Analog Digital Converter

AWA/SSI/12

12 Bit

Version 2
Notification

This handbook corresponds with the unit version of 18.3.2002. The company Digitronic Automationsanlagen GmbH reserves the right to implement changes that result in an improvement of the quality and the functions of the device at any time and without any announcements. This instructions manual was created with a maximum of care, but mistakes are not out of the question. We are thankful for any comments, regarding possible mistakes in the instruction manual.

UP-date

You can also obtain this instruction manual on the Internet at http://www.digitronic.com in the latest version as PDF file.

Qualified personal only

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Note: This device fulfills the following norms according to electromagnetical compatibility:

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1. Introduction

The analog - digital - converter AWA/SSI/12 of the next generation offers the possibility to measure voltages from 0 to +10 Volt or from 0 to 20mA with a resolution of 12 Bit. The enclosed pre-resistor enables adjusting and configuring the measuring range. The measured value is read out via the serial synchronous interface.

1.1. Data format at the synchronous serial interface

Data format Graycode, according to Stegmann Tannenbaum, compatible to the singleturn encoder with 4096 steps.

2. Assembly

The device is clip-locked onto an "EN carrier rail" in the switchboard (see also chapter "5. Dimensions" on page 6). The grounding pins and cable mantlings are to be put on the shortest way possible onto serial grounding clip next to the device. The grounded assembly plate and its electrical connection to the "EN carrier rail" allow an excellent grounding of the disturbances onto the covering. All cable connections are to be switched in a cold state!! The SSI data lines of the external interface are galvanically separated with an optical couplerthey have to be shielded, wired as pairs and the shield has to be laid on ground with both cable ends. Analog signals have to be placed and covered separately and the cover has to be grounded on one end. The supply voltage measures 24V DC +/- 20%.
3. Terminal allocation

3.1. Terminal allocation of the power supply

- Terminal 1: 0V voltage supply
- Terminal 2: 0V voltage supply
- Terminal 3: +24V voltage supply
- Terminal 4: +24V voltage supply

3.2. SSI interface

- DSUB Pin 5: SSI Data +
- DSUB Pin 9: SSI Data -
- DSUB Pin 8: SSI Clock +
- DSUB Pin 3: SSI Clock -

3.3. Terminal allocation of the analog input

- Terminal 5: Signal ground GND
- Terminal 6: Analog IN
- Terminal 7: reference voltage

3.4. An example for terminal allocation of the CamCon

Attention: At the CamCon an SSI-singleturn encoder with 4096 steps, Gray has to be chosen as the measuring system at this AWA/SSI version 2.

4. Configuration

4.1. Change the input - signal level

The analog inputs' signal level can be changed by soldering bridges on the solder side of the AWA/2X12B's printed circuit board.

The following input signals can be set: "0-20mA" or "0 - +10V".

The adjusted signal level is marked for every input by a cross on the metal cap.

To change the input level, detach all cable connections from the device, remove the device from the switch chest, open the floor part at the devices side using a screwdriver and pull the printed circuit board out of the floor part. On the soldering side of the printed circuit board are soldering bridges for signal input 1 and 2 which are called SJ1 to SJ4. For the measuring of a currency signal the solderingbridge SJ" has to be closed. To measure a voltage signal, it has to be opened.

Note: Having adjusted the desired signal level, the input switching has to be equalized anew. See also chapter "4.3. Calibration".
4.2. Reference voltage supply

Two internal voltages (+4.096 and +5V) are available, an external voltage source may be enabled by switching them both on. The choice is made via a jumper ledge on the component side of the printed circuit board. To change the reference voltage, remove the cap by unscrewing the four cap nuts and choose your voltage source at jumper JP1.

- Bridge at 1+2 = +5V Ref. voltage from the operating voltage.
- Bridge at 2+3 = +4.096V Ref. voltage by precision voltage controller (default).
- Bridge open = external Ref. voltage external by at least +1V to a maximum of +5V.

**Note:** If the source of reference voltage is changed, the input switching has to be equilibrated anew. (see also chapter “4.3. Calibration”).

4.3. Calibration

If the AWA/2X12B module has to be equilibrated anew, remove the case’s top by unscrewing the four cap nuts, to get to the potentiometer. Four multi-gear trimmers called R36 is provided for this purpose.

**4.3.1. Calibration during power input**

Set a constant power source to the terminals 5 and 6. The value of current has to be known with great accuracy. It should be in the range of 15 to 20 mA. Now choose the menu in which this value is displayed in the device (CamCon). You are able to increase this displayed value by turning to the left at the R36 (input 1) or R39 (input 2) or decrease it by turning to the right. Set the now present current or its corresponding value and seal the potentiometer with sealing wax.

**4.3.2. Calibration during voltage-input 0 - +10V**

Set a voltage source to the terminals 5 and 6. The value of voltage has to be known with great accuracy. It should be in the range 0 to +10 Volt. Now choose the menu in which this value is displayed in the device (CamCon). You are able to increase this displayed value by turning to the left at the R36 (input 1) or R39 (input 2) or decrease it by turning to the right. Set the now present voltage or its corresponding value and seal the potentiometer with sealing wax.
5. Dimensions

The following mounting rails may be used to assemble the case: NS 35 / 7.5 (DIN 50022), NS 35 / 15 (DIN 50022) oder NS 32 (DIN 50035)

6. Technical data

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value/Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage supply</td>
<td>24VDC +20%</td>
</tr>
<tr>
<td>Power consumption</td>
<td>150 mA</td>
</tr>
<tr>
<td>Input ranges</td>
<td>&quot;0 - +10V&quot; oder &quot;0 - 20mA&quot;</td>
</tr>
<tr>
<td>Input resistance: at voltage input</td>
<td>RL = 10 kOhm</td>
</tr>
<tr>
<td>Resolution</td>
<td>12 Bit</td>
</tr>
<tr>
<td>Reference voltage source</td>
<td>+4.096V (standard), +5V oder external.</td>
</tr>
<tr>
<td>Data output</td>
<td>Synchronous serial RS422, Graycode corresponding to Stegmann &quot;Tannenbaum&quot;</td>
</tr>
<tr>
<td>Clock frequency</td>
<td>Maximum 1 MHz</td>
</tr>
<tr>
<td>Monoflop i.e. transforming time</td>
<td>Minimum 250 µs</td>
</tr>
<tr>
<td>Grounding</td>
<td>Via 4 * 6.3mm Flatplugs directly to be laid on row-grounding pin.</td>
</tr>
<tr>
<td>Assembling</td>
<td>Simply clamp upon carrier rail according to EN 50 022, may be set in rows. The following mounting rails may be used to fasten the case: NS 35 / 7.5 (DIN 50022) NS 35 / 15 (DIN 50022) NS 32 (DIN 50035)</td>
</tr>
<tr>
<td>Disassembly</td>
<td>Pulling back the snapping bars.</td>
</tr>
<tr>
<td>Protection</td>
<td>Type of case: Phoenix UM corresponds to IP20 and cap made of 1mm galvanized tin</td>
</tr>
<tr>
<td>Dimensions</td>
<td>See also chapter 5. Dimensions.</td>
</tr>
<tr>
<td>Working temperature</td>
<td>0°C ... + 50°C</td>
</tr>
<tr>
<td>Weight</td>
<td>Approximately 400g</td>
</tr>
</tbody>
</table>