Module and Application Description

PROCONTROL 13
Signal Conditioning
Input Module for Analog Signals
32fold

81 EA10-E /R0100 /R0200 /R0300

Application

The input module for analog signals is used to input standard current signals in the signal ranges 0...20 mA, 4...20 mA or standard voltage signals in the range 0...10 V.

The module contains 32 function units. Therefore, 32 different analog signals can be input simultaneously.

The module is available in 3 different hardware versions:

81 EA10-E/R0100 - for analog signals of 0...20 mA
81 EA10-E/R0200 - for analog signals of 4...20 mA
81 EA10-E/R0300 - for analog signals of 0...10 V

Features

The module can be plugged into every multi-purpose processing station of the PROCONTROL bus system; it has a slot requirement of 2 divisions.

It incorporates a standard interface SEA to the I0-bus.

The module receives the analog signals from analog value transmitters installed in the process and transfers the values, in the form of telegrams, via the I0-bus to the PROCONTROL bus system.

The analog value transmitters are cyclically scanned by twin-pole CMOS switches, and the signals are digitized by means of a non-integrating A/D converter.
Description

Basically, the module consists of three functional blocks:

- Analog/digital conversion of the input signals
- Sequential control of signal acquisition and filing of the digitized measured value in a memory
- Bus adaption with output of the stored measured value when the module is called.

SIGNAL INPUT FROM THE PROCESS

The module is used for acquisition of 32 standard current signals in the range 0...20 mA or 4...20 mA or, alternatively, for acquisition of 32 standard voltage signals 0...10 V.

Current signals of 0...20 mA or 4...20 mA pass through a load resistance of 100 ohms and are converted to voltage signals in the range of 0...2000 mV and 400...2000 mV, respectively.

The voltage signals are supplied via resistors.

The 32 measuring voltages are scanned cyclically by a CMOS multiplexer and transferred in analog form to a non-integrating analog/digital converter.

This converter converts the analog value into a digital value of 12-bit word length and files this in a memory.

The module receives the up to 32 measured values via its two process connectors X3 and X4.

The supply voltage is fed to the module via its bus connector X1. Auxiliary voltages required internally are generated on the module.

WIRING OF UNUSED FUNCTION UNITS

In versions R0100 and R0300, all unused function units of the module should be bridged and connected to frame (Z) on the process connectors.

If used function units of version R0200 are not supplied with a current of approx. 4 mA, the disturbance bit in the respective data telegram will be set.

To avoid the initiation of disturbance announcements, the inputs of the unused function units are to be connected with the transmitter simulation module 81 ES02/R0100.

Connection is effected for 16 function units in common.

The transmitter simulation module is able to supply the unused function units with the required current of 4 mA.

Wiring of version R0200 with transmitter simulation module 81 ES02/R0100:

![Diagram of cable connection]
Note:

It is essential to connect the cables for the used function units before the simulation module is plugged onto the connector.

The corresponding switches must be open for used function units and closed for unused function units.

After attaching the simulation module, the cable connections to the positive contacts E11...E321 of the unused function units are to be installed.

The supply voltage and the reference potential Z can be connected through from one simulation module to the next.

DATA OUTPUT TO I0-BUS

Whenever the module is called by its starting address, it transfers the contents of its measured value memories to the I0-bus in the form of data telegrams.

The module additionally transfers the specification telegram pertaining to each data telegram.
Formation of telegrams

Two telegrams are formed by the module for every function unit and transferred to the IO-bus. For this, 64 consecutive addresses are needed on the IO-bus.

DATA TELEGRAM

The data telegram has a length of 16 bits with the contents specified below. It is output under an even-numbered address.

The measured value is represented digitally as a percentage of the corresponding measuring range, as follows:

15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0

<table>
<thead>
<tr>
<th></th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sign</td>
<td>(always 0)</td>
</tr>
<tr>
<td>Measured value</td>
<td>12 bits</td>
</tr>
<tr>
<td>Disturbance bit</td>
<td>Measuring range (always 00)</td>
</tr>
</tbody>
</table>

Adding the bits set to logic "1" yields the analog measured variable.

SPECIFICATION TELEGRAM

Details on the type of transmitter as well as the start and end of the set measuring range are additionally output by the module for every data telegram.

The specification telegram is output to the next odd-numbered address of the preceding data telegram.

15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0

<table>
<thead>
<tr>
<th></th>
<th>0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start of measuring range (always 0)</td>
<td></td>
</tr>
<tr>
<td>End of measuring range</td>
<td></td>
</tr>
<tr>
<td>Transmitter type</td>
<td></td>
</tr>
</tbody>
</table>
Data communication with the module

The module is provided on its front with 2 hex code switches which serve to set the module starting address.

When the module is called by its starting address, it transfers its data and specification telegrams to the IO-bus during the following 64 cycles.

The module starting address is set on the module; the remaining 63 module addresses are generated module internal.

FORMATION OF ADDRESS

The bus control module transfers address telegrams of 16-bit length to call the individual modules connected to the IO-bus. In the module, every incoming address telegram is compared with its own module address. This comparison takes place in parallel mode.

The address transferred by the bus control module is evaluated as follows:

If bits 6 to 11 of the address telegrams are the same, the module responds and transfers, during the next clock cycle, the data telegram of its first function unit to the IO-BUS.

The measured value memories of the individual function units are addressed directly by bits 1 to 5.

The 0 address bit is the so-called specification bit. Depending on the state of the specification bit, a specification telegram or a data telegram is transferred.

0 = data telegram
1 = specification telegram

The address transferred by the bus control module is compared with the address set on the module.

The address required by the module for comparison is as follows:

always 000
Annunciation functions

Disturbances in the module, in the process peripherals, and in the communication with the IO-bus are detected and signalled by the module.

Disturbances can be signalled by the module in the following three ways:

- Visual disturbance annunciation on the module by the light-emitting diode ST visible on the module front which emits a steady red light in the event of a disturbance.

- Annunciation via bus line SME of the IO-bus.

- Annunciation by setting disturbance bit SB in the data telegram of the corresponding function unit.

ANNUNCIATION ON THE MODULE

The red light-emitting diode ST is connected with the bus line SME. It emits a steady light when a disturbance annunciation is transferred via bus line SME.

ANNUNCIATION TO THE IO-BUS

A disturbance annunciation is output in the following cases:

- If the module is not addressed by a valid address telegram within 7 s.

Disturbance annunciation signal SME and light-emitting diode ST are set. If the module is called again by the bus control module, SME and ST are reset after 200 ms.

- If one or more of the bus connecting lines are interrupted or disturbed.

Disturbance annunciation signal SME and light-emitting diode ST are set as long as disturbances are present.

After the disturbances have been removed, SME and ST are reset after 200 ms.

- If disturbances occur in the internal sequential cycle, e.g. in the measured value memory allocation.

Disturbance annunciation signal SME and light-emitting diode ST are set as long as disturbances are present.

After the disturbances have been removed, SME and ST are reset after 200 ms.

- If one or more function units are supplied by the process with values exceeding 150 % of the measuring range.

Disturbance bit SB in the corresponding data telegram is set as long as the measured value exceeds this 150 % limit. (This applies to versions R0100 and R0200).

- If one or more measuring lines to the process inputs are interrupted.

(Measured current \( \leq 2.4 \text{ mA} \)).

Disturbance bit SB is set in the corresponding data telegram and value 0 is output. (This applies only to version R0200).

- If one or more function units have negative input values.

Disturbance bit SB is set in the data telegram, and value 0 is output when the analog input value is \( \leq -2 \text{ mA} /+/0.2 \text{ mA} \) in the case of R0100, \( \leq 2.4 \text{ mA} /+/0.16 \text{ mA} \) in the case of R0200 and \( \leq -1 \text{ V} /+/0.1 \text{ V} \) in the case of R0300.

If the values do not fall below these limits, disturbance bit SB is not set, and only value 0 is output.

72
Setting of the module

The settings on the module are performed using address switches S1, S2 and S3, configuration switch S4 as well as potentiometers U6 (lower limit value = R92) and U6 (upper limit value = R83).

SETTING OF ADDRESS

The module starting address is to be set by means of address switches S1 and S2. The address is set with the module withdrawn. The 3rd address switch is permanently wired in the module. The position of switch S3 is marked by 0 imprinted on the module front below the cut-outs for switches S1 and S2.

- Possible settings of the hex. code address switches:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>adjustable</td>
<td>0</td>
<td>always 0</td>
</tr>
<tr>
<td>0 - F</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C</td>
<td></td>
</tr>
</tbody>
</table>

Other settings are not accepted by the module. In this case, the module outputs a disturbance annunciation signal SME after 7 s and signals a disturbance via light-emitting diode SI.

The address set on these address switches is the address of the first function unit (module starting address).

It can be read on the front panel.

When the module is used in connection with a bus coupling module 88 QTO2, value 1 must be set on address switch S1.

By setting the first address switch to position "1", the bus coupling module 88 QTO2 is notified that specification telegrams are transferred by the module.

MEANING OF THE CONFIGURATION SWITCH

Configuration switch S4 is used to set the transmitter type in the specification telegram.

<table>
<thead>
<tr>
<th>Version</th>
<th>Transmitter type</th>
<th>Switch positions</th>
</tr>
</thead>
<tbody>
<tr>
<td>R0100</td>
<td>0...20mA</td>
<td>S4 : 1 : 2 : 3 : 4 : 5 : 6 : 7 : 8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ON</td>
</tr>
<tr>
<td>R0200</td>
<td>4...20mA</td>
<td>S4 : 1 : 2 : 3 : 4 : 5 : 6 : 7 : 8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ON</td>
</tr>
<tr>
<td>R0300</td>
<td>0...10V</td>
<td>S4 : 1 : 2 : 3 : 4 : 5 : 6 : 7 : 8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ON</td>
</tr>
</tbody>
</table>

Contacts S4:6 to S4:8 are not used and can be set as desired.

It is not possible to convert a version only by changing the contacts.

To convert a version, it is additionally necessary to re-arrange the resistors in the analog value processing part.

Also, the load resistors must be removed or installed, as required.

It is necessary to re-calibrate the module after conversion.
Adjustment and calibration of module

Potentiometers are provided on the module to allow adjustment of the lower limit value, the upper limit value and the 4 mA live zero current of the analog inputs.

Adjustments are performed on function unit 1 simultaneously for all function units. The adjustments are only valid for the version concerned.

To allow connection of a voltage, terminals E11 and E12 of the first function unit on the printed circuit board (2) are designed as minitermipoint test pins.

Conversion of the module from version R0100 to version R0200 necessitates recalibration.

If the module is to be converted from version R0100 or R0200 to version R0300, it is also necessary, for re-calibration, to change the resistors in the analog value processing part and to add or remove load resistors.

ADJUSTMENT OF THE UPPER AND LOWER LIMIT VALUES

Adjustments are made with the potentiometers for the upper limit value (UG = R83), the lower limit value (UG = R92), and live zero current 4 mA (R99).

VERSION R0100 (0 mA...20 mA)

Before adjustments are made, the following prerequisites must be satisfied:

- Contacts S4:1 to S4:5 of the configuration switch must be set as required for the version concerned.
- Jumper 1002 in place.
- Jumper 1001 removed.

Calibration procedure

- Apply a voltage of 0.970 mV to the minitermipoint test pins E11 and E12 of function unit 1 (± 0 %).

- Using potentiometer R92, calibrate to 0% + 0 + 1 LSB of the measuring range.

```
14 13 12 11 10 9 8 7 6 5 4 3
0 0 0 0 0 0 0 0 0 0 0 0
```

or

```
14 13 12 11 10 9 8 7 6 5 4 3
0 0 0 0 0 0 0 0 0 0 0 1
```

The value alternates between the two indications shown.

- Apply a voltage of 2000 mV to the minitermipoint test pins E11 and E12 (± 100 %).

- Using potentiometer R83, calibrate to 100% + 0 - 1 LSB of the measuring range.

```
14 13 12 11 10 9 8 7 6 5 4 3
0 1 1 1 1 1 1 1 1 1 1 1
```

or

```
14 13 12 11 10 9 8 7 6 5 4 3
1 0 0 0 0 0 0 0 0 0 0 0
```

The value alternates between the two indications shown.

- Perform a zero check.

VERSION R0200 (4 mA...20 mA)

Before adjustments are made, the following prerequisites must be satisfied:

- Contacts S4:1 to S4:5 of the configuration switch must be set as required for the version.
- Jumper 1003 in place.
- Jumper 1001 removed.
Calibration procedure

- Apply a voltage of 0.970 mV to the minitermipoint test pins E11 and E12 of the function unit 1 (± 0%).
- Using potentiometer R92, calibrate to 0% + 0 + 1 LSB of the measuring range.

\[
\begin{array}{cccccccc}
14 & 13 & 12 & 11 & 10 & 9 & 8 & 7 & 6 & 5 & 4 & 3 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0
\end{array}
\]

or

\[
\begin{array}{cccccccc}
14 & 13 & 12 & 11 & 10 & 9 & 8 & 7 & 6 & 5 & 4 & 3 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0
\end{array}
\]

The value alternates between the two indications shown.

- Install jumper 1001.
- Apply a voltage of 400.780 mV to minitermipoint test pins E11 and E12 (± 20%).
- Using potentiometer R99, calibrate to 0% + 0 + 1 LSB of the measuring range.

\[
\begin{array}{cccccccc}
14 & 13 & 12 & 11 & 10 & 9 & 8 & 7 & 6 & 5 & 4 & 3 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0
\end{array}
\]

or

\[
\begin{array}{cccccccc}
14 & 13 & 12 & 11 & 10 & 9 & 8 & 7 & 6 & 5 & 4 & 3 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0
\end{array}
\]

The value alternates between the two indications shown.

- Apply a voltage of 2000 mV to minitermipoint test pins E11 and E12 (± 100%).
- Using potentiometer RB3, calibrate to 100% + 0 - 1 LSB of the measuring range.

\[
\begin{array}{cccccccc}
14 & 13 & 12 & 11 & 10 & 9 & 8 & 7 & 6 & 5 & 4 & 3 \\
0 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1
\end{array}
\]

or

\[
\begin{array}{cccccccc}
14 & 13 & 12 & 11 & 10 & 9 & 8 & 7 & 6 & 5 & 4 & 3 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0
\end{array}
\]

The value alternates between the two indications shown.

- Perform a zero check.

VERSION 0300 (0 V...10 V)

Before adjustments are made, the following prerequisites must be satisfied:

- Contacts S4:1 to S4:5 of the configuration switch must be set as required for the version.
- Jumper 1002 in place.
- Jumper 1001 removed.

Calibration procedure

- Apply a voltage of 4.9 mV to minitermipoint test pins E11 and E12 of the function unit 1 (± 0%).
- Using potentiometer R92, calibrate to 0% + 0 + 1 LSB of the measuring range.

\[
\begin{array}{cccccccc}
14 & 13 & 12 & 11 & 10 & 9 & 8 & 7 & 6 & 5 & 4 & 3 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0
\end{array}
\]

or

\[
\begin{array}{cccccccc}
14 & 13 & 12 & 11 & 10 & 9 & 8 & 7 & 6 & 5 & 4 & 3 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0
\end{array}
\]

The value alternates between the two indications shown.

- Apply a voltage of 10 V to minitermipoint test pins E11 and E12 (± 100%).
- Using potentiometer RB3, calibrate to 100% + 0 - 1 LSB of the measuring range.

\[
\begin{array}{cccccccc}
14 & 13 & 12 & 11 & 10 & 9 & 8 & 7 & 6 & 5 & 4 & 3 \\
0 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1
\end{array}
\]

or

\[
\begin{array}{cccccccc}
14 & 13 & 12 & 11 & 10 & 9 & 8 & 7 & 6 & 5 & 4 & 3 \\
1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0
\end{array}
\]

The value alternates between the two indications shown.

- Perform a zero check.
Functional diagram

The module consists of two printed circuit boards (see "Mechanical design") which are equipped with four connectors X1, X2, X3 and X4, two address switches S1 and S2, one configuration switch S4 as well as the potentiometers for the lower and upper measuring range limits.

TERMINAL DESIGNATIONS:

Printed circuit board (1) is fitted with connectors X1 and X3. Connector X1 contains the standard interface to the 10-bus SEA, connector X3 contains 16 process inputs E11 and E162.

Printed circuit board (2) is fitted with connectors X2 and X4. Connector X2 contains the operating voltage supply, connector X4 contains 16 further process inputs E171 to E322.

Terminals for the screen can be connected via a jumper with b32 of connector X1 or connector X2.
Connection diagrams

The connections of module versions R0100 and R0300 are the same.

Connections of module version R0200 in which unused function units are wired via the transmitter simulation module 81 ES02/R0100.
Mechanical design

The mechanical design is the same for all module versions.

Board size: 6 U, 2 T, 160 mm deep

View of connector side:

Connector: to DIN 41 612

2 x for 10-bus connection
48-pole,
edge-connector type F
(connector X1, X2)

2 x for process connection
48-pole,
edge-connector type F
(connector X3, X4)

Weight: ca. 0.84 kg

Printed circuit boards (1) and (2) are connected with each other mechanical and electrically.

The exact contact allocation of the individual connectors can be seen from the operating principles description "Connectors of the 10-bus modules" GKWE 705 321 or from the functional diagram of the module.
POSITIONS OF THE ADJUSTABLE COMPONENTS AND VISUAL DISPLAYS ON THE FRONT

The front panels of module versions R0100, R0200 and R0300 as well as the functions of the components shown are the same.

Light-emitting diode for disturbance annunciation ST

<table>
<thead>
<tr>
<th>IO-bus address</th>
<th>Significance:</th>
<th>Hexadecimal</th>
<th>Decimal</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>100</td>
<td>256</td>
<td></td>
</tr>
<tr>
<td>S2</td>
<td>10</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>S3</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Upper limit of measuring range (R83)  
Lower limit of measuring range (R92)  

Switch S3 is permanently wired to 0 and shown as imprint on the front of the module.
POSITIONS OF THE ADJUSTABLE COMPONENTS ON PRINTED CIRCUIT BOARD (1)

The printed circuit board contains the two potentiometers UG (R83) and OG (R92) for adjusting the limit values, the potentiometer R99 which serves to increase the lower limit value to 4 mA on module version RO200, as well as the three soldering jumpers 1001 to 1003 which are installed in the factory in their basic positions as required for the respective module versions.

The inputs of the first function unit FEl are connected to test pins for limit value adjustment.

<table>
<thead>
<tr>
<th>Position of soldering jumpers on the printed circuit board:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Version:</td>
</tr>
<tr>
<td>Jumper: 1001</td>
</tr>
<tr>
<td>1002</td>
</tr>
<tr>
<td>1003</td>
</tr>
</tbody>
</table>
POSITIONS OF THE ADJUSTABLE COMPONENTS ON PRINTED CIRCUIT BOARD (2)

The printed circuit board incorporates address switches S1 and S2, configuration switch S4 as well as the following plug-in jumpers.

The allocation of plug-in jumpers is the same for module versions R0100, R0200 and R0300.

Position of the plug-in jumpers on the printed circuit board:

<table>
<thead>
<tr>
<th>Jumper</th>
<th>51-52</th>
<th>53-54</th>
<th>55-56</th>
<th>57-58</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>in place</td>
<td>in place</td>
<td>removed</td>
<td>in place</td>
</tr>
</tbody>
</table>
Technical data

In addition to the system data, the following values apply:

**MODULE VERSION:**

<table>
<thead>
<tr>
<th></th>
<th>R0100</th>
<th>R0200</th>
<th>R0300</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>POWER SUPPLY</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated voltage:</td>
<td>16.8...33 V</td>
<td>16.8...33 V</td>
<td>16.8...33 V</td>
</tr>
<tr>
<td>Operating voltage $U_S$:</td>
<td>24 V</td>
<td>24 V</td>
<td>24 V</td>
</tr>
<tr>
<td>Current consumption $I_{typ}$:</td>
<td>150 mA</td>
<td>150 mA</td>
<td>150 mA</td>
</tr>
<tr>
<td>Power dissipation $P_{vtyp}$:</td>
<td>3.6 W</td>
<td>3.6 W</td>
<td>3.6 W</td>
</tr>
</tbody>
</table>

The values specified for $P_{vtyp}$ and $I_{typ}$ apply for unloaded inputs. To obtain an exact value, the input loads must be added.

Reference potential 10-bus 2: 0 V 0 V 0 V

**TRANSFER**

Multiplexer: twin-pole CMOS switch
Analog-digital converter: non-integrating, step converter
Scanning time of all inputs: $\leq 200$ ms
Resolution: 12 bits + sign

**INPUTS**

Number of function inputs to be connected: 32 32 32

<table>
<thead>
<tr>
<th></th>
<th>Differential inputs</th>
<th>Differential inputs</th>
<th>Differential inputs</th>
</tr>
</thead>
</table>

Input type: Standard current 4 mA...20 mA 0 V...10 V

Input designation: E11 to E322 E11 to E322 E11 to E322

**INPUT VALUES OF STANDARD CURRENT INPUTS**

Nominal range 0 %...100 %: 0 mA...20 mA 4 mA...20 mA -
Maximum measuring range 0 %...200 %: 0 mA...40 mA 4 mA...36 mA -
Load resistance: 100 Ohm +/- 0.1 100 Ohm +/- 0.1 -
Temperature effect of load: 20 ppm/K 20 ppm/K -
Maximum input current: (surge limit) 50 mA 50 mA -
MODULE VERSION:

INPUT VALUES OF STANDARD VOLTAGE INPUTS

Nominal range 0 %...100 %: - - 0 V...10 V
max. measuring range within the error limits - - 0 V...10.5 V
(max. %: 105 %): - -
max. measuring range outside the error limits - - 0 V...12 V
(max. %: 120 %): - -

OUTPUTS

Output designation: SEA standard interface IO-bus

ERROR SPECIFICATION

Zero error at 0 °C...70 °C typ.: 0.08 % 0.12 % 0.04 %
Amplification error at 0 °C...70 °C typ.: 0.15 % 0.15 % 0.15 %
Zero error at 0 °C...70 °C max.: 0.3 % 0.41 % 0.07 %
Amplification error at 0 °C...70 °C max.: 0.3 % 0.3 % 0.3 %
Linearity error: 0.1 % 0.1 % 0.1 %
Effect of temperature max.: 60 ppm/K 60 ppm/K 60 ppm/K
Total error max.: 0.7 % 0.8 % 0.47 %
Effect of supply voltage variations: none with 16.8 V...33 V supply voltage
Common-mode rejection: 60 db
Series-mode rejection typ.: Cut-off frequency 5.2 Hz
Suppression with cut-off frequency fo = 3 db
Increase 20 dB per decade f/fo

PERMISSIBLE TEMPERATURE RANGES

Operating temperature: 0 °C...70 °C 0 °C...70 °C 0 °C...70 °C
Storage temperature: -40 °C...85 °C -40 °C...85 °C -40 °C...85 °C

ORDERING DATA

1. Complete module:
   Type designation: 81 EA10-E/R0100
   81 EA10-E/R0200
   81 EA10-E/R0300
   Order number: GJR2338600R0100
   GJR2338600R0200
   GJR2338600R0300

2. Transmitter simulation module 81 ES02/R0100
   for terminating unused function units of version R0200
   Order number: GJR2364000R0100

3. Standard cables between modules
   81 EA10/R0200 and 81 ES02/R0100
   (one item required for each unused function
   unit).
   Order number: GHR70001201R0100

Technical data are subject to change without notice.