

General Introduction

In measurement, positioning and control applications, it is necessary to monitor and indicate the status of the machine or installation. In order for the signal to be processed by the programmable controller, it must be presented in digital form or converted to one of the standard signals of 0...20 mA, 4...20 mA or 0...10 V.

Murrelektronik can supply a wide range of intelligent interface modules with the additional benefit of opto-isolation of inputs and outputs.

These modules present a number of practical advantages to the user:

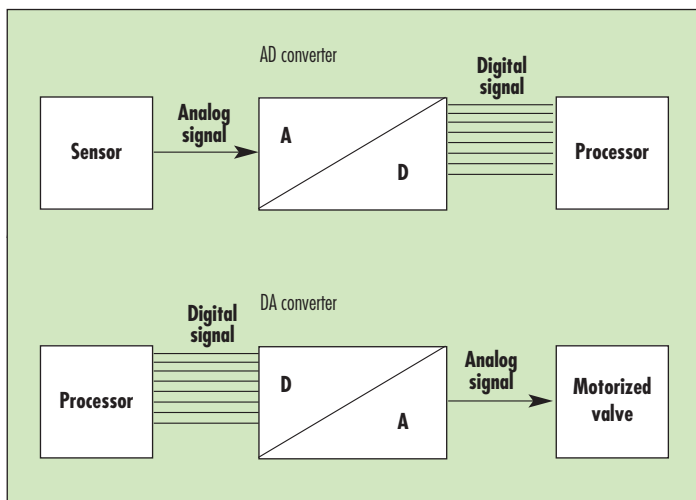
- short-circuit protected solid state or electro-mechanical relay outputs
- galvanical isolation
- LED status indicator
- mounting on DIN-rail

AD/DA converter

In order for the analog signals, for example, from sensors to be accepted and processed by the controller, they must be converted into digital form.

Sometimes, the digital output signals from the PLC must be converted into analog signals, e.g. to control positioning devices. The programmable control unit works in binary as does the Murrelektronik module. The higher the number of bits, the finer the resolution and the better the control. The signals from the sensors are converted into the correct form for the PLC, processed and presented to the output field devices simply and effectively.

The digital-analog module converts binary signals into one of the standard signals of 0...20 mA, 4...20 mA, 0...10 V, where the analog-digital module does the reverse.



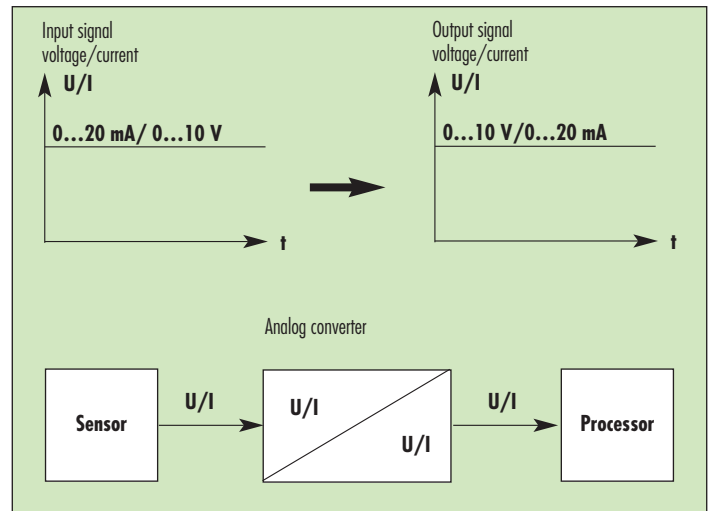
Analog converter

The analog signals from sensors and other such measuring devices are usually in one of the standard signal formats of 0...20 mA, 4...20 mA or 0...10 V.

The Murrelektronik analog converter modules will accept one of these signals and change it to give an output in any of the 3 forms.

The additional benefit is that the inputs and outputs are also opto-isolated.

A common problem occurs when a voltage signal must be transferred over a long distance. In order to minimize the possibility of an incorrect signal being received, it is common practice to convert the voltage into a current signal.

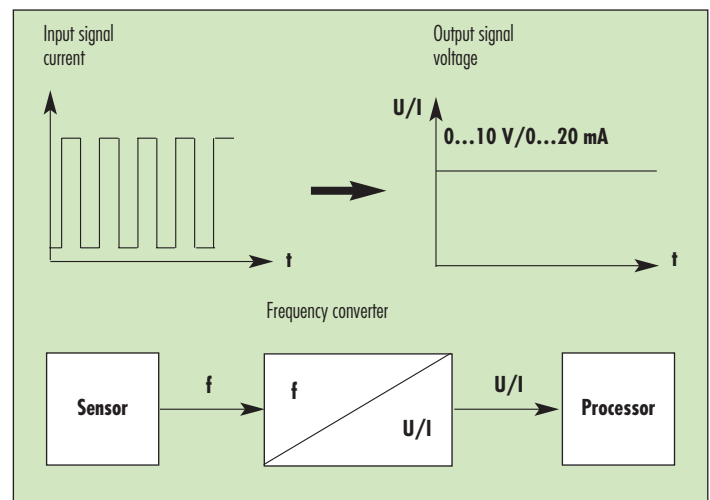


Frequency converter

Frequency converters have two essential applications:

In case frequency and speed will be measured or displayed, signals are converted via frequency-/voltage converter into current or voltage. The signals can be processed in the PLC without quick frequency input.

The frequency-/voltage converters are used for an interference free long distance signal transfer. Signals will be converted into frequency – transferred and converted back.



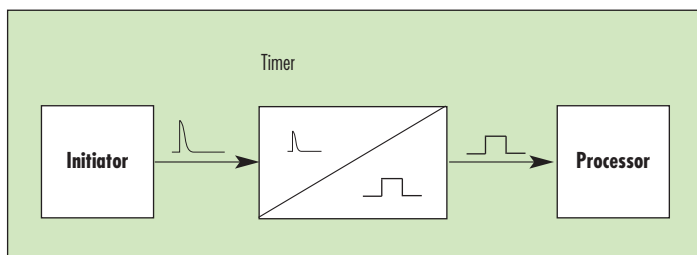
Timer

In automated systems, process needs timing functionality. Many applications can be easily controlled by using a timer. Expansion of an already existing application is possible without re-programming the control system.

With functions such as, wiper, delay time and switch-off delay, all requirements are met. Exact adaption through variable time adjustment via potentiometer is possible.

Timer are used at:

- | | |
|------------------|--|
| Wiper | <ul style="list-style-type: none"> – downtime observation – impulse expansion of short impulse (slow controlling; counter) – fill-up process – suspension of mechanical contacts |
| Delay time | <ul style="list-style-type: none"> – delayed-switch of loads – reversing motor development from star into triangle |
| Switch-off delay | <ul style="list-style-type: none"> – fan is still in use after switching-off – controlling of vehicle doors |



Comparator modules

The Murrelektronik comparator modules compare to the analog voltage or current values with internal or external references to overshoot and undershoot these adjustable limits.

The desired set point succeeds either above the located module potentiometer or externally above the terminal connection.

Three outputs for processing with the operating mode window discriminator are possible:

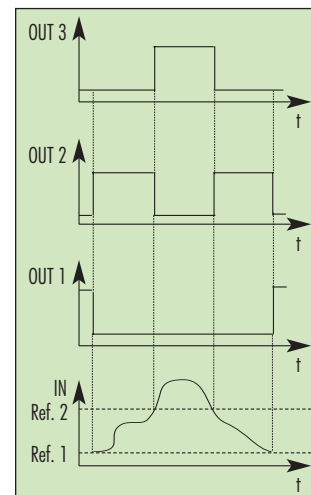
- "under operating point"
(this means input signal is underneath the first reference value)
- "in window"
(this means input signal is between the reference value)
- "over operating point"
(this means input signal is above the second reference value)

Example: Method of connection Window Discriminator:

IN 1 and IN 2 must be connected in parallel

Ref 1 defines the lower limit of the window
Ref 2 defines the upper limit of the window

- OUT 1 – "under operating point"
- OUT 2 – "in window"
- OUT 3 – "over operating point"



Temperature converter

In industry, most temperature measurements are made with a resistance type thermometer PT100, where the temperature of the resistance is known.

The measurements of the signals can be converted through MTW into standard signals (0...20 mA, 4...20 mA or 0...10 V). The connection between monitoring and processing (i.e. PLC) will be less expensive.

A 3-wire measuring method is used to reduce the errors due to the cable resistance.

