D 653
23.03.10 LB
REV. 01

FOR CONVERTING A 3-WIRE or 0…10 V– or 4…20mA SIGNAL INTO TWO 0…10 V – SIGNALS

C ←BUS

CSC 328 C1 Eng.

- **1 input : – 3-wire (Common - Open - Close)**
  – 0…10 V–
  – 4…20 mA
- **Two 0…10 V- outputs (configurable as required)**
- **Power supply 230 V ~; DIN rail mounting**
- **C-Bus system for remote management, communication speed of between 1200 and 9600 bps**

CE

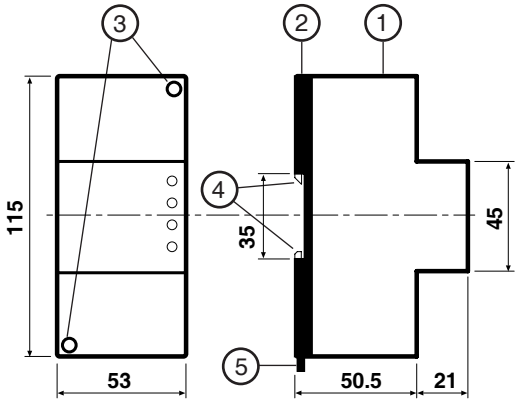
1. APPLLICATION

Used to convert one input signal (3-wire or 0…10 V– or 4…20 mA) in two independent 0…10 V– output signals, configurable as required.
The values of the output signals can be phased differently to the input signal and be set manually from the display or by the Telemanagement PC using the FOC SWC-701 software.

2. FUNCTIONS

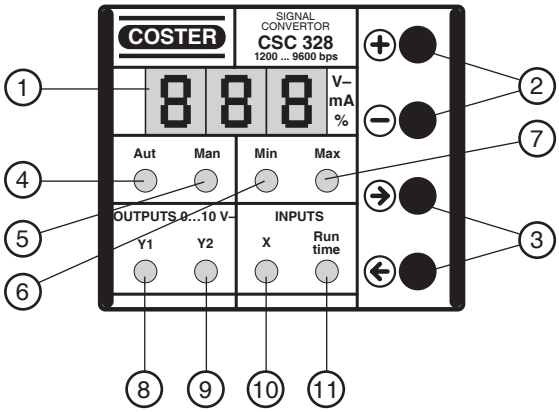
One input :– one 3-wire modulating signal (Common – Open – Close).
– one 0…10 V – signal,.
– one 4…20 mA signal,.
Two 0…10 V outputs : – outputs (configurable as required).

3. OVERALL DIMENSIONS



1 – Protective cover for electronic components
2 – Base with transformer, relay and terminal blocks
3 – Screws for securing base and cover
4 – DIN rail securing elements
5 – DIN rail release lever

4. FACIA



1 – 3-figure numerical display
2 – Keys for adjusting parameters
3 – Keys for viewing parameters
4 – Automatic" operation LED
5 – "Manual" operation LED
LEDs identifying data shown on display :
6 – Minimum value
7 – Maximum value
8 – Output Y1
9 – Output Y2
10 – Input X signal
11 – Run time of 3-wire input signal

5. TECHNICAL DATA (factory setting in bold time)

Power supply	230 V ~ ± 10%
Frequency	50 Hz
Consumption	3 VA
Protection	IP40
Radio disturbances	VDE0875/0871
Vibration test	with 2g (DIN 40 046)
Construction standards	Italian Electrotech. Committee (CEI)
Case	DIN 3E module
Mounting	on DIN 35 rail
Materials :	
Base	NYLON
Cover	ABS
Ambient temperature:	
Operating	0…45 °C
Storage	– 25…+ 60 °C
Ambient humidity	Class F DIN 40040
Weight	0.31 kg

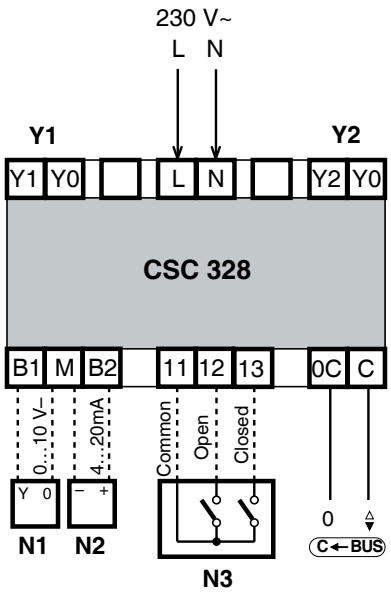
Signals

1 input signal:	– 3-wire modulating – 0…10 V– – 4…20 mA
1 output signal 0…10 V– (Y1) :	– Direct action – Inverse action
1 output signal 0…10 V– (Y2) :	– Direct action – Inverse action

Setting range

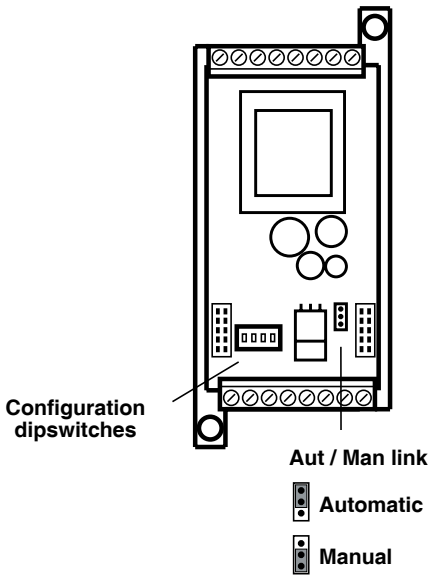
Modulating input run time	15…**60**…990 sec
Minimum value outputs Y..Min	**0**…10 V–
Maximum value outputs Y..Max	0…**10** V–
Value input signal for Y1Min :	– **0**…100 % – **0**…10 V– – **4**…20 mA
Value input signal for Y1Max :	– 0…**100** % – 0…**10** V– – 4…**20** mA
Value input signal for Y2Min :	– 0…**100** % – 0…**10** V– – 4…**20** mA
Value input signal for Y2Max :	– **0**…100 % – **0**…10 V– – **4**…20 mA
Resolution :	
Modulation signal	1 %
0…10 V– signal	0,1 V–
4…20 mA signal	0.1 mA
Max. current outputs Y1 and Y2	10 mA.
Telemanagement	
Telemanagement address	1…239
C-Bus speed selected between	**1200**, 2400, 4800, 9600 bps

6. WIRING DIAGRAMS



N1 – 0…10 V–i nput signal (as alternative to N2 and N3)
N2 – 4…20 mA input signal (as alternative to N1 and N3)
N3 – 3-wire input signal (as alternative to N1 and N2)
Y1 – 0…10 V– output signal.
Y2 – 0…10 V– output signal.

7. BASE



8. SITING

The controller must be installed in a dry location that meets the ambient limits given under TECHNICAL DATA. If installed in a space classified as "Hazardous" it must be mounted in a cabinet for electrical appliances constructed according to the regulations in force for the type of hazard concerned. The controller can be mounted on a DIN rail and installed in a standard DIN enclosure.

9. ELECTRICAL CONNECTIONS

Proceed as follows:

- Separate base from cover (by removing the two securing screws)
- Mount the base on the DIN rail and check that it is firmly anchored by the securing elements (2.4)
- Carry out the wiring according to the diagram and in compliance with current electrical regulations, and using:
  - 1.5 mm^2 cables for power supply
  - 1 mm^2 for input and output signals
- Apply power (230 V~) and check its presence across terminals L and N.
- Remove power, replace cover on base/terminal block and secure it with the two screws supplied (2.3) .

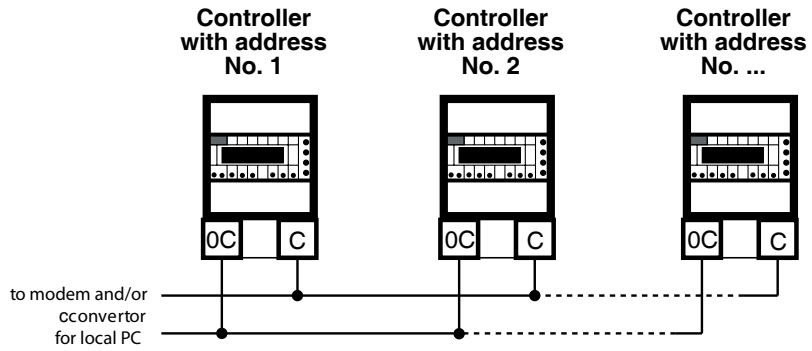
You are advised not to insert more than two cables in a single terminal of the device and, if necessary, to use an external junction box.

10. COMMUNICATION

10.1 C-Bus communication for Telemanagement (for detailed information see Data Sheet T 021)

By means of C-Bus (0 and 0C) CSC 328 can be Telemanaged, two-way exchange of data with one or more local PCs and/or a remote central PC via the telephone line .
C-Bus speed settable from 1200 to 9600 bps (factory-setting: 1200 bps)
From the PC it is possible to see the values of the input signal and the status of the outputs and to modify the setting data with the exception of the configuration dipswitches.

10.2 Electrical connections C-Bus



10.3 Address for Telemanagement

For Telemanagement, in order that the controllers can be identified by the central PC and/or by the local PCs, they must be given an address number:

- Repeatedly press → key until all the LEDs flash
- Display flashing with - - - .
- Use the + and – keys to enter the address number.
- Press → to return to first page.

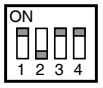
11. "AUTOMATIC" OPERATION (outputs reactive to an input signal)

CSC converts 1 input signal : – 3-wire modulating, or
– 0…10 V – (resolution 0.1 V-) or
– 4…20 mA (resolution 0.1 mA)
into two 0…10 V – signals (in steps of 0.1 V–).

Set the Aut/Man link (on the base) to Automatic (factory setting)

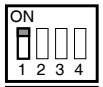
11.1 Configuration

It is essential to configure CSC328 by means of the dipswitches located on the base.
The position of the dipswitch is shown in black.

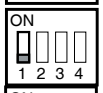


Factory configuration : – Output signal Y1 : direct action (1 on On)
– Output signal Y2 : inverse action (2 on Off)
– 3-wire modulating input signal (3 on On)

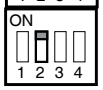
To change the configuration position only the dipswitches concerned:



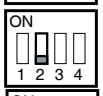
1 On = Output Y1: direct action



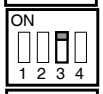
1 Off = Output Y1: inverse action



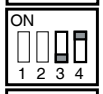
2 On = Output Y2: direct action



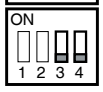
2 Off = Output Y2: inverse action



3 On = Input signal: 3-wire modulating



3 Off + 4 On = Input signal: 0…10 V– (only with 3 on Off)



3 Off + 4 Off = Input signal: 4…20 mA (only with 3 on Off)

After having completed the wiring and configuring the dipswitches, switch on CSC 328 while keeping pressed – and → keys until "ini" appears on the display.

11.2 Output signals Y1 - Y2

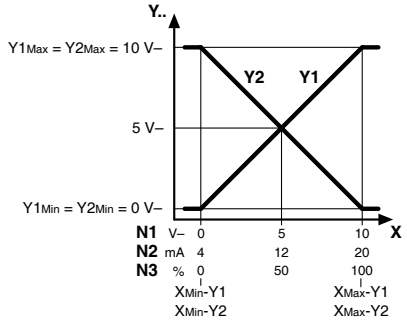
The output signals Y1 and Y2 can be adapted to the operational requirements by setting the parameters as required:

$Y1_{Min}$ = Minimum value of output Y1 (0…10 V–).
$Y1_{Max}$ = Maximum value output Y1 (0…10 V–).
X_{Min}-Y1 = Minimum value of input signal for output Y1 (0…10 V– ; 4…20 mA ; 0…100 %).
X_{Max}-Y1 = Maximum value of input signal for output Y1 (0…10 V– ; 4…20 mA ; 0…100 %).
$Y2_{Min}$ = Minimum value of output Y2 (0…10 V–).
$Y2_{Max}$ = Maximum value of output Y2 (0…10 V–).
X_{Min}-Y2 = Minimum value of input signal for output Y2 Y2 (0…10 V– ; 4…20 mA ; 0…100 %).
X_{Max}-Y2 = Maximum value of input signal for output Y2 (0…10 V– ; 4…20 mA ; 0…100 %).
Setting these parameters is shown in section 11.3

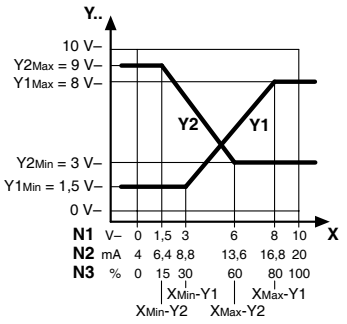
Outputs with default data

Y1 : Direct action
$Y1_{Min}$ = 0 V– ; $Y1_{Max}$ = 10 V–
X_{Min}-Y1 = 0 V– , 4 mA , 0% ; X_{Max}-Y1 = 10 V– , 20 mA , 100%

Y2 : Inverse action
$Y2_{Min}$ = 0 V– ; $Y2_{Max}$ = 10 V–
X_{Min}-Y2 = 0 V– , 4 mA , 0% ; X_{Max}-Y2 = 10 V– , 20 mA , 100%

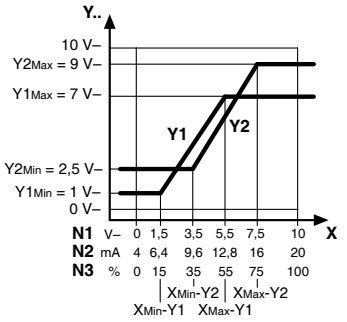


Examples of outputs with modified minimum and maximum values:



Y1 : Direct action
$Y1_{Min}$ = 1,5 V– ; $Y1_{Max}$ = 8 V–
X_{Min}-Y1 = 3 V– , 8,8 mA , 30% ; X_{Max}-Y1 = 8 V– , 16,8 mA , 80%

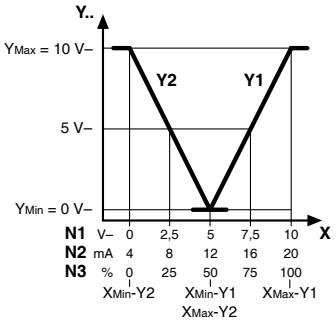
Y2 : Inverse action
$Y2_{Min}$ = 3 V– ; $Y2_{Max}$ = 9 V–
X_{Min}-Y2 = 1,5 V– , 6,4 mA , 15% ; X_{Max}-Y2 = 6 V– , 13,6 mA , 60%



Y1 : Direct action
$Y1_{Min}$ = 1 V– ; $Y1_{Max}$ = 7 V–
X_{Min}-Y1 = 1,5 V– , 6,4 mA , 15% ; X_{Max}-Y1 = 5,5 V– , 12,8 mA , 55%

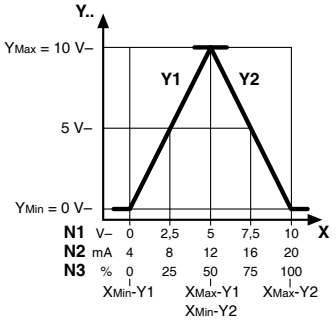
Y2 : Direct action
$Y2_{Min}$ = 2,5 V– ; $Y2_{Max}$ = 9 V–
X_{Min}-Y2 = 3,5 V– , 9,6 mA , 35% , X_{Max}-Y2 = 7,5 V– , 16 mA , 75%

Examples of sequencing:



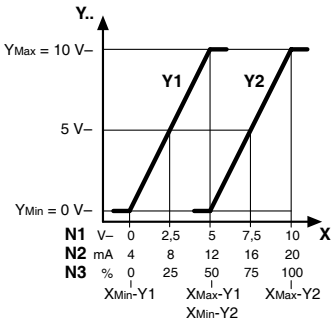
Y1 : Direct action
$Y1_{Min}$ = 0 V– ; $Y1_{Max}$ = 10 V–
X_{Min}-Y1 = 5 V– , 12 mA , 50% ; X_{Max}-Y1 = 10 V– , 20 mA , 100%

Y2 : Inverse action
$Y2_{Min}$ = 0 V– ; $Y2_{Max}$ = 10 V–
X_{Min}-Y2 = 0 V– , 4 mA , 0% ; X_{Max}-Y2 = 5 V– , 12 mA , 50%



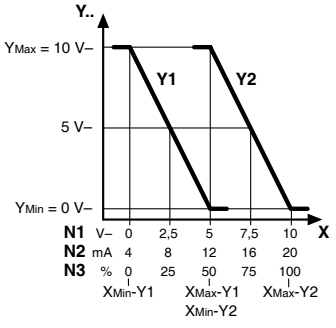
Y1 : Direct action
$Y1_{Min}$ = 0 V– ; $Y1_{Max}$ = 10 V–
X_{Min}-Y1 = 0 V– , 4 mA , 0% ; X_{Max}-Y1 = 5 V– , 12 mA , 50%

Y2 : Inverse action
$Y2_{Min}$ = 0 V– ; $Y2_{Max}$ = 10 V–
X_{Min}-Y2 = 5 V– , 12 mA , 50% ; X_{Max}-Y2 = 10 V– ; 20 mA ; 100%



Y1 : Direct action
$Y1_{Min}$ = 0 V– ; $Y1_{Max}$ = 10 V–
X_{Min}-Y1 = 0 V– , 4 mA , 0% ; X_{Max}-Y1 = 5 V– , 12 mA , 50%

Y2 : Direct action
$Y2_{Min}$ = 0 V– ; $Y2_{Max}$ = 10 V–
X_{Min}-Y2 = 5 V– , 12 mA , 50% ; X_{Max}-Y2 = 10 V– ; 20 mA ; 100%



Y1 : Inverse action
$Y1_{Min}$ = 0 V– ; $Y1_{Max}$ = 10 V–
X_{Min}-Y1 = 0 V– , 4 mA , 0% ; X_{Max}-Y1 = 5 V– , 12 mA , 50%

Y2 : Inverse action
$Y2_{Min}$ = 0 V– ; $Y2_{Max}$ = 10 V–
X_{Min}-Y2 = 5 V– , 12 mA , 50% ; X_{Max}-Y2 = 10 V– ; 20 mA ; 100%

11.3 Setting

The setting parameters must be entered after having completed the wiring and dipswitches have been configured .

On switching on, the software version number is displayed for two seconds and then the value of the input signal (V-; mA; %) is shown. If 4…20 mA configured and input B2-M not connected a flashing dash appears.

The → and ← keys permit viewing the setting parameters (display flashing).
The + and – keys permit adjusting the parameters shown on the display.
The setting parameter, shown by the display flashing, are shown by the relative LED being lit.
If for 60 seconds no key is pressed, the display shows the value of the input signal as a percentage.

Entering setting data :

Display shows input signal value (V– ; mA ; %). **Aut** LED lit.
Press → key: LED **Y1** lit ;
Display shows value 0…10 V– of output Y1.
Press → key: LED **Y2** lit ;
Display shows value 0…10 V– of output Y2.
Press → key: LED **Y1** and **Min** lit ;
Display flashing with minimum value of output signal **Y1Min** ;
Set with + or – .
Press → key: LED **Y1** and **Max** lit ;
Display flashing with maximum value of output signal **Y1Max** ;
Set with + or – .
Press → key: LED **Y1**, **Min** and **X** lit ;
Display flashing with value of input signal **XMin** for output **Y1**;
Set with + or – .
Press → key: LED **Y1** , **Max** e **X** lit ;
Display flashing with value input signal **XMax** for output**Y1**;
Set with + or –.
Press → key: LED **Y2** and **Min** lit ;
Display flashing with minimum value of output signal**Y2Min** ;
Set with + or – .
Press → key: LED **Y2** and **Max** lit ;
Display flashing with maximum value of output signal**Y2Max** ;
Set with + or –.
Press → key: LED **Y2** , **Min** and **X** lit ;
Display flashing with value of output signal **XMin** for output **Y2**;
Set with + or –.
Press → key: LED **Y2** , **Max** and **X** lit ;
Display flashing with value of input signal **XMax** for output **Y2**;
Set with + or –.
Press → key: LED **Run time** lit (only with 3-wire input configured) ;
Display flashing with value of run time of 3-wire input signal;
Set with + or – (resolution 15 seconds).
Press → key : All LEDs off.
Display flashes showing C-Bus transmission speed
Adjust with + or – (b12 = 1200 bps; b 24 = 2400 bps; b48 = 4800 bps; b96 = 9600 bps).
Press → key: All LEDs flashing;
Display flashing with - - - for entering address C-Bus Telemanagement;
Set with + or – .
Press → key: Display shows value (V– ; mA ; %) of input signal..

Testing procedure :

Having completed all of the configuration it is possible to adjust manually the output values Y1 and Y2 in order to check their correct operation:

Set the Aut/Man link on the base to Manual 

Display shows 000 (input signal not considered). **Man** LED lit.
Press → key: LED **Y1** lit ;
Display flashing with value 0…10 V– of output Y1.
Adjust with + or – ;
Check result.
Press → key: LED **Y2** lit ;
Display flashing with value 0…10 V– of output Y2.
Adjust with + or – .
Check result.
Press ← twice: Display shows 000.

Restore Aut/Man link on the base to Automatic 

12. "MANUAL" OPERATION (outputs do not react to the input signal)

The two outputs can be removed from the input signal and the value of each single output can be set from the display or by the Telemanagement PC.

When the two outputs are used exclusively in “Manual” there is no input signal and the dipswitch settings 3 and 4 have no significance; nor do the settings for direct-inverse action (dipswitches 1 and 2).

Settings from the display are expressed in V-, the settings by PC can be expressed in measurement units (e.g. temperature in °C, humidity in %, pressure in bar, etc).

Set the Aut/Man link (located on the base) to Manual 

Entering the setting data

Display shows 000 (absence of input signal). **Man** LED lit.
Press → key: LED **Y1** lit ;
Display flashing with value 0…10 V– from output Y1.
Set desire value with + or –;
Press → key: LED **Y2** lit ;
Display flashing with value 0…10 V– from output Y2.
Set desire value with + or –;
Press → key: LED **Y1** and **Min** lit ;
Display flashing with minimum value of output signal **Y1Min** ;
Set with + or –.
Press → key: LED **Y1** and **Max** lit ;
Display flashing with maximum value of output signal **Y1Max** ;
Set desire value with + or –.
Press → key: LED **Y2** and **Min** lit ;
Display flashing with minimum value of output signal **Y2Min** ;
Set with + or –.
Press → key: LED **Y2** and **Max** lit ;
Display flashing with maximum value of output signal **Y2Max** ;
Set desired value with + or –
Press → key : All LEDs off.
Display flashes showing C-Bus transmission speed
Adjust with + or – (b12 = 1200 bps; b 24 = 2400 bps; b48 = 4800 bps; b96 = 9600 bps).
Press → key: All LEDs flashing;
Display flashing with - - - for entering address Telemanagement C-Bus;
Set with + or –.
Press → key: Display fixed 000

Procedure for reading and adjusting desired values:

Display shows 000 (absence of input signal). **Man** LED lit.
Press → key: LED **Y1** lit ;
Display flashing with desired value 0…10 V– from output Y1.
Adjust desired value with + or – ;
Press → key: LED **Y2** lit ;
Display flashing with desired value 0…10 V– from output Y2.
Adjust desired value with + or – ;
Press ← twice: Display shows 000.

Amendment to data sheet

Date	Revision No.	Page	Section	Details of amendment
23.03.10 VM	**01**	4,5 and 6	10.1, 11.3 and 12	Setting of C-Bus transmission speed

COSTER
CONTROLLI TEMPERATURA ENERGIA
COSTER TECNOLOGIE ELETTRONICHE S.p.A.
Sede Legale: 20132 Milano - Via San G.B. De La Salle, 4/a

Head Office & Sales
Via San G.B. De La Salle, 4/a — Tel. +39 022722121
20132 - Milano — Fax +39 022593645
Orders — Fax +39 0227221239
Reg. Off. Central & Southern
Via S. Longanesi, 14 — Tel. +39 065573330
00146 - Roma — Fax +39 065566517
Shipping
Via Gen. Treboldi, 190/192 — Tel. +39 0364773200
25048 - Edolo (BS) — Tel. +39 0364773202

E-mail: info@coster.info — Web: www.coster.eu