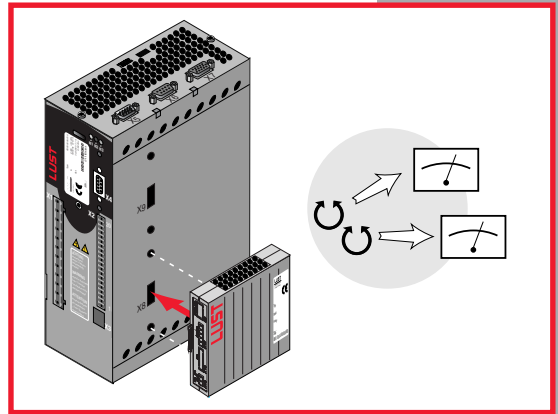# UM-2AO

Type description
Ausführungs-
beschreibung

**2-Channel
Analog Output Modul
of c-line DRIVES
2-Kanal
Analogausgabemodul
der c-line DRIVES**

**Adaptation of the drive system
to the application
Anpassen des Antriebssystems
an die Anwendung**

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Type Description CDD3000 with UM-2AO
Ausführungsbeschreibung CDD3000 mit UM-2AO

Id.-Nr./ID no: 0931.03B.1-00

Stand/Date: 12/2005

Gültig ab Softwareversion V2.20 des CDD3000
Valid from software version V2.20 of CDD3000

Technische Änderungen vorbehalten.
Subject to technical alterations.

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➢ **Attention!** Faulty operation can cause damage or malfunction of the drive

➢ **Note:** Useful information

Attention: This description does not replace the operation manual of c-line DRIVES. During commissioning and other operations at the drive the specifications and especially the safety hints of the operation manual have to be considered.

Intended use

The drive of CDD3000 series can be equipped with the analog module UM-2AO. Output of actual values via the both external analog outputs, for example output current, speed, torque and position.
The resolution is 10 bit at voltage range of −10 up to +10 V. The analog output signal of both channels will be smoothed via a filter in 4. order (limit frequency 4 kHz), could not be changed.

Attention: During initializing (at net-on) the output supplies no valid values.

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Mechanical installation

BG1... BG5
(CDD32.003 - CDD.34.032)

On drive units sizes **BG1 ... BG 5** the UM-2AO modul is connected on the side (X8) [see Fig 1 (A)]. The mounting gap of the drive unit is therefore min. 35 mm [see Fig 1 (B)].
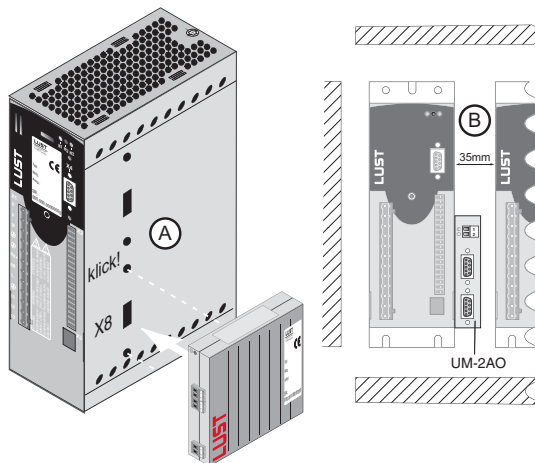
Fig 1

1. Make sure the power to the drive unit is cut.

2. Plug the UM-2AO into the drive unit as per Fig 1(A), using the mounting slot **X8**. The module lock must engage audibly.

Attention: Always plug the modul into the drive at tensionless state!

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BG6 ... BG8
(CDD34.072 - CDD34.170)

On drive unit sizes **BG6 ... BG 8** the UM-2AO module is connected on the front [see Fig. 2 (C)].
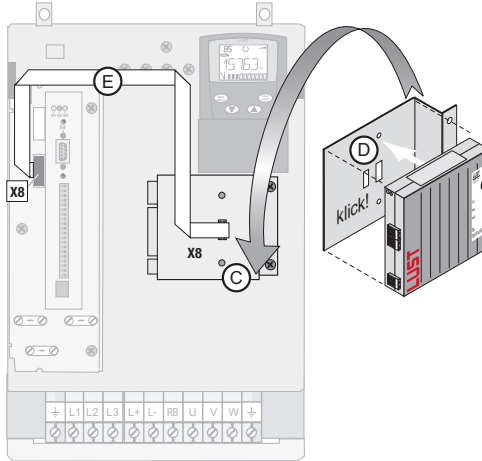

Fig. 2

For this you will additionally require the mounting set MP-UMCM,2.0 [see Fig. 3 (G)]. You can also use the mounting set MP-UMCM [see Fig. 3 (F)].
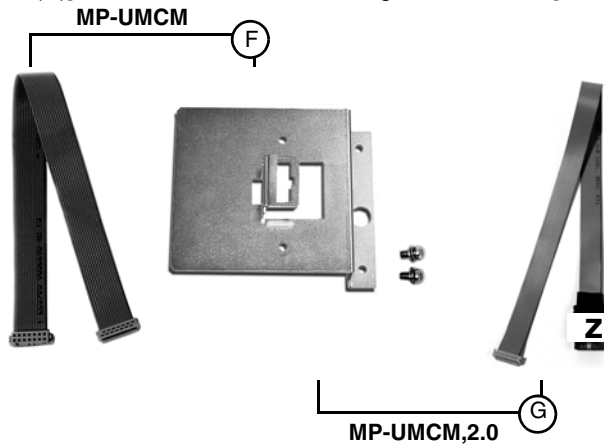

Fig. 3

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Using the MP-UMCM,2.0 the jumpers have to be changed as per Fig. 4.

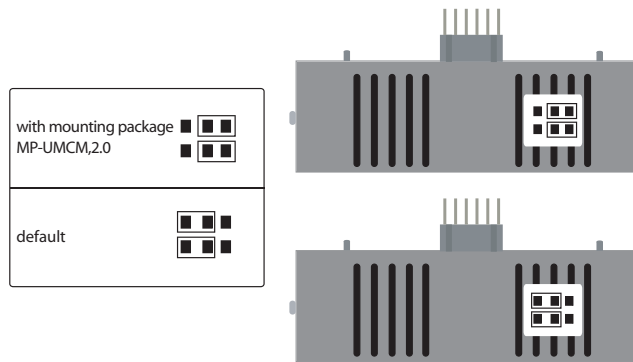|	
with mounting package MP-UMCM,2.0	
default	

Fig. 4

BG6 ... BG8

1. Make sure the power to the drive is cut.
2. Open the cover.
3. Click the module into the mounting bracket. For position and orientation see Fig. 2 (D). The bracket is a component of the mounting set MP-UMCM,x.
4. Screw the bracket onto the top mounting; see Fig. 2 (C). The UM-2AO module is thereby placed on its head and the rear of the module is facing forwards.
5. Connect the module with the ribbon cable as per Fig. 2 (E) (with MP-UMCM,2.0 plug Z onto X8). The bracket is a component of the mounting set MP-UMCM,x.

Attention: Always plug the modul into the drive at tensionless state!

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Installation

Please note:

- Always wire the control terminals with shielded cables.
- Lay the control cables seperate from the mains power and motor cables.
- The two control outputs are freely programmable.

1. Connect the control cables.

2. Contact the cable shield as per Fig. 5.

3. Connect the power supply to the module (U_V = 24 V DC).
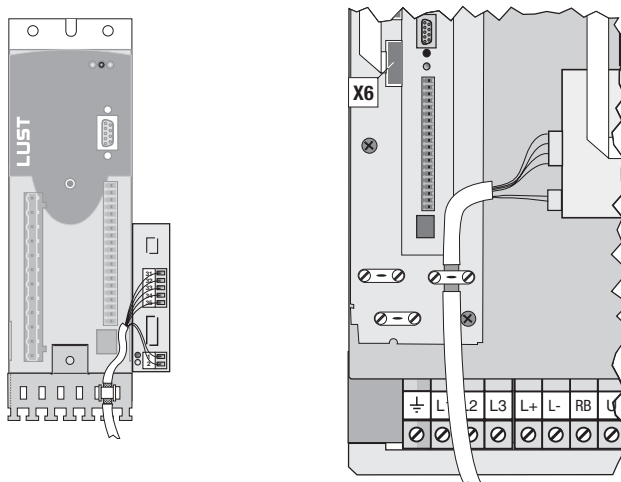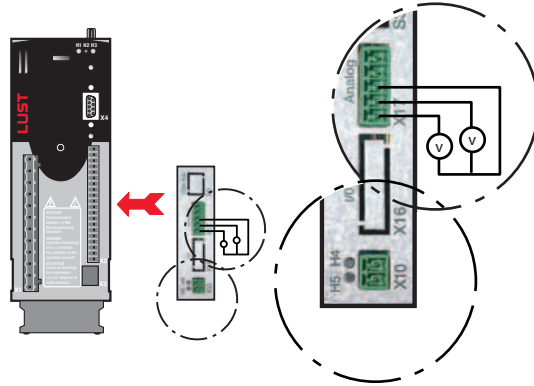
4. Switch on the drive unit.

Fig. 5

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Position plan

Fig. 6

	X17	Allocation
	31	DGND don't care
	32	
	33	AGND = Analog ground galvanically discon-nected
	34	ANA1 = Analog signal 1
	35	ANA0 = Analog signal 0

	X10	Allocation
	1	V_V = Supply voltage 24 V DC
⊥	2	DGND = Digital ground

Error list / blink code

LED - Code	Description
green	24 V OK
red	Module not ready to operate

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Error codes UM-2AO

Description	Error type	Error location
BUS-OFF-condition identified. Check power supply of module.	E-OP1	151
Unable to send transmit-protocol.	E-OP1	152
Error at initializing module (no answer of module). Check power supply of module.	E-OP1	155
The set range is not useful (negative) e.g. speed: lower limit 1000 rpm, upper limit 200 rpm.	E-OP1	160

Description	Error type	Error location
BUS-OFF-condition identified. Check power supply of module.	E-OP2	171
Unable to send transmit-protocol.	E-OP2	172
Error at initializing module (no answer of module). Check power supply of module.	E-OP2	175
The set range is not useful (negative) e.g. speed: lower limit 1000 rpm, upper limit 200 rpm.	E-OP2	180

Technical Data

Input voltage (supply voltage)	18 - 30 V
Input current	max. 0.1 A
Resolution	10 Bit
Accuracy	±0.1 % resp. ±19.5 mV
Output voltage	-10 ... +10 V
Current carrying capacity	max. 3 mA, short-circuit proof
Filtering fixed	4. order
Limit frequency	4 kHz
Refresh-cycle time	5 ms

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Description of the function

Selecting the output size

FOEA0, FOEA1 subject area_OPT	
Eunction Selector Output External Analog Channel 0, 1	Function selector for selecting the value shall be output at channel 0 resp. 1 analog.
Parameter number	375 resp. 376
Physical unit	-
Value range	See following list
Factory setting	SPEED
Display level	3
Editor level	3
SMARTCARD section	OPT

Parameter FOEA0 resp. FOEA1 is for selecting the value shall be output at channel 0 resp. 1.

No.	Setting	Function
0	OFF	Switched off (0 V)
1	TORQE	Actual torque in Nm
2	SPEED	Actual speed in rpm
3	POS	Actual position revolutions
4	CURNT	Effective line current in A
5	ASPED	Value of actual speed in rpm
6	CURFI	Effective strand current filtered in A
7	PARAM	Parameter 414-EA0PA for channel 421-EA1PA for channel The parameter can be operated via the process program (iMotion), RS232 or field bus.

Resolution of output size ±10 V corresponds to ...

The requested value range (window) will be fixed with the parameters for the minimum and maximum value. So the whole output voltage range of –10 V to +10 V can be used.

EA0MN, EA1MN (subject area _OPT)	
External Analog 0, 1 Minimum Value	Minimum output value for channel 0 resp. 1 (value of output size at -10 V).
Parameter number	377 resp. 378

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EA0MN, EA1MN (subject area _OPT)	
Physical unit	-
Value range	-32764 ... +32764
Factory setting	-3000
Display level	3
Editor level	3
SMARTCARD section	OPT

EA0MX, EA1MX (subject area _OPT)	
External Analog 0, 1 Maximum Value	Maximum output value for channel 0 resp. 1 (value of output size at +10 V).
Parameter number	391 resp. 412
Physical unit	-
Value range	-32764 ... 32764
Factory setting	3000
Display level	3
Editor level	3
SMARTCARD section	OPT

Parameter EAxMN describes the lower limit, refers to the analog output value −10 V. Parameter EAxMX describes the upper limit, refers to the analog output value +10 V.
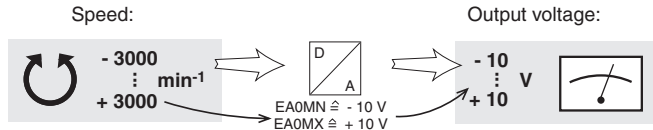
Example

Show a speed via analog output 0

Step 1 – Select in parameter *375-FOEA0 function selector analog output 0 at UM-2AO setting SPEED.*

Step 2 – Set via parameters *377-EA0MN minimum output value for channel 0 of UM-2AO and 391-EA0MX maximum output value for channel 0 of UM-2AO the value range (window) of your output size.*
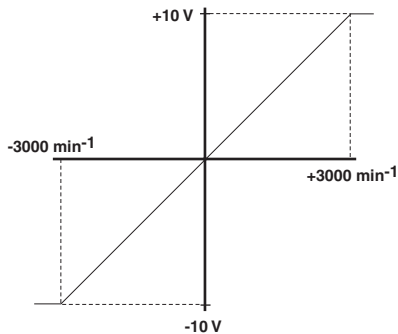
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1. Output symmetrical

Speed: Output voltage:

- 3000		**- 10**
⋮ **min⁻¹**		⋮ **V**
+ 3000		**+ 10**

-3000 ⋮ min^{-1} + 3000

EA0MN ≙ - 10 V
EA0MX ≙ + 10 V

-10 ⋮ V + 10

Standardisation:

at speed -3000 min^{-1} => Output = -10 V
at speed +3000 min^{-1} => Output = +10 V
at speed 0 min^{-1} => Output = 0 V

Process: Linear

Set parameters

EA0MN   => -3000
EA0MX   => +3000

+10 V

-3000 min^{-1}

+3000 min^{-1}

-10 V

Output voltage is
limited to ±10 V

2. Output asymmetrical

You have only speeds of –3000 to +2000 rpm, shall be redissolved opti-
mal.

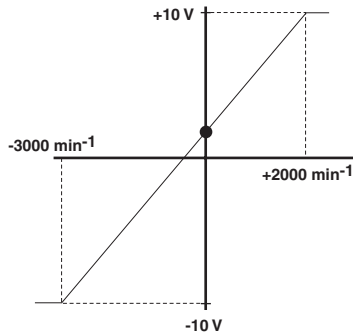Speed: Output voltage:

- 3000 ⋮ min^{-1} + 2000

EA0MN ≙ - 10 V
EA0MX ≙ + 10 V

- 10 ⋮ V + 10

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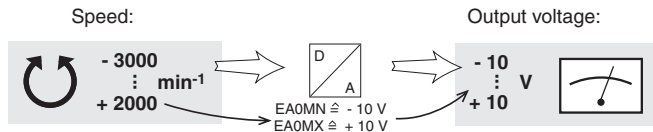
Standardisation:

at speed -3000 min^{-1} => Output = -10 V
at speed +2000 min^{-1} => Output = +10 V
at speed 0 min^{-1} => Output = + 2 V

Process: Linear

Set parameters

EA0MN => -3000
EA0MX => +2000

Output voltage is limited to $\pm$10 V

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Appendix

Offset-Alignment via parameter

If the output size zero does not correspond with 0 V, you can use the parameters 379-EA0SZ resp. 383-EA1SZ for zero-offset.

Parameter setting 1 corresponds to an offset by +0.02 V. In case an alignment in negative direction shall be necessary, the setting –1 corresponds to an offset of –0.02 V.

Example:

For analog output 0 the output size speed is selected. Speed of 0 rpm shows a voltage of –0.04 V. In order to correct the offset, enter value 2 in parameter 379-EA0SZ, wich corresponds to a zero-offset by +0.04 V.

Attention: Zero-offset for adjustment of analog outputs will be lost when changing the operation mode.

Note: Zero-offset does not effect in increasing the max. output voltage!