

## EH-RIO SERIES

Remote I/O Modules



## Technical Data

Hitachi's new Remote I/O series for increased flexibility and cost efficiency

- Fieldbus adapters for Profibus-DP and DeviceNet (others coming soon)
- Separation of electronics module and wiring base for ease of installation and maintenance
- "Hot Swapping": remove and exchange modules under power
- Optional screw clamp or spring clamp terminations
- Large selection of I/O modules
- Super slim design: 4 I/O = 12 mm
- Standard DIN rail mounting



DeviceNet

## Flexible design, highly modular, user-friendly handling.

The EH-RIO series of Remote I/O modules allows you the flexibility to distribute I/O throughout your application. Using EH-RIO, you can precisely plan and expand your I/O and locate them right where they are needed: close to the sensors and actors. A proximity which pays back: By mounting I/Os in a

junction box directly on or near the machine, you minimize wiring and eliminate the need for further control and marshalling cabinets. This solution benefits today's modular production processes and is especially advantageous when upgrading centralized automation systems.

### Design concept:

Each I/O module consists of the following three components:

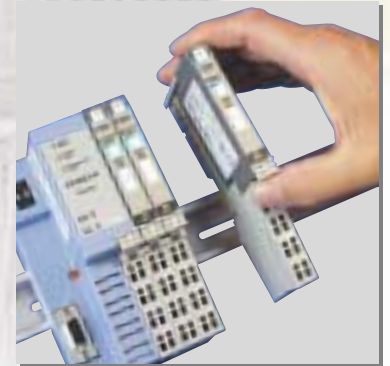
- ① The **Mounting Base** provides the mounting locations for the I/O modules and the removable terminal blocks. The mounting base also forms the inter-connection for the I/O backplane communication and the field power distribution.
- ② The **Removable Terminal Block** provides 8 or 12 separate terminal locations for your field wiring. You can choose between screw clamp or spring clamp terminations.
- ③ The **I/O Modules** convert field device signals to control status indicators. The LEDs indicate module, network, power and calibration status as well as I/O point status (ON/OFF/Error or diagnostic). I/O modules report diagnostic information back over the network communication adapter, thus making debugging tasks much easier.



### Mounting

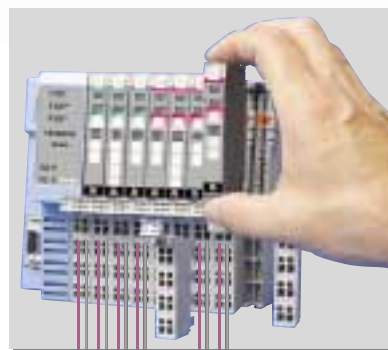
The I/O modules are mounted on a standard DIN rail, providing easy installation by vertically inserting the modules, without using any additional tools. The modules can either be mounted separately or as a complete, pre-mounted system.

A mechanical key slot protects the modules from being inserted into a wrong mounting base and therefore from being exposed to incorrect signal levels.



### Hot Swapping

The separation of the electronics unit from the removable terminal block makes it possible to remove and exchange the electronics unit under power, without having to re-wire the entire I/O module.

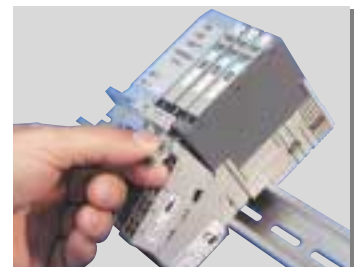


The separation of the electronics unit from the removable terminal block makes it possible to remove and exchange the electronics unit under power, without having to re-wire the entire I/O module.

### Ease of use

The Removable Terminal Block and Electronics Module insert into the mounting base with an audible click, so you know they are correctly installed.

The connection can be released just as easily, without having to remove the wiring or interfering with system communication.



## Modules

### Fieldbus Modules



RIO-DNA	DeviceNet Adapter
Expansion I/O Capacity	63 modules
Communication rate (per scanner configuration)	125 kbit/s (500 m maximum) 250 kbit/s (250 m maximum) 500 kbit/s (100 m maximum)
Power Requirements	24 V DC
Input Overvoltage Protection	Reverse polarity protected
Indicators	3 red/green status indicators <ul style="list-style-type: none"> <li>• adapter status</li> <li>• DeviceNet status</li> <li>• Backplane Bus status</li> </ul> 2 green power supply status indicators <ul style="list-style-type: none"> <li>• system power (backplane bus 5 V power)</li> <li>• field power (24 V from field supply)</li> </ul>
Output Current to Backplane Bus	1 A maximum at 5 V DC $\pm 5\%$ (4,75 – 5,25)
Dimensions (HxWxD)	76,2 mm x 54,9 mm x 133,4 mm

RIO-DNP	DeviceNet Interface
Expansion I/O Capacity	12 modules
Communication rate (per scanner configuration)	125 kbit/s (500 m maximum) 250 kbit/s (250 m maximum) 500 kbit/s (100 m maximum)
Power Requirements	24 V DC
Input Overvoltage Protection	Reverse polarity protected
Indicators	3 red/green status indicators: <ul style="list-style-type: none"> <li>• adapter status</li> <li>• DeviceNet status</li> <li>• Backplane Bus status</li> </ul> 2 green power supply status indicators <ul style="list-style-type: none"> <li>• system power (backplane bus 5 V power)</li> <li>• DeviceNet power (24 V from DeviceNet)</li> </ul>
Output Current to Backplane Bus	1 A maximum at 5 V DC $\pm 5\%$ (4,75 – 5,25)
Dimensions (HxWxD)	76,2 mm x 25,4 mm x 133,4 mm

RIO-PBA	Profibus-DP Adapter
Expansion I/O Capacity	63 modules
Communication rate (per scanner configuration)	9,6 kBaud – 12 MBaud
Power Requirements	24 V DC
Input Overvoltage Protection	Reverse polarity protected
Indicators	3 red/green status indicators <ul style="list-style-type: none"> <li>• adapter status</li> <li>• PROFIBUS status</li> <li>• Backplane Bus status</li> </ul> 2 green power supply status indicators <ul style="list-style-type: none"> <li>• system power (backplane bus 5 V power)</li> <li>• field power (24 V from field supply)</li> </ul>
Output Current to Backplane Bus	1 A maximum at 5 V DC $\pm 5\%$ (4,75 – 5,25)
Dimensions (HxWxD)	76,2 mm x 54,9 mm x 133,4 mm

### Mounting Base



**RIO-BSP / -BSP3** Mounting Base with Removable Terminal Block and spring clamp terminations / 3-wire connection

**RIO-BSC / -BSC3** Mounting Base with Removable Terminal Block and screw clamp terminations / 3-wire connection

Terminations	
RIO-BSP / -BSP3	Spring clamp terminations
RIO-BSC / -BSC3	Screw clamp terminations
Field Power Bus Supply Voltage	28,8 V DC, 120/240 V AC
Supply Current	10 A maximum
Dimensions (HxWxD)	65,0 mm x 12,0 mm x 133,4 mm

## I/O-Modules

### DC Input Modules



**RIO-XDP2 / RIO-XD2** 2 digital inputs, 24 VDC, positive logic / negative logic

**RIO-XDP4 / RIO-XD4** 4 digital inputs, 24 VDC, positive logic / negative logic

Inputs per module		Indicators	
RIO-XDP2, -XD2	2 (1 group of 2), positive logic (RIO-XD2 negative logic)	RIO-XD2, -XDP2	2 green/red module/network status indicators
RIO-XDP4, -XD4	4 (1 group of 4) positive logic (RIO-XD4 negative logic)	RIO-XDP4, -XD4	2 yellow input status indicators
ON-State Voltage	10 V DC minimum, 24 V DC nominal, 28,8 V DC maximum	Backplane Bus Current	4 yellow input status indicators
Input Filter Time		Field Power Bus Supply Voltage	75 mA maximum at 5 V DC
OFF to ON	0 - 65 ms (1 ms default setting)	Field Power Bus Voltage Range	24 V DC nominal
ON to OFF	0 - 65 ms (1 ms default setting)	Dimensions (HxWxD)	10 - 28,8 V DC
			56,0 mm x 12,0 mm x 75,5 mm

### DC Output Modules



**RIO-YTP2** 2 digital outputs, 24 VDC, positive logic, short-circuit protected

**RIO-YTP4** 4 digital outputs, 24 VDC, positive logic, short-circuit protected

Outputs		Indicators RIO-YTP4	
RIO-YTP2	2 (1 group of 2) positive logic	RIO-YTP4	2 green/red module/network status indicators
RIO-YTP4	4 (1 group of 4) positive logic	Backplane Bus Current	4 yellow output status indicators
ON-State Voltage	10 V DC minimum, 24 V DC nominal, 28,8 V DC maximum	External DC power Supply Voltage	4 red output fault indicators
Output Signal Delay		Supply Voltage	75 mA maximum at 5 VDC
OFF to ON	0,1 ms maximum	Voltage Range	24 V DC nominal
ON to OFF	0,1 ms maximum	Supply Current	10 - 28,8 V DC
Output Current	Maximum 1,0 A per output Maximum 2,0 A per module	RIO-YTP 2	8 mA
Indicators RIO-YTP2	2 green/red module/network status indicators	RIO-YTP 4	16 mA
	2 yellow output status indicators	Dimensions (HxWxD)	56,0 mm x 12,0 mm x 75,5 mm
	2 red output fault indicators		

### Relais Module



**RIO-YR2** 2 relay outputs, potential-free

Outputs per module	2 electromechanical relays (potential-free, normally open)	Indicators	2 yellow output status indicators
ON-State Voltage	10 V DC minimum, 24 V DC nominal, 28,8 V DC maximum	Backplane Bus Current	2 green/red module/network status indicators
Output Signal Delay		Field Power Bus Supply Voltage	80 mA maximum at 5 V DC
OFF to ON	10 ms maximum	Voltage Range	None required
ON to OFF	26 ms maximum	Switching Capacity	240 V AC maximum
Switching Frequency	1 Operation/3 s (0,3 Hz at rated load) maximum	Dimensions (HxWxD)	2 A per channel maximum, 4 A per module
			56,0 mm x 12,0 mm x 75,5 mm

## Modules

### DC Analog Input Modules



**RIO-AX2I** 2 analog inputs, 0/4 - 20 mA, 24 VDC

**RIO-AX2V** 2 analog inputs, 0 - 10 V

<b>Inputs</b>	2 analog inputs	<b>Indicators</b>	2 green/red input status indicators 2 green/red module/network status indicators
Resolution RIO-AX2I	16 bits - over 21 mA, 0,32 µA/cnt	<b>Backplane Bus Current</b>	75 mA maximum at 5 V DC
RIO-AX2V	16 bits signed, 320 µV/cnt	<b>External DC Power</b>	
Input Current Terminal RIO-AX2I	4-20 mA, 0-20 mA	Supply voltage	24 V DC nominal
Input Voltage Terminal RIO-AX2V	±10 V, 0 - 10 V	Voltage range	10 - 28,8 V DC
Absolute Accuracy	0,1% full scale at 25°C	Supply current	10 mA at 24 V DC
Current Terminal		<b>Dimensions (HxWxD)</b>	56,0 mm x 12,0 mm x 75,5 mm

### DC Analog Output Modules



**RIO-AY2I** 2 analog outputs, 0/4 - 20 mA, 24 VDC

**RIO-AY2V** 2 analog outputs, 0 - 10 V

<b>Outputs</b>	2 analog outputs	<b>Indicators</b>	2 green/red output status indicators 2 green/red module/network status indicators
Resolution RIO-AY2I	13 bits - over 21 mA, 513 µA/cnt	<b>Backplane Bus Current</b>	75 mA maximum at 5 V DC
RIO-AY2V	14 bits signed, 1,28 mV/cnt	<b>External DC Power</b>	
Output Current RIO-AY2I	0 mA output until communication is established 4-20 mA user configurable 0-20 mA user configurable	Supply Voltage	24 V DC nominal
Output Voltage RIO-AY2V	±10 V, 0 - 10 V	Voltage Range	10 - 28,8 V DC
Absolute Accuracy	0,1% full scale at 25°C	Supply Current	50 mA at 24 V DC (including outputs at 20 mA)
Current Terminal		<b>Dimensions (HxWxD)</b>	56,0 mm x 12,0 mm x 75,5 mm

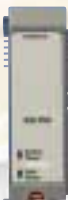
### Field Power Supply



**RIO-PS** Field Power Supply for various potentials (5 - 250 VDC and/or 24-240 VAC)

<b>Input Voltage Rating</b>	12 V DC, 24 V DC, 120 V AC, 240 V AC nominal
<b>Input Voltage Protection</b>	Reverse polarity protected
<b>Input Current</b>	10A maximum
<b>Backplane Bus</b>	Pass-Through
<b>Module Location</b>	Between I/O modules in EH-RIO system, breaks power bus
<b>Dimensions (HxWxD)</b>	76,2 mm x 25,4 mm x 133,4 mm

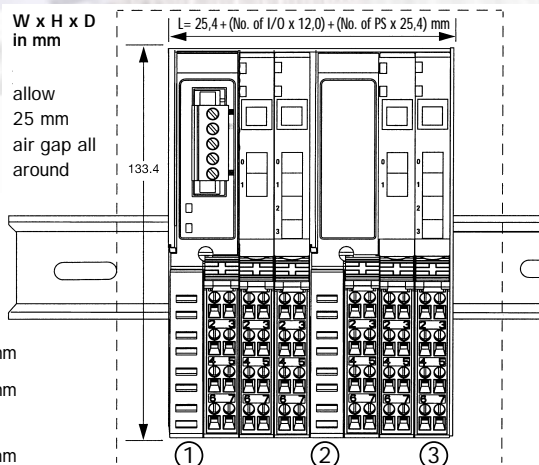
### Expansion Power Supply (DC)



**RIO-PSD** Expansion Power Supply for 12 I/O modules maximum

<b>Input Voltage Rating</b>	24 V DC nominal
<b>Input Voltage Protection</b>	Reverse polarity protected
<b>Input Current</b>	400 mA
<b>Backplane Bus Current</b>	1,3 A (at 19,2 - 28,8 V)
<b>Module Location</b>	Between I/O modules in EH-RIO system, breaks field power bus
<b>Dimensions (HxWxD)</b>	76,2 mm x 25,4 mm x 133,4 mm

### EH-RIO Series Dimensions



- ① RIO-DNP: 76,2 x 25,4 x 133,4 mm
- ② RIO-PS: 76,2 x 25,4 x 133,4 mm
- ③ RIO-BSC or -BSP with I/O:  
76,2 x 12,0 x 133,4 mm

### Environmental conditions

<b>Operational Temperature</b>	-20 to +55°C
<b>Storage Temperature</b>	-40 to 85°C
<b>Relative Humidity</b>	5 to 95% noncondensing



2549 Rosebay Street | Suite 100  
Eugene, OR 97402-6148 USA  
Ph 541.463.1496 Fx 541.463.1497  
Em [info@lighthouseplcs.com](mailto:info@lighthouseplcs.com)  
URL <http://www.lighthouseplcs.com>