MANUAL

VBA-4E3A-G20-ZEL/M1L-P2

AS-Interface
Motor Control Module

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1   Introduction

Congratulations

You have chosen a device manufactured by Pepperl+Fuchs. Pepperl+Fuchs develops, produces and distributes electronic sensors and interface modules for the market of automation technology on a worldwide scale.

Please read the operating instructions carefully before installing this device and putting it into operation. The instructions and notes contained in this document will guide you step by step through the installation and commissioning procedures to ensure trouble-free use of this product. By doing so, you:

- Guarantee safe operation of the device
- Can utilize the entire range of device functions
- Avoid faulty operation and associated faults
- Reduce costs associated with downtime and incidental repairs
- Increase the effectiveness and operating efficiency of your plant.

Store these instructions somewhere safe in order to have them available for future work on the device.

After opening the packaging, please ensure that the device is intact and that the package is complete.

Symbols used

The following symbols are used in this manual:

Note!

This symbol draws your attention to important information.

Handling instructions

You will find handling instructions beside this symbol

Contact

If you have any questions about the device, its functions, or accessories, please contact us at:

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68307 Mannheim
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E-Mail: fa-info@pepperl-fuchs.com

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2 Declaration of Conformity

All products were developed and manufactured under observance of the applicable European standards and guidelines.

Note!

A Declaration of Conformity can be requested from the manufacturer.

The product manufacturer, Pepperl+Fuchs GmbH, 68307 Mannheim, has a certified quality assurance system that conforms to ISO 9001.

ISO**9001**

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3 Safety

3.1 Symbols Relevant to Safety

Danger!

This symbol indicates an imminent danger.

Non-observance will result in personal injury or death.

Warning!

This symbol indicates a possible fault or danger.

Non-observance may cause personal injury or serious property damage.

Caution!

This symbol indicates a possible fault.

Non-observance could interrupt the device and any connected systems and plants, or result in their complete failure.

3.2 Intended Use

The AS-Interface motor control module is used to control one or two DC roller Interroll EC310 motors or compatible types. The motor control module has two inputs for connecting three-wire sensors.

Read through these instructions thoroughly. Familiarize yourself with the device before installing, mounting, or operating.

Always operate the device as described in these instructions to ensure that the device and connected systems function correctly. The protection of operating personnel and plant is only guaranteed if the device is operated in accordance with its intended use.

3.3 General Safety Information

Make sure that the flat cables engage completely in the flat cable guide, to ensure a complete seal and secure contact.

During operation, make sure that connectors are not disconnected or inserted, and the flat cable guide is not opened. This could inadvertently start motors.

Only instructed specialist staff may operate the device in accordance with the operating manual.

User modification and or repair are dangerous and will void the warranty and exclude the manufacturer from any liability. If serious faults occur, stop using the device. Secure the device against inadvertent operation. In the event of repairs, return the device to your local Pepperl+Fuchs representative or sales office.

The connection of the device and maintenance work when live may only be carried out by a qualified electrical specialist.

The operating company bears responsibility for observing locally applicable safety regulations.

Store the not used device in the original packaging. This offers the device optimal protection against impact and moisture.

Ensure that the ambient conditions comply with regulations.

Note!

Disposal

Electronic waste is hazardous waste. When disposing of the equipment, observe the current statutory requirements in the respective country of use, as well as local regulations.

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4 Product Description

4.1 Use and Application

The VBA-4E3A-G20-ZEL/M1L-P2 motor control module is an AS-Interface connection module for controlling one or two DC roller motors. The module is optimized for type Interroll EC310 motors, but can be used for compatible DC motors as well.

To record statuses in the field environment, the module has two inputs for three-wire sensors with positive-switching output (PNP) or for mechanical contacts. The input characteristic of the inputs corresponds to type 1 according to EN 61131-2.

The motors and the sensors are supplied with power via external auxiliary power. This auxiliary power is supplied to the AS-Interface flat cable of the motor control module via a second flat cable.

- The permissible auxiliary power is 18 V....30 V.

- The sensor power supply may be loaded, in total, with 500 mA.

- For each motor, a maximum current load of 5 A is permitted.

Figure 4.1   VBA-4E3A-G20-ZEL/M1L-P2 motor control module

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Essential function and application characteristics of the motor control module are:

- Compact housing for direct mounting in support profiles or cable ducts
- Connection of the motors/sensors via cable outputs with M8 connectors
- Insulation piercing technology with gold-plated contact pins for contacting the AS-Interface flat cable
- Function displays for the bus, external auxiliary power, status information, inputs, and outputs
- Communication monitoring
- Configurable start/stop ramps for motor control
- Supply of the connected components from the external auxiliary power

4.2 Housing

The housing is made entirely of plastic, with the exception of the hinge pins for the hinged cable guide.

The main components are

- A mounting base with electronics encapsulated in casting resin
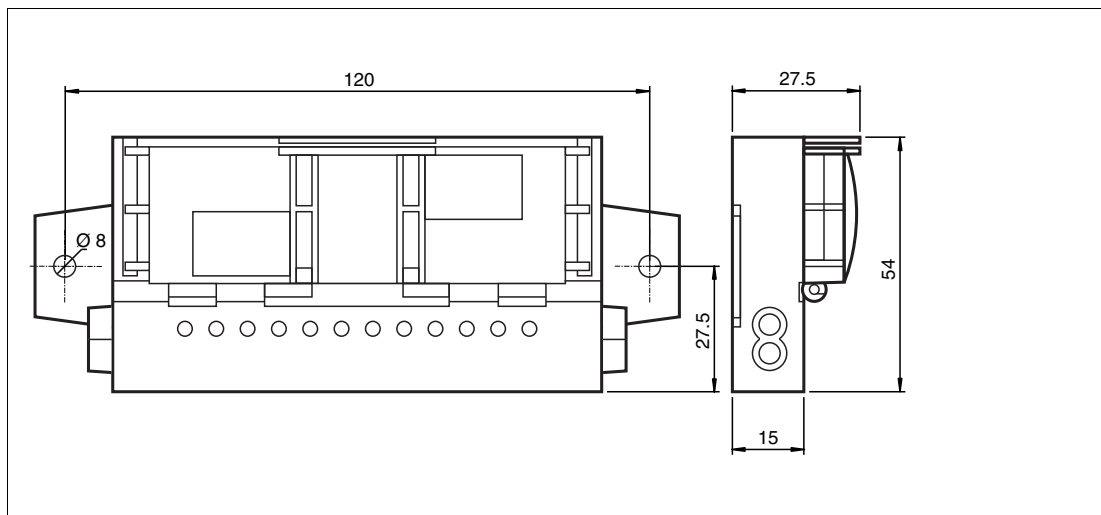- A folding guide cage as a cable guide for the AS-Interface flat cable.

Figure 4.2   Housing dimensions

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4.3 Indicators and Operating Controls
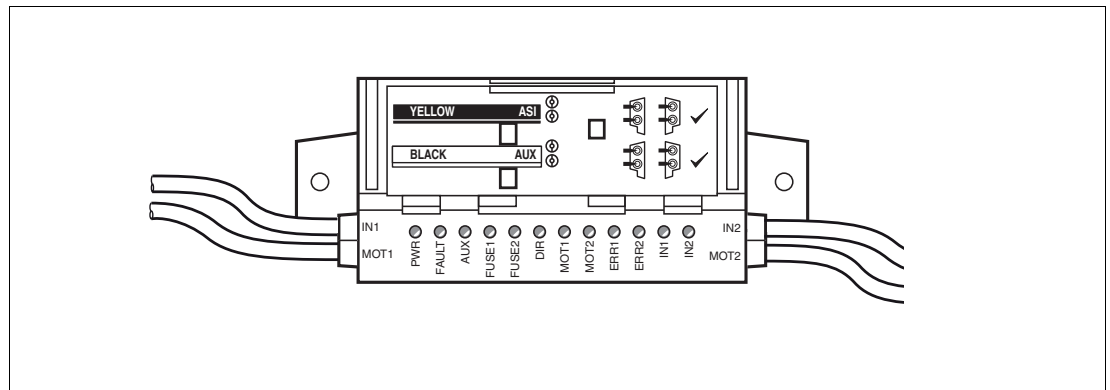

Figure 4.3   Status indications on the motor control module.

The operating status of the motor control module is displayed via 12 LEDs.

Note!

Additional Flashing Codes during Module Configuration

The following status information relates only to the normal mode of the motor control module. If you set the motor control module to configuration mode for parameterization, this is indicated by multiple LEDs flashing. Details can be found in the "Commissioning" chapter.

Status Indication for Start/Stop Ramps

Once the AUX external auxiliary power has been switched on, the motor control module first shows the number of the stored start/stop ramp. For ramps 1 to 7, the ERR2, IN1, and IN2 LEDs indicate a numerical value in binary code by short flashing. ERR2 LED is the highest value bit. The LEDs flash five times for 50 ms each time.

If no start/stop ramp is stored, the six MOT1 ... IN2 LEDs flash.

For more information on the start/stop ramps, see "Configuration of Start/Stop Ramps" in the "Commissioning" chapter.

Start/Stop Ramp Display

Ramp no.	LED MOT1	LED MOT2	LED ERR1	LED ERR2	IN1 LED	IN2 LED
0	Flashes	Flashes	Flashes	Flashes	Flashes	Flashes
1	Off	Off	Off	Off	Off	Flashes
2	Off	Off	Off	Off	Flashes	Off
3	Off	Off	Off	Off	Flashes	Flashes
4	Off	Off	Off	Flashes	Off	Off
5	Off	Off	Off	Flashes	Off	Flashes
6	Off	Off	Off	Flashes	Flashes	Off
7	Off	Off	Off	Flashes	Flashes	Flashes

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Status Indications for AS-Interface and Power Supply

The PWR LED and the FAULT LED show the AS-Interface operating status. Various error statuses are displayed as a collective error message "Peripheral fault."

Display of the AS-Interface Operating Statuses

LED PWR Green	LED FAULT Red	Status
On	Off	AS-Interface power supply is OK
Flashes	On	Address = 0
On	On	AS-Interface communication error
Flashes	Flashes	Peripheral fault, collective error message for: ■ AUX external auxiliary power is missing or is inverted ■ Overload of the sensor supply (IN+, IN-) ■ Overload of the speed signal SPEED
Off	Off	AS-Interface voltage missing

The AUX LED shows the status of the AUX external auxiliary power.

Display of the AUX External Auxiliary Power

AUX LED Red/green	Status
Green on	AUX external auxiliary power is OK
Red on	AUX external auxiliary power is inverted
Off	AUX external auxiliary power voltage is missing

Status Indications for Motor Fuses

The FUSE1 LED for motor 1 and the FUSE2 LED for motor 2 show the status of the power supplied to the motors.

Motor Fuse Indicator

LED FUSE1 LED FUSE2 Green	Status
On	Power supply for motor is OK
Off	Power supply for motor is missing: ■ Fuse is faulty or ■ AUX external auxiliary power is not connected

Note!

Motor Fuses Are Safety Fuses

Fuses with a 5 A rated current act as protection against short circuits. Each motor is safeguarded with a fuse. The fuses are not interchangeable. If a fuse is faulty, the module must be replaced.

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Status Indications for Motors MOT1, MOT2

The MOT1, MOT2, ERR 1, ERR2, and DIR LEDs display information about the operating statuses of the respective motor.

Motor Activity Indicators

LED MOT1 LED MOT2 Yellow	Status
On	Motor is in operation
Off	Motor is off

Motor Fault Indicators

LED ERR1 LED ERR2 Yellow	Status
On	Motor fault is present: ■ Fault output of the motor is active or ■ No motor is connected or ■ Fuse is faulty
Off	No motor fault

Motor Direction of Rotation Indicator

LED DIR Yellow	Status
On	Direction of rotation to the right (in accordance with EC310,)
Off	Direction of rotation to the left (in accordance with EC310,)

Status Indications for IN1, IN2 Sensors

The IN1 LED for input 1 and IN2 LED for input 2 show the switching statuses of the inputs.

Display of the Inputs

IN1 LED IN2 LED Yellow	Status
On	Input is set (high)
Off	Input is not set (low)

4.4   Interfaces and Connections

Flat Cable Specification

The AS-Interface motor control module is compatible with the AS-Interface standard cable in accordance with IEC 62026-2.

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The following AS-Interface cable types are available with UL Recognized approval:

AS-Interface Cable Types with UL Approval

Pepperl+Fuchs Designation	Color	Sheathing material/ wire insulation	Cross-section	UL "Cable Style"	Approval
VAZ-FK-R-YE	Yellow	TPE/TPE	2x 1.5 mm	2103	CE 🔺 c(UL)us
VAZ-FK-R-BK	Black	TPE/TPE	2x 1.5 mm	2103	CE 🔺 c(UL)us
VAZ-FK-PUR-YE	Yellow	PUR(TMPU)/TPM	2x 1.5 mm	20549	CE 🔺 c(UL)us
VAZ-FK-PUR-BK	Black	PUR(TMPU)/TPM	2x 1.5 mm	20549	CE 🔺 c(UL)us

Input/Output Connections

The sensors and motors are connected to the motor control module via cables with round M8 connectors:

- Sensors: socket, four-pin
- Motors: socket, five-pin

The cable length is 1 m.

Motor Supply from Auxiliary Power

The motors are supplied with power directly from the AUX external auxiliary power and this cannot be switched. The voltage is always on contacts 1 and 3 of the five-pin M8 connector.

Connector Assignment

Connection for	Connectors	Plug type/plug assignment
Sensor		**Input:** LF004-GS1-A in accordance with IEC/EN 61076-2-104 M8, 4-pin, socket, cap nut, coding A **Matching female connector:** LM004-Gx1-A or similar 1: IN+ sensor supply 2: Not used 3: IN- sensor supply 4: IN input
Motor		**Motor:** NF005-SS1-B in accordance with IEC/EN 61076-2-104 M8, 5-pin, socket, snap lock, coding B **Matching female connector:** NM005-Sx1-B or similar 1: MOT+ motor supply 2: DIR direction of rotation 3: MOT- (=AUX-) motor supply 4: ERROR motor fault 5: SPEED velocity signal

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5   Installation

5.1   Storage and Transport

For storage and transport purposes, package the unit using shockproof packaging material and protect it against moisture. The best method of protection is to package the unit using the original packaging. Furthermore, ensure that the ambient conditions are within allowable range.

5.2   Unpacking

Check the product for damage while unpacking. In the event of damage to the product, inform the post office or parcel service and notify the supplier.

Retain the original packaging in case the device must be stored or shipped again at a later date.

Should you have any questions, please direct them to Pepperl+Fuchs.

5.3   Connecting the AS-Interface and Auxiliary Power Flat Cable

The motor control module is connected to the AS-Interface network and the AUX auxiliary power via the AS-Interface flat cable. The yellow flat cable is for communication and the black flat cable is for the AUX auxiliary power. The permissible auxiliary power is 18 V ... 30 V.

Contact between the motor control module and flat cables is established via two metal mandrels and using insulation piercing technology. The flat cables are routed through a hinged cable guide. When closed, the cable guide is locked using a locking bracket and can be opened again without the needs for tools.

The profiled flat cables have a narrow upper side (with a visibly offset profile edge) and a wide under side (profile edge not visible). The cable guide allows the flat cables to be inserted on both sides, for flexible connection of flat cables already laid in cable ducts. However, you must make sure that the profile edge always points to the motor control module. Mechanical reverse polarity protection prevents complete closure of the cable guide if the flat cable is inserted incorrectly.

Caution!

If one is inserted incorrectly, the motor control module will not work.

If the flat cable is inserted in the cable guide in the wrong direction, the voltage is inverted. The motor control module will not work. However, internal electrical reverse polarity protection protects it against breakage.

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Connecting Flat Cables on the Narrow Side

The profile edge is visible from above.

1. Open the cable guide. To do this, push the locking bracket (1) slightly to one side.

2. Insert the black AUX flat cable with the profile edge (4) to the motor control module into the lower guide (see the module tag "Black AUX").

3. Insert the yellow AS-Interface flat cable with the profile edge (3) to the motor control module into the upper guide (see the module tag "YELLOW").

4. Make sure that the profile edges of both flat cables are under the respective reverse polarity protection (2, 5).

5. Close the cable guide. It must engage securely in the locking bracket (1).

↳ The metal mandrels contact the strands in the flat cables.
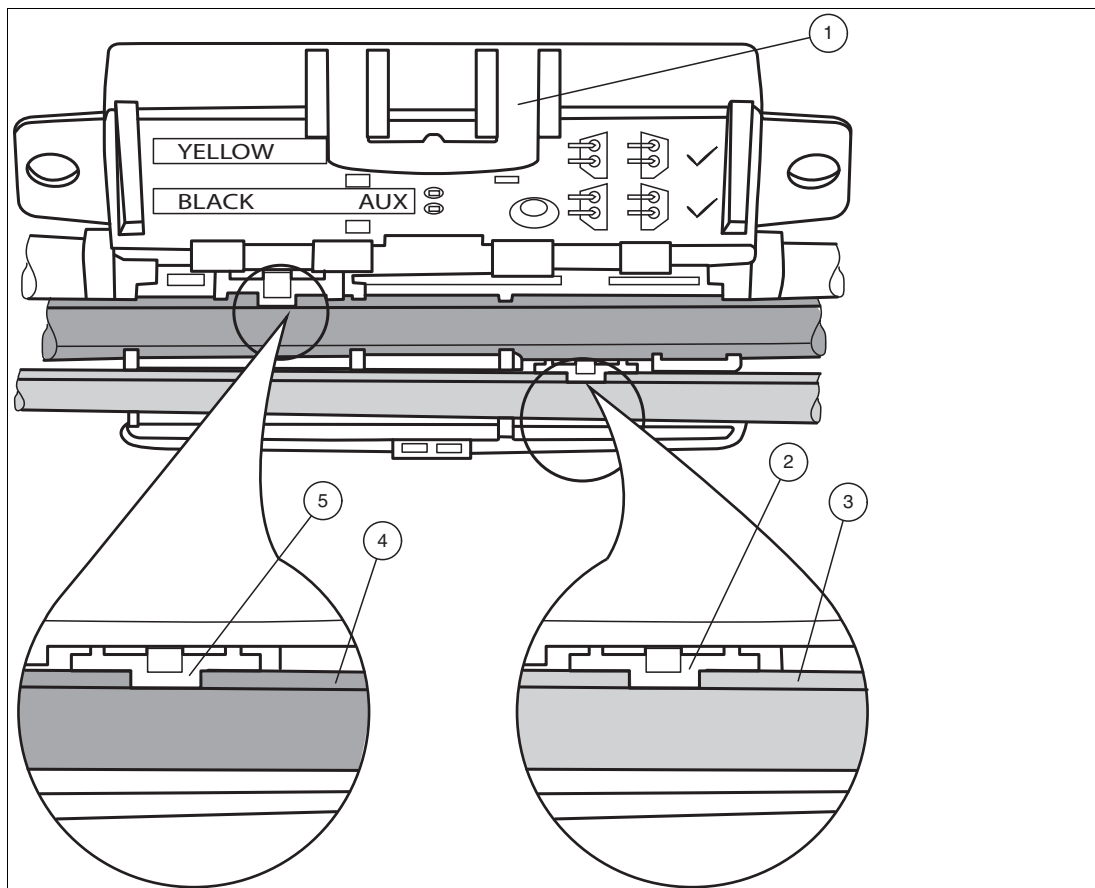
Figure 5.1   Connecting Flat Cables on the Narrow Side

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Connecting Flat Cables on the Wide Side

The profile edge is not visible from above. For orientation purposes in the figure below, the edge is shown as a hidden edge drawn with a dotted line.

1. Open the cable guide. To do this, push the locking bracket (1) slightly to one side.

2. Insert the black AUX flat cable with the profile edge (3) to the motor control module into the lower guide (see the module tag "Black AUX").

3. Insert the yellow AS-Interface flat cable with the profile edge (2) to the motor control module into the upper guide (see the module tag "YELLOW").

4. Close the cable guide. It must engage securely in the locking bracket (1).

↪ The profile edges (2, 3) of both flat cables are above the two reverse polarity protections. The metal mandrels contact the strands in the flat cables.
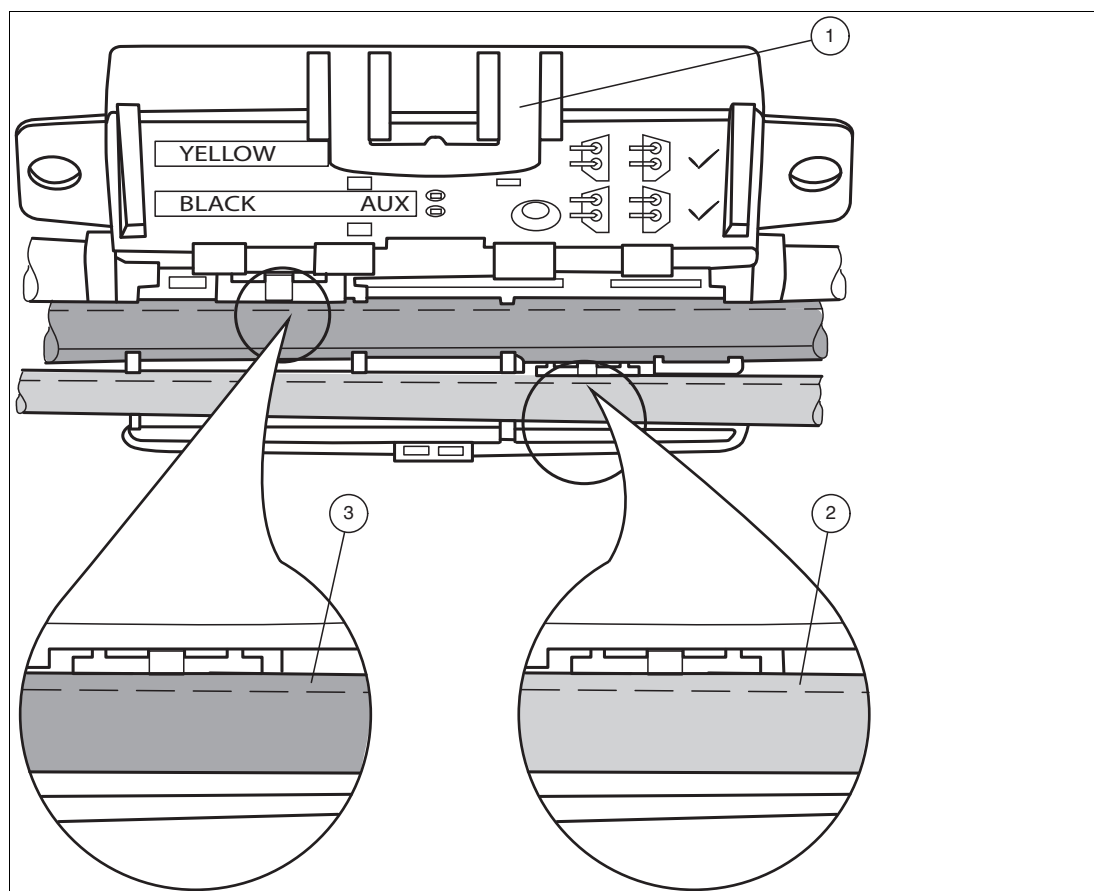
Figure 5.2   Connecting flat cables on the wide side (profile edge as dotted line)

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Flat Cable Inserted Incorrectly

The figure below shows an incorrectly inserted flat cable. The profile edge (2) does not point to the motor control module; the flat cable is therefore inserted with reverse polarity. The flat cable is located on the reverse polarity protection (1) with a curvature, which means that the cable guide cannot be closed completely (mechanical reverse polarity protection).
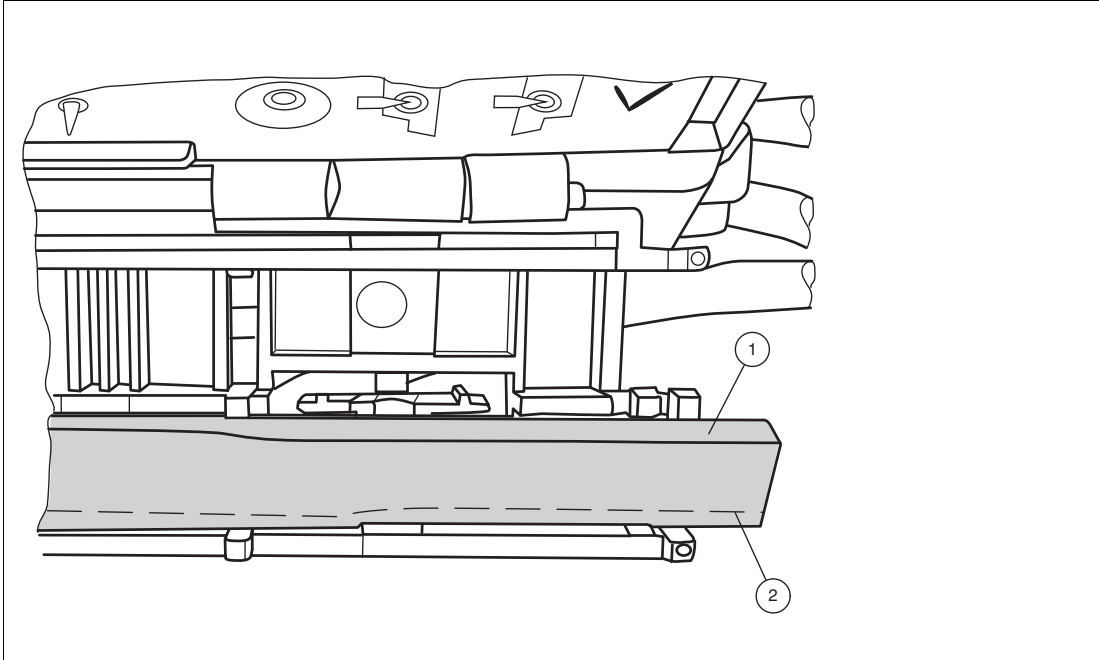
Figure 5.3   Flat cable inserted incorrectly (profile edge as dotted line)

5.4   Connecting Motors and Sensors

Figure 5.4   Connection wiring diagram for motors and sensors

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6 Commissioning

6.1 AS-Interface Communication

Assigning the AS-Interface Data Bits

Four data bits are available for communication to take place between the motor control module and the master. Three data bits are available for controlling the motors.

The following designations apply below:

- DI0...DI3 for AS-Interface input data (motor control module to master)
- DO0...DO2 for AS-Interface output data (master to motor control module)

DI0...DI03 Motor Control Module to Master

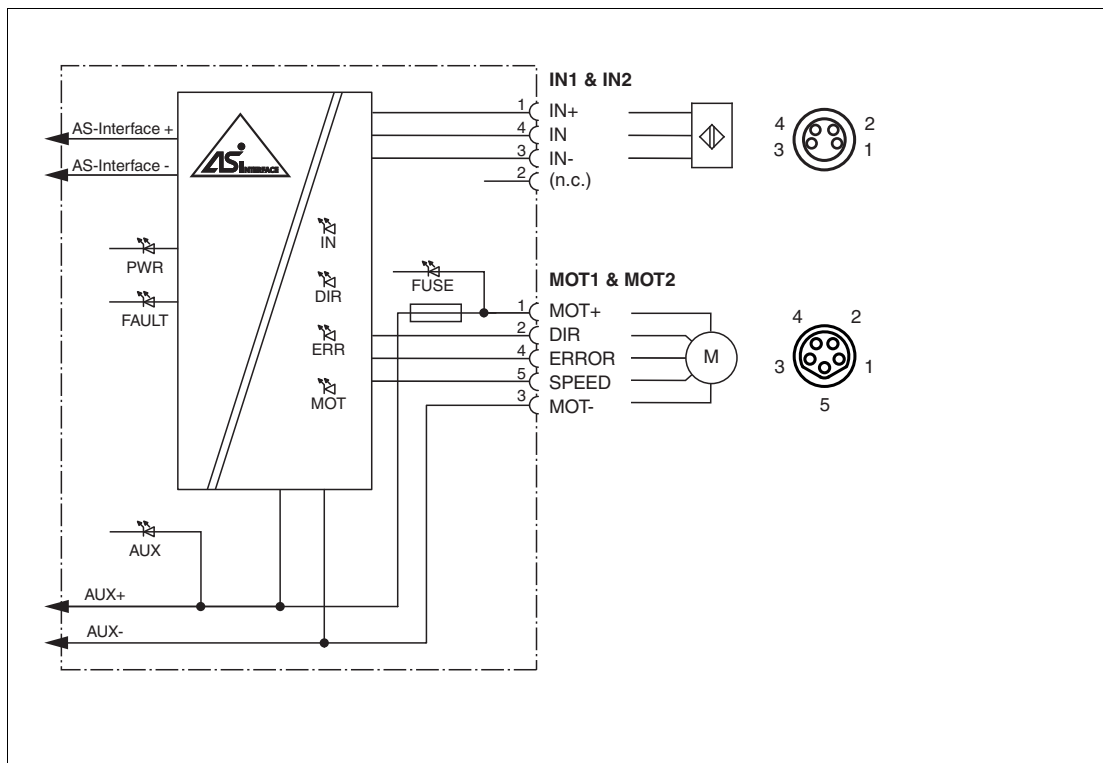| AS-Interface data bit	Input DI
DI0	Fault at output MOT1
DI1	Fault at output MOT2
DI2	Switching status input IN1
DI3	Switching status input IN2

DO0...DO2 Master to Motor Control Module

AS-Interface data bit	Output DO
DO0	Start/stop motor 1
DO1	Start/stop motor 2
DO2	Direction of rotation of motor 1 and motor 2

AS-Interface Communication Monitoring

The motor control module has a watchdog function. If there has been no communication with the master for more than 40 ms, the motor control module sets the output data DO0...DO2 to logical 0.

Starting/Stopping Motors (D00, D01)

You can start or stop the motors separately via the DO0 and DO1 bits. To start motors, you must set the corresponding data bit to logical 1. Via the joint SPEED control signal, the motor control module actuates the respective motor switched on with an analog voltage value. The SPEED control signal is released only when DO0 or DO1 data bit is set for the relevant output. The analog voltage value corresponds to the set speed.

DO0, DO1 Data Bits

Data bit	Status	Function	LED MOT1/2
DO0	1	Start motor 1 (SPEED > 1.5 V)	MOT1: on
	0	Stop motor 1 (SPEED < 1.5 V)	MOT1: off
DO1	1	Start motor 2 (SPEED > 1.5 V)	MOT2: on
	0	Stop motor 2 (SPEED < 1.5 V)	MOT2: off

Switching the Motor Direction of Rotation (DO2)

You can switch the direction of rotation of the motors using the DIR control signal. The direction of rotation signal is valid for both motors together. For control purposes, you must parameterize the DO2 data bit accordingly.

Logical 0, according to EC310, corresponds to direction of rotation to the left. The motor control module switches the DIR control signal to high impedance.

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Logical 1, according to EC310, corresponds to direction of rotation to the right. The motor control module switches the DIR control signal to AUX level.

DO2 Data Bit

Data bit	Status	Function	DIR direction of rotation signal	LED DIR
DO2	0	Direction of rotation left	High impedance, approx. 0 V	Off
	1	Direction of rotation right	$\geq (U_{AUX} - 1)$ V At idle speed, R_i=5.6 kΩ	On

Adjusting the Motor Speed (P0...P2)

You can adjust the speed for both motors simultaneously only via the P0...P2 parameter bits. To do this, you must parameterize one of eight predefined speed values. The speed values correspond to analog voltage values.

If the master does not change the parameter bits when the AS-Interface network is switched on, the eighth speed value (7.26 V) is set per default on the motor control module.

The motor control module issues the set control voltage to the motors via the SPEED control signal as soon as the motors are switched on via DO0 and DO1 data bits (logical 1). The control voltage is readjusted by the motor control module and is therefore independent of the load within certain limits. If the control limits are exceeded due to an excessive load, the motor control module issues a peripheral fault.

Parameter Bits P0...P2

P2	P1	P0	DO0 (MOT1) or DO1 (MOT2)	Speed signal SPEED (Tolerance range)	LED MOT1 or MOT2
x	x	x	0	< 1.5 V	Off
0	0	0	1	3.96 V (3.92 V ... 4.00 V)	On
0	0	1	1	4.78 V (4.73 V ... 4.83 V)	On
0	1	0	1	5.61 V (5.55 V ... 5.67 V)	On
0	1	1	1	6.44 V (6.38 V ... 6.50 V)	On
1	0	0	1	8.50 V (8.42 V ... 8.59 V)	On
1	0	1	1	9.63 V (9.53 V ... 9.73 V)	On
1	1	0	1	10.00 V (9.90 V ... 10.10 V)	On
1	1	1	1	7.26 V (7.19 V ... 7.33 V) Basic setting	On

Reporting a Motor Fault (DI0, DI1)

The motor control module records a motor fault via the ERROR status signal. The motor control module reports faults to the master using DI0 (motor 1) and DI1 (motor 2) data bits. In the event of a motor fault, the motor control module sets the respective DI0 or DI1 data bit to logical "1." This status is set if no motor is connected or the motor is not supplied with power if a fuse in the motor control module is defective.

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DI0, DI1 Data Bits

Data bit	Status	Motor error status	Motor error signal ERROR	LED ERR1/2
DI0	0	No fault in motor 1	$U_{ERROR} \leq 1.2$ V, $I_{ERROR} \geq 40$ μA	ERR1: off
	1	■ Fault in motor 1 ■ Or motor 1 is not connected ■ Or fuse is defective	High impedance	ERR1: on
DI1	0	No fault in motor 2	$U_{ERROR} \leq 1.2$ V, $I_{ERROR} \geq 40$ μA	ERR2: off
	1	■ Fault in motor 2 ■ Or motor 2 is not connected ■ Or fuse is defective	High impedance	ERR2: on

Status of the Sensor Inputs (DI2, DI3)

The motor control module transfers the switching statuses of the IN1 and IN2 inputs to the master using the DI2 (IN1) and DI3 (IN3) data bits.

There is a filter downstream of the inputs that suppresses pulses ≤ 2 ms.

DI2, DI3 Data Bits

Data bit	Status	Input switching status	LED IN1/2
DI2	0	Unattenuated, $I_{IN} \leq 0.5$ mA	IN1: off
	1	Attenuated, $I_{IN} \geq 2.0$ mA	IN1: on
DI3	0	Unattenuated, $I_{IN} \leq 0.5$ mA	IN2: off
	1	Attenuated, $I_{IN} \geq 2.0$ mA	IN2: on

6.2 Configuration of the Start/Stop Ramps

Overview

To control the acceleration and to stop the motors, you can set one of eight defined start/stop ramps for the speed signal SPEED. These ramps always apply to both motors simultaneously. The ramp duration corresponds to the time from stopping to reaching the maximum speed or from the maximum speed up to stopping. The inclines of the ramps are constant for each of the eight ramps and independent of the set speed. The reference value for all ramps is the speed signal SPEED = 10 V. For a lower parameterized speed, the ramp duration is proportionally shorter.

Predefined Start/Stop Ramps

Ramp no.	Ramp duration
0	No ramp (default setting)
1	50 ms
2	100 ms
3	200 ms
4	300 ms
5	500 ms
6	1000 ms
7	1500 ms

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The ramp is not effective if the direction of rotation signal is switched when the motor is active. In this case, the direction of rotation is reversed immediately.

Note!

Default Setting on Delivery

On delivery, ramp no. 0 (no ramp) is the default setting.

Configuring Start/Stop Ramps

To adjust a start/stop ramp, you must change the motor control module to configuration mode. The motor control module stores a new ramp set in the internal nonvolatile memory. This ramp is activated automatically every time the motor is switched on. You can reconfigure a ramp as often as required.

A prerequisite for configuration is that the flat cables for the AS-Interface and AUX are connected. Communication must already be taking place between the master and motor control module.

Note!

Configuration Mode Display via LEDs

If the motor control module is in configuration mode, the MOT1, MOT2, ERR1, ERR2, IN1, IN2 LEDs flash simultaneously with a frequency of approx. 2 Hz.

The configuration sequence consists of nine steps. Defined data and parameter values are transmitted between the master and the motor control module via the DO0...DO2, DI0....DI3 data bits and the P0...P2 parameter bits. The master must keep the data and parameter bits constant for at least 10 ms for each step. Longer intervals are possible as long as a period of 10 s is not exceeded for steps one to six.

The configuration of a new start/stop ramp runs in the following phases:

- In steps one to six, the master sends parameter values to the motor control module to activate configuration mode (max. 10 s). DO0...DO2 must have the value "4" in each step.

- If the parameter sequence was correct, the motor control module responds to the master via DI0...DI2 on the last parameter value with "C_{hex}." This response indicates that configuration mode is activated. The six MOT1...IN1 LEDs flash.

- In step seven, the master sends the selected ramp no. to the motor control module via DO0...DO2.

- In step eight, the master sends the parameter value "4" to the motor control module via P0...P2. The motor control module stores the ramp number in the nonvolatile memory. It responds to the master with "A_{Hex}" via DI0...DI2.

- In step nine, the master exits configuration mode. The master sends data value "4" via DO0...DO2 and data value "7" via P0...P2. The motor control module switches to normal mode. The six MOT1...IN1 LEDs stop flashing.

Note!

Sequence for Command Transmission

For each step, you generally send the data value via DO0...D02 first and then the parameter value P0...P2. The following table shows the contexts of communication between the master and motor control module. The value "x" represents any of the values in the table.

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> **Sequence for Configuring a Start/Stop Ramp**
>
> Send the following data values and parameter values to the motor control module:

1. In accordance with steps one to six, for each step send the data value "4" via DO0...DO2 and then via P0...P2, a value of the parameter string 3,1,6,3,1,6 one after the other.
2. If configuration mode is active, send the required ramp number via DO0...DO2 and the parameter value "6" via P0...P2 as step seven.
3. As step eight, send the ramp number again via DO0...DO2 and parameter value "4" via P0...P2.
4. As step nine, send data value "0" via DO0...DO2 and parameter value "7" via P0...P2.

   ↳ The motor control module has stored the new start/stop ramp and switched back to normal mode.

Contexts of Module Communication

Step	DO0...DO2	P0...P2	DI0....DI3	Comment
	≠ 4	x	x	Motor control module in normal mode
1	4	3	x	Start activation sequence for configuration mode
2	4	1	x	
3	4	6	x	
4	4	3	x	
5	4	1	x	
6	4	6	C_{hex}	End activation sequence for configuration mode. Motor control module responds with C_{hex} if configuration mode is OK.
7	Ramp no.	6	C_{hex}	Transfer of the ramp number to the motor control module
8	Ramp no.	4	A_{hex}	The ramp is stored
9	0	7	x	Motor control module switches back to normal mode

Troubleshooting during Configuration

The following table describes the behavior of the motor control module if a fault occurs during the nine-step configuration process.

Fault Scenarios

Step	Possible fault	Motor control module reaction
1 to 6	■ Incorrect data or parameter values or ■ steps 1 to 6 take longer than 10 s	Motor control module remains in normal mode
7 or 8	Incorrect data or parameter values	■ Motor control module responds with "E_{hex}" via DI0 ... DI3 and remains in configuration mode. ■ The motor control module switches to normal mode only when the master sends "0" via DO0 ... DO2 and "7" via P0 ... P2. ■ If "0" or "7" has already been set by the master in one of these steps, the motor control module switches to normal mode immediately without sending a response. The stored ramp is not changed.

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7 Troubleshooting

Fault Information and Remedy

Fault	LED display	Possible cause	Remedy
No data communication with AS-Interface master	PWR off	AS-Interface voltage is missing or has reverse polarity	Check AS-Interface wiring
	PWR flashes and FAULT on	Module address is 0	Program module address
	PWR on and FAULT on	AS-Interface Master is not switched on (offline) or There is duplicate addressing	Switch on the AS-Interface master or Check the addresses of all modules on the AS-Interface segment
Motors will not start	AUX off	AUX external power supply is missing	Check AUX voltage and AUX flat cable
	AUX red on	AUX external power supply is inverted	Correct the polarity of the AUX flat cable in the cable guide
	AUX green on and FUSE1 (motor 1) and/or FUSE2 (motor 2) off	Motor fuse is faulty due to overloading of the motor supply	Replace the motor control module (cannot be repaired) and remove the cause of the overload before starting the motor again\n\n**Note:** Fault information via AS-Interface via DI0 (motor 1) data bit and/or DI1 (motor 2) data bit and ERR1 LED on and/or ERR2 LED on
	PWR and FAULT flash alternately	Peripheral fault "Overload speed signal SPEED": Motor or motor cable or motor control module is faulty	Replace motor or motor control module
	FUSE1 (motor 1) on and/or FUSE2 (motor 2) on and ERR1 (motor 1) on and/or ERR2 (motor 2) on	Motor fault: motor is blocked or faulty	Remove the motor blockage or replace the motor\n\n**Note:** Fault information via AS-Interface via DI0 (motor 1) data bit and/or DI1 (motor 2) data bit
Sensors or IN1, IN2 inputs not working	AUX off	AUX external power supply is missing	Check AUX voltage and AUX flat cable
	AUX red on	AUX external power supply is inverted	Correct the polarity of the AUX flat cable in the cable guide
	PWR and FAULT flash alternately	Periphery fault: overload on sensor supply	Check the sensors and eliminate the overload

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