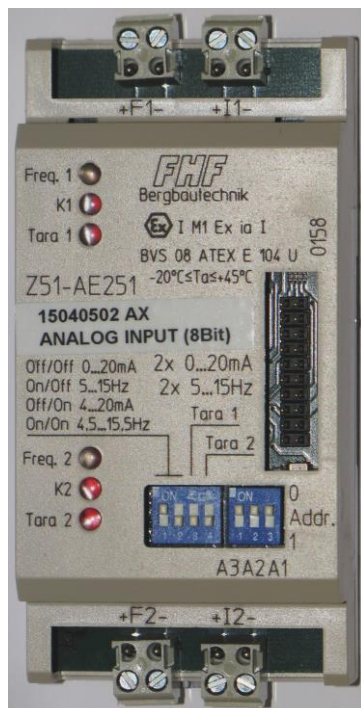


Analog input unit Z51-AE251 (8-bit res.)

Ordering data

Designation	Type	Item no.
Analog input unit, duplex type, 0-20mA / 4-20mA or 5-15Hz / 4.5-15.5Hz, 8 bit resolution	Z51-AE251	150 405 02 AX



- Acquisition of two analog process signals
- 0-20mA / 4-20mA or 5-15Hz / 4.5-15.5Hz, 8-bit resolution
- Tare function
- Galvanic isolation
- Suited for top-hat rail mounting
- Type of protection: I M1 Ex ia I

Application and functioning

The analog input unit of type Z51-AE251 is used to acquire 2 analog process signals (either current or frequency measurement). Depending on the set operating mode, the two analog values can be acquired as 5 – 15 Hz or 4.5 – 15.5 Hz frequency signal or as 0 – 20 mA or 4 – 20 mA current value. The operating mode is set at two DIP switches and is effective for both inputs. Thus, the analog input unit of type Z51-AE251 (8 bit resolution) can be utilized as replacement for types Z51-AE25 (0 – 20mA), Z51-AE29 (4 – 20mA) and Z51-AE241 (5 – 15Hz).

The frequency inputs and the current inputs are galvanically isolated from each other and from the ZM5IIO bus connection.

The module is equipped with a "tare" function for both inputs. When the associated DIP switch is actuated, the value active at the input at that moment will be taken over as the new zero point offset

and stored non-volatile in the component.

The two analog values are converted with 8-bit resolution (256 steps) and made available for acquisition by a type Z51 central unit.

To connect the two analog signals (frequency and current) of the two analog channels, two 2-pin plug-in terminals ea. are available at the module top and bottom side.

The measuring value acquisition and the measuring value transfer through the 20-pin I/O bus connection is controlled by a powerful microcontroller in the Z51-AE251 (8-bit resolution).

For each measuring value input, the unit features 3 LEDs which indicate the measuring frequency of the frequency input, the activation of the tare function and the status of the measuring value transmission of the channel concerned (steady light: "OK", flashing light: "measuring value defective").

The analog input unit of type Z51-AE251 is an electronic component for installation in equipment destined for use in environments susceptible to fire-damp. The analog input unit is designed with a ZM51 module

housing that enables mounting on top-hat rails and therefore especially well suited for installation in the station housings of the associated automation and control devices of the ZM51 series.

The analog input unit of type Z51-AE251 conforms to category I M1, protection type Ex ia I as per EN 60079-0:2006, EN 60079-11:2007 and EN 50303:2000.

Measuring value format

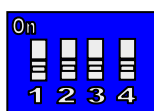
The measuring value of one channel is represented as a byte (without sign, line fault or overflow) compatible to the format of the type Z51-AE25, Z51-AE29 or Z51-AE241 units. The module has the type code "5".

The format is likewise valid for the measuring values of the current and frequency ranges.

Operating modes

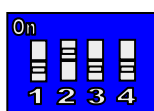
Adjacent to the normal address switch to select the UM51 module address, a 4-fold DIP switch is located on the module. This is used to select the module operating mode and to set the tare function.

Operating mode current measurement 0 – 20 mA



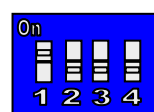
In this operating mode the inputs I1 and I2 are activated and measured. A current in the range from 0 ... 20 mA is represented in unipolar form by an 8-bit data word (0..255). If the tare function has been activated, this is indicated by the TA signal. The tare value is subtracted from the current measuring value.

Operating mode current measurement 4 – 20 mA



In this operating mode the inputs I1 and I2 are activated and measured. A current in the range from 4 ... 20 mA is represented in unipolar form by an 8-bit data word (0..255). If the tare function has been activated, this is indicated by the TA signal. The tare value is subtracted from the current measuring value.

Operating mode frequency measurement 5 – 15 Hz



In this operating mode the inputs F1 and F2 are activated and measured. The input signal frequency in the range from 5 Hz – 15 Hz is represented in unipolar form by an 8-bit data word (0..255). If the tare function has been activated, this is indicated by the TA signal. The tare value is subtracted from the current measuring value.

Operating mode frequency measurement 4.5 – 15.5 Hz



In this operating mode the inputs F1 and F2 are activated and measured. The input signal frequency in the range from 4.5 Hz – 15.5 Hz is represented in unipolar form by an 8-bit data word (0..255). If the tare function has been activated, this is indicated by the TA signal. The tare value is subtracted from the current measuring value.

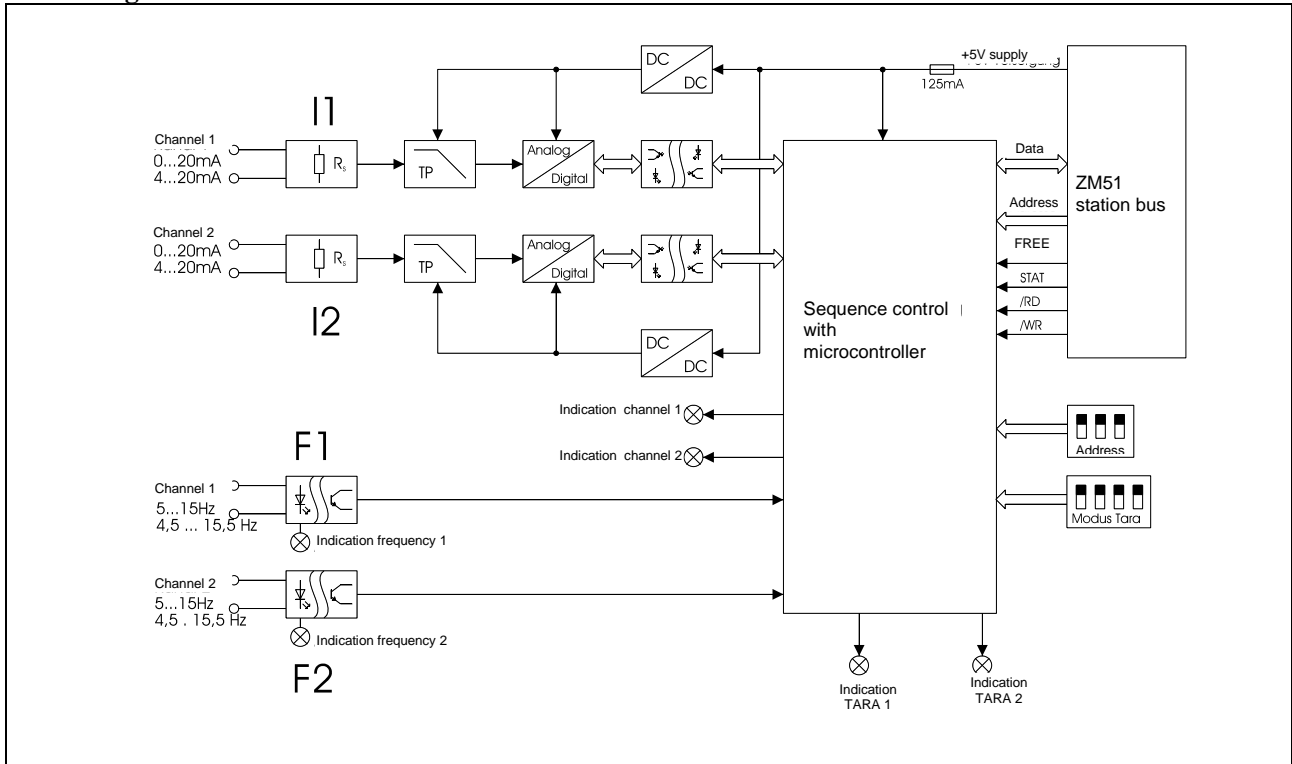
The tare function

Individual switch-on of the tare function for each channel is possible. For this purpose, the module features two tare switches (Tara 1 and Tara 2).

In the neutral position, the tare switch is 'OFF'. In the switch position 'ON', the current measuring value is now taken over as zero point (tare value) and stored in the EEPROM. The tare LED will now start to flash to indicate the taking over process. When switching the tare switch now back into 'OFF', the tare LED shows a steady light. In connection with the measuring value, now one tare bit is transferred onto the module bus. The next 'OFF'-'ON'-'OFF' sequence will delete the stored tare value! The tare LED remains constantly off.

Analog input unit Z51-AE251 (8-bit res.)

Block diagram



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