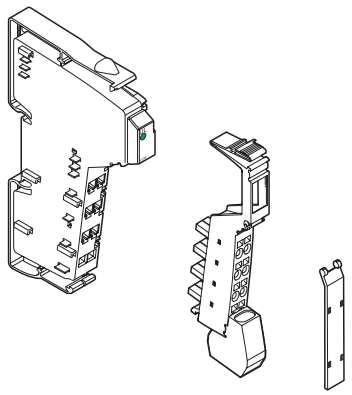
IB IL 24 FLM-PAC



Branch Terminal for Integrating a Fieldline Modular Local Bus in an Inline Station or for Local Bus Extension of an Inline Station

AUTOMATION

Data Sheet
7240_en_05

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1 Description

The terminal is designed for use within an Inline station.

This terminal can be used to implement two different tasks:

1. **Integration of a Fieldline Modular local bus in an Inline station**

This terminal can be used to integrate sensors and actuators in close proximity to the station, which are connected to the Fieldline Modular M8 or M12 local bus with IP65/67 protection, in your bus system.

2. **Local bus extension in combination with the IB IL 24 LSKIP (-PAC) Inline local bus extension terminal**

In combination with the IB IL 24 LSKIP (-PAC) terminal, this terminal can be used to extend an Inline station by one or more rows. The IB IL 24 FLM-PAC terminal is installed at the end of an Inline station row and the IB IL 24 LSKIP (-PAC) terminal at the beginning of the following row (see also data sheet for the IB IL 24 LSKIP (-PAC) terminal).

Features

- **When integrating a Fieldline Modular local bus**
  Conversion of the physical transmission method of the Inline local bus to the physical transmission method of the Fieldline Modular local bus
- **When used for local bus extension**
  Data transmission between the IB IL 24 FLM-PAC and IB IL 24 LSKIP (-PAC) terminals via the RS-422 protocol

This data sheet is only valid in association with the IL SYS INST UM E user manual or the Inline system manual for your bus system.

When connecting a Fieldline Modular local bus, please refer to the technical data for this product group. This can be found in the device-specific data sheets and in the user manuals.

When using the IB IL 24 LSKIP (-PAC) terminal, please observe the information in the terminal-specific data sheet.Make sure you always use the latest documentation.
It can be downloaded at www.phoenixcontact.net/catalog.

A conversion table is available on the Internet at
www.download.phoenixcontact.com/general/7000_en_00.pdf.

– General

NOTE:

Only use the branch terminal as the last terminal in an Inline station or as the last terminal of an Inline station row.

The data jumpers for the local bus are **not** available after the branch terminal. If terminals are snapped on after the branch terminal, the first INTERBUS device after the branch terminal indicates an interface error (D LED flashes at 4 Hz). In this case, change the Inline station so that the branch terminal is the last terminal in the station.

This terminal does not have a protocol chip and therefore is not a bus device.

The Inline system limits apply to the entire station regardless of the number of rows in the station.

2 Ordering Data

Product

Description	Type	Order No.	Pcs./Pck.
Branch terminal for integrating a Fieldline Modular local bus in an Inline station, complete with accessories (connector and labeling field)	IB IL 24 FLM-PAC	2736903	1

Accessories

Description	Type	Order No.	Pcs./Pck.
Inline segment terminal with fuse and diagnostics; complete with accessories (connector and labeling field)	IB IL 24 SEG/F-D-PAC	2861904	1
Fuse	SI 5x20 6,3 A T DIN 41662	2726104	1
Inline local bus extension terminal; complete with accessories (connectors and labeling fields)	IB IL 24 LSKIP (-PAC)	2897457	1
Standard remote bus cable for permanent installation	IBS RBC METER-T	2806286	Sold by the meter
Remote bus cable for flexible applications	IBS RBC METER/F-T	2723123	Sold by the meter

Documentation

Description	Type
"Automation Terminals of the Inline Product Range" user manual	IL SYS INST UM E
"Configuring and Installing the INTERBUS Inline Product Range" user manual	IB IL SYS PRO UM E
"Installation of Devices in the Fieldline Product Range" user manual	FLS FLM SYS INST UM E
"Inline Local Bus Extension Terminal" data sheet	DB EN IB IL 24 LSKIP (-PAC)

3 Technical Data

General Data	
Housing dimensions (width x height x depth; with connector)	12.2 mm x 134 mm x 72 mm
Weight (with connector)	43 g
Ambient temperature (operation)	-25°C to +55°C
Ambient temperature (operation/storage/transport)	-25°C to +85°C
Permissible humidity (storage/transport)	10% to 95%, according to EN 61131-2
Permissible air pressure (operation/storage/transport)	70 kPa to 106 kPa (up to 3000 m above sea level)
Degree of protection	IP20 according to IEC 60529
Protection class	Class 3 according to EN 61131-2, IEC 61131-2
Connection data for Inline connectors	
Connection method	Spring-cage terminals
Conductor cross-section	0.2 mm^2 to 1.5 mm^2 (solid or stranded), 24 - 16 AWG

Interfaces	
Local bus	Through data routing
Fieldline Modular M8 system	
Cable (common system cable for bus and supply)	2 x 2-pos., shielded twisted pair, plus common braided shield (e.g., type SAC-4P-950/..., Order No. 1543401)
Permissible cable cross-section	
- Bus	0.14 mm^2, minimum
- Voltage	0.34 mm^2, minimum
Maximum cable length	40 m
Fieldline Modular M12 system	
Bus cable	5-pos., shielded twisted pair, plus common braided shield (e.g., type IBS RBC METER/F-T, Order No. 1511491)
Supply cable	5-pos. (supply, e.g., type SAC-5P-100,0-186/0,75, Order No. 1535590)
Permissible cable cross-section	
- Bus	0.25 mm^2, minimum
- Supply	0.75 mm^2, minimum
Maximum cable length	20 m
In combination with the IB IL 24 LSKIP (-PAC) terminal	
Cable	Standard INTERBUS cable
Maximum cable length	20 m (total cable length between the first IB IL 24 FLM-PAC and the last IB IL 24 LSKIP (-PAC) of an Inline station)

Transmission Speed	
Can be used in Inline stations with the following transmission speed	500 kbps or 2 Mbps

Power Consumption	
Communications power U_L	7.5 V
Current consumption at U_L	110 mA
Power consumption at U_L	825 mW
Segment supply voltage U_S	24 V DC (nominal value)
Nominal current consumption at U_S	
Fieldline Modular M8 local bus	3 A, maximum (with supply via return line) 4 A, maximum (with simultaneous supply; 2 A, maximum each for forward and return line)
Fieldline Modular M12 local bus	4 A, maximum total (U_L and U_S); not relevant for separate supply to the first FLM device
Internal	55 mA, maximum

Supply of the Module Electronics and I/O Through Bus Coupler/Power Terminal	
Connection method	Through potential routing

Special Demands on the Voltage Supply

When installing a Fieldline Modular M8 system, insert a segment terminal with fuse and diagnostics directly before the IB IL 24 FLM-PAC terminal (see "Ordering Data" on page 2). The supply voltage for the Fieldline Modular system is thus protected and diagnostics can be performed for the supply voltage.

When installing a Fieldline Modular M12 system, supply the supply voltage U_{LS} separately at the first FLM device, if possible, in order to use the maximum permissible logic and sensor current of 4 A each for the FLM station.

Safety Equipment

Overload in local bus ring	Yes; by fuse in the preconnected IB IL 24 SEG/F-D-PAC segment terminal
Protection against polarity reversal	Yes; by protective elements in the preconnected IB IL 24 SEG/F-D-PAC segment terminal
Short-circuit protection	Yes; by fuse in the preconnected IB IL 24 SEG/F-D-PAC segment terminal

Electrical Isolation/Isolation of the Voltage Areas

Common Potentials

The 24 V main voltage, 24 V segment voltage, and GND have the same potential. FE is a separate potential area.

Separate Potentials in the System Consisting of Bus Coupler/Power Terminal and I/O Terminal

Test Distance	Test Voltage
Functional earth ground/Fieldline Modular M8 local bus	500 V AC, 50 Hz, 1 min.
Functional earth ground/Inline (7.5 V supply U_L)	500 V AC, 50 Hz, 1 min.
Inline (7.5 V supply U_L)/Fieldline Modular M8 local bus	500 V AC, 50 Hz, 1 min.

Error Messages to the Higher-Level Control or Computer System

Yes	Via preconnected IB IL 24 SEG/F-D-PAC segment terminal

Approvals

For the latest approvals, please visit www.phoenixcontact.net/catalog.

4 Local Diagnostic Indicator and Terminal Point Assignment

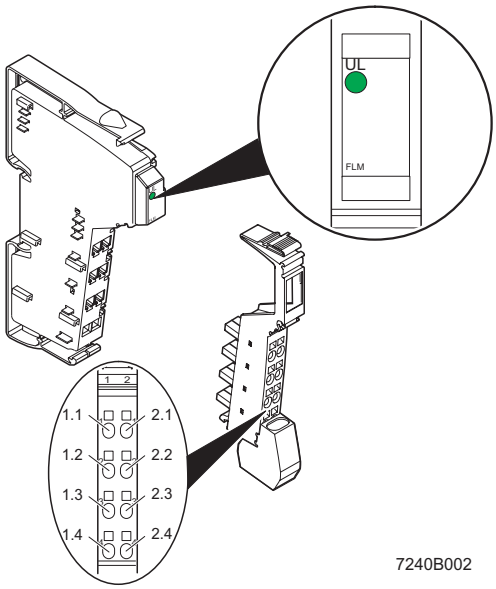


Figure 1 IB IL 24 FLM-PAC terminal

4.1 Local Diagnostic Indicator

Designation	Color	
UL	green	Communications power present

4.2 Function Identification

Orange

4.3 Terminal Point Assignment

Terminal Point	Assignment	Conductor Color for the Connection of		
		M8	M12*	LSKIP*
Forward Line, Local Bus				
1.1	/DO	Pin 4 green	Pin 2 green	green
2.1	DO	Pin 2 yellow	Pin 1 yellow	yellow
Return Line, Local Bus				
1.2	/DI	Pin 4 green	Pin 4 pink	pink
2.2	DI	Pin 2 yellow	Pin 3 gray	gray
1.3	GND (FLM)		Pin 5 brown	brown
2.3	Not used			
1.4	Shield connection			
2.4	Shield connection			

* Phoenix Contact recommends using the INTERBUS standard cable to connect Fieldline Modular M12 or for local bus extension in combination with an IB IL 24 LSKIP (-PAC) terminal. For a detailed description of the assignment, please refer to the documentation for Fieldline Modular or the data sheet for the IB IL 24 LSKIP (-PAC) terminal.

5 Internal Basic Circuit Diagram

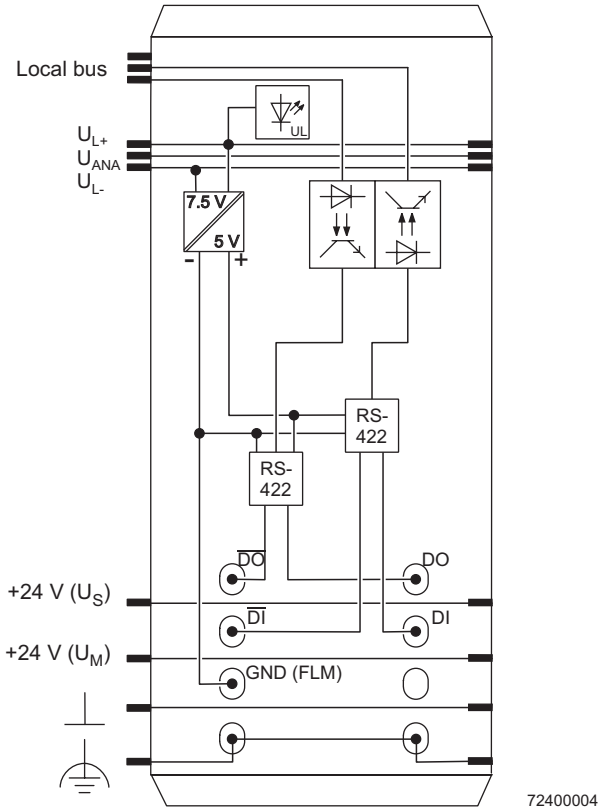


Figure 2 Internal wiring of the terminal points

Key:

DC/DC converter with electrical isolation

LED with details of the indicator designation (UL; see page 5)

Optocoupler

RS-422 interface

Other symbols used are explained in the IL SYS INST UM E user manual or in the system manual for your bus system.

6 Installation Notes

Only use the branch terminal as the last terminal in an Inline station or as the last terminal of an Inline station row (see also page 8).

In combination with Fieldline Modular M8:

– The maximum cable length within a branch is 40 m.

In combination with Fieldline Modular M12:

– The maximum cable length within a branch is 20 m.

In combination with Fieldline Modular M8 or M12:

– The maximum number of devices in a branch is 16.

– The maximum number of devices in an Inline station including the connected Fieldline Modular devices is 63. Only bus devices are counted (e.g., the branch terminal is not a bus device).

In combination with a local bus extension terminal or with several local bus extension terminals:

– The total length of all cables between the first IB IL 24 FLM-PAC and last IB IL 24 LSKIP (-PAC) within an Inline station must not exceed a maximum of 20 m.

7 Connection Notes

When integrating a Fieldline Modular M8 local bus in an Inline station:

To supply the FLM M8 system, insert a segment terminal with fuse and diagnostics directly before the IB IL 24 FLM-PAC terminal (see "Ordering Data" on page 2).

IB IL 24 SEG/F-D-PAC terminal point assignment

Terminal Point	Assignment	Conductor Color	Connection of M8
1.1, 2.1	+24 V U_S	red	Pin 1
1.2, 2.2	+24 V U_M		
1.3, 2.3	GND	blue	Pin 3
1.4, 2.4	FE		

When integrating a Fieldline Modular M12 local bus in an Inline station:

Supply the supply voltage U_{LS} separately at the first FLM device, if possible, in order to use the maximum permissible logic and sensor current of 4 A each for the FLM station.

8 Connecting the Cables

Example: Wiring for an FLM M8 system using the IB IL 24 SEG/F-D-PAC segment terminal

Stripping the Outer Cable Sheath and Cables (Figure 3, Detail A)

- Strip approximately 100 mm off the outer cable sheath.
- Remove the protective foil.
- Shorten the braided shield by approximately 85 mm.
- Remove the felt and the protective foil of the wire pairs.
- Wind the filler litz wire around the shielding.
- Strip 8 mm off the wires.

Connecting the Cables to the Terminal Points

- Release the spring by pressing with the screwdriver.
- Insert the cable in the corresponding terminal point.
- Secure the cable by removing the screwdriver.

Connecting the Shield

- Open the shield connection (Figure 3, detail B).
- Insert the shield connection clamp according to the cable cross-section.
- Insert the cable (Figure 3, detail C).
- Close the shield connection (Figure 3, detail D).
- Tighten the screws on the shield connection with a screwdriver (Figure 3, detail E).

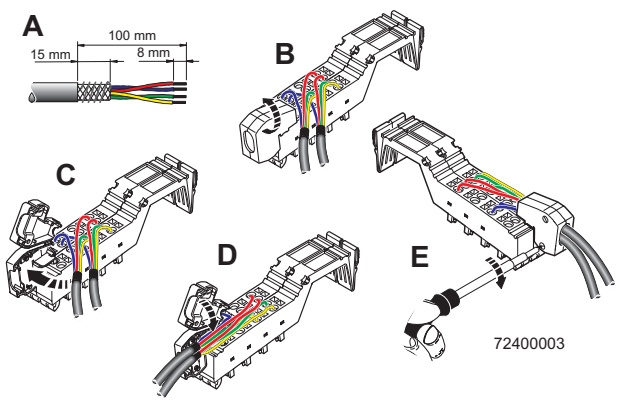


Figure 3 Example: Wiring of the IB IL 24 FLM-PAC and IB IL 24 SEG/F-D-PAC terminals

9 Connection Examples

9.1 Integration of a Fieldline Modular M8 Local Bus in an Inline Station

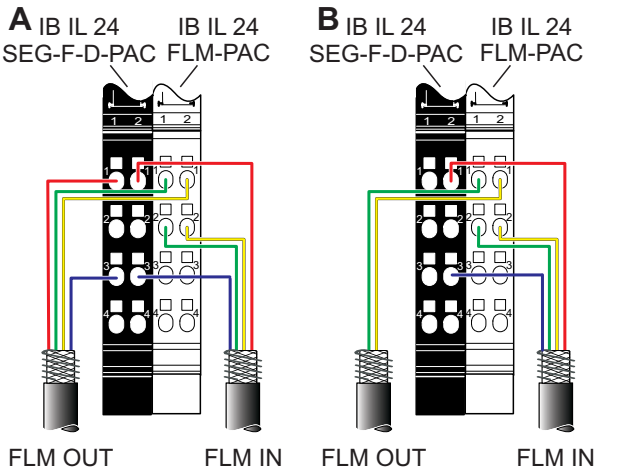


Figure 4 Typical connection of the Fieldline Modular M8 local bus

A	Supply voltage supplied from both sides
B	Supply voltage supplied from one side
FLM OUT	System cable forward line
FLM IN	System cable return line

Please note when using the segment terminal that the maximum current consumption at U_S is 4 A.

9.2 Example: Integration of Fieldline Modular M8 Devices in an Inline Station

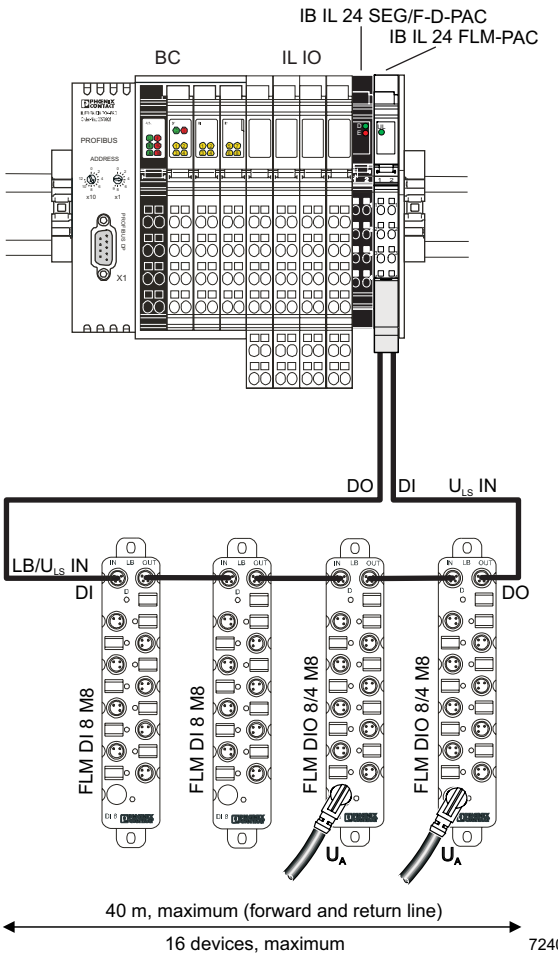


Figure 5 Example: Integration of Fieldline Modular M8 devices in an Inline station

Key

BC	Bus coupler
IL IO	Any Inline terminals

9.3 Example: Integration of Fieldline Modular M12 Devices in an Inline Station With Separate Supply From U_{LS}

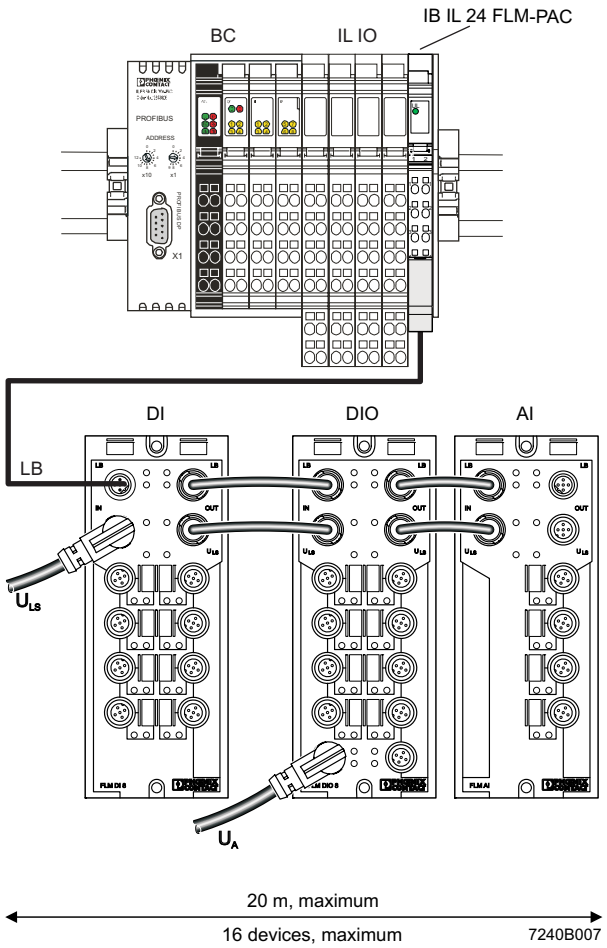


Figure 6 Example: Integration of Fieldline Modular M12 devices in an Inline station

Key

BC	Bus coupler
IL IO	Any Inline terminals

9.4 Local Bus Extension in Combination With the IB IL 24 LSKIP (-PAC) Inline Local Bus Extension Terminal

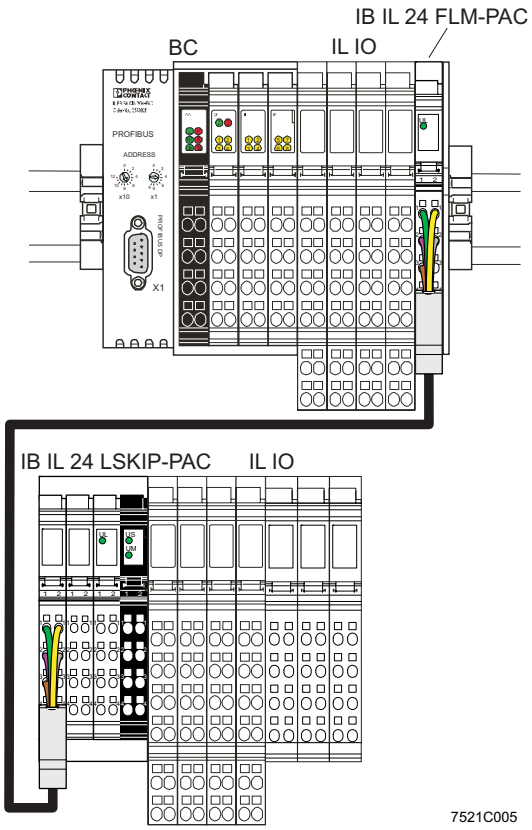


Figure 7 Example: Jumping between two rows within an Inline station

Key

BC	Bus coupler
IL IO	Any Inline terminals

A bus coupler opens the Inline station with any Inline terminals. To jump between two rows, insert an IB IL 24 FLM-PAC terminal at the end of the first row of the Inline station. The terminal operates in combination with the IB IL 24 LSKIP (-PAC) terminal, which creates the start of the next row of the Inline station. Supply the supply voltage for the Inline station at the IB IL 24 LSKIP (-PAC) terminal again. Any Inline terminals can be used within the Inline station.

For the terminal point assignment of the IB IL 24 LSKIP (-PAC) terminal, please refer to the corresponding data sheet.

Integration of Fieldline Modular Devices and Local Bus Extension

If only the IB IL 24 FLM-PAC terminal is used, the local bus can be extended by several rows and the IB IL 24 FLM-PAC terminal inserted at the end of the last row in order to integrate Fieldline Modular devices.

If this is not sufficient for the application, the IB IL 24 FLM MULTI-PAC branch terminal can be used. This can be used multiple times and at any position within the Inline station (see Figure 8).

When using the IB IL 24 FLM MULTI-PAC terminal, please observe the information in the corresponding data sheet.

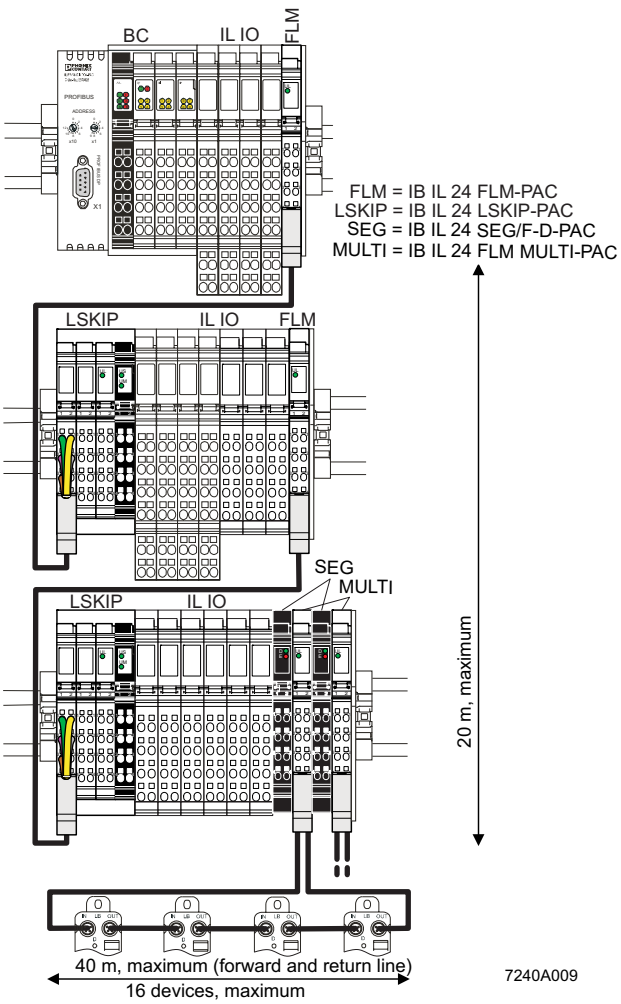


Figure 8 Example: Integration of Fieldline Modular devices and local bus extension

PHOENIX CONTACT GmbH & Co. KG • 32823 Blomberg • Germany • Phone: +49-(0) 5235-3-00
PHOENIX CONTACT • P.O.Box 4100 • Harrisburg • PA 17111-0100 • USA • Phone: +717-944-1300
www.phoenixcontact.com