



EP7408

8 Mixed I/O and Serial PIFA

PIFA with one serial port, 2 DI, 4 AI and 2 AO for mounting in an EXOflex house. Suitable for small applications with mixed I/O.

- 2 DI standard functions, e.g. filtering, on-/off-delay, run-time measurement
- 4 AI for individually selectable measurement ranges
- 2 AO 0...10 V DC

- One serial port (Port 3) selectable between RS232, RS485 (EXOline) and hIEXOline
- Can be completed with option cards for modem, EIB, SIOX, etc.
- Can be completed with external M-Bus/SIOX-connection

EP7408 is an 8 Mixed I/O and Serial PIFA, designed for use in general control applications.

EXOflex

EXOflex is a general system for control, regulation, supervision and communication in general automation installations. The system offers great possibilities when constructing many different types of control and regulation systems: outstations in distributed systems, controllers in building automation systems, service gateways in LANs and on the Internet, etc.

The system is of a modular design and provides unique opportunities for adapting the number and type of inputs and outputs required, as well as the type of communication needed.

EXOflex consists of a housing and a selection of PIFA units. One Power PIFA must always be present in each house.

Installation

EP7408 can only be mounted in an EXOflex processor house. See "Rules for mounting" on page 2. It is of a standard design and size and can quickly and simply be slotted into place.

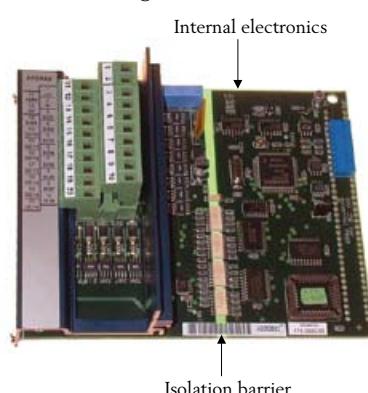


All electrical connections to external equipment are easily attainable on plug-in screw connectors.

For more information on how to install PIFA:s, see the instruction for EH11-S...41-S / EH10-S...40-S / ECX2.

EP7408 handles difficult electrical environments

The process connections are, as a group, galvanically insulated from each other and from the internal control logic circuits by a protective barrier, which is bridged by optocouplers. If necessary, the isolation from other circuits can be retained by using a separate power supply. Each process connection has active transient protection, which is led to a special EMI ground (disturbance protection ground) or to protective ground. This provides for optimal handling of difficult electrical environments.



The principles of the isolation barrier

Prepared for redundant power supply

The parts of the PIFA closest to the process get their power from an external source, which is normally the same as the source supplying the whole EXOflex-unit with power. To handle power outage situations, it could also be power supplied from an alternative source, e. g. 9035 with external battery. See the product sheets for EP1011 and 9035.

Connections

EP7408 has:

2 analog outputs of the type Standard AO.

4 analog inputs of the type Multisensor AI, also handling 0...20 mA transmitters.

2 digital inputs of the type Standard 24V DC DI. The inputs are supplied with advanced software functions for pulse counting etc.

1 communication port of the type Port 3 .

- **Power supply**

The EMI earth must be connected to the earth rail or equivalent, to prevent disturbances.

The 0 V connection must also be grounded. This is normally done at the power unit's negative pole.

- **Standard AO**

Each output is current limited and short circuit proof. This type of output is mainly intended for use with damper motors, shunt valves, frequency inverters and other analog actuators for 0...10 V.

Process Connections

Normal, high-ohm loads are connected between the output and AGnd. Other types of loads for special applications with low-ohm loads are best connected between the output and 0 V (terminal 20).

- **Multisensor AI**

This type of input is mainly intended for use with sensors using voltage outputs and resistance elements or measuring temperature, pressure, flow, etc.

In the range 0...20 mA, the internal current shunt resistor is activated by software-controlled electronic circuits. The shunt resistor has an active current limiter that limits the current to approximately 25 mA. However, the input voltage must not exceed 12 V on the input, as each input also has active transient protection that activates at this voltage level.

All analog inputs have active transient protection that activates at an in-voltage of >12 V. This means that if you mistakenly allow 24 V on an input for longer than approx. 0.5 seconds the input will be permanently damaged and the guarantee will not be valid!

If you connect an active transmitter (4...20 mA) and power it with 12 V, the analog input will not be damaged if the transmitter is mistakenly short-circuited.

Process Connections

Voltage signals are connected between the input and AGnd.

The cable screen is connected to the connector SCR.

The +C output is current limited. External transmitters for 4...20 mA can be powered from a +C output. A fast fuse should be fitted in serial with the transmitter to protect the input from short circuits in the transmitter.

All AGnd are internally linked to each other and to 0 V (terminal 20). To attain maximum accuracy on analog input measurements and according to specifications, each respective AGnd should be used as a reference for each respective group of AI. As an example, the AGnd-connection 7 acts as an accurate reference for AI1 and AI2.

- **Standard 24 V DC DI**

This type of input is used for reading off floating (potential free) contacts and is active high.

A yellow LED for each input shows its current status.

Process Connections

The external contact's one end is connected to the input and the other to +C. The +C output is current limited and short circuit proof.

Communication Ports

Port 3 is **not** handled by independent PIFA's via EFX, but directly by EXOreal. Port connections cannot be used in expansion houses.

RS232

The RS232 interface is selected via the hardware if you connect the signal SEL3 to GND3 for Port 3.

Port 3 has a complete set of control signals for RS232, i.e. RxD, TxD, RTS, CTS, DTR, DSR, RI and DCD, as well as advanced modem support.

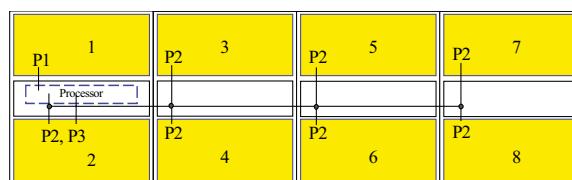
EXOline/hlEXOline

hlEXOline is obtained by changing a jumper setting on EP7408. EXOline is default.

Rules for mounting

The internal port connections (Port 3) in an EXOflex processor house go to different positions (2-8).

Port 3 is available in position 2 in the processor section. See below:



Internal Port 3 connections.

Options for EP7408

In addition to the capabilities of EP7408, you can also add an option card for each port and position (2-8). When using an option card, software is used to connect a port to the card. See the product sheets for modem 9011, the SIOX option 9020F, the EIB option 9017, and the Foxboro option 9015.

Technical data

| | |
|----------------------------|--|
| Supply voltage | 24 V DC |
| tolerance | 18...30 V DC |
| power consumption | max load: electronically fused to 1.1 A, no load: 80 mA |
| +C output for DI, level | = Supply voltage |
| max load | 200 mA |
| Internal power consumption | 5 V, 70 mA |
| CE | This product conforms with the requirements of European EMC standards CENELEC EN 61000-6-1 and EN 61000-6-3 and carries the CE-mark. |

Analog outputs

| | |
|---------------------------|-------------------------------------|
| Number of outputs | 2 |
| Basic resolution | 11 bits |
| Output range | 0...10 V |
| accuracy | ±0.2 % ±20 mV at max 1000 Ohms load |
| Max current on one output | 20 mA, 10 V/500 Ohm |

Analog inputs

| | |
|--|---|
| Number of inputs | 4 |
| Basic resolution | 12 bits |
| Measurement range | individually configurable, determined by program parameters |
| Current | 0 to 22 mA |
| input resistance | 10 Ohm |
| current limit | 25 mA (active up to 12 V, then transient protection is activated) |
| accuracy (% of value) | ±0.1 % ±20 uA |
| Temperature Ni1000, Pt1000 | -50...150°C |
| accuracy (excluding sensor) | ±0.2°C |
| Temperature Pt100 | -50...150°C |
| accuracy (excluding sensor) | ±0.3°C |
| Temperature Pt100, (extended range) | 0...600°C |
| accuracy | ±0.6°C |
| Voltage | 0...10 V, 0...200 mV |
| input resistance | 10 MOhm |
| accuracy (% of full scale) | ±0.1 % |
| Resistance | 0...2000 Ohm |
| accuracy | ±3 Ohm |
| Conversion time | see software description |
| +C output for feeding of sensor, level | = Supply voltage |
| current limit, electronically fused | 200 mA |

Digital inputs

| | |
|--------------------------------------|-----------|
| Number of inputs | 2 |
| Input type | Advanced |
| Logic 0 | 0...5 V |
| input current at 0 V | 0 mA |
| input resistance | 5.7 kOhm |
| Logic 1 | 11...30 V |
| input current at +24 V | 4 mA |
| Shortest pulse length for detection, | |
| software type normal | 9 ms |
| software type advanced | 4.5 ms |

Communication port 3

| | |
|--|---|
| Type | EXOline (RS485), hIEXOline or RS232, standard EXOline |
| Speed | configurable, max 19200 bps, standard 9600 bps |
| Galvanic isolation from the rest of the electronics, | |
| common mode voltage | max 250 V |
| Control signals, RS232 | RxD, TxD, RTS, CTS, DTR, DSR, RI and DCD |
| Control signals, RS485 | E |
| Connector EXOline, hIEXOline and RS232 | Terminal block |

Connections

The RS232 Port

The designations below follow the RS232 standard's DTE terminology.

| Pin no | Signal | Function | Direction |
|---------------|--------|--|-----------|
| Port 3 | | | |
| 27 | TxD3 | Transmit Data | Out |
| 28 | RxD3 | Receive Data | In |
| 29 | RTS3 | Request To Send | Out |
| 30 | CTS3 | Clear To Send | In |
| 31 | GND3 | Signal Ground | |
| 32 | SEL3 | Select RS232 interface. The RS232 interface is selected via the hardware if you connect the signal SEL3 to GND3. | |
| 33 | DTR3 | Data Terminal Ready | Out |
| 34 | DSR3 | Data Set Ready | In |
| 35 | DCD3 | Data Carrier Detect | In |
| 36 | RI3 | Ring Indication | In |

Standard connection. Connections for EP7408 with the PTT modem 9011 on Port 3

| Pin no | Signal | Detailed function | Group function |
|---------------|---------------|--|---|
| 1 | +C | +24 V DC. Output for analog inputs AI and digital inputs DI. | |
| 2 | EMI ground | This terminal is connected internally to the PIFA's frame and to internal protective circuits. It should be connected to the ground rail with a separate, heavy wire. | |
| 3 | AI1 | Analog input 1, type Multisensor | |
| 4 | AI2 | Analog input 2, type Multisensor | |
| 5 | AI3 | Analog input 3, type Multisensor | |
| 6 | AI4 | Analog input 4, type Multisensor | |
| 7 | AGnd | Reference pole for AI1-AI4 | |
| 8 | SCR | Connection for screen, AI1-AI4 | |
| 9 | AO1 | Analog output 1, type Standard | |
| 10 | AO2 | Analog output 2, type Standard | |
| 11 | AGnd | Reference pole for AO1-AO2 for high-ohm loads. For low-ohm loads, use the 0 V terminal (20) as reference pole. | |
| 12 | nc | | Modem 9011 |
| 13 | nc | | |
| 14 | EMI ground | This terminal is connected internally to the PIFA's frame and to internal protective circuits. It should be connected to the ground rail with a separate, heavy wire. | |
| 15 | R | Ring, connect to analog PSTN | |
| 16 | T | Tip, connect to analog PSTN | |
| 17 | A | Secondary Ring, connect to phone | |
| 18 | A1 | Secondary Tip, connect to phone | |
| 19 | +24 V DC | | Inputs for +24 V DC power supply |
| 20 | 0 V | Power supply 0 V. The 0 V-connection is normally grounded at the supply source, so as to define the potential to earth reference and to compensate for disturbances and transients from I/O signals. | |
| 21 | DI1 | Digital input 1, type Standard 24 V DC | |
| 22 | DI2 | Digital input 2, type Standard 24 V DC | |
| 23 | B3 | | EXoline connection, Port 3 Galvanically insulated from all other circuits. |
| 24 | A3 | | |
| 25 | N3 | The 0 V reference. This should be connected to the screen of the communication cable, which in turn should be grounded at one point at least. | |
| 26 | E3 | | |
| 27 | TxD3 | See "The RS232 Port" on page 4. | RS232 connection, Port 3 This connection is galvanically insulated from the internal circuits. GND3 is the signal zero. Use screened cable and earth it at one point. |
| 28 | RxD3 | | |
| 29 | RTS3 | | |
| 30 | CTS3 | | |
| 31 | GND3 | | |
| 32 | SEL3 | | |
| 33 | DTR3 | | |
| 34 | DSR3 | | |
| 35 | DCD3 | | |
| 36 | RI3 | | |

Option EIB. Connections for EP7408 with the EIB option 9017 on Port 3

| Pin no | Signal | Detailed function | Group function |
|--------|------------|--|---|
| 1 | +C | +24 V DC. Output for analog inputs AI and digital inputs DI. | |
| 2 | EMI ground | This terminal is connected internally to the PIFA's frame and to internal protective circuits. It should be connected to the ground rail with a separate, heavy wire. | |
| 3 | AI1 | Analog input 1, type Multisensor | |
| 4 | AI2 | Analog input 2, type Multisensor | |
| 5 | AI3 | Analog input 3, type Multisensor | |
| 6 | AI4 | Analog input 4, type Multisensor | |
| 7 | AGnd | Reference pole for AI1-AI4 | |
| 8 | SCR | Connection for screen, AI1-AI4 | |
| 9 | AO1 | Analog output 1, type Standard | |
| 10 | AO2 | Analog output 2, type Standard | |
| 11 | AGnd | Reference pole for AO1-AO2 for high-ohm loads. For low-ohm loads, use the 0 V terminal (20) as reference pole. | |
| 12 | DTR | | Option 9017 |
| 13 | Gnd | Signal Ground | |
| 14 | EMI ground | This terminal is connected internally to the PIFA's frame and to internal protective circuits. It should be connected to the ground rail with a separate, heavy wire. | |
| 15 | TxD | Transmit Data (Out) | |
| 16 | RxD | Receive Data (In) | |
| 17 | RTS | Request To Send (Out) | |
| 18 | CTS | Clear To Send (In) | |
| 19 | +24 V DC | | Inputs for +24 V DC power supply |
| 20 | 0 V | Power supply 0 V. The 0 V-connection is normally grounded at the supply source, so as to define the potential to earth reference and to compensate for disturbances and transients from I/O signals. | |
| 21 | DI1 | Digital input 1, type Standard 24 V DC | |
| 22 | DI2 | Digital input 2, type Standard 24 V DC | |
| 23 | B3 | | EXOline connection, Port 3 Galvanically insulated from all other circuits. |
| 24 | A3 | | |
| 25 | N3 | The 0 V reference. This should be connected to the screen of the communication cable, which in turn should be grounded at one point at least. | |
| 26 | E3 | | |
| 27 | TxD3 | See "The RS232 Port" on page 4. | RS232 connection, Port 3 This connection is galvanically insulated from the internal circuits. GND3 is the signal zero. Use screened cable and earth it at one point. |
| 28 | RxD3 | | |
| 29 | RTS3 | | |
| 30 | CTS3 | | |
| 31 | GND3 | | |
| 32 | SEL3 | | |
| 33 | DTR3 | | |
| 34 | DSR3 | | |
| 35 | DCD3 | | |
| 36 | RI3 | | |

Option SIOX. Connections for EP7408 with the SIOX option 9020F on Port 3

| Pin no | Signal | Detailed function | Group function |
|--------|------------|--|---|
| 1 | +C | +24 V DC. Output for analog inputs AI and digital inputs DI. | |
| 2 | EMI ground | This terminal is connected internally to the PIFA's frame and to internal protective circuits. It should be connected to the ground rail with a separate, heavy wire. | |
| 3 | AI1 | Analog input 1, type Multisensor | |
| 4 | AI2 | Analog input 2, type Multisensor | |
| 5 | AI3 | Analog input 3, type Multisensor | |
| 6 | AI4 | Analog input 4, type Multisensor | |
| 7 | AGnd | Reference pole for AI1-AI4 | |
| 8 | SCR | Connection for screen, AI1-AI4 | |
| 9 | AO1 | Analog output 1, type Standard | |
| 10 | AO2 | Analog output 2, type Standard | |
| 11 | AGnd | Reference pole for AO1-AO2 for high-ohm loads. For low-ohm loads, use the 0 V terminal (20) as reference pole. | |
| 12 | nc | | Option 9020F |
| 13 | nc | | |
| 14 | EMI ground | This terminal is connected internally to the PIFA's frame and to internal protective circuits. It should be connected to the ground rail with a separate, heavy wire. | |
| 15 | nc | | |
| 16 | S | Meter signal | |
| 17 | N | Meter signal | |
| 18 | +24 V DC | | |
| 19 | +24 V DC | | Inputs for +24 V DC power supply |
| 20 | 0 V | Power supply 0 V. The 0 V-connection is normally grounded at the supply source, so as to define the potential to earth reference and to compensate for disturbances and transients from I/O signals. | |
| 21 | DI1 | Digital input 1, type Standard 24 V DC | |
| 22 | DI2 | Digital input 2, type Standard 24 V DC | |
| 23 | B3 | | EXoline connection, Port 3 Galvanically insulated from all other circuits. |
| 24 | A3 | | |
| 25 | N3 | The 0 V reference. This should be connected to the screen of the communication cable, which in turn should be grounded at one point at least. | |
| 26 | E3 | | |
| 27 | TxD3 | See "The RS232 Port" on page 4. | RS232 connection, Port 3 This connection is galvanically insulated from the internal circuits. GND3 is the signal zero. Use screened cable and earth it at one point. |
| 28 | RxD3 | | |
| 29 | RTS3 | | |
| 30 | CTS3 | | |
| 31 | GND3 | | |
| 32 | SEL3 | | |
| 33 | DTR3 | | |
| 34 | DSR3 | | |
| 35 | DCD3 | | |
| 36 | RI3 | | |

Option Foxboro. Connection of EP7408 with Foxboro option 9015 on Port 3.

| Pin no | Signal | Detailed function | Group function |
|--------|------------|--|---|
| 1 | +C | +24 V DC. Output for analog inputs AI and digital inputs DI. | |
| 2 | EMI ground | This terminal is connected internally to the PIFA's frame and to internal protective circuits. It should be connected to the ground rail with a separate, heavy wire. | |
| 3 | AI1 | Analog input 1, type Multisensor | |
| 4 | AI2 | Analog input 2, type Multisensor | |
| 5 | AI3 | Analog input 3, type Multisensor | |
| 6 | AI4 | Analog input 4, type Multisensor | |
| 7 | AGnd | Reference pole for AI1-AI4 | |
| 8 | SCR | Connection for screen, AI1-AI4 | |
| 9 | AO1 | Analog output 1, type Standard | |
| 10 | AO2 | Analog output 2, type Standard | |
| 11 | AGnd | Reference pole for AO1-AO2 for high-ohm loads. For low-ohm loads, use the 0 V terminal (20) as reference pole. | |
| 12 | nc | | Option 9015 |
| 13 | Gnd | Signal Ground | |
| 14 | EMI ground | This terminal is connected internally to the PIFA's frame and to internal protective circuits. It should be connected to the ground rail with a separate, heavy wire. | |
| 15 | TxD | Transmit Data (Out) | |
| 16 | RxD | Receive Data (In) | |
| 17 | RTS | Request To Send (Out) | |
| 18 | CTS | Clear To Send (In) | |
| 19 | +24 V DC | | Inputs for +24 V DC power supply |
| 20 | 0 V | Power supply 0 V. The 0 V-connection is normally grounded at the supply source, so as to define the potential to earth reference and to compensate for disturbances and transients from I/O signals. | |
| 21 | DI1 | Digital input 1, type Standard 24 V DC | |
| 22 | DI2 | Digital input 2, type Standard 24 V DC | |
| 23 | B3 | | EXOline connection, Port 3 Galvanically insulated from all other circuits. |
| 24 | A3 | | |
| 25 | N3 | The 0 V reference. This should be connected to the screen of the communication cable, which in turn should be grounded at one point at least. | |
| 26 | E3 | | |
| 27 | TxD3 | See "The RS232 Port" on page 4. | RS232 connection, Port 3 This connection is galvanically insulated from the internal circuits. GND3 is the signal zero. Use screened cable and earth it at one point. |
| 28 | RxD3 | | |
| 29 | RTS3 | | |
| 30 | CTS3 | | |
| 31 | GND3 | | |
| 32 | SEL3 | | |
| 33 | DTR3 | | |
| 34 | DSR3 | | |
| 35 | DCD3 | | |
| 36 | RI3 | | |

Product documentation

| Document | Type |
|--------------------------------------|---|
| EH11-S...41-S / EH10-S...40-S / ECX2 | Instruction for EXOflex houses and the EXOflex processor ECX2 |
| EXO System Manual | Manual covering the EXO System |

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