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Translation of original operating instruction
MCU-04X(E)

CE

1 General information

1.1 Notice
This document is part of the product. Keep this operating instruction for future references.

1.2 Scope of delivery
Check the delivery according to the delivery note.

Product designation

Art.-Nr.	Description
0108006.XXX	MCU-04X main module (incl. bus connector)
0108007.XXX	MCU-04E extension module (incl. plug connector)
	Operating instruction

1.3 Product description
The motor control units are designed for the control of 230 V$_{AC}$ drives with 2 end switches for blinds, awnings, large louvre blades, roller shutters, windows, light domes, etc. in a KNX bus system.

An extension module can be connected to the main module via the included plug connector.

Each module has 4 motor outputs and inputs for the connection of 4 conventional blind switches or 8 potential-free contacts.

Each channel can be controlled individually via the KNX bus and operating states, position and fault messages for the connected drives/ blinds can be transmitted.

1.4 Limitations of liability
All information and notes in this operating instruction has been compiled in consideration of the applicable standards and regulations, the state of the art as well as our many years of knowledge and experiences.

The manufacturer assumes no liability for damages and operational malfunction due to
- disregarding this operating instruction
- improper use
- faulty connection
- non-use of original spare parts and accessories

1.5 Disposal
The disposal of this product in normal household waste is forbidden within the European Union.

Dispose of the device via the municipal collection points.

The packaging materials used are recyclable. Dispose of packaging materials that are no longer required according to local regulations.

1.7 Manufacturer/ Customer service

BMS GmbH

Heinrich-Heine Straße 3
47906 Kempen
Germany

Phone: +49 (0) 2152 / 95 989 – 0
Fax: +49 (0) 2152 / 95 989 – 9
E-Mail: info@bms-solutions.de
Internet: www.bms-solutions.de

2 Safety

2.1 Intended use
The motor control units are intended to control drives for blinds, awnings, large louvre blades, roller shutters, windows, light domes, etc. within the specified limits.

Any other use or extended use is considered to be improper.

2.2 Foreseeable misuse
Any use for a purpose other than the above mentioned purpose is improper. The risk of improper use or misuse is borne solely by the operator.

All types of claims due to damage arising from improper use are excluded.

2.3 Personnel's qualification
Improper use can cause considerable personal injury and material damage!

All tasks for installation, connection and commissioning must be carried out exclusively by a qualified electrician.

A qualified electrician is able to carry out work on electrical installations due to her/ his professional training, knowledge, and experience as well as knowledge of the relevant standards and regulations. She/ he can identify and avoid possible dangers.

The qualified electrician is trained for the specific place of employment in which she/ he is working and is aware of the relevant standards and regulations.

2.4 Basic safety instructions

⚡	⚠DANGER
	Danger of life!

There is a risk of life when touching live parts.
▶ All tasks must be carried out exclusively by qualified personnel.
▶ Disconnect all power supplies before starting work.

⚠	*CAUTION*
	Material damage!

Incorrect wiring and configuration of the device can lead to damage up to total failure.
▶ Ensure that the supply voltage corresponds to the specifications from the technical data for the device.
▶ Ensure that all external devices like push buttons and motors are connected correctly according to the wiring diagrams.
▶ Refer to technical documentation of the motor manufacturer for notes on required settings such as relais switching times.
▶ Refer to the software-helpfile for details on the configuration.

2.5 Signage

Symbol	Meaning
⚠	General warning
🖐	Electrostatic discharge
CE	CE label

3 Design and function
3.1 Complete overview
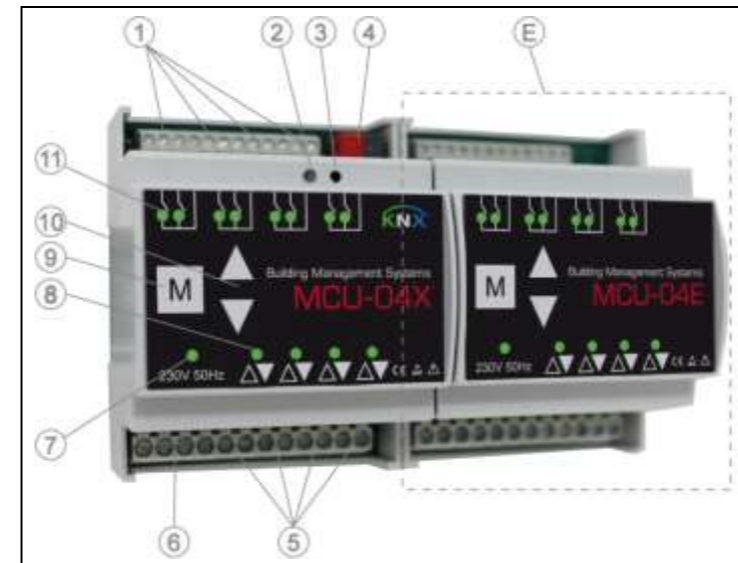
Location of control and display elements
1 Push button local operation (UP/ DOWN/ +)
2 Programming LED
3 Programming button
4 KNX bus connector
5 Motor connection terminals
6 Connection terminal supply voltage
7 Status display ready for operation
8 Status display motor output
9 Test button M
10 Test buttons (UP/ DOWN)
11 Status display local operation
E Extension module

3.2 Control and display elements
Status display ready for operation
- lights continuously "GREEN" when the device is ready for operation

Programming button
- activates/ deactivates the programming mode
(supply voltage and KNX bus voltage must be available)

Programming LED
- lights continuously "RED" when the programming mode is activated

Test button M
used to select a motor output for direct operation via the test buttons UP/ DOWN (test mode) –
if a motor output is in test mode, the corresponding status LED lights continuously "GREEN"
- by briefly pressing the M button all 4 channels are switched to the test mode
- each additional operation switches through the individual channels 1, 2, 3, 4
- after 6 operations all channels are in normal mode again
- additionally the M button can be used to reset the device (for further information see chapter troubleshooting)

Test buttons UP/ DOWN
- to control the motor outputs in test mode
- short key press (< 0,4s) > step/ stop
- long key press (> 0,4s) > movement command end position
- additionally the test buttons UP/ DOWN can be used to re-learn the motor runtimes (for further information see chapter troubleshooting)

Status display motor output
- LED off = channel is in normal-/ automatic mode
- LED flashes "GREEN" = automatic lock is active
(for further information see software-helpfile)
- LED lights continuously "GREEN" = channel is in test mode/ control via test buttons is activated
- LED flashes "RED" = security lock is active
(for further information see software-helpfile)
- LED lights continuously "RED" > motor error
(for further information see chapter troubleshooting)

Status display local operation
- the corresponding LED (UP/ DOWN) lights "GREEN" as long as the button of the local operation is pressed

3.3 Local operation
The local operation can be installed as push button or switch.

If no adjustments have been made in the ETS configuration, the functionality is according to the following table

Function	Control
"Upper end positon"	• long key press "UP" (> 0.4s)
"Lower end position"	• long key press "DOWN" (> 0.4s)
"Shading position"	• long key press "DOWN" (> 0.4s) immediately followed by • short key press "DOWN" (< 0.4s)
"STOP"	• short key press in opposite direction of current movement (< 0.4s)
"Move slats"	• short key press when stationary (< 0.4s)

4 Installation
4.1 Mounting
To mount the main module proceed as follows
- place the main module on the DIN rail in the desired position and lock in

To mount the extension module proceed as follows
- disconnect all power supplies from the main module (supply voltage and KNX bus voltage)
- mount the supplied connector on the left side of the extension module
- remove the protective sticker on the right side of the main module
- place the extension module on the DIN rail on the right side of the main module
- push the extension module to the left against the main module – ensure that the connector is inserted precisely into the main module
- lock in the extension module to the DIN rail
- secure the two modules against disconnection using the supplied connector

4.2 Electrical connection

Overview
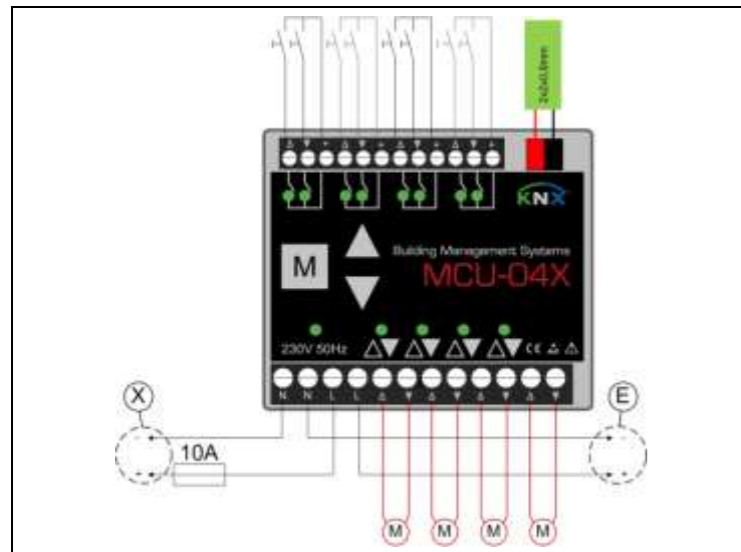
Wiring diagram

X Power
E to extension module (optional)

Motor

Connect motors as follows

Motor connection terminals	Destination
△ / ▼	"UP / DOWN" Motor 1
△ / ▼	"UP / DOWN" Motor 2
△ / ▼	"UP / DOWN" Motor 3
△ / ▼	"UP / DOWN" Motor 4

> **NOTICE**
>
> If the direction of rotation is incorrect (test via test buttons) adjust the motor connection.

KNX-Bus

Connect the KNX bus connector to the KNX bus.

Supply voltage

Connect supply voltage to the motor control unit as follows

Power	
L	Phase 230V_{AC}
N	Neutral conductor

Device coupling (optional)

The electrical connection between main and extension module is made via the connectors on the sides of the devices (see chapter installation).

Local operation

Several push buttons can be connected to one local operation input.

> **NOTICE**
>
> It is possible to connect one push button to several local operation inputs.
> This push button may only be connected within a device combination (main + extension module).

Local operation inputs	Destination
△	Push button "UP"
▼	Push button "DOWN"
+	Push button

4.3 Configuration

The configuration of the motor control unit is done via ETS from version 4.0 of KNX-Association.

> **NOTICE**
>
> For details about the configuration software see documentation of KNX-Association.

Requirements

➢ supply voltage and KNX bus voltage must be present

Approach

➲ connect PC/Laptop to the KNX bus via programming interface
➲ set the motor control unit to programming mode by pushing the programming button
⇦ the programming LED lights continuously "RED"
➲ download the physical address and the application program

4.4 Commissioning/ Test run

For commissioning of the motor control unit proceed as follows

- check the condition of the device and the tight attachment of the terminals and connections
- switch on the supply voltage
- check supply voltage and status display on the device
- check function and direction of rotation by means of test buttons –
  if the direction of rotation, is incorrect adjust the motor connection
  check the local operation –
  if the function is reversed, correct the local operation connection
- move blinds, awnings, large louvre blades, roller shutters, windows, light domes, etc. into a safe end position
- mount all protective covers
- maintain system documentation and, if necessary, affix labels and/ or signs

5 Operation

5.1 Manual operation

The manual operation is done via the local operation inputs of the motor control unit by means of push buttons or switches (see chapter local operation) and/ or via the KNX system (see software-helpfile).

5.2 Automatic operation

Automatic operation is performed according to the parameters specified in the ETS configuration. The control commands received via the KNX bus are considered.

6 Troubleshooting

> **NOTICE**
>
> If the listed troubleshooting procedures do not lead to the desired result, contact the customer service.

Fault	Rectification
motor error status LED for the corresponding motor lights continuously "RED"	• check motor connection, motor cable, and motor
device does not communicate via KNX	• check supply voltage (LED ready for operation must light continuously "GREEN") • check KNX bus voltage (programming LED can be switched on and off via the programming button)

Fault	Rectification
no local/ manual commands are executed	• check whether the corresponding output is in test mode (status LED for the output lights continuously "GREEN") – press the M key several times to exit the test mode (all status LEDs of the outputs do not light continuously "GREEN") • check whether a security lock is active (status LED for the output flashes "RED") – the triggering and reset conditions for a security lock are defined in the ETS configuration by the system integrator • check local operation inputs and/ or KNX communication
no central/ automatic commands are executed	• check whether the corresponding output is in test mode (status LED for the output lights continuously "GREEN") – press the M key several times to exit the test mode (all status LEDs of the outputs do not light continuously "GREEN") • check whether a security lock is active (status LED for the output flashes "RED") – the triggering and reset conditions for a security lock are defined in the ETS configuration by the system integrator • check whether an automatic lock is active (status LED for the output flashes "GREEN") – the triggering and reset conditions for an automatic lock are defined in the ETS configuration by the system integrator • check KNX communication

Re-learn motor runtimes

If runtimes have been learned incorrectly, or if the runtimes have changed considerably (e.g. by a motor change), the stored runtimes can be deleted and re-learned.

➲ switch motor output to test mode by pressing test button M (status LED of the output is permanently "GREEN")
➲ press test buttons "UP" and "DOWN" simultaneously for at least 5s
⇦ the runtimes will be re-learned during the next position movement

Reset the device to the factory setting

A reset must be carried out for resetting the device to the factory setting.

> **NOTICE**
>
> The reset will clear the entire configuration.

➲ press test button M (on the main or on the extension module) for at least 10s (all status displays of the motor outputs flash alternately "RED" and "GREEN")
➲ press test button M again within 10s and keep it pressed for at least 10 more seconds (all status LEDs of the motor outputs light continuously "RED")
➲ press test button M again within 10s and keep it pressed for at least 10 more seconds (the device is reset to factory settings)
⇦ the restart of the device is shown by flashing the status LEDs of inputs and motor outputs

7 Technical data

General		
Operating environment	Dry rooms (free of condensation) +5° to +45°C pollution index 2	
Mounting	DIN rail 35mm or equivalent	
Dimensions (W x H x D)	4 SU	
	72 x 90.5 x 62	mm
Weight	200	g
Binary inputs	8	
Motor outputs	4	

> **NOTICE**
>
> The connection and the wiring of the local operation units and the KNX bus must be carried out according to the current SELV requirements.

Connection data		
Supply voltage	230 ± 10 %	V_{AC}
	50	Hz
Cable	2 wires	
	single or fine wire	
Wire cross-section	2.5	mm²
Terminal tightening torque	0.4	Nm
Fuse protection	10	A
Electrical protection	IP 20	
Electrical protection class	III	

Motor connection (Outputs)		
Motor type	230	V_{AC}
	max. 2.5	A
	2 end switches	
Cable	2 wires	
	single or fine wire	
Wire cross-section	2.5	mm²
Terminal tightening torque	0.4	Nm

Local operation (Inputs)		
Voltage	12	V_{DC}
Current	2	mA
Cable	3 wires	
	Single or fine wire	
Wire cross-section	1.5	mm²
Terminal tightening torque	0.25	Nm
Cable length max.	100	m
Operation via	Push button or switch potential-free contact	

KNX		
Bus connector	Ø 0.5 ... 0.8	mm
	single wire	
Bus cable	according to KNX standard	