved</td>
</tr>
<tr>
<td>=8.0</td>
<td>END_STRUCT</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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++

**IP address**
Destination PLC

**MPI address**
Slot of Dest. PLC

**Rack/Slot**
always 0

UDT68:

Switching of connections by „DEST_ID“

```
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
```
MPI / PROFIBUS to Ethernet

- Connection to multiple PLCs
  - IBHLink S7++ connected to PROFIBUS-CP
MPI / PROFIBUS to Ethernet

- Parallel connections
  - Configurated with NetPro
MPI / PROFIBUS to Ethernet

Parallel connections
- Configuration with S7 Connections (unspecified)

MPI address
IBHLink S7++
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 := #16#1
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STATUS := MW2
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SD_1 := "PLC_CONNECTION_RECORDS".Connection[0]
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"Verbindung wählen"

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<tr>
<td>+1.0</td>
<td></td>
<td>BYTE</td>
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further data exchange via FB/SFB 14/15 (GET/PUT)