CONTA-ELECTRONICS
Multi-function Multi-channel converter

CONTACLIP

CMS-BS100

Electrical specifications

Order information

type	CMS-BS100
cat.no	15963.2

Input data

	input type is selected via jumpers
4 Multifunctional analog/dig. Inputs	0..1V / 0..10V / 0(4)..20mA / RTD / 24VDC(14..30V)
input resistance (U)	40K2 Ohm
input resistance (I)	100 Ohm
accuracy (U/I)	10mV/20uA
configuration resistor (PT/ NI1000)	Resistor type: Plug-in(Rt) 18K2-0.1% (not included), Temp. range -20°C .. 140°C
RTD standard (PT1000 / NI1000)	EN60751/DIN 43760
accuracy (PT1000 / NI1000)	0,5°C
RTD current (PT1000 / NI1000)	0.52mA
digital input min puls width	500us
digital input HI / LO status	>14VDC / <4VDC

Output data

2 analog/dig. outputs	output type is selected via jumpers
analog output	jumper selectable
	0...10V DC or 0(4)..20mA, short-circuit and overvoltage (24Vac/dc) protected
analog output load	U: > 1kOhm I: < 500Ohm
offset U/I	< 10mV / 20uA
digital output	Optocoupler transistor output
digital output current	100mA continious collector current
digital output voltage	5..40VDC

General data

configuration information	CMS-BS100 manual
power supply voltage	24V DC ±20%
current consumption	Approx. 25mA
conversion error	<1% FSR, <0.5% when calibrated on requested range(U, I or RTD)
response time (analog / digital)	10ms / 60us + minimal pulse width
temperature coefficient	< 0,02% /K
operating temperature range	-20°C...50°C
CE marking	Low Voltage Directive (LVD) 2006/95/EC, according requirements of EN 50178
	EMC Directive 2004/108/EC, according requirements of EN 55011 and EN 61326-1
dimensions (l x w x h) on TS35x7,5	99 x 17,5 x 114,5mm
conductor cross section	0,2 - 2,5 mm²
connection system	screw clamp
insulation stripping length	7 mm

Manual

The CMS-BS100 is a multi-functional signal converter with multiple inputs and outputs. Analog voltage-, current-, RTD- and digital signals can be converted to analog or digital outputs. Several common conversion functions are already included, e.g.

- analog inverter(s)
- 1 input to 2 separate outputs
- 2 inputs to 1 output (highest or lowest input)
- 2 inputs to 1 output (difference between inputs)
- RTD (Ni1000, PT1000) to analog output(s)
- Potentiometer(s) to analog output(s)

- up/down (2 digital inputs) to 1 analog output, with selectable ramp from 5sec to 30min.
- if analog input1>2 then digital output1 on if analog input3>4 then digital output2 on
- pulse stretcher(s)

Furthermore, this module is especially suited for customer-specific applications. Due to its number of inputs and outputs it can be programmed to measure the inputs and control the outputs in any way or function the customer desires.
Even for very low volumes, special programming can be very interesting for you!

Features:

• 4 Multifunctional analog/digital inputs

• 2 Multifunctional analog/digital outputs

• several conversion functions included

• especially suited for customer-specific applications

• Input range and output range selectable via DIP switches

Configuration

To open the module press the locking levers under the terminals with a screwdriver.

The module is configured by setting the dip-switches and jumpers according to this manual.

Connecting the module

The pin configuration for I/O and power connection is shown on the top of the module. The green Led on top indicates Power ON.

Input configuration

The CMS-BS100 has 4 multifunctional inputs which can be configured for measuring voltage, current, RTD and to detect digital signals. To configure the inputs a series of jumpers and/or additional resistors(not included) have to be set according to the text on the PCB.
The inputs must be set as follows:
• Uin: jumper on U, resolution: jumper on 2.5V, no resistor placed
• Iin: jumper on I, resolution: jumper on 2.5V, no resistor placed
• RTD: no jumper on input, resolution: jumper on 1V, resistor 18K2 0.1% placed
• Digital in: jumper on U, resolution: jumper on 2.5V, no resistor placed

In the example drawing input1 is set to measure Voltage and input2 to measure current.
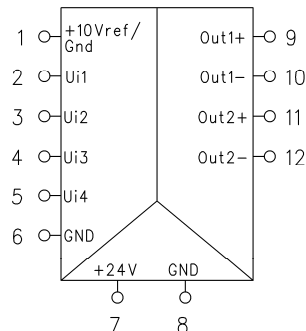
Output configuration

The CMS-BS100 has 2 multifunctional outputs which can be configured to output voltage, current and digital signals. To configure the outputs a series of jumpers have to be set according to the text on the PCB.
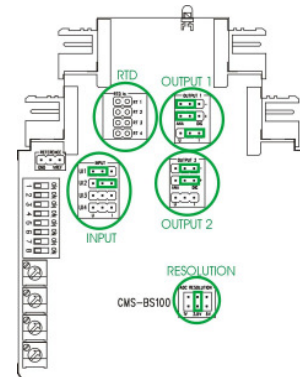The outputs must be set as follows:
• Uout: jumper on U, 2 jumpers on ANA
• Iout: jumper on I, 2 jumpers on ANA
• Digital out: no jumper on U/I, 2 jumpers on DIG

In the configuration example output1 is set to output current and output2 to output digital signals.

Connection diagram

1	+10Vref/Gnd	
2	Ui1	Out1+ 9
3	Ui2	Out1− 10
4	Ui3	Out2+ 11
5	Ui4	Out2− 12
6	GND	

+24V GND
7   8

Configuration example

CMS-BS100

Function: splitter

Input1 is forwarded to both output1 and output2. This function is selected by setting the dipswitches as shown below.

DIP1	DIP2	DIP3	DIP4
off	off	off	off

Select the input range:

DIP5	DIP6	value
off	off	0..10V / 0..20mA
off	on	0..5V / 0..10mA
on	off	2..10V / 4..20mA
on	on	1..5V / 2..10mA

Select the output range:

DIP7	DIP8	value
off	off	0..10V / 0..20mA
off	on	0..5V / 0..10mA
on	off	2..10V / 4..20mA
on	on	1..5V / 2..10mA

Function: inverter

The value from input1 and/or input2 is forwarded inverted to resp. output1 and/or output2. This function is selected by setting the dipswitches as shown below.

DIP1	DIP2	DIP3	DIP4
off	off	off	on

Select the input range:

input1		input2		
DIP5	DIP6	DIP7	DIP8	value
off	off	off	off	0..10V / 0..20mA
off	on	off	on	0..5V / 0..10mA
on	off	on	off	2..10V / 4..20mA
on	on	on	on	1..5V / 2..10mA

Function: optocoupler out

The optocoupler out function behaves as shown in the switching diagram. Potentiometer P1 an P2 represent the threshold for input1, potentiometer P3 and P4 represent the threshold for input2. Input1 switches output1 and input2 switches output2.
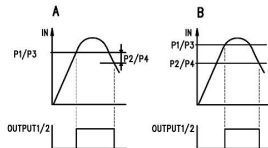
A: output1/2 switches on when value P1/P3 is reached. The output1/2 switches off when value P1 - P2 / P3 – P4 is reached.
B: output1/2 switches on when value P1/P3 is reached. The relays switches off when value P2/P4 is reached.

All potentiometers represent a percentage from the selected input value. Full left turn is 0% and full right turn is 100%.

This function is selected by setting the dipswitches as shown below.

DIP1	DIP2	DIP3	DIP4
off	off	on	off

Select the input range:

DIP5 input1	DIP6 input2	value
off	off	0..10V / 0..20mA
on	on	0..5V / 0..10mA

Select the switching behaviour:

DIP7 output1	DIP8 output2	value
off	off	A
on	on	B

Function: RTD

The RTD function forwards a temperature range from -20..140ºC to the selected output range, input1 to output1 and input2 to output2. This function is selected by setting the dipswitches as shown below.

DIP1	DIP2	DIP3	DIP4
off	off	on	on

Select the input RTD:

DIP5 input1	DIP6 input2	RTD
off	off	NI1000
on	on	PT1000

Select the output range:

DIP7 output1	DIP8 output2	value
off	off	0..10V / 0..20mA
on	on	2..10V / 4..20mA

Function: digital in to digital out

Digital input1 and input2 will be forwarded to resp. output1 and output2.

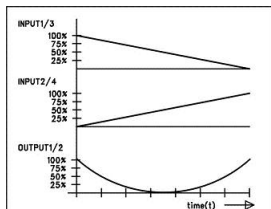This function is selected by setting the dipswitches as shown below.

DIP1	DIP2	DIP3	DIP4
on	off	off	off

Select the output type:

output1		output2		
DIP5	DIP6	DIP7	DIP8	value
off	off	off	off	not inverted
off	on	off	on	inverted

Function: absolute differential

The absolute differential between input 1 and 2 and/or input 3 and 4 will be forwarded to resp. output1 and output2.

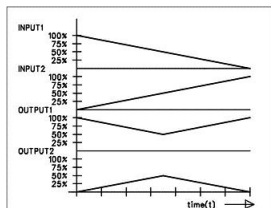This function is selected by setting the dipswitches as shown below.

DIP1	DIP2	DIP3	DIP4
off	on	off	off

Select the input range:

input1		input2		
DIP5	DIP6	DIP7	DIP8	value
off	off	off	off	0..10V / 0..20mA

Function: highest / lowest value

The highest / lowest value between input 1 and 2 and/or input 3 and 4 will be forwarded to resp. output1 and output2.

This highest value is selected by setting the dipswitches as shown below.

DIP1	DIP2	DIP3	DIP4
off	on	off	on

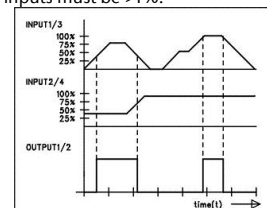This lowest value is selected by setting the dipswitches as shown below.

DIP1	DIP2	DIP3	DIP4
off	on	on	off

Select the input range:

input1		input2		
DIP5	DIP6	DIP7	DIP8	value
off	off	off	off	0..10V / 0..20mA

Function: analog to digital differential

Digital output1 switches when input1 > input2, output2 switches when input3 > input4. The difference between the inputs must be >1%.

This function is selected by setting the dipswitches as shown below.

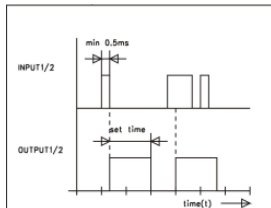| DIP1	DIP2	DIP3	DIP4
off	on	on	on

Select the input range:

input1		input2		
DIP5	DIP6	DIP7	DIP8	value
off	off	off	off	0..10V / 0..20mA
off	on	off	on	NI1000
on	off	on	off	PT1000

Note: due to different resolutions this function cannot combine U/I in with RTD in. When RTD is selected for input1/2, input3/4 must also be set as RTD.

Function: pulse stretcher

A pulse > 0.5ms on digital input1 and/or digital input2 stretches resp. digital output1 and/or digital output2.

This function is selected by setting the dipswitches as shown below.

DIP1	DIP2	DIP3	DIP4
on	off	off	on

Select the output time:

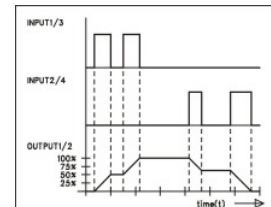| output1		output2		
DIP5	DIP6	DIP7	DIP8	value
off	off	off	off	0.5 sec
off	on	off	on	1.0 sec
on	off	on	off	1.5 sec
on	on	on	on	2.0 sec

Function: up / down digital input

A pulse > 0.5ms on digital input1 or digital input3 increases resp. analog output1 and/or analog output2 with a selected rise/fall time.
A pulse > 0.5ms on digital input2 or digital input4 decreases resp. analog output1 and/or analog output2 with a selected rise/fall time.
The minimum and maximum value for the output values can be selected with P1 and P2 for output1, P3 and P4 for output2.

This function is selected by setting the dipswitches as shown below.

DIP1	DIP2
on	on

Select the rise/fall time:

output1 P1 to P2			output2 P3 to P4			
DIP3	DIP4	DIP5	DIP6	DIP7	DIP8	value
off	off	off	off	off	off	5sec
off	off	on	off	off	on	10sec
off	on	off	off	on	off	30sec
off	on	on	off	on	on	1min
on	off	off	on	off	off	3min
on	off	on	on	off	on	5min
on	on	off	on	on	off	10min
on	on	on	on	on	on	30min