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.

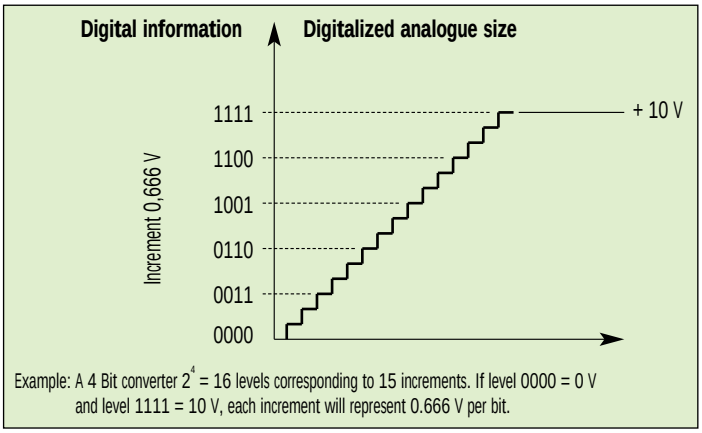
These modules present a number of practical advantages to the user:

- A wide supply voltage range of 21…30 V DC
- Short-circuit protected solid state or electro-mechanical relay outputs
- Opto-isolation
- LED status indicator
- Mounting on DIN-rail

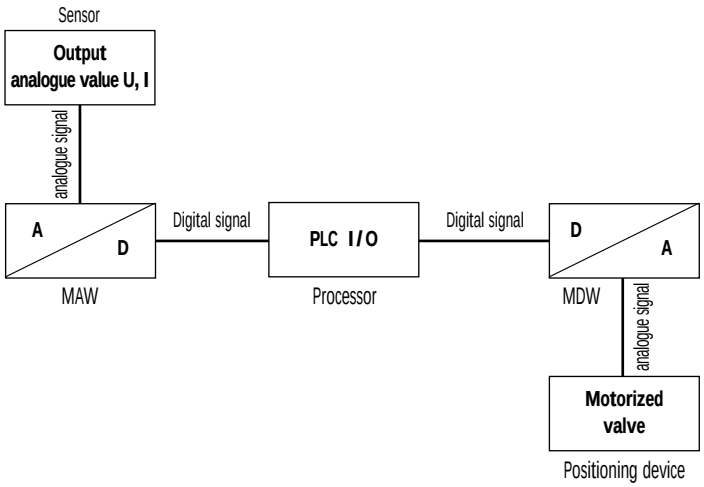
AD / DA Converter Modules

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

Similarly, the digital output signals from the PLC must sometimes be converted into analogue 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-analogue module converts binary signals into one of the standard signals of 0…20 mA, 4…20 mA, 0…10 V, whereas the analogue-digital module does the reverse.



Example: A 4 Bit converter 2^4 = 16 levels corresponding to 15 increments. If level 0000 = 0 V and level 1111 = 10 V, each increment will represent 0.666 V per bit.

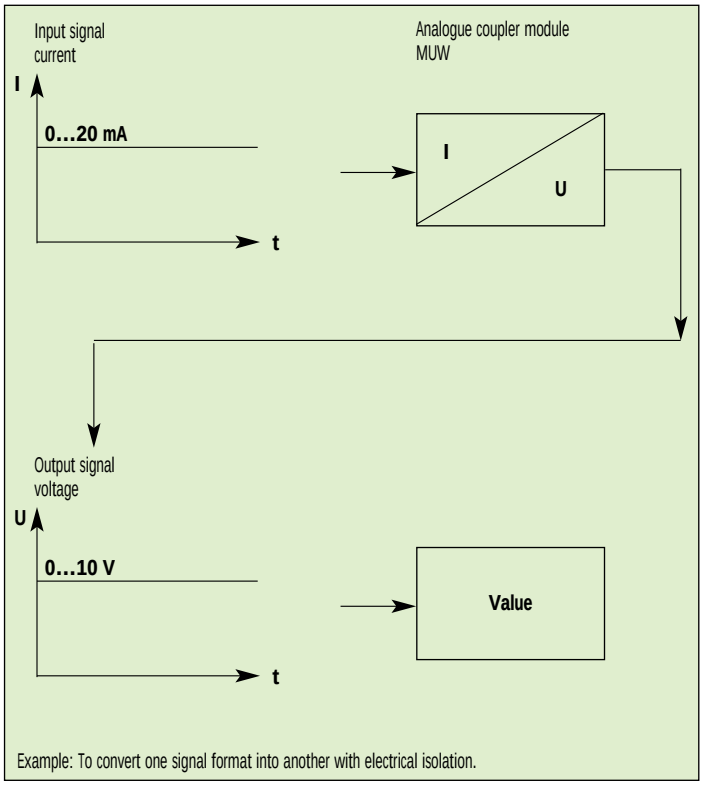


Analogue Coupler Modules

The analogue 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 analogue coupler 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.

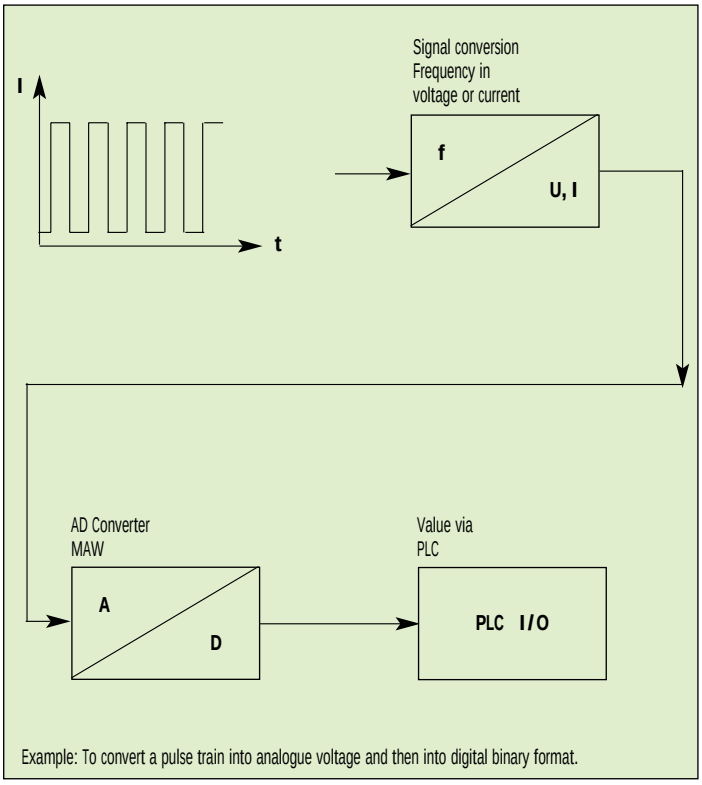
A common problem occurs when a voltage signal must be transfered over a long distance. In order to minimize the possibility of an incorrect voltage signal being received, it is common practice to convert the voltage into a current signal.



Example: To convert one signal format into another with electrical isolation.

The frequency to analogue converter from Murrelektronik will convert the sinusoidal output from a tachogenerator, or the pulse train from an encoder, into an analogue value proportional to the RPM.

The output will be one of the standard forms of voltage or current 0…20 mA, 4…20 mA or 0…10 V.
The output is opto-isolated from the input to avoid interference.



Example: To convert a pulse train into analogue voltage and then into digital binary format.

Comparator Modules

The Murrelektronik comparator modules compare to the analogue voltage or current values with internal or external references to overshoot and undershoot these adjustable limits and give up the corresponding output signals.

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

With the operating mode window discriminator, stand three outputs for continuation to disposition:

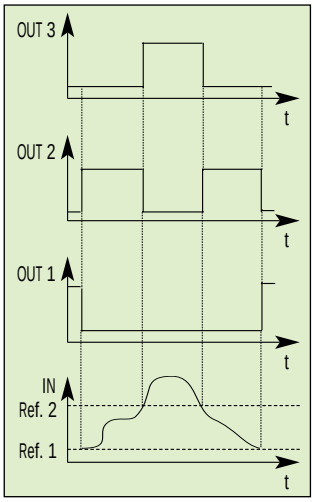
– ”under operating point”
(this means input signal is underneath the first reference value)
– ”in window”
(this means input signal is between the reference value)
– ”over operating point”
(this means input signal is above the second reference value)

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”



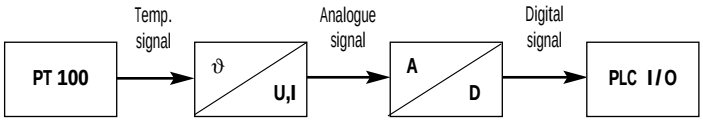
Temperature Converter Modules

In industry, most temperature measurements are made with a resistance type thermometer, where the probe is supplied with a constant voltage and the output varies with the change in resistance caused by changes in the temperature.

The most commonly used probe is the PT 100 type.

Connecting the probe to the Murrelektronik MTW module gives the probe the necessary voltage supply and also converts its output to the standard signal forms of 0…20 mA, 4…20 mA or 0…10 V.

The errors due to the cable resistance can be compensated for on the module.



Example: Monitoring and evaluating temperature by means of a PLC.

MAW, MDW

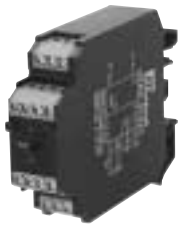
Analogue-digital / digital-analogue converter modules with 6, 8, 10 or 12 Bit resolution. For the direct input of standard analogue signals in digital control systems or the analogue control of equipment via digital signals.

Page 3.10.5

MUUW, MUIW, MIUW, MIIW, MULTIWANDLER

The analogue-coupler modules can make differing analogue signals, which occur in the sensor and output circuits (0…10 V, ± 10 V, 0…20 mA, 4…20 mA) work together. The input and output circuits are galvannically separated . With the new MULTIWANDLER all functions can be covered only with the module.

From page 3.10.6



RM

Motor protection relays to protect and monitor motors with integrated temperature sensor.
The modules have 2 contacts.

Page 3.10.8

MUFW, MIFW

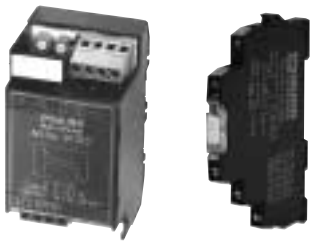
Over long distances, signals can be falsified or damaged due to the cable resistance and other interference. This can be stopped by converting the standard output signals into an equivalent frequency signal. Signal input and output are electrically isolated.

Page 3.10.9

MFUW, MFIW

The frequency converter converts frequency signals up to 100 kHz into an equivalent analogue signal (0…10 V, 0…20 mA, 4…20 mA). Herewith, it is possible to process impulse signal chains from i.e. revolution or speed measurements from controllers which do not have the ability to accept rapid number inputs.

Page 3.10.10



MIB

The pulse extension modules increase the length of very short impulses which cannot be used as a defined control signal to the controller. Control signals with a lengthened cycle time can then be accepted and processed by slower PLC systems.

Page 3.10.11

MAK

The comparator modules are designed to monitor and regulate simple automatic processes .
Two possible applications can be covered:
1. Monitoring an analogue input signal to see if it goes outside pre-defined limits
2. Monitoring an analogue input signal to see if it remains within pre-defined limits

Page 3.10.12

MTW

Signals from a PT 100 Sensor are converted using the temperature converter modules into standard output signals (0…10 V, 0…20 mA, 4…20 mA). It is therefore easy to make a cost-effective connection between the process monitoring and the process administration (i.e. PLC).
To stop signal corruption which occurs due to cable resistance, the module allows for 3-wire measurement compensation.

Page 3.10.13

MESCO

Measuring and monitoring relays to monitor and measure electrical values. They both control and safeguard systems. MESCO modules are used in AC, DC and three phase applications where exact voltages, temperatures, levels and rotational speeds need to be measured.
The terminal block are removable which reduces servicing time.
Double chamber terminals allow 2 wires of differing diameters to be connected.

From page 3.10.14

Analogue-Digital Digital-Analogue Converter modules

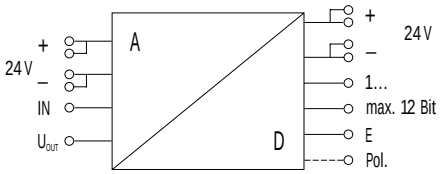
Inputs and outputs galvanically isolated

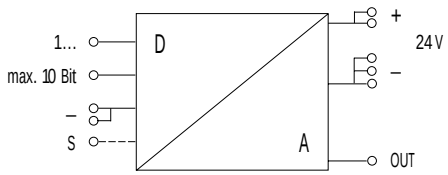
CE

MAW
Analogue-Digital-Converter

MDW
Digital-Analogue-Converter

Circuit diagram





Ordering data		Art.-No.	Art.-No.
Digital	analogue		
6 Bit	0…10 V DC	**44061**	**44066**
8 Bit	0…20 mA	**44090**	**44072**
8 Bit	4…20 mA	**44091**	**44073**
8 Bit	0…10 V DC	**44062**	**44067**
8 Bit + Pol.	±10 V DC	**44097**	
10 Bit	0…20 mA	**44094**	**44074**
10 Bit	4…20 mA	**44095**	**44075**
10 Bit	0…10 V DC	**44063**	**44068**
10 Bit + Pol.	±10 V DC		**44078**
12 Bit	0…20 mA	**44100**	
12 Bit	4…20 mA	**44101**	
12 Bit	0…10 V DC	**44064**	

Technical data		
Supply voltage range	2 x 21…30 V DC, smoothed (with LED)	21…30 V DC, smoothed (with LED); ±15 V DC at 44078
Supply current	60 mA (no load) in addition to max. 100 mA per digital output	100 mA no load, max. 150 mA (full load)
Input signal	type dependent	0…30 V DC log 1 ≥ 16 V, log 0 ≤ 6 V (with LED)
Input current	type dependent	max. 10 mA/Bit
Output current	100 mA/Bit (with LED)	max. 40 mA at 0…10 V DC; max. 20 mA at 0…20 mA, 4…20 mA
Tolerance	±1 LSB	±1 %
Converter cycle time	80 ms, at 6 Bit adjustable 2,5/150 ms	–
Release input $\bar{E}$	log 1 ≥ 16 V, log 0 ≤ 6 V	
Test insulation voltage	2,5 kV AC	
Temperature range	0…+50 °C	
Dimensions H x W x D	86 x 90 (67,5) x 65 mm (6 Bit)	

Description

The analogue-digital converter from Murrelektronik changes analogue input signals into a digital format. Inputs and outputs are isolated. On modules with voltage inputs, it is possible to set the maximum input signal using a trimmer. The unit 44097 is suitable for both positive and negative input signals. The output "POL" indicates the polarity (log 1 = Positive). A voltage output U_{OUT} 15 V/20 mA (minimal ripple) can be used as a power supply for the analogue output device. The hold input $\bar{E}$ will sample and hold the analogue value. When $\bar{E}$ is taken to log 1, the outputs will represent the last measured value. When $\bar{E}$ is taken to log 0, the converter will run again.

The Murrelektronik digital-analogue converter changes digital input signals into an analogue output. The inputs and outputs are isolated. The voltage output version has the facility of adjustment to the output signal to a maximum of supply voltage minus 2 V. Art.-No. 44078 is a 10 Bit module with a polarity bit (terminal "S", log 1 = positive) and is therefore suitable for positive and negative output signals (0…±10 V). The module therefore needs a supply of ±15 V. The outputs are short-circuit protected.

Notes

DIN-rail mounting to EN 50022.

Analogue-coupler modules

MUIW 6,2 Voltage-Current
MIUW 6,2 Current-Voltage
MIIW 6,2 Current-Current

Inputs and outputs galvanically isolated

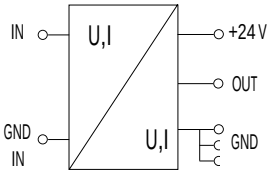
CE

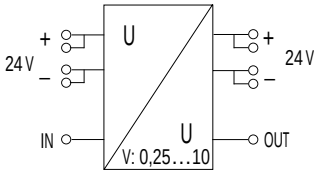
MU..W 6,2
INPUT 0…10 V DC

MI..W 6,2
INPUT 0…20 mA

MI..W 6,2
INPUT 4…20 mA

Circuit diagram





Art.-No. 44201
no galvanic separation
regular voltage amplification

Ordering data	**Art.-No.**	**Art.-No.**	**Art.-No.**
OUTPUT	spring clamp / screw terminals	spring clamp / screw terminals	spring clamp / screw terminals
0…10 V DC / 20 mA	6644205	6644212	6644213
0…10 V DC / 300 mA	[1] 44201		
0…20 mA	6644232	6644226	6644227
4…20 mA	6644233	6644228	
±0…10 V DC			

Technical data	
Supply voltage range	24 V DC ±20 %, smoothed
Supply current	50…70 mA
Input resistance	≥ 200 k-Ohm for input voltages; 325 Ohm for current input
Input frequency	max. 500 kHz
Output load	R_L ≥ 500 Ohm for output voltages; R_L ≤ 500 Ohm for current output
Output current	max. 20 mA
Tolerance	≤ 0,3 %
Test insulation voltage	1,5 kV
Temperature range	0…+60 °C
Mounting method	DIN-rail mounting to EN 50022
Dimensions H x W x D	90 x 6,2 x 65 mm ([1] Art.-No. **44201**: 86 x 67,5 x 65 mm)

Description

The Murrelektronik analogue coupler modules accept input signal formats of 0…10 V, 0…20 mA, 4…20 mA.
Due to an integrated current limiter on the output, short-ciruit and overload protected.

Notes

Coupler module MIIW - 0/4…20 mA to 0/4…20 mA - without auxiliary supply, Art.-No. **44225** on request.
To order screw terminal option omit 66 from the part number. Accessories in chapter 3.16

Analogue-coupler modules

Inputs and outputs and input voltage galvanically isolated

CE

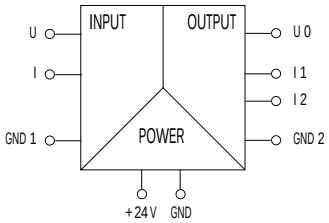
MULTIWANDLER 12,4

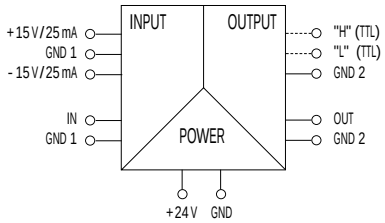
INPUT 0…5 V DC, 0…10 V DC,
INPUT ± 10 V, 0…20 mA
INPUT 4…20 mA

MUUW

INPUT ±0…10 V DC

Circuit diagram





Ordering data	**Art.-No.**	**Art.-No.**
OUTPUT	spring clamp/screw terminals	
0…10 V DC/20 mA	6644207	**44202**
0…20 mA	6644207	
4…20 mA	6644207	
±0…10 V DC		**44203**
Technical data		
Supply voltage range	24 V DC ±15 %, smoothed	24 V DC +15 %/-10 %, smoothed
Supply current	approx. 50 mA	max. 200 mA
Input resistance	approx. 100 k-Ohm for input voltages; approx. 75 Ohm for current input	
Input frequency	max. 25 Hz	5 kHz, sine wave
Output load	$R_L \leq$ 400 Ohm for current output	
Tolerance	≤ 0,5 %	± 1 %
Test insulation voltage	0,75 kV DC between input and output	1,5 kV
Temperature range	- 25…+50 °C	0…+50 °C
Mounting method	DIN-rail mounting to EN 50022	
Dimensions H x W x D	90 x 12,4 x 65 mm	75 x 22,5 x 102 mm

Description

The Murrelektronik analogue coupler modules accept input signal formats of 0…10 V, 0…20 mA, 4…20 mA.
Due to an integrated current limiter on the output, short-ciruit and overload protected.

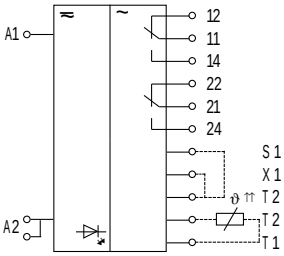
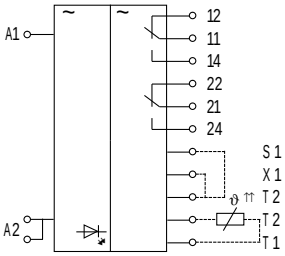
A special characteristic of the MULTIWANDLER Art.-No. 6644207 includes:
Analogue voltage signal 0…5 V/0…10 V and -10…+10 V as well as current signal 0…20 mA and 4…20 mA, these compactable modules can be galvanically isolated in the three normal signals, which means all combinations will be covered with the model

Isolation prevents interference on the input from appearing at the output. Art.-Nos. 44202 and 44203 have 2 electrically isolated ±15 V DC/25 mA supplies available. The "H" (+) and "L" (–) shown on the diagram are only on Art.-No. 44202 and give the input signals.

Notes

Accessories in chapter 3.16.
To order screw terminal option omit 66 from the part number

MCVO-Motor protection relay

	RM	RM
	Motor protection relay for monitoring motors with an integrated temperature sensor	Motor protection relay for monitoring motors with an integrated temperature sensor
		
Circuit diagram		
Ordering data	**Art.-No.**	**Art.-No.**
Input voltage	1 relays; 2 C/O contacts	1 relays; 2 C/O contacts
24 V DC	**51010**	
230 V AC		**51015**
Technical data Input (coil)		
Input voltage / current	24 V DC ±10 %/100 mA	230 V AC +10 % -15 %/15 mA
Status indicator	LED green	LED green
Technical data Output (contact)		
Max. switched voltage	250 V AC/DC	
Max. contact current	8 A	
Min. load current	10 mA	
Max. power rating	2000 VA	
Contact material	Ag Cd 0	
De-energize/energize delay	< 80 ms/25 ms	
Temperature monitoring data		
Total cold resistance (between T1 and T2)	≤ 1,5 kOhm	
Operate (relay de-energize)	2,5…3,6 kOhm	
Reset (relay energize)	1,5…2,3 kOhm	
Fault indicator	LED red	
Reset	with push button or remote reset	
Sensor wire short-circuit protection	≤ 20 Ohm	
General data		
Mech./elect. life	2 x 10^7/load dependent	
Max. switching frequency	10 Hz	0,1 Hz
Test insulation voltage	3,75 kV AC	4,0 kV AC
Temperature range	-20…+60 °C	
Mounting method	DIN-rail mounting to EN 50022 or EN 50035	
Dimensions H x W x D	75 x 22,5 x 102 mm	
Function description		
	Used with motors that have an integrated PTC temperature sensor to DIN 44081. The sensor is galvanically isolated from the supply and connected to terminals T1 and T2. Minimal changes of temperature will trip the relay. A red LED shows the fault optically. A bridge link X1/T2 enables fault latching. Via the bridge S1/T2, remote resetting can be realised.	
Notes		
	Accessories in chapter 3.16	

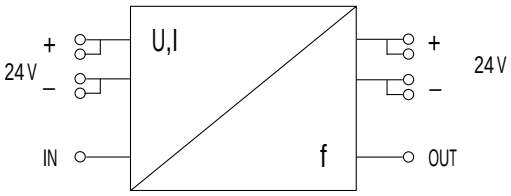
Analogue-coupler modules

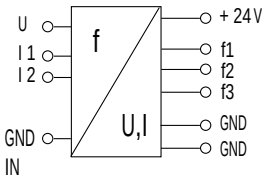
MUFW Voltage-Frequency
MIFW Current-Frequency

Inputs and outputs galvanically isolated

	MUFW	**MIFW**	**MIFW**	**M..FW 12,4**
	INPUT 0…10 V DC	INPUT 0…20 mA	INPUT 4…20 mA	INPUT 0…10 V DC INPUT 0…20 mA INPUT 4…20 mA

Circuit diagram





Ordering data		**Art.-No.**	**Art.-No.**	**Art.-No.**	**Art.-No.**
OUTPUT	(separable)				spring clamp / screw terminals
0… 1 kHz	(0,5/0,25/0,125 kHz)	**44241**	**44251**	**44261**	**6644245**
0… 10 kHz	(5/2,5/1,25 kHz)	**44242**	**44252**	**44262**	**6644245**
0…100 kHz	(50/25/12,5 kHz)	**44243**	**44253**	**44263**	**6644245**

Technical data			
Supply voltage range	2 x 15…30 V DC, smoothed		24 V DC ±20 %
Supply current	max. 2 x 60 mA		max. 60 mA
Input resistance	100 k-Ohm	500 Ohm	U: 100 k-Ohm / I: 75 Ohm
Output voltage	supply voltage -1,5 V, square signal		0,5 V short-circuit protected
Tolerance	±1 %		0,5 % from end value
Test insulation voltage	2,5 kV AC		2 kV AC
Temperature range	0…+50 °C		-25…+50 °C
Mounting method	DIN-rail mounting to EN 50022		
Dimensions H x W x D	86 x 45 x 65 mm		90 x 12,4 x 65 mm

Description

The Murrelektronik Aanalogue coupler modules MUFW and MIFW convert input signals of 0…10 V, 0…20 mA and 4…20 mA into a proportional frequency. By means of the plug bridges 1…4 the output frequency range can be adjusted to 1/1, 1/2, 1/4 and 1/8. In order to obtain a galvanic isolation between the input and output, 2 separate voltage supplies are required.
The output is short-circuit and overload protected.

The new interface module in narrow MIRO casing is able to be used universally. An analogue voltage or current, these are applied to three inputs, and are galvanically isolated, transformed and stay as square wave voltage (frequency) on all three outputs symmetrical to disposition. The output frequencies are through a 4-pole switch separable in relation to 1:2, 1:4 and 1:8 .

Notes

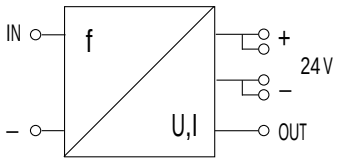
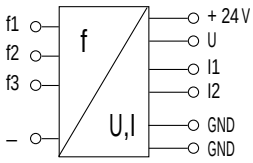
Intelligent Interface Modules

Analogue-coupler modules

MFUW Frequency-Voltage
MFIW Frequency-Current

Inputs and outputs galvanically isolated

CE

	MF..W	**MF..W**	**MF..W**	**MF..W 12,4**
	INPUT 0…1 kHz	INPUT 0…10 kHz	INPUT 0…100 kHz	INPUT 0…1 kHz INPUT 0…10 kHz INPUT 0…100 kHz
				
Circuit diagram				
Ordering data	**Art.-No.**	**Art.-No.**	**Art.-No.**	**Art.-No.**
OUTPUT				spring clamp / screw terminals
0…10 V DC	**44271**	**44272**	**44273**	**6644275**
0…20 mA	**44281**	**44282**	**44283**	**6644275**
4…20 mA	**44291**	**44292**	**44293**	**6644275**
Technical data				
Supply voltage range	21…30 V DC, smoothed			24 V DC ±20 %
Supply current	max. 60 mA			max. 80 mA
Input voltage	15…30 V (with LED)			10…30 V
Input current	2,5…15 mA			6,2…23 mA
Output signal	0…10 V DC at $R_L \geq 500$ Ohm	0…20 mA at $R_L \leq 500$ Ohm	4…20 mA at $R_L \leq 500$ Ohm	0…10 V, 0…20 mA, 4…20 mA
Response time	max. 2 s	max. 0,5 s	max. 0,2 s	max. 0,35 s
Tolerance	±1 %			0,5 % from end value
Test insulation voltage	2,5 kV AC			2,5 kV AC
Temperature range	0…+50 °C			-25…+50 °C
Mounting method	DIN-rail mounting to EN 50022			
Dimensions H x W x D	86 x 45 x 65 mm			90 x 12,4 x 65 mm
Description				
	The Murrelektronik analogue coupler modules MFUW and MFIW convert input signals of 0…1 kHz, 0…10 kHz and 0…100 kHz irrespective of the wave form, into output signals of 0…10 V, 0…20 mA and 4…20 mA. By means of the plug bridges 1…4 the input frequency range can be adjusted to 1/1, 1/2, 1/4 and 1/8. The output is short-circuit and overload protected. An LED indicates that there is an input signal.			The new interface module in narrow MIRO casing is able to be used universally. The frequency, that are applied on the three inputs, will be galvanically isolated, transformed and stay as an analog signal on all three outputs symmetrical to disposition.
Notes				

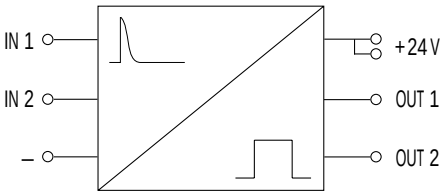
Pulse extension modules

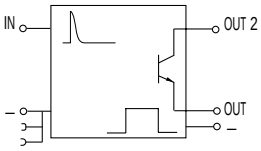
MIB

MIB 6,2 mm

Timer

Circuit diagram





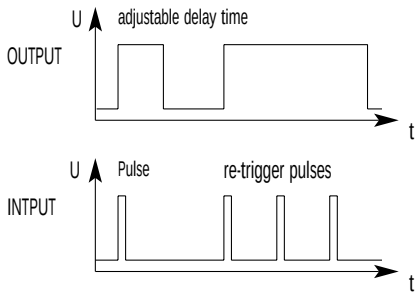
Ordering data	Art.-No.	Art.-No.	Art.-No.	Art.-No.
Output pulse				spring clamp / screw terminals
5…100 ms	**44010**			
0,1 …1 s		**44011**		
0,1 …10 s				**6652320**
500 ms			**44012**	

Technical data		
Supply voltage range	19…35 V DC, smoothed	19…29 V DC, smoothed
Supply current	max. 10 mA (no load)	max. 0,5 mA (no load)
	max. 80 mA (full load)	max. 105 mA (full load)
Input voltage	2 x 0…35 V DC, log. 0 ≤ 6 V DC,	0…32 V DC, log. 0 ≤ 6 V DC,
	log. 1 ≥ 16 V DC	log. 1 ≥ 16 V DC
Control impulse	min. 0,5 ms	min. 0,5 ms
Input resistance	1,6 k Ohm	4 k Ohm
Output voltage	supply voltage - 1,5 V	
Output current	max. 20 mA	max. 100 mA
Temperature range	0…+50 °C	0…+55 °C
Mounting method	DIN-rail mounting to EN 50022	
Dimensions H x W x D	86 x 45 x 65 mm	90 x 6,2 x 65 mm

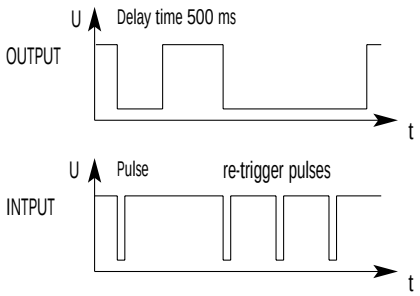
Description

The Murrelektronik pulse extension module lengthens very short pulses in order for them to be recognized as switching signals, which enables e.g. a PLC to act. The module consists of one or two mutually independant pulse extension stages. If further input pulses are received during the duration of the output pulse, then the output will again be triggered. The modules part nos. 44010 and 44011 trigger on a rising input and 44012 triggers on a falling input (see drawings).
The outputs of modules 44010 and 44011 are adjustable within the specified ranges by means of a potentiometer.
The output of all the modules are short-circuit and overload protected.

44010 / 44011 / 52320



44012



Notes

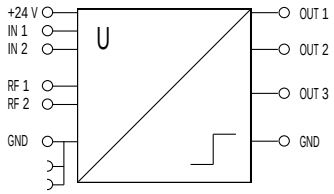
To order screw terminal option omit 66 from the part number.

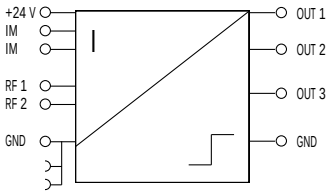
Comparator modules

Input voltage
input current

	MAK	**MAK**	**MAK**
	Input signal Voltage DC	Input signal Voltage AC	Input signal Current AC/DC

Circuit diagram





Ordering data	**Art.-No.**	**Art.-No.**	**Art.-No.**
	spring clamp/screw terminals	spring clamp/screw terminals	spring clamp/screw terminals
	6644110	**6644111**	**6644115**
Technical data			
Supply voltage range	19…33 V DC, smoothed		
Supply current	30 mA (no load), max. 3,0 A (full load))		
Input voltage approx. Input current	2 x 0…30 V DC (IN 1, IN 2)	2 x 0…30 V AC (IN 1, IN 2)	0,2…15 A AC/DC
Input resistance	100 kOhm	50 kOhm	< 1,5 mOhm
Time constant	approx. 10 ms	approx. 200 ms	approx. 200 ms
Input hysteresis	< 0,5 % from end value, max. 150 mV	< 3,5 % from end value, max. 1,05 mV	< 5 % from end value
Outputs	3 Transistor outputs, pulse switch		
Output current	max. 0,7 A per channel, short-circuit protected		
Temperature range	0…+50 °C		
Mounting method	DIN-rail mounting to EN 50022		
Dimensions H x W x D	90 x 12,5 x 65 mm		

Description

The DC- or AC-voltage comparator for analogue voltage, which, i. e. will generate from pressure, temperature, or other sensors. It converts the analogue measured in a digital signal, whereby the transfer point are dependent from the adjustable reference voltage

Characteristics:
– 2 separable measuring channels (no galvanic separation, and only by comparator service)
– 2 operating modes (comparator/window discrimination)
– adjustable reference voltage (internal/external) per channel
– adjustable outputs (negated/not negated) per channel, (only by comparator service)
– compact equipment (12,4 mm)
– higher switched current at output
– output state display through LED
– simple configuration of the modules with DIP-switch

The power comparator is used to monitor a current signal regarding the under range or over range limited to an adjusted limit. The comparator works in window discriminator mode, whereby the reference input RF1 is marked under and RF2 is market over the operating point. It can range in current measured from 0,2…15 A AC/DC. The current will be galvanic isolated and measured next to no loss, then converted internally in a True RMS voltage, which allows evaluation of different wave forms.

Characteristics :
– measured current AC/DC, in range from 0,2…15 A
– operating mode window discriminator
– adjustable reference voltage (internal/external)
– compact equipment (12,4 mm)
– higher switched current at output
– output state display through LED
– simple configuration of the modules with DIP-switch

Notes

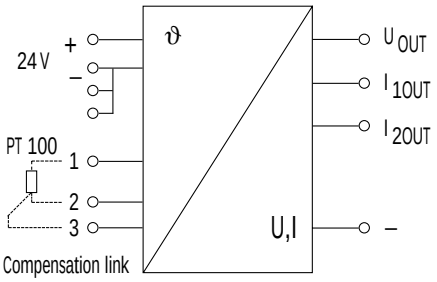
Refer to application examples on page 3.10.2

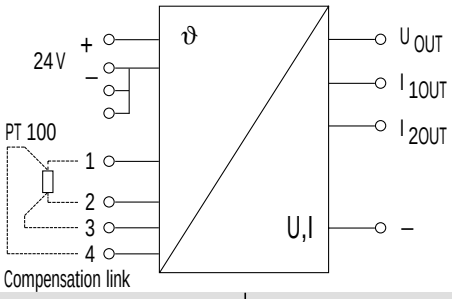
Temperature modules for PT 100 Sensors

MTW 12,4
2- 3-wire

MTW 12,4
4-wire

Circuit diagram





Ordering data	Art.-No.	Art.-No.	Art.-No.	Art.-No.
INPUT	spring clamp terminals	screw terminals	spring clamp terminals	screw terminals
± 50 °C	**6644330**	**44330**	**6644340**	**44340**
– 50 …150 °C	**6644331**	**44331**	**6644341**	**44341**
0 …100 °C	**6644332**	**44332**	**6644342**	**44342**
0 …150 °C	**6644333**	**44333**	**6644343**	**44343**
0 …200 °C	**6644334**	**44334**	**6644344**	**44344**
0 …300 °C	**6644335**	**44335**	**6644345**	**44345**
0 …600 °C	**6644336**	**44336**	**6644346**	**44346**

Technical data

Supply voltage range	18…30 V DC, smoothed	
Supply current	max. 80 mA	
Cable resistance (without PT 100)	for 3- and 4-wire technology max. 100 Ohm	
Output signals	at 0…10 V DC	max. 25 mA, overload protected
	at 4…20 mA	max. 500 Ohm
	at 0…20 mA	max. 500 Ohm
Tolerance	±1 % from end value	
Temperature range	0…+50 °C	
Mounting method	DIN-rail mounting to EN 50022	
Dimensions H x W x D	90 x 12,4 x 65 mm	

Description

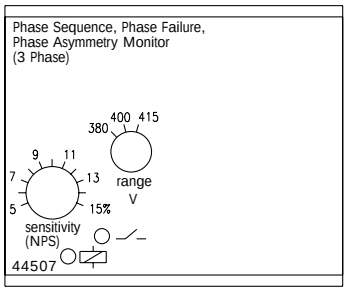
The Murrelektronik temperature converter module works in conjunction with a temperature sensor PT 100 (DIN 49760) and converts the output from the sensor into a standard signal format of (0…10 V, 0…20 mA or 4…20 mA). The MTW module supplies a constant current to the PT 100 resistor across, which develops a variable voltage. These are then measured and the signal sent to the OUT terminal. All three signals can be used at the same time.
The 2 wire technology allows short distances between the MTW and the PT100 sensor to be covered i.e. <5m. For longer distances , 3 wire technology compensates for the cable resistance. For three wire technology, remove the bridge between 2 and 3. For the greatest accuracy, 4 wire technology compensates for both the outgoing and incoming cables which may have differing resistances or lengths.

Notes

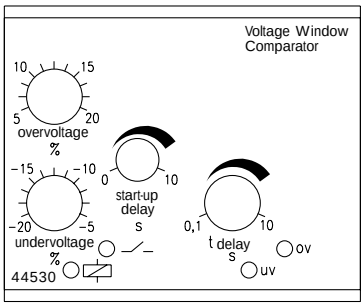
Other temperatures on request.

MESCO

Phase monitoring relays

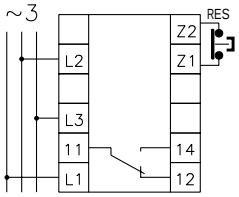


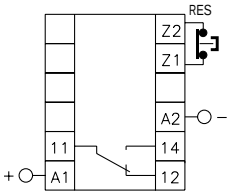
Voltage monitoring relays



CE

Circuit diagram

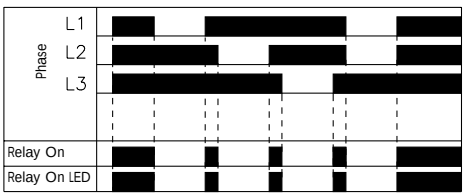


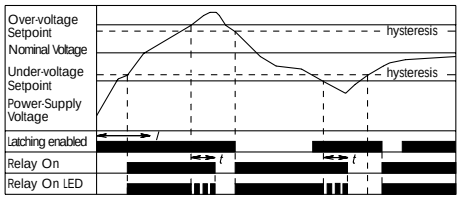


Ordering data	Art.-No.	Art.-No.
Supply voltage		
24 V DC		**44530**
230 V AC		**44535**
3 x 400 V AC	**44507**	**44517**

Technical data		
Hysteresis	2 %	
Programmable	bridge Z1/Z2	
Adjustment parameters	input voltage 380/400/415 V AC	under voltage –5…–20 %
	sensitivity 5…15 %	over voltage +5…+20 %
		response delay 0,1…10 s
		start up delay 0…10 s
Monitoring functions	phase failure	over voltage
	phase sequence	under voltage
	phase symmetry	
Max. contact voltage	250 V AC	
Max. contact current	8 A *	
Mounting method	DIN-rail mounting to EN 50022	
Temperature range	0…+50 °C	
Dimensions H x W x D	82 x 45 x 100 mm	

Function diagram





/ = latching disabled at power up t = response time on trip

Description

Phase monitoring relays monitor three phase circuits. They check for phase failure, sequence and symmetry. In the event of phase loss, phase regeneration from motors or transformers is also detected.
Typical applications:
- Protection of three phase motors
- Protection of transformers from unbalanced loading

Voltage monitoring relays monitor AC and DC circuits. Under voltage and over voltage thresholds can be adjusted.
Typical applications:
- Stand by power system monitoring
- Protection of computer systems

Notes

* When switching inductive loads, Murrelektronik suppressors should be used in order to increase relay contact life and reliability.

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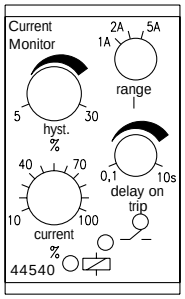
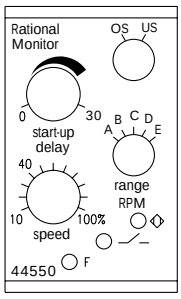
Current monitoring relays

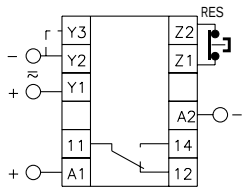


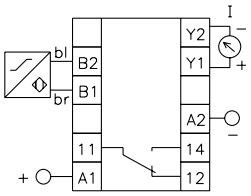
Impulse monitoring relays

for NAMUR (DIN 19234)



Circuit diagram



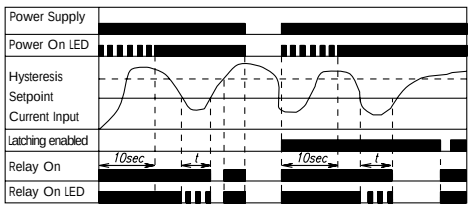


Ordering data	Art.-No.	Art.-No.
Supply voltage		
24 V DC	[1] **44540**	**44550**
230 V AC	**44545**	

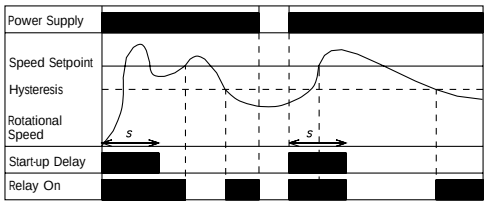
Technical data

Programmable	bridge Z1/Z2	
Adjustment parameters	current range 1 · 2 · 5 A	start up delay 0…30 s
	hysteresis 5…30 %	trip point 10…100 %
	trip point 0…100 %	impulse/min A: 10…100, B: 50…500, C: 100…1000
	response delay 0,1…10 s	D: 500…5000, E: 1000…10 000
Monitoring functions	over current	over speed
	under current bridge Y2/Y3	under speed
Max. contact voltage	250 V AC	
Max. contact current	8 A *	
Mounting method	DIN-rail mounting to EN 50022	
Temperature range	0…+50 °C	
Dimensions H x W x D	82 x 22,5 x 100 mm	

Function diagram



t = response time on trip



s = start-up delay

Description

The current monitoring relays monitor current up to 5 A AC/DC.
Dependant on the program, under current or over current can be monitored.
Typical applications:
– monitoring electrical loads
– monitoring motor overloads

The impulse monitoring relays work with NAMUR switches to DIN 19234.
Dependant on the program, it monitors over and under speed. Additionally, there is an analogue output of 0...20mA.
There are 2 LED´s showing wire break and short-circuit.
Typical applications:
· Rotational speed monitoring of motors
· Speed indication displays

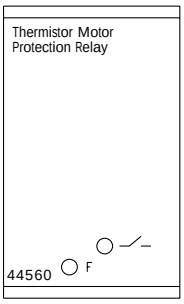
Notes

* When switching inductive loads, Murrelektronik suppressors should be used in order to increase relay contact life and reliability.
[1] no galvanic isolation

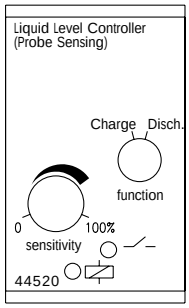
MESCO

Temperature monitoring relays

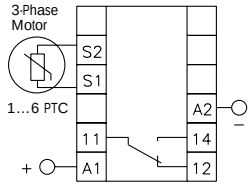
for PTC-Sensors to DIN 44081

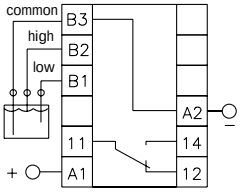


Liquid level monitoring relays



Circuit diagram

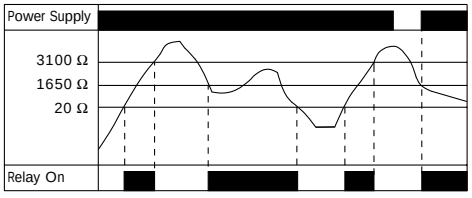


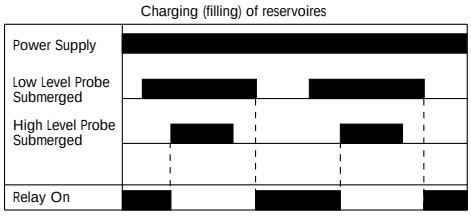


Ordering data	Art.-No.	Art.-No.
Supply voltage		
24 V DC	**44560**	**44520**
230 V AC	**44565**	

Technical data		
Hysteresis	2 %	
Programmable via Z1/Z2	no	
Adjustment parameters		sensitivity 0…100 %
Monitoring functions	temperature	2 point detection for high low level
Measurement voltage	≤ 2,5 V DC	4 V AC
Max. contact voltage	250 V AC	
Max. contact current	8 A *	
Mounting method	DIN-rail mounting to EN 50022	
Temperature range	0…+50 °C	
Dimensions H x W x D	82 x 22,5 x 100 mm	

Function diagram





Description

The temperature monitoring relay monitors PTC signals to DIN 44081.
An LED shows wire break and short-circuit.
Up to 6 sensors can be connected in series.
Typical applications:
- Protection of motors and transformers from overheating
- monitoring heat in substances

The liquid level monitoring relay monitors the level of conductive liquids.
With three probes , high low detection can be realised.
Fail safe high or low level detection can be programmed.
Typical applications:
- level detection in tanks and vats
- pump control

Notes

* When switching inductive loads, Murrelektronik suppressors should be used in order to increase relay contact life and reliability.