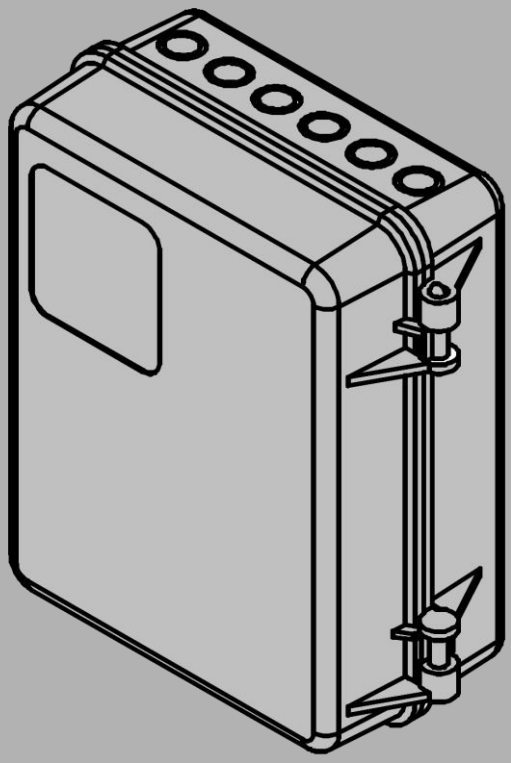
Baier®

Bewegende Licht- und Schattenelemente

# INSTRUCTIONMANUAL



## Hyperion-IV

### 24V motor control unit for 2 - 4 motors

| | |
|---|---|
| **Product Group:** | Folding Shutters |
| **Version:** | 1.4 |
| **Language:** | english |
| **Orig. Language:** | german |
| **Document:** | ------ |

# Imprint

Baier GmbH
Reiersbacher Straße 28
D-77871 Renchen-Ulm

+49 (0) 78 43 / 94 76 - 0
+49 (0) 78 43 / 94 76 - 33

info@baier-gmbh.de
www.baier-gmbh.de

**Document information**

| | |
|---|---|
| Document type: | Instruction Manual |
| Title: | Hyperion-IV |
| Product group: | Sliding folding shutters |
| Version: | 1.4 |
| Language: | english |
| Orig. language: | german (deutsch) |

**Copyright notice**



**Declaration of conformity**

This product fulfills the basic requirements of the applicable European Directives. The conformity was detected. The original of the Declaration of conformity is available as a separate document from the manufacturer.

**Technical subjects to change**

Our products are always under further development and get improved. The data used for this document represents the state of the product at the time of the creation of this document.

Changings of technical details are excepted. Please use the latest version of the document and contact the manufacturer in case of doubt.

# Table of content

# 1 About this document

## 1.1 Target group

This document addresses qualified personnel only. The mounting must be done by technical educated, trained and qualified personnel. Electrical wirings have to be done by a specialist.

This document has to be made accessible for qualified personnel. Its content must be read, understood and followed.

## 1.2 Objective of this document

This document contains important information for mounting and wiring of the product. It has to be read before working with the product. It must be handed out and explained to the operator and kept available all the time as a part of the product.

## 1.3 Reference to other documents, guidelines and standards

Additional documents like guidelines, standards and laws for products of this kind, have to be considered.

**Hint**

The fabricator has an increased duty to advice the customer. The relevant guidelines, standards and laws have to be considered.

## 1.4 Used symbols

**Hint**

A hint gives important and additional information.

**NOTICE**

**Description of type and source of hazards**

Warnings, marked with this symbol, are related to safety.

Disregard may result in property damage.

➢ Steps to avoid hazards.

**⚠ CAUTION**

**Description of type and source of hazards**

This symbol indicates a hazardous situation which, if not avoided, could result in minor or moderate injury and/or property damage.

The following levels of warning show the severity and probability of possible hazards, in ascending order.

- CAUTION, coloured yellow
- WARNING, coloured orange
- DANGER, coloured red

➢ Steps to avoid hazards.

- symbolizes a list with no specific order

**Lists**

1. symbolizes a list or instruction in specific order

➢ symbolizes an action

→ symbolizes a reference

✓ symbolizes the result of the action

**Instructions**

# 2 Safety

**DANGER**

**Electric Shock**

Danger to life and health due to electrical shock.

- Electrical connections have to be installed by approved personnel only.
- Switch off power before carrying out work and secure power against being switched on.
- Observe relevant safety instructions.

## 2.1 Requirements for operation

**Hint**

Read the instruction manual before doing any work on the motor control box.

### 2.1.1 Environmental conditions

The 24V 50VA motor control box is designed for use in dry interior.

## 2.2 Proper use

This product is a motor control device for 24V DC motors of the manufacturer. It is powered by an internal 24V power supply. It allows connection to on-site switches (Ground / Open / Close).

The manufacturer's instructions must be respected, in especially maximum and minimum dimensions and maximum weight of the moving part.

Any other use of this product is considered inappropriate use.

It is not guaranteed, that this product will work in combination with fittings, motors or other electronic devices of other manufacturers.

## 2.3 Behavior in case of an error

In case of an error, the device must be shut down and the manufacturer must be informed.

**Shut down**

- ➢ Do not operate device.
- ➢ Disconnect device from power supply.
- ➢ Inform the manufacturer.

# 3 Functional description

**Motor control unit**

The motor control unit is used for the control of two to four 24V DC motors. The motors power a folding shutter usually by means of toothed belts. The motor control unit controls several motors at the same time, in order to synchronize the movement sequences of the folding shutters. The motor control unit is controlled using potential-free inputs (0 / Open / Close).

**Installation**

The electronics are housed in a box, which is intended for installing on flat surfaces or for stowage in appropriate locations.

**Power supply unit**

The control unit is powered by an integrated power supply unit. This supplies 24V DC voltage, and is an integral component of the electronics. There is a connection to feed an external power supply for special cases.

**Connection**

Screw terminals are available for connecting the circuits: terminals for two to four motors with encoders as well as inputs, outputs, and safety functions.

**Displays and settings**

The control unit sets various parameters via a potentiometer, a DIP switch with eight switches, as well as several buttons for initial operation. There are light-emitting diodes for displaying the operational status and simplifying initial operation.

**Modes of operation**

The motor control unit can be operated in semi-automatic or dead-man mode:

- In semi-automatic mode, the drive continues to run automatically until an obstacle is detected or the final position is reached, even if the control signal is no longer present.
- In dead-man mode, the drive continues to run automatically until an obstacle is detected or the final position is reached, but it stops immediately when the control signal is no longer present.

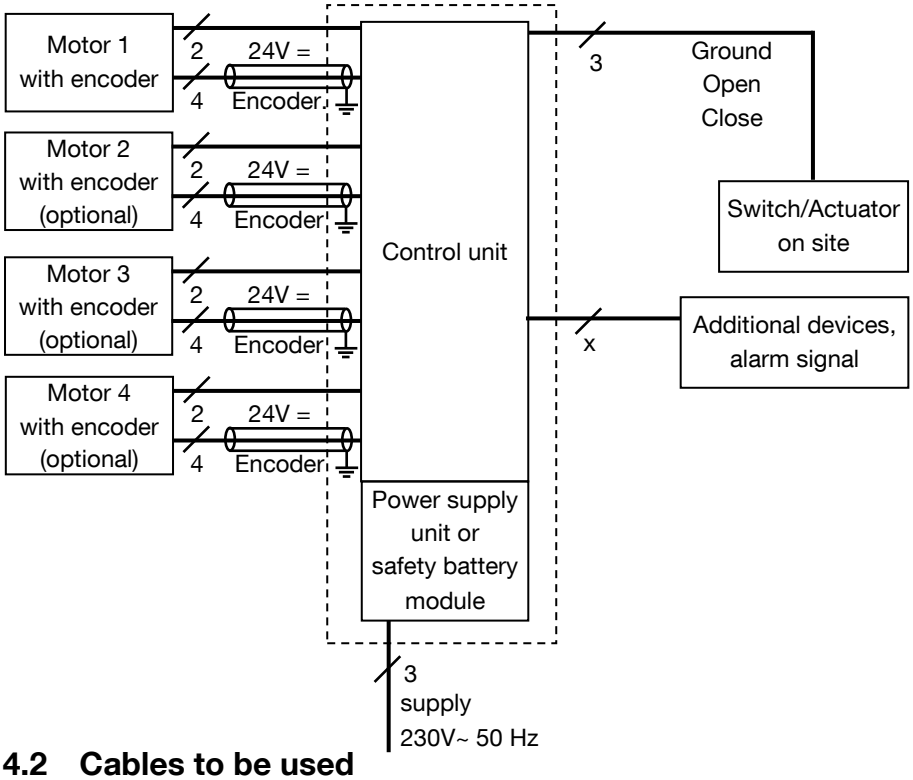
**Safety functions**

The control unit can be configured so that it performs safety functions. These are:

- Connecting a wind monitor, so that the system moves into a secure position at excessively high wind speeds.
- Connecting an alarm signal that performs an emergency opening when triggered in order to make escape and emergency routes available.

# 4 Cabeling

## 4.1 Wiring Diagram




## 4.2 Cables to be used

The following information are minimum details.

| Function of cable | Kind of cable |
|---|---|
| Between motor and control units<br><br>Cables must be suitable for usage in outdoor conditions | Motor (24V = )<br>up to 20 m: 2 x 0,75 mm²<br>up to 50 m: 2 x 1,50 mm²<br>Example: H05RN-F (or similar)<br><br>Encoder (shielded)<br>up to 20 m: 4 x 0,25 mm²<br>up to 50 m: 4 x 0,50 mm²<br>Example: Unitronic® Robust C (o. sim.) |
| Between switch/actuator and control unit | up to 50 m: 3 x 0,25 mm² |
| Between additional devices and control unit | up to 50 m: depending on needs<br>min. 0,25 mm² |

Table 1 – Cable types

# 5 Cable installation and connection

## 5.1 Installation

The motor control unit can be stored anywhere suitable, accessible only to qualified personnel, or screwed on a flat surface.

## 5.2 Dimensions

The motor control unit incl. power supply unit is housed in a box with external dimensions of
approx. 300 x 200 x 100 mm³, without taking into account the cable access points.

## 5.3 Versions

The motor control unit can be used for the following system types.

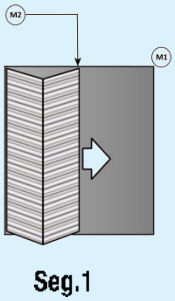
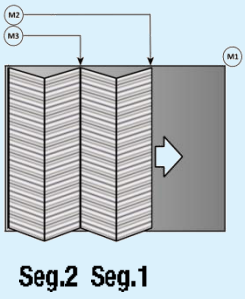
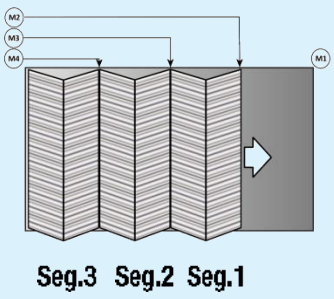
| Variant | 2 Motors | 3 Motors | 4 Motors |
|---|---|---|---|
| Intended use |  |  |  |
| **Motor 1** | Interlock | Interlock | Interlock |
| **Motor 2** | Segment 1 | Segment 1 | Segment 1 |
| **Motor 3** | - | Segment 2 ( $^{1}/_{2}$ Speed) | Segment 2 ( $^{2}/_{3}$ Speed) |
| **Motor 4** | - | - | Segment 3 ( $^{1}/_{3}$ Speed) |

Table 2 - Versions of control units

## 5.4 Electrical connection

**⚠ CAUTION**

**Destruction of the component in the event of an incorrect connection**

Faulty control unit

➢ Ensure the correct polarity of the connections

**Electrical connections**

➢ Securely disconnect power supply
➢ Secure against reactivation
→ Safety instructions in Chapter 2
➢ Connect the integrated power supply unit of the motor control unit to the mains supply
➢ Connect the motor(s) with a rotary encoder
The polarity of the motor determines its running direction
➢ Connect on-site operation
➢ Connect additional devices depending on requirements
✓ The motor control unit is connected

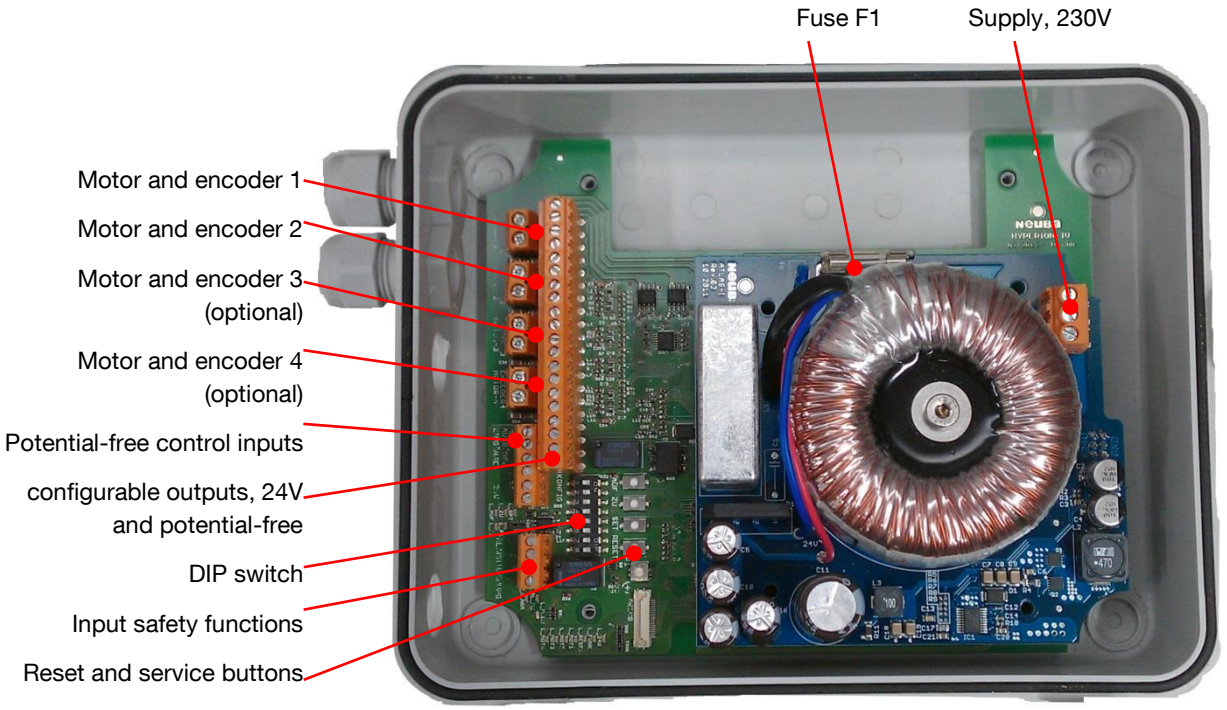
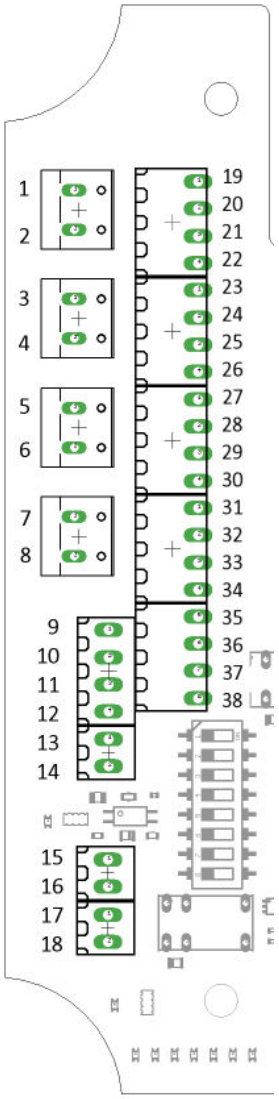



Figure 1 – control unit, top view

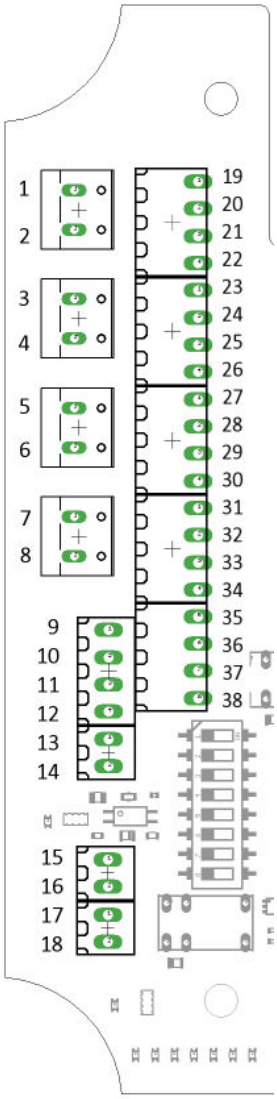
## Installation and connection



| Terminal | Description | Function |
|---|---|---|
| 1 | M1+ | **Interlocking Motor**<br>Swap the motor connection of motor 1 (+ red / - blue) to reverse the rotation direction of red and blue |
| 2 | M1- | |
| 3 | M2+ | **Motor for Segment 1**<br>Swap the motor connection of motor 2 (+ red / - blue) to reverse the rotation direction of red and blue |
| 4 | M2- | |
| 5 | M3+ | **Motor for Segment 2 (if present)**<br>Swap the motor connection of motor 3 (+ red / - blue) to reverse the rotation direction of red and blue |
| 6 | M3- | |
| 7 | M4+ | **Motor for Segment 3 (if present)**<br>Swap the motor connection of motor 4 (+ red / - blue) to reverse the rotation direction of red and blue |
| 8 | M4- | |
| 9 | GND | Potential-free control inputs<br>Open: Opening command<br>CLOSE: Closing command<br>OPTION: wind monitor (superordinate closing command) |
| 10 | OPEN | |
| 11 | CLOSE | |
| 12 | OPTION | |
| 13 | GND | Permanent 24V output for external devices<br>max. 0.5 A |
| 14 | +24 V | |
| 15 | ALARM– (0V) | Alarm input for safety function<br>24 V DC isolated<br>Input is active when 24V are interrupted. |
| 16 | ALARM+ (+24V) | |
| 17 | WARN-A | Warning output for safety functions<br>potential-free, max. 30 V DC / 0.5 A |
| 18 | WARN-B | |
| 19 | Enc.1 GND | GND white / Encoder signals, motor 1 |
| 20 | Enc.1 Sig.A | Sig.A yellow |
| 21 | Enc.1 Sig.B | Sig.B green |
| 22 | Enc.1 +5 V | +5 V brown |



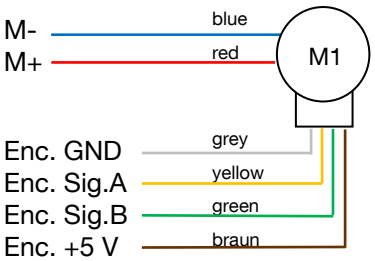
# 5 Installation and connection

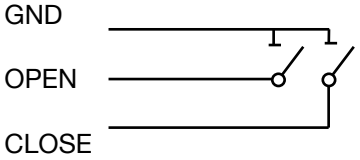



| Terminal | Description | Function |
|---|---|---|
| 23 | Enc.2 GND | GND white / Encoder signals, motor 2 |
| 24 | Enc.2 Sig.A | Sig.A yellow |
| 25 | Enc.2 Sig.B | Sig.B green |
| 26 | Enc.2 +5 V | +5 V brown |
| 27 | Enc.3 GND | GND white / Encoder signals, motor 3 |
| 28 | Enc.3 Sig.A | Sig.A yellow |
| 29 | Enc.3 Sig.B | Sig.B green |
| 30 | Enc.3 +5 V | +5 V brown |
| 31 | Enc.4 GND | GND white / Encoder signals, motor 4 |
| 32 | Enc.4 Sig.A | Sig.A yellow |
| 33 | Enc.4 Sig.B | Sig.B green |
| 34 | Enc.4 +5 V | +5 V brown |
| 35 | GND (-) | Swappable 24 V-output<br>max. 24 V / 0.5 A |
| 36 | A1 (+) | |
| 37 | P-A | Swappable potential-free output<br>max. 30 V DC / 0.5 A |
| 38 | P-B | |

Table 3 - terminal allocation

Examples of connections:



# 6 Initial Operation

After mounting and electrical connection of the control system, an initial operation has to be done.

This section explains the parts of the control unit which are necessary for commissioning. The following chapters explain which functions must be set and how the commissioning takes place step-by-step.

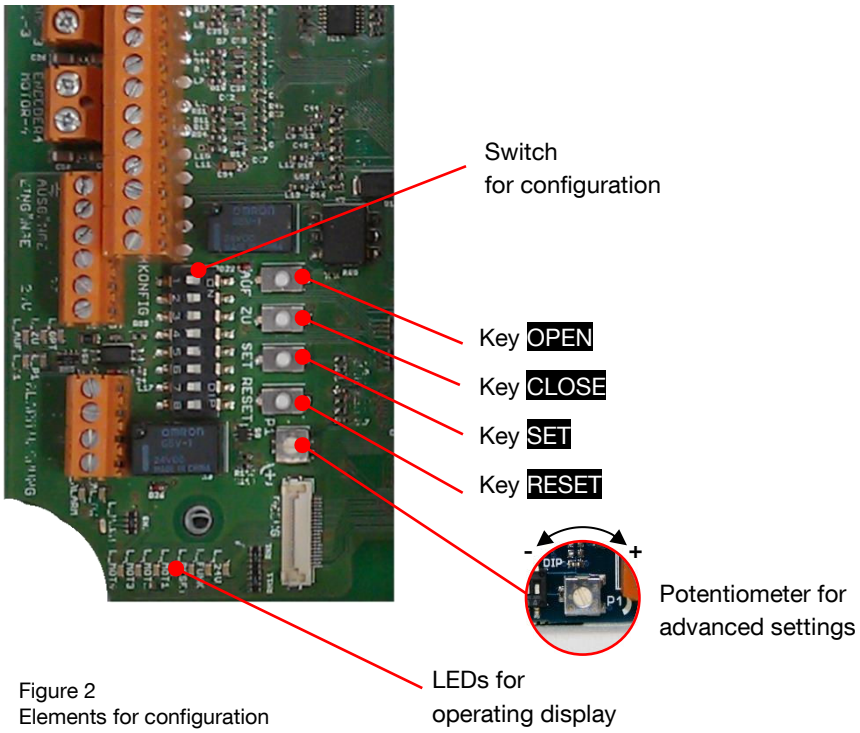



Figure 2
Elements for configuration

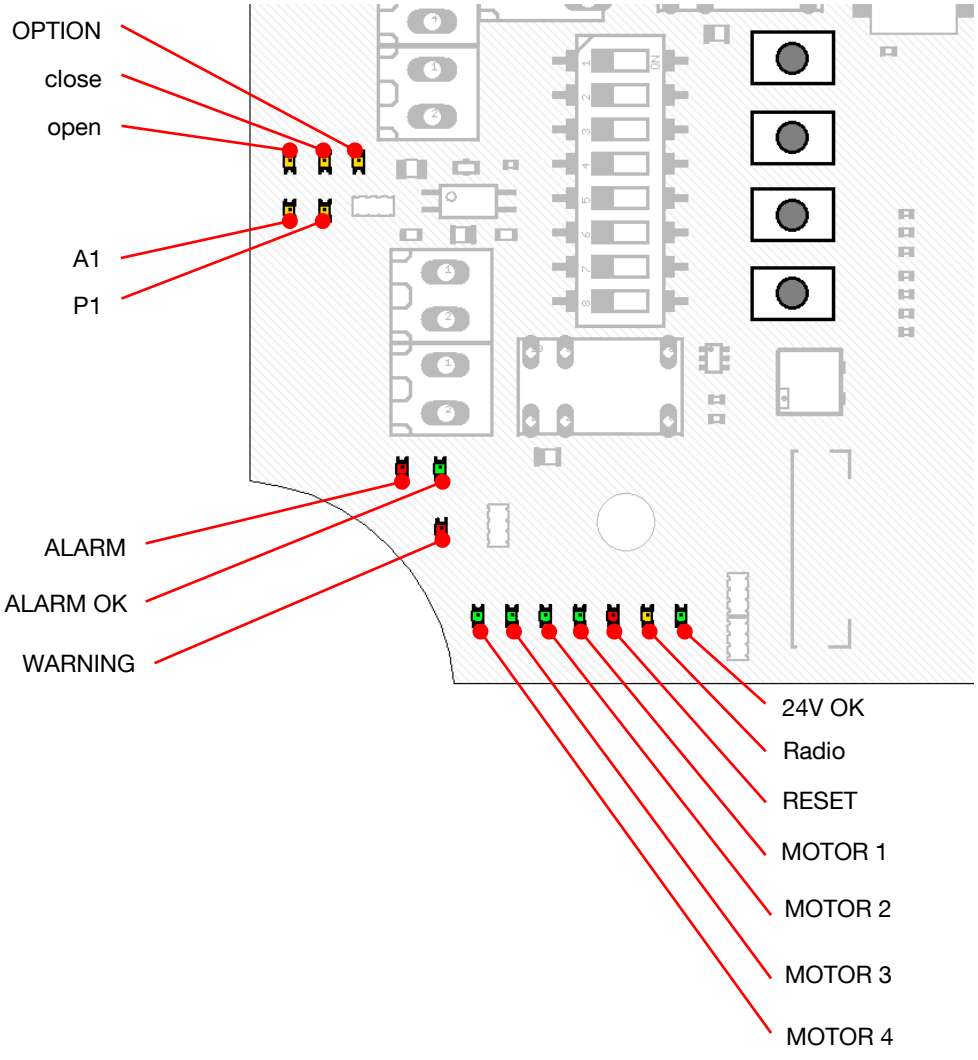
The LEDs facilitate commissioning by displaying the status of the control unit. The following functions are indicated by the LEDs: **LEDs**

| Name | Colour | Display |
|---|---|---|
| 24V OK | Green | Lights up when the supply voltage lies between 22-26 V DC. |
| A1 | Yellow | Lights up when output A1 (24V) is active. |
| ALARM | Red | Lights up when no ALARM signal is present, provided that safety functions are activated. |
| ALARM OK | Green | Lights up when no ALARM signal is present, provided that safety functions are activated. |
| OPEN | Yellow | Lights up when input OPEN is set. |

# 6 Initial operation

| Name | Colour | Display |
|---|---|---|
| RADIO | Yellow | No function (Reserved). |
| MOTOR 1 – 4 | Green | Lights up when the respective motor is active. |
| OPTION | Yellow | Lights up when input OPTION is set. |
| P1 | Yellow | Lights up when output P1 (Potential-free) is active. |
| RESET | Red | Displays the operational status during configuration. |
| WARNING | Red | Lights up when output WARNING is active. |
| CLOSE | Yellow | Lights up when input CLOSE is set. |

Table 4 – LED overview



## 6.1 Configuration

**Note**

Commissioning must be repeated after changes are made to the configuration.

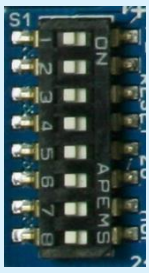
### 6.1.1 Switch

**⚠ CAUTION**

**No safety functions due to incorrect setting**

No safety functions of the system available.

- ➢ Switch 8 must be activated.
- ➢ Check safety functions after commissioning.




| Switch | Description | OFF | ON |
|---|---|---|---|
| 1 | Modes of operation | Semi-automatic | Dead-man |
| 2 | Use interlock | Interlock active | Interlock not active |
| 3 | Number of folding segments | 1 segment | 2 segments |
| 4 | Number of folding segments | See switch 3 | 3 segments |
| 5 | Motor type | Standard | FL-NRM (deprecated) |
| 6 | Automatic Toothbelt Relaxation | Inactive | Active |
| 7 | Safety functions ALARM | Function not active | Closing on ALARM |
| 8 | | | Opening on ALARM |

Table 5 – DIP switch

1. Function semi-automatic / dead-man
   When “semi-automatic” mode has been activated, the drive continues to run automatically until an obstacle is detected or the final position is reached, even if the control signal is no longer present.
   When “dead-man” mode has been activated, the drive continues to run automatically until an obstacle is detected or the final position is reached, but it stops immediately when the control signal is no longer present.

2. Use interlock
   When using the interlock, the first motor is used to ensure flush closure of the shutter. The switch must be activated, if there is no fitted flush.
3. Number of folding segments
   By default, a folding shutter with one segment is used. In the case of shutters with two folding segments, a further motor must control the additional segment. The motor is activated via this switch.
4. Number of folding segments
   In the case of shutters with three folding segments, two additional motors must be activated. These are activated by switch 4.
5. Depending on the system, another motor type may be used. In this case, other controller settings are required, which can be selected with this switch.
6. During the engagement and disengagement process, the system automatically relaxes the timing belt (short travel in the opposite direction). This may be necessary depending on the width of the system.
7. Safety functions ALARM – Superordinated Closing.
8. Safety functions ALARM - Superordinated Opening

   In order to use this function, a smoke detector or an active alarm signal must be connected. If the signal is interrupted, a operation of the system is performed, in order to make escape and emergency routes available or to bring the system in a safe parking position.

### 6.1.2 Potentiometer

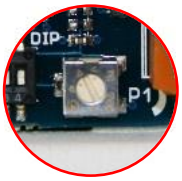
**ATTENTION**

**Overtightening of the potentiometer**

Damage to components

- Potentiometers have a right and left stop. This must not be overtightened
- Adjust potentiometer only with minimal force and an appropriate screwdriver

The potentiometer is reserved for special applications and has no function by default.



## 6.2 Steps for initial operation

**⚠ CAUTION**

**Danger due to moving parts**

Impacts and crushing due to moving curtain.

- ➢ The curtain automatically moves during commissioning
- ➢ Keep danger clear free during commissioning.

**Preparing control units**

- ➢ Carrying out electrical connections
- ➢ Set configuration

**Carrying out teach-in operation**

- ➢ Connecting the control unit to the power supply and operating it.
- ✓ Control unit in the as-delivered state or after electrical isolation from the mains:
  Red LED RESET flashes continuously twice in rapid succession with approx. 1.5-second pause

- ➢ Press RESET button for approx. 2 seconds until RESET LED flashes constantly.

- ✓ The red LED RESET flashes every second.
- ➢ Press SET in order to select the active motor.
  Selection is indicated by the LEDs MOTOR 1 up to MOTOR 4.
- ➢ Check the running direction of each motor
  Press and hold OPEN in order to run the active motor in opening direction.
  Press and hold CLOSED in order to run the active motor in closing direction.
  Press SET in order to select the next motor.
  → If the running direction is incorrect:
  Swap the motor cable of the active motor and re-check the running direction
- ➢ Move the curtain out of the final position
- ➢ Press RESET button for approx. 2 seconds until the RESET LED lights up continuously.

- ✓ Red RESET LED lights up continuously.
- ✓ Green LEDs MOTOR 1 up to MOTOR 4 light up when the respective motors are active.
- ✓ The drive carries out several runs
  (Unlock-> open-> close-> lock).
- ✓ The LEDs are switched off.

**Check function**

- ➢ Test the appropriate functions
- ➢ In the event of a malfunction, check connections and configuration
  → if necessary, repeat commissioning
- ✓ The commissioning is completed if functioning properly

# 7 Safety functions

The control unit has two basic safety functions:

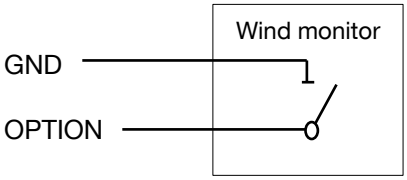
- Opening in the event of fire
- Closing in the event of high wind speeds

The opening in the event of fire has highest priority which is triggered via the ALARM input. In order to use the alarm signal, the security battery module must be installed. This buffers the power supply in order to ensure the function even in case of a power outage. For the subsequent installation of the safety battery module see chapter 7.3.

## 7.1 Connecting a wind monitor

**Wind monitor**

The control unit can run the system at excessively high wind speeds into a secure, closed position. To do so, a wind monitor must be connected to the potential-free inputs.




**Note**

The command of the wind monitor is superordinate to the normal control inputs (OPEN / CLOSE), but subordinate to the ALARM function.

## 7.2 Connection of an alarm signal

The control unit can be connected to a fire alarm. In case of fire, the control unit then makes escape and emergency routes available, by means of a positive opening operation. In addition, the alarm operation is performed even during a power failure. This safety function must be activated during the configuration (see chapter 6.1).

**Alarm signal**

For this safety function, an active 24 V signal from an external device is required, which is connected to the ALARM input of the control unit. If the signal is interrupted, the control unit operates similarly to an escape door and performs a positive opening operation, i.e. the curtain is opened automatically and cannot be closed until the ALARM signal is present again.

**Power failure**

During a power failure, depending on the battery status, the positive opening operation is performed at the latest after a waiting period of 15 minutes. A command is only accepted by the user after mains power is restored.

**Warning**

The potential-free output WARNING is another integral component of this safety feature. This becomes active when a problem is detected by the control unit, which affects the security function, such as a defective battery or missing power supply.

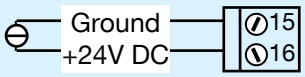
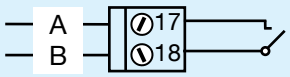
| | **ALARM** | **WARNING** |
|---|---|---|
| **Direction** | Input | Output |
| **Function** | Triggering the safety function “opening operation” | Reporting a hazardous error |
| **Wiring** |  |  |
| **Electrical Data** | Voltage feed (electrically-isolated) 12..24 V DC / max. 20 mA | Relay contact (potential-free) max. 30 V DC / 0.5 A |

Table 6 – inputs/outputs safety function

# 7 Notes

# Notes 7

Baier: Where our established quality is made.

Baier GmbH
Reiersbacher Straße 28
D-77871 Renchen-Ulm

Tel. +49 (0) 78 43 / 94 76 - 0
Fax +49 (0) 78 43 / 94 76 - 33

info@baier-gmbh.de
www.baier-gmbh.de

Baier®

Bewegende Licht- und Schattenelemente