Analog Inputs

Analog Inputs Module

USER MANUAL

User Manual Version: [0.2]_a

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1 INTRODUCTION

A variety of Zennio devices incorporate an input interface where it is possible to connect one or more analog inputs with different measurement ranges:

- Voltage (0-10V, 0-1V y 1-10V).
- Current (0-20mA y 4-20mA).

Important: *In order to confirm whether a particular device or application program incorporates the analog input function, please refer to the* ***device user manual****, as there may be significant differences between the functionality of each Zennio device. Moreover, to access to the proper analog input user manual, it is always recommended to make use of the specific download links provided at the Zennio website (www.zennio.com) within the section of the specific device being parameterised.*

2 CONFIGURATION

Please note that the screenshots and object names shown next may be slightly different depending on the device and on the application program.

After enabling the **Analog Input** module**,** in the device general configuration tab, the tab “Analog Input X” is added to the left tree.

2.1 ANALOG INPUT X

The **analog input** is capable of measuring both **voltage** (0…1V, 0…10V o 1…10V) and **current** (0…20mA o 4…20mA), offering different input signal ranges to suit the connected device. **Range error** objects can be enabled to notify when these input measurements are outside these ranges.

When an input is enabled, the object **“[AIx] Measured Value”** appears, which may be of different **formats** depending on the chosen parameter (see Table 1). This object will notify the current value of the input (periodically or after a certain increment/decrement, according to the parameter configuration).

Limits can also be configured, i.e., the correspondence between the maximum and minimum value of the signal measuring range and the actual value object of the sensor.

On the other hand, it shall be possible to configure an alarm object when certain **threshold values** are exceeded above or below, and a **hysteresis** to avoid repeated changes when the signal oscillates between values close to the threshold values. These values will differ depending on the format chosen for the input signal (see Table 1).

Device featuring the analog input functional module shall incorporate a LED indicator associated to each input. The LED will remain off while the measured value is outside the parameterised measurement range and on while it is inside.

ETS PARAMETERISATION

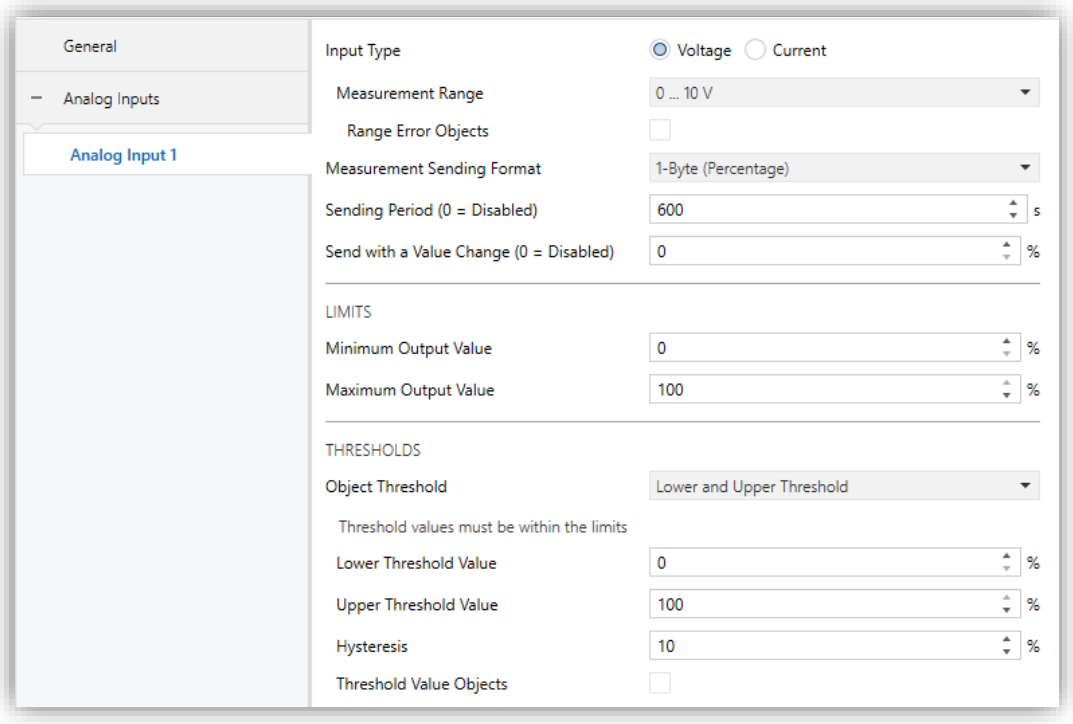

Figure 1. Analog Inputs X.

- **Input Type** [*Voltage / Current*][1]: selection of the signal type to be measured. If the chosen value is "Voltage":

  - **Measurement Range** [0…1 V / 0…10 V / 1…10 V].

  If the chosen value is "Current":

  - **Measurement Range** [*0…20 mA / 4…20 mA*].

- **Range Error Objects** [*Disabled / Enabled*]: enables one or two error objects (**"[AIx] Lower Range Error"** and/or **"[AIx] Upper Range Error"**) that notify an out-of-range value by periodically sending the value "1". Once the value is within the configured range, a "0" will be sent through these objects.

- **Measurement Sending Format** [*1-Byte (Percentage) / 1-Byte (Unsigned) / 1-Byte (Signed) / 2-Byte (Unsigned) / 2-Byte (Signed) / 2-Byte (Float) / 4-Byte (Float)*]: allows to choose the format of the **"[AIx] Measured Value"** object.

[1] The default values of each parameter will be highlighted in blue in this document, as follows: [*default/rest of options*].

- **Sending Period** [*0…600…65535*][*s*]: sets the time that will elapse between sendings of the measured value to the bus. The value "0" leaves this periodical sending disabled.

- **Send with a Value Change**: defines a threshold so that whenever a new value reading differs from the previous value sent to the bus in more than the defined threshold, an extra sending will take place and the sending period will restart, if configured. The value "0" disables this sending. Depending on the format of the measurement, it shall have different ranges.

- **Limits**.

  - **Minimum Output Value**. Correspondence between the minimum value of the signal measuring range and the minimum value of the object to be send.

  - **Maximum Output Value**. Correspondence between the maximum value of the signal measuring range and the maximum value of the object to be send.

- **Threshold**.

  - **Object Threshold** [*Disabled / Lower Threshold / Upper Threshold / Lower and Upper Threshold*].

    - **Lower Threshold**: Two extra parameters will come up:

      - **Lower Threshold Value**: minimum value permitted. Readings below this value will provoke a periodical sending with value "1" through the **"[AIx] Lower Threshold"** object, every 30 seconds.

      - **Hysteresis**: dead band or threshold around the lower threshold value. This dead band prevents the device from repeatedly sending alarm and no-alarm, when the current input value keeps fluctuating around the lower threshold limit. Once the lower threshold alarm has been triggered, the no-alarm will not be sent until the current value is greater than the lower threshold value plus the hysteresis. Once there is no alarm, a "0" (once) shall be sent through the same object.

- **Upper Threshold**: Two extra parameters will come up:
    - **Upper Threshold Value**: maximum value permitted. Readings greater than this value will provoke a periodical sending with value "1" through the **"[AIx] Upper Threshold"** object, every 30 seconds.
    - **Hysteresis**: dead band or threshold around the upper threshold value. As in the lower threshold, once the upper threshold alarm has been triggered, the no-alarm will not be sent until the current value is lower than the upper threshold value minus the hysteresis. Once there is no alarm, a "0" (once) shall be sent through the same object.
- **Lower and Upper Threshold**: The following extra parameters will come up:
    - **Lower Threshold Value.**
    - **Upper Threshold Value**.
    - **Hysteresis**.

    The three of them are analogous to the previous ones.

➢ **Threshold Value Objects** [*Disabled / Enabled*]: enables one or two objects (**"[AIx] Lower Threshold Value"** and/or **"[AIx] Upper Threshold Value"**) to change the value of the thresholds at runtime.

The range of allowed values for the parameters depends on the chosen "Measurement Sending Format", the following table list the possible values:

Measurement format	Range
1-Byte (Percentage)	[*0…100*][*%*]
1-Byte (Unsigned)	[*0…255*]
1-Byte (Signed)	[*-128…127*]
2-Byte (Unsigned)	[*0…65535*]
2-Byte (Signed)	[*-32768…32767*]
2-Byte (Float)	[*-671088.64…670433.28*]
4-Byte (Float)	[*-2147483648…2147483647*]

Table 1. Range of allowed values.

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