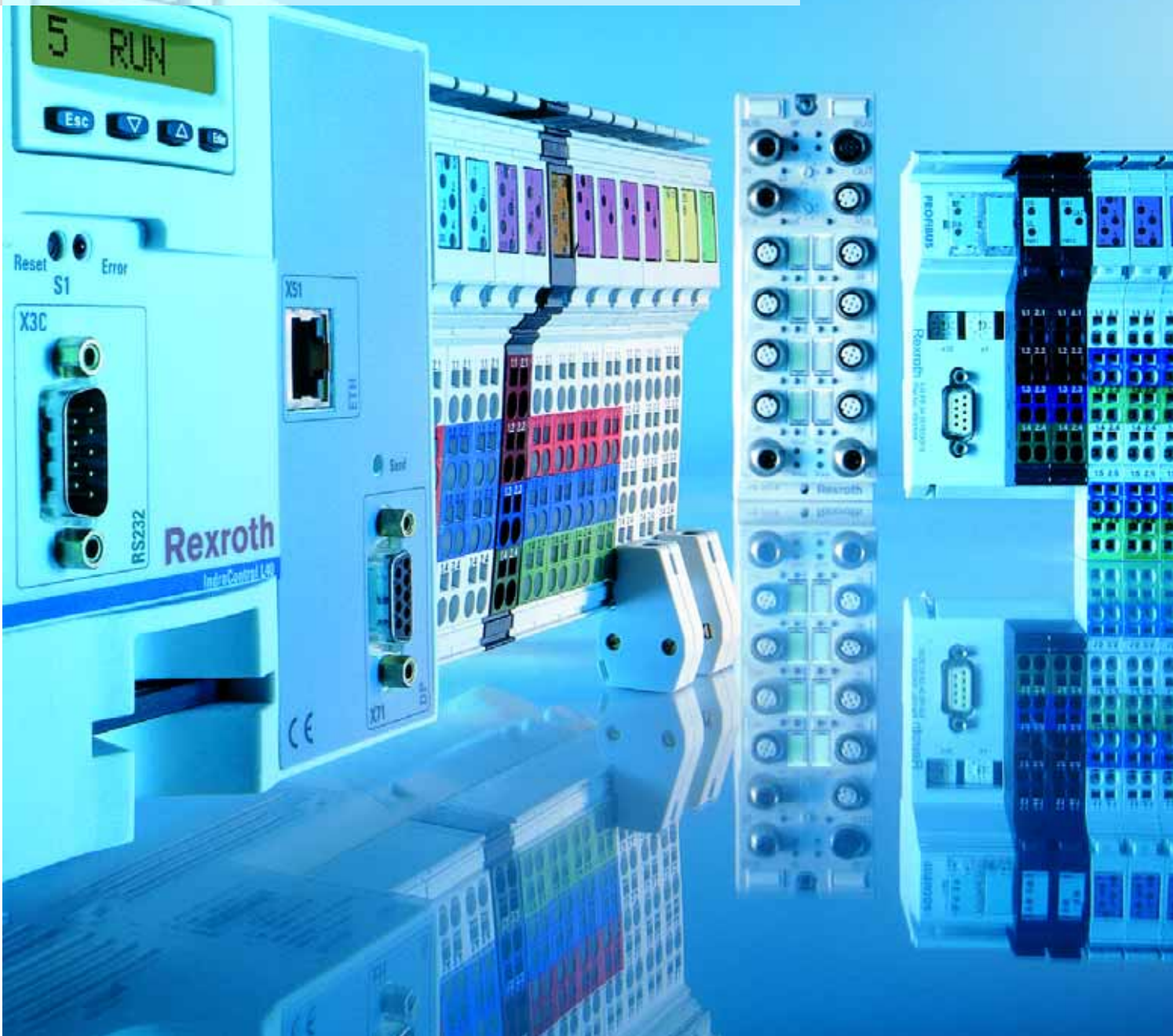


Rexroth IndraControl L – The clever way to automate

Scalable, future-proof and flexible



Rexroth IndraControl L – The clever way to automate

Automating can be easy, flexible and consistent – with Rexroth IndraControl L, the controller-based PLC platform for all central and distributed architectures. In conjunction with our innovative system solutions IndraLogic and IndraMotion you get exceptionally compact PLC systems with the necessary openness and consistency to provide all the freedom you need for modern and future-proof factory automation.

IndraControl L is the future-proof, controller-based hardware platform for modular system solutions from Rexroth in the following applications:

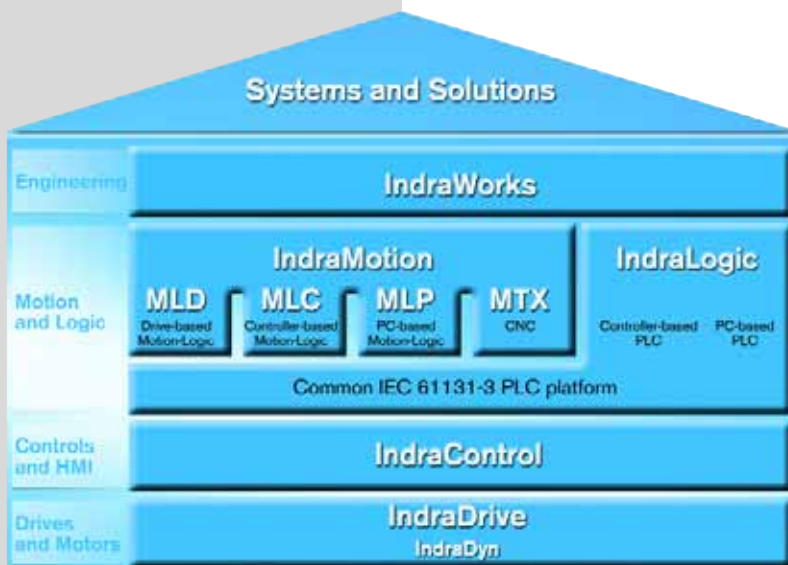
- machine tools
- printing and paper converting machines
- food and packaging machines
- handling and assembly systems
- general automation

Using standardized interfaces and IndraControl L from the Rexroth modular system you can build a perfect PLC system consisting of:

- scalable controllers
- user-friendly control and visualization hardware
- modular I/O peripherals

With IndraControl L and our innovative IndraWorks engineering software framework you will implement your forward-pointing automation concepts easily and quickly. The components are optimized in both technical and economical terms to offer a host of advantages for machine manufacturers as well as end users. For example, IndraControl L is:

- consistent in the use of automation components
- open through standardized communication interfaces
- scalable in power and functionality
- user-friendly in terms of installation and maintenance
- expandable through connection of I/O peripherals



IndraControl L is the modular PLC platform from our own unique modular system containing all the components needed for successful automation concepts – from drives and controllers to a high-performance software framework for engineering and user-friendly operation. This innovation is the result of our many years of applications-related experience and provides you with all the freedom you expect of modern automation technology – consistent, intelligent and future-proof.

Consistent

Be it motion logic or PLC – IndraControl L is the universal hardware platform for all controller-based Rexroth control systems. What this means to you: uniform hardware regardless of your application. Your application is defined solely by the firmware used.

Easy

The components can be installed quickly on standard DIN rails, without having to use any tools: Snap on the controller, plug in the function modules on the left and right and connect up the I/O modules on the right – that's all there is to it!



Open

Function modules for expanding IndraControl L make integration in heterogeneous system architectures simpler. The many different connection modules and technology functions maximize your flexibility:

- fieldbus masters
- fieldbus slaves
- cam groups
- cross communication
- encoder interface

Scalable

IndraControl L is available in a choice of different performance classes for optimum adaptation of the system to your application as the basis for individual solutions with high profitability.



Expandable

With Inline and Fieldline from Rexroth you can expand the system's I/O peripherals in exact accordance with your requirements, whether centrally in the control cabinet or locally on the machine.



IndraControl L – The modular, controller-based PLC hardware that provides all the freedom needed for future-proof factory automation



Rexroth IndraControl L – The intelligent compact control system

IndraControl L allows you to automate your individual applications flexibly and consistently. It is available in the power classes L20 and L40 and with a large choice of expansion options.

Simple handling and a uniform connection technique provide all the freedom expected of modern factory automation. What this means to you: You can implement the most diverse topologies and plant structures with maximum flexibility.

Open for your architecture

Applications as master or slave (in distributed control architectures) are made possible by configurable interfaces. IndraControl L40 can be easily expanded with function modules in order to meet special requirements imposed on system integration and technology functions.

Sensors and actuators are connected either centrally using Inline modules designed for direct end-to-end mounting or locally using Inline modules with a corresponding fieldbus interface and Fieldline modules for near-machine use.

Performing automation tasks perfectly

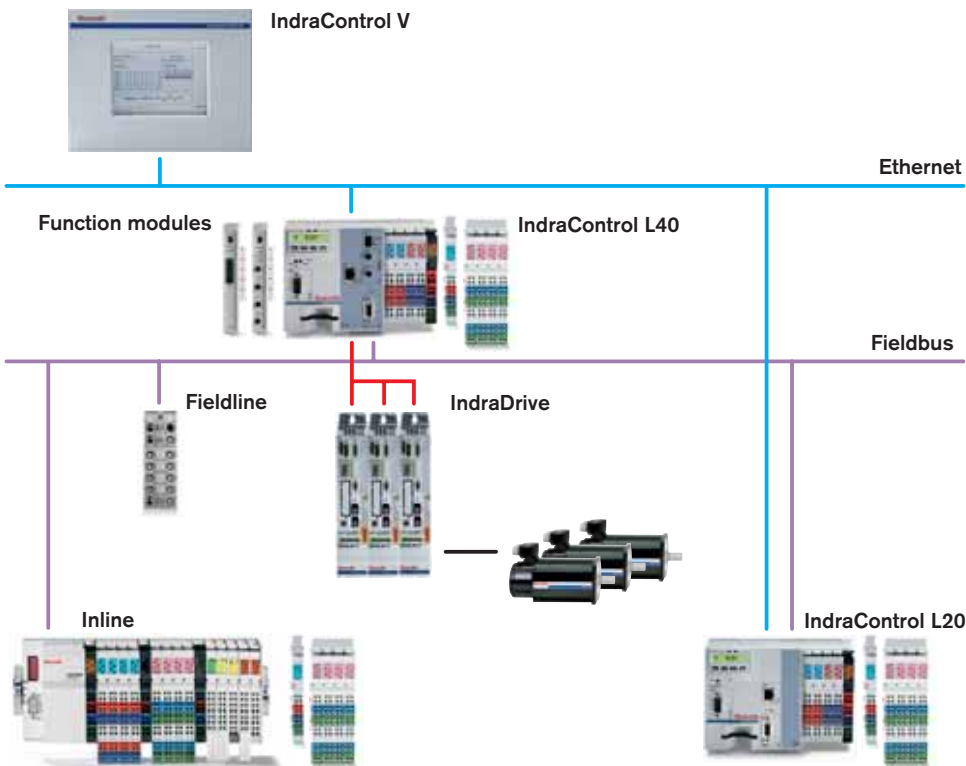
Connecting our IndraDrive drive system is a piece of cake with IndraControl L: Positioning tasks are performed with the integrated fieldbus interface. Applications with demanding real-time requirements are implemented via the integrated SERCOS interface.

Communicating intelligently

For controller-to-controller communication, visualization and programming, IndraControl L is networked over Ethernet. For operation and monitoring, our IndraControl V range of HMI devices covers everything from simple text visualization to full-graphic machine operation.

User-friendly engineering

The IndraWorks engineering software framework makes working with IndraControl L easy. It is tailor-made for all system solutions and standardizes configuration, parameterization and diagnostics in a uniform environment.



With openness and continuity, IndraControl L from Rexroth helps you down the road to maximum flexibility

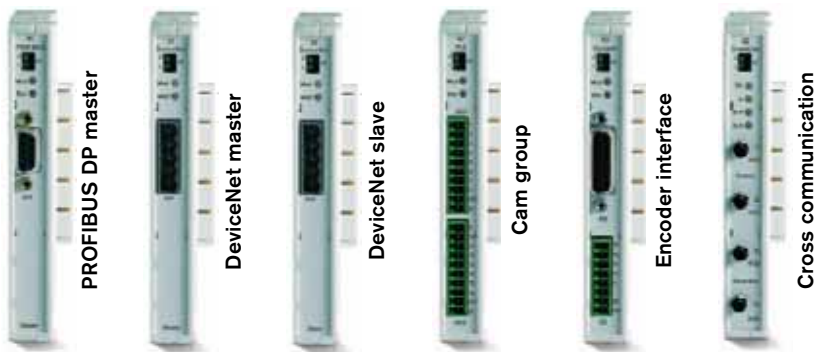
Interfaces already on board

The comprehensive interface portfolio includes:

- Ethernet
- PROFIBUS DP (configurable as master or slave)
- SERCOS interface (optional)
- RS232
- ready contact (optional)
- digital inputs and outputs
- function module interface (IndraControl L40)

User programs and firmware




All programs and the system firmware are stored on an easily accessible CompactFlash card that can be replaced in next to no time. Changing devices without a PC is therefore possible at any time and quickly finished.



Function modules for even more flexibility

Always well informed

An integrated display means that you have the system's status in sight at all times. User-friendly diagnostics and setting options enable fast localization and rectification of any plant malfunctions.

	IndraControl L20		IndraControl L40	
Type	CML20.1-120-NP	CML40.1-220-NP	CML40.1-220-SP	
				
CPU	Microcontroller	266 MHz, Pentium-compatible	266 MHz, Pentium-compatible	
RAM	16 MB	32 MB	32 MB	
NvRAM	64 kB	64 kB	64 kB	
Storage medium	removable CompactFlash	removable CompactFlash	removable CompactFlash	
Interfaces	RS232 Ethernet 10/100 MBit/s PROFIBUS DP master/slave	RS232 Ethernet 10/100 MBit/s PROFIBUS DP master/slave	RS232 Ethernet 10/100 MBit/s PROFIBUS DP master/slave SERCOS interface Ready contact	
I/O	8DI, interrupt-enabled 8DO	8DI, interrupt-enabled 8DO	8DI, interrupt-enabled 8DO	
Display	1-line, 4 buttons	1-line, 4 buttons	1-line, 4 buttons	
I/O expansion	Inline I/O modules (256 I/O)	Inline I/O modules (512 I/O)	Inline I/O modules (512 I/O)	
Function modules	–	•	•	
Dimensions	175 x 120 x 76 mm	175 x 120 x 76 mm	175 x 120 x 76 mm	
Connector set	R-IB IL CML S01-PLSET	R-IB IL CML S01-PLSET	R-IB IL CML S01-PLSET	

Rexroth Inline – Compact I/O technology in your control cabinet

Rexroth Inline is the flexible, scalable and modular I/O system for time-saving control cabinet installation – be it locally on the IndraControl L itself or as a distributed I/O station.

Rexroth Inline is available in two different versions for all standard fieldbus systems:

- Inline Modular – with fine scalability for individual configuring
- Inline Block – a bus coupler with integrated I/Os as the ideal solution for nodes with a limited number of I/Os

Advantages

- user-friendly operation and application
- fully-featured as fieldbus or local I/O
- open for all standard bus systems
- flexible thanks to greatest modularity
- reliable through insensitivity to temperature
- time-saving due to tool-less assembly and user-friendly diagnostics
- space-saving due to high-density modules

Collection of digital signals

The range of digital I/O modules covers 1-, 2-, 4-, 8-, 16- and 32-channel modules.

Reliable collection of analog signals

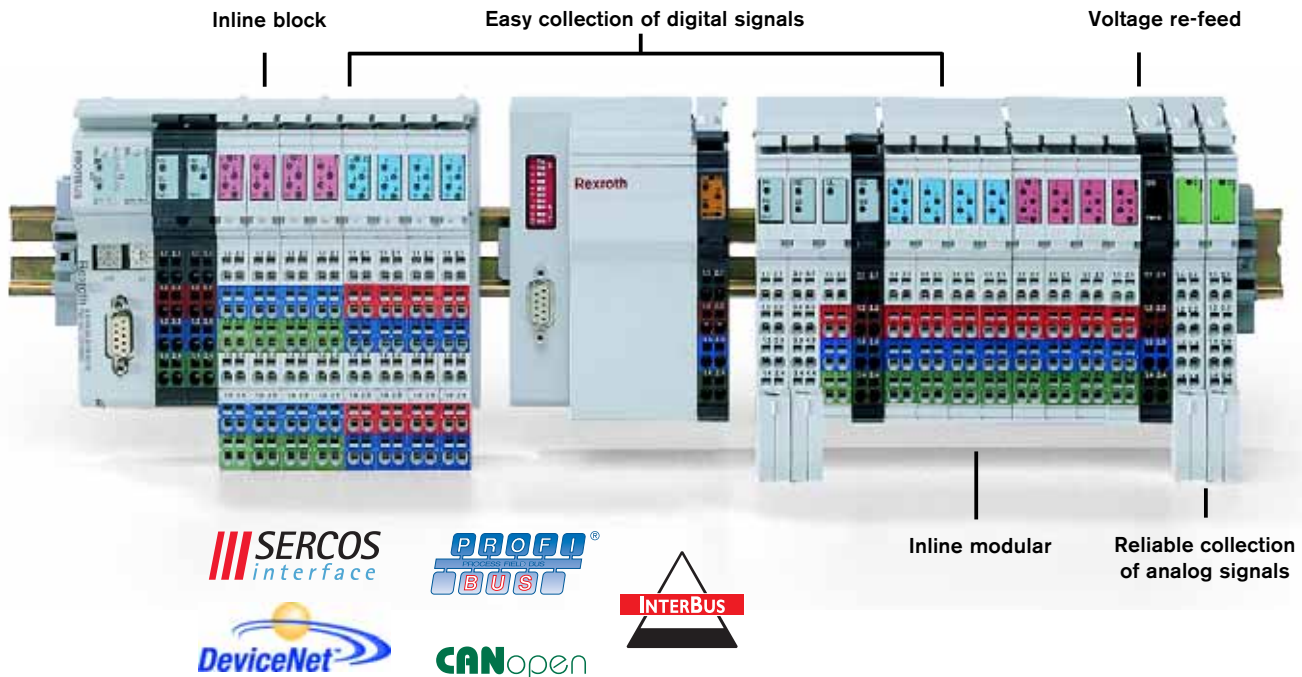
Measured value collection is performed with 16-bit resolution and very high interference and common-mode rejection. A direct shield connection option provides protection in environments with electromagnetic emission.

Fast communication

Inline serial communication modules make it easy to read in information from scanners, printers and scales.

Counting and position scanning

Function modules are available for realizing many different applications which require events to be counted and routes or positions to be scanned.



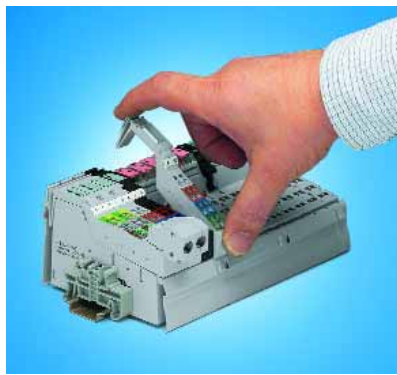
Rexroth Inline – For quick and easy assembly

Time-saving combination of bus couplers and modules



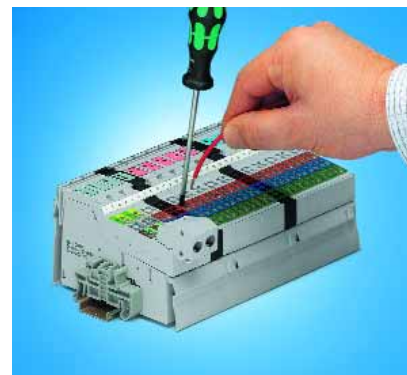
The bus coupler is the head of an Inline station. The I/O modules are simply connected to it end-to-end. All the voltages needed for these modules and the sensors/actuators are automatically cross-wired via the lateral contacts within an Inline station.

Flexible connection through permanent wiring



Using snap-on connectors you can quickly make connections to sensors/actuators in the field and release them again without any complex labeling of individual cores. Shielded cables can be connected directly to functional ground using connectors with an integrated shield connection.

Easy connection of conductors

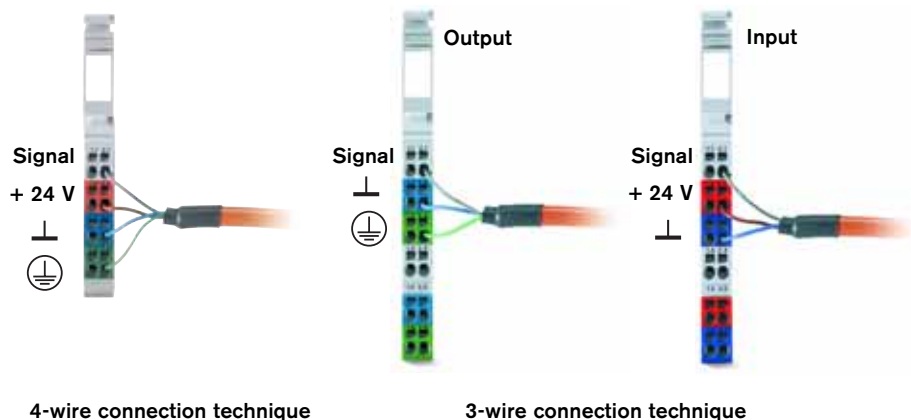


Conductors with stripped ends are simply inserted in the spring-loaded terminals of the Inline connectors without any connector sleeves. Connection cross-sections in the range from 0.2 mm² to 1.5 mm² are possible.

Cost-effective multi-wire connection technique

With the multi-wire connection technique there are no longer any strapping terminals in the control cabinet – this saves money and cuts installation time.

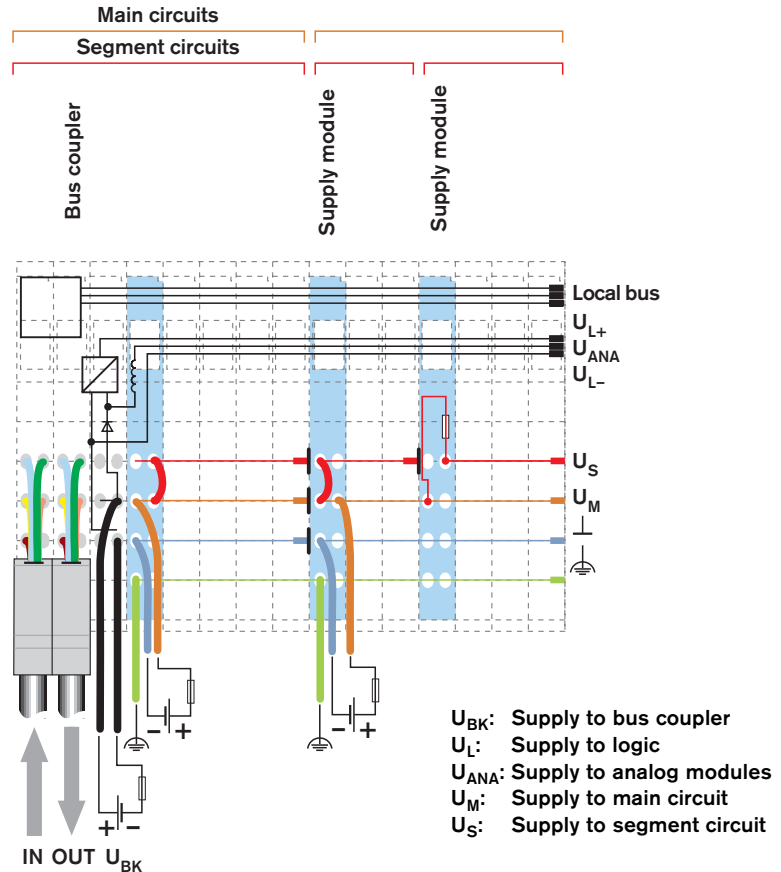
The 1-wire connection technique provides you with particularly compact high-density modules with 32 channels.



The multi-wire connection technique minimizes your wiring costs

Rexroth Inline – With intelligent voltage distribution

Rexroth Inline convinces with its intelligent distribution concept for all voltages. The internal contacts of the modules automatically see to the cross-wiring for the internal local bus as well as for the voltage supply to the logic, analog modules, sensors and actuators. Separate protection arrangements, electrical isolation and the formation of segments can be implemented very easily. What this means to you: All voltages can be directly taken from the Inline modules and no additional distribution modules are necessary. This saves space, reduces costs and prevents wiring errors.



Easy construction of main and segment circuits – possible with Rexroth Inline

Supply to the bus coupler and provision of primary voltage

The voltages U_L for the logic circuit and U_{ANA} for analog modules are generated from the supply voltage U_{BK} which is connected to the bus coupler.

The 24 V voltage supply to the main circuit U_M is fed in likewise at the bus coupler.

Main and segment circuits







The signal and actuator supply to the digital I/Os is effected by the segment voltage U_S . It is diverted from the main circuit U_M at the bus coupler via a bridge, an external fuse or a switch. Through the separation of U_M and U_S it is very easy to form segments which can be separately switched or protected. Neighboring terminals and their I/Os continue to be supplied when, for example, a single segment circuit is switched off.

Supply and segment modules







U_M and U_S can be fed in by means of supply modules if the power required by the signal and actuator supply exceeds the maximum distributable value. It is also possible to construct electrically-isolated main circuits within an Inline station.

Inline segment modules enable several segment circuits to be constructed within a main circuit.

Rexroth Inline – Open for your fieldbus

Inline Modular	
Fieldbusses	Bus couplers
 	PROFIBUS DP-V1 slave, D-Sub R-IL PB BK DP/V1 Connector: R-IB IL SCN-PWR-IN-CP
 	INTERBUS slave R-IBS IL 24 BK-T/U Connector: R-IB IL BK-PLSET
 	INTERBUS slave, D-Sub R-IBS IL 24 BK-DSUB Connector: R-IB IL SCN-PWR-IN-CP
 	DeviceNet slave, D-Sub R-IL DN BK Connector: R-IB IL SCN-PWR-IN-CP
 	CANopen slave R-IL CAN BK-TC Connector: R-IB IL SCN-PWR-IN-CP
 	SERCOS slave, FOC (Fiberoptic Cable) R-IL SE BK Connector: R-IB IL SCN-PWR-IN-CP

The bus coupler forms the first module of an Inline station and is the interface to the fieldbus system. Individual I/O modules can then be connected to it end-to-end.

Inline Block	
Fieldbusses	Digital inputs/outputs
 	16 inputs and 16 outputs, 0.5 A, 24 V DC, 2- and 3-wire connection, D-SUB R-ILB PB 24 DI16 DO16 Connector: Included in delivery
 	16 inputs and 16 outputs, 0.5 A, 24 V DC, 2- and 3-wire connection R-ILB IB 24 DI16 DO16 Connector: Included in delivery
 	16 inputs and 16 outputs, 0.5 A, 24 V DC, 2- and 3-wire connection R-ILB DN 24 DI16 DO16 Connector: Included in delivery

Inline Block – The ideal solution for a limited number of I/Os and minimum complexity. The bus couplers are already equipped with digital inputs and outputs. It is not planned to add any more Inline modules.



Connectors

Accessories

The connectors are color-coded according to their function. Hence it is easy to see during wiring work how the modules are assigned.


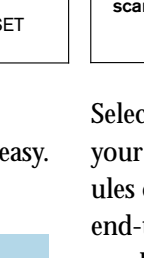
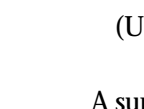


Labels (optional)

Labels can be used to identify the individual modules in accordance with your needs.

Rexroth Inline – The flexible, modular I/O system

Inline Modular				
Channels	Digital input modules	Digital output modules	Analog input modules	Analog output modules
				
1		1 relay changeover contact 5 - 253 V AC, 12.2 mm R-IB IL 24/230 DOR1/W Connector: R-IB IL SCN-8-AC-REL		1 output, 0 - 20 mA, 4 - 20 mA 0 - 10 V, 24.4 mm R-IB IL AO 1/SF Connector : R-IB IL AO/CNT-PLSET
2	2 inputs 24 V DC 4-wire connection, 12.2 mm R-IB IL 24 DI 2 Connector: R-IB IL SCN-8-CP	2 outputs, 24 V DC, 2 A 4-wire connection, 12.2 mm R-IB IL 24 DO 2-2A Connector: R-IB IL SCN-8-CP	2 inputs, 0 - 20 mA, 4 - 20 mA ± 20 mA, 0 - 10 V, ± 10 V, 12.2 mm R-IB IL AI2/SF Connector: R-IB IL SCN 6-SHIELD-TWIN	2 outputs 0 - 10 V, ± 10 V, 12.2 mm R-IB IL AO 2/U/BP Connector: R-IB IL SCN 6-SHIELD-TWIN
	2 inputs, 24 V DC Short-circuit-proof actuator supply 2 Desina diagnostic inputs 4-wire connection, 12.2 mm R-IB IL 24 EDI2-DESINA Connector: R-IB IL SCN-8		2 RTD sensors, 12.2 mm R-IB IL TEMP 2 RTD Connector: R-IB IL SCN 6-SHIELD-TWIN	
4	4 inputs, 24 V DC 3-wire connection, 12.2 mm R-IB IL 24 DI 4 Connector: R-IB IL SCN-12 ICP	4 outputs, 24 V DC, 0.5 A 3-wire connection, 12.2 mm R-IB IL 24 DO 4 Connector: R-IB IL SCN-12-OCP		
		4 relay changeover contact 5 - 253 V AC, 48.8 mm R-IB IL 24/230 DOR4/W Connector: R-IB IL SCN-AC-REL		
8	8 inputs, 24 V DC 4-wire connection, 48.8 mm R-IB IL 24 DI 8 Connector: R-IB IL SCN-8-CP	8 outputs, 24 V DC, 0.5 A 4-wire connection, 48.8 mm R-IB IL 24 DO 8 Connector: R-IB IL SCN-8-CP	8 inputs, 0 - 20 mA, 4 - 20 mA ± 20 mA, ± 40 mA, $\pm 0 - 5$ V, ± 5 V 0 - 10 V, ± 10 V, 0 - 25 V, ± 25 V 0 - 50 V, 48.8 mm, multiplex mode R-IB IL AI8/SF, available soon Connector: R-IN IL SCN 6 SHIELD-TWIN	
		8 outputs, 24 V DC, 2 A 4-wire connection, 48.8 mm R-IB IL 24 DO 8-2A Connector: R-IB IL SCN-8-CP	8 inputs with actuator supply 0 - 20 mA, 4 - 20 mA, ± 20 mA, 0 - 40 mA ± 40 mA, 48.8 mm, multiplex mode R-IB IL AI8/IS, available soon Connector: R-IB IL SCN 6-SHIELD-TWIN	
16	16 inputs, 24 V DC 3-wire connection, 48.8 mm R-IB IL 24 DI 16 Connector: R-IB IL SCN-12-ICP	16 outputs, 24 V DC, 0.5 A 3-wire connection, 48.8 mm R-IB IL 24 DO 16 Connector: R-IB IL SCN-12-OCP		
32	32 inputs, 24 V DC 1-wire connection, 48.8 mm R-IB IL 24 DI 32 Connector: R-IB IL DI/DO 8-PLSET	32 outputs, 24 V DC, 0.5 A 1-wire connection, 48.8 mm R-IB IL 24 DO 32 Connector: R-IB IL DI/DO 8-PLSET		
Misc.		Voltage clearance modules 24 V DC/253 V AC, 12.2 mm R-IB IL DOR LV-SET Connector: R-IB IL DOR LV-PLSET		

Inline Modular		Inline Modular		Inline Modular	
	Communication modules 		Function modules 		Supply/segment modules 
Branch	INTERBUS remote branch, 12.2 mm R-IBS IL 24 RB-T Connector: R-IB IL SCN 6-SHIELD DDL - pneum. connect. module, 24.4 mm R-IB IL DDL, available soon Connector: R-IB IL AO/CNT-PLSET	Counter	1 counter input, 1 control output, 1 output, 24.4 mm R-IB IL CNT Connector: R-IB IL AO/CNZN-PLSET	Supply modules	24 V DC, 12.2 mm R-IB IL 24 PWR IN Connector: R-IB IL SCN-PWR IN-CP
Serial interface	1 serial input and output channel RS232 type, 24.4 mm R-IB IL RS232, available soon Connector: R-IB IL AO/CNT-PLSET	Position scanning	Position scanning for incremental encoders, 24.4 mm R-IB IL INC-IN, available soon Connector: R-IB IL SCN-12-ICP R-IB IL SCN-6 SCHIELD	Segment modules	with fuse, 24 V DC (U_s), 12.2 mm R-IB IL 24 SEG/F Connector: R-IB IL SCN-PWR IN-CP

Easy configuration

Configuring your Inline station is easy. Proceed as follows:

- ① Select the bus coupler
- ② Specify the I/O modules
- ③ Choose the supply/segment module
- ④ Select the connectors
- ⑤ Define the labels

Selecting the Inline components

Select the bus coupler which matches your preferred bus system. More modules can be connected to this coupler end-to-end. Important factors to consider when selecting these modules are the functionality and the type of connection. Modules with 1-, 2-, 3- and 4-wire connections are available.

The current loads of the voltage supplies are subject to the following limit values:

- logic (U_L) < 2 A
- analog modules (U_{ANA}) < 0.5 A
- main and segment circuits ($U_M + U_S$) ≤ 8 A

A supply module – and hence the power to the attached I/Os – is already contained in the bus coupler.

Another supply module is required if one of the limit values is exceeded. More I/O modules can then be connected to it end-to-end.

Given an exact knowledge of the power consumed by the actuator supply and of the actuators and their simultaneity it is possible to minimize the number of supply modules and configure the Inline station to optimum effect.

After you have specified the modules, select the necessary connectors and, if required, the corresponding labels.

If the relay modules are used in the 230 V AC range, you will need voltage clearance modules for separation from the 24 V environment.

Rexroth Fieldline – The robust I/O technology for field use

Rexroth Fieldline enables on-machine installation with particularly high operational reliability even in harsh environments – thanks to the IP67 enclosure rating.

User-friendly operation, easy installation and flexible assembly enable I/Os to be connected over shorter wiring distances and without a control cabinet.

Whatever your choice of fieldbus you can obtain the stand-alone modules in three different versions:

- digital inputs
- digital outputs
- digital inputs and outputs

Advantages

- easy handling
- flexible mounting
- simple operation and application
- fast and convenient diagnostics
- intelligent voltage concept
- open for standard bus systems:
 - PROFIBUS DP
 - INTERBUS
 - DeviceNet

Cost-saving installation

All Fieldline modules have a connection for both the incoming and the outgoing fieldbus. What this means to you: cash savings because T-connectors are no longer required for wiring.

Convenient diagnostics

Intelligent diagnostic functions keep you informed on the status of your plant.

Screw-fitted rather than molded

The modules are not molded in order to prevent mechanical stresses on the electronics during rapid changes of temperature. Operational reliability is thus assured even in extreme ambient conditions.



Whether it's an input, output, or combination module – Rexroth Fieldline enables the reliable transmission of I/O signals directly on the machine

Rexroth Fieldline – For cost-effective assembly

Flexible mounting



Fieldline can be mounted on any level base. Mounting holes are integrated so that the installation is adapted to the application and not vice versa. The modules can be mounted from the front as well as from the side.

Simple operation

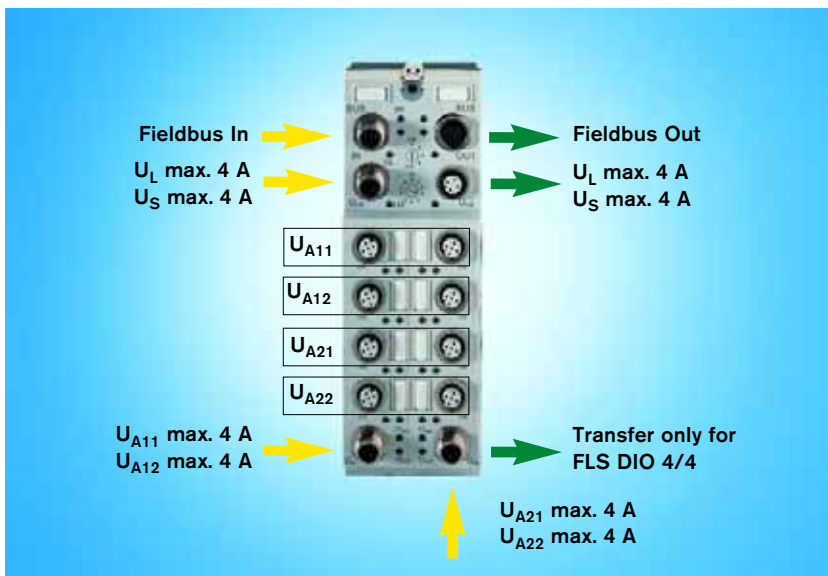


The bus parameters are set without the use of any additional equipment or tools. A standard screwdriver is all you need to set the bus address – even in difficult assembly conditions.

Easy handling



Connections are arranged for Fieldline to be installed easily, quickly and error-free. This is why we have opted for the M12 connection system in an ideally prepared layout – this saves time and money.















The well thought-out voltage concept enables the flexible grouping of actuators

Well thought-out voltage concept

The three voltages for logic (U_L), sensor (U_S) and actuator (U_A) are separated from each other. The actuator voltage can be broken down into 4 groups (U_{AXX}), each interruptible on its own. This means that if one actuator suffers a short-circuit, the other groups will still be fully functional.

Rexroth Fieldline – Distributed I/O technology with IP67

	Digital inputs	Digital outputs	Digital inputs/outputs
	 8 inputs, 24 V DC RF-FLS PB M12 DI 8 M12	 8 outputs, 24 V DC, 2 A RF-FLS PB M12 DO 8 M12-2A	 4 inputs, 4 outputs, 24 V DC, 2 A RF-FLS PB M12 DIO 4/4 M12-2A 8 inputs, 8 outputs, 24 V DC, 0.5 A RF-FLS PB M12 DIO 8/8 M12
	 8 inputs, 24 V DC RF-FLS IB M12 DI 8 M12	 8 outputs, 24 V DC, 2 A RF-FLS IB M12 DO 8 M12-2A	 4 inputs, 4 outputs, 24 V DC, 2 A RF-FLS DN M12 DIO 4/4 M12-2A
	 8 inputs, 24 V DC RF-FLS DN M12 DI 8 M12	 8 outputs, 24 V DC, 2 A RF-FLS IB M12 DO 8 M12-2A	 4 inputs, 4 outputs, 24 V DC, 2 A RF-FLS DN M12 DIO 4/4 M12-2A

Complete range of accessories



A comprehensive offering of cables and connectors for connecting Fieldline components is available:

- fieldbus cables
- sensor/actuator cables
- M12 connectors

You can choose between using our preassembled cables with molded connectors or you can assemble the cables and connectors yourself. This is done without soldering or crimping – either with the QUICKON fast-connection technique or by screw-fitting the individual strands in the connector.



Rexroth IndraControl L – Always the right connection

Fieldbus cable	IndraControl L D-SUB	Inline D-SUB	Fieldline M12	IndraControl L 5-pin	Inline 5-pin	Fieldline M12	Inline D-SUB	Fieldline M12
IndraControl L	IKB0033/xxx	IKB0033/xxx						
	IKB0034/xxx INS0541 1)	IKB0034/xxx INS0541 1)	IKB0049/xxx INS0541 1)			IKB0043/xxx		
Inline	IKB0033/xxx	IKB0033/xxx					IKB0031/xxx	
	IKB0034/xxx INS0541 1)	IKB0034/xxx INS0541 1)	IKB0049/xxx INS0541 1)			IKB0043/xxx		IKB0046/010 INS0703
Fieldline			IKB0050/xxx			IKB0044/xxx		IKB047/xxx
	INS0541 IKB0048/xxx	INS0541 IKB0048/xxx	RBS0002 IKB0048/xxx	IKB0042/xxx	IKB0042/xxx	RBS0008 IKB0042/xxx	INS0702 IKB0045/xxx	RBS0002 IKB0045/xxx

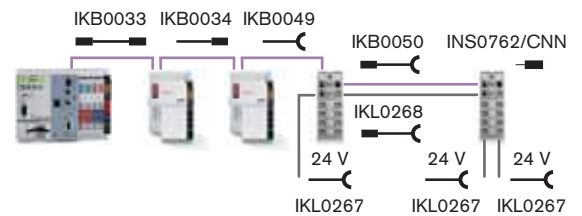
Power supply cable	Fieldline M12
+ 24 V	IKL0267/xxx
	RKB003/xxx
Fieldline	IKL0268/xxx

Selection of fieldbus and power supply cables

A large cable portfolio is available for wiring all IndraControl L components.

Procedure for selecting your cable and connectors:

- 1) Specify the stations n (header column)
- 2) Specify the stations n + 1 (header line)
- 3) Select preassembled cable (on gray background), partly preassembled cable or connectors
- 4) Define the bus terminating resistance³⁾



Selection example for PROFIBUS DP

1) Connector is required if neither IKB0033 nor IKB0034 is used on the preceding module.
 2) 5-pin DeviceNet connector included in delivery of modules.
 3) Bus termination resistor required if fieldbus is not continued (PROFIBUS INS762/CNN, DeviceNet INS763/CNN).
 4) Assumes there is a functional module on the IndraControl L40.
 xxx: length of cable in meters

Presented by:

