FIESSLER
ELEKTRONIK

Type 4 muting sytem
For the series AKAS...F

AKAS Muting System **AMS 3 / G**

Operating manual
valid starting from Software V1.4 -->

translation

AMS 3 / G
AKAS Muting System
for integrated linear scale sensors

CONTENTS:

BA - AMS3 G Dok 1444 Stand 3.7.2014 / SG/Aui

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All safety instructions are marked with this symbol and must be observed in particular!

Safe functionality of the entire installation is guaranteed only if this operating manual and applicable accident-prevention regulations are observed. Forming part of the controller's scope of delivery, this operating manual must be kept at the controller's site of use.

All instructions in this operating manual must be strictly observed. The manual provides the user with important information concerning proper use of the AMS safety controller. Before comisioning the AKAS... F safety light curtains with the AMS safety controller, make sure to read both operating manuals.

Observe applicable standards and guidelines when using safety light curtains. Local authorities or trade associations will provide you with the relevant information. All other applicable regulations and standards issued by employers' liability insurance associations must be observed too.

Qualified personnel Installation, commissioning and maintenance must only be carried out by qualified personnel.

AMS is sensitive to electrostatic discharge.
If you change the operation mode or the wiring please take care to discharge any electricity in your body by touching the metal frame or cabinet of the machine.

On request by the customer, Fiessler Elektronik carries out the acceptance test and annual inspections. In addition, seminars providing customers with training in annual inspections are held at regular intervals.

The AMS 3 G provides the muting signal according to safety class 4 and the control signals for the AKAS F series. To get the information about movement direction and speed, the AMS 3 G is using the signals from the machines linear scale sensors.
The sensor signals will be connected to POS_1 and POS_2 (figure1) and are looped through the AMS 3 G, going back to the original machine connectors. AMS 3 G measures and evaluates speed, course and direction of the closing and opening movement of the press.

Furthermore it can measure the overrun traverse during the first stroke of the machine.
You can also see the result of the overrun test when you keep the footpedal activated after AMS 3 G stopped the machine. AMS 3 G will show you the value for sensor POS_1 on AMS STATUS L3, sensor POS_2 will be shown through L4. Every Led ON pulse is +1mm. So if AMS led L3 flashes six and led L4 seven times you have 6mm overrun on POS_1 and 7mm on POS_2.

The maximum travel speed of the machine must **not exceed 300mm/s**

AMS 3 G can be used for AKAS LC **F**, AKAS II **F** and AKAS 3 **F**.
The different operation modes can be selected with the dipswitch DIP_1 and DIP_2 (figure1).
It is **NOT** possible to connect AMS 3 G to AKAS type M

New in Softwareversion 1.4 is the operating mode with overrun measurement at every stop of machine (footpedal / AKAS interruption)

The AMS 3 G is especially designed to reduce the time for installing AKAS F series and to be able to mount AKAS without having position monitored valves for slow speed (working speed).
There is also a version with additional scale sensors available (AMS 3). This version should be used if you don't want to use the machines linear scale sensors.

The AMS 3 G must be mountet inside the switch cabinet of the protective type IP54.
It should be mounted on a DIN rail.

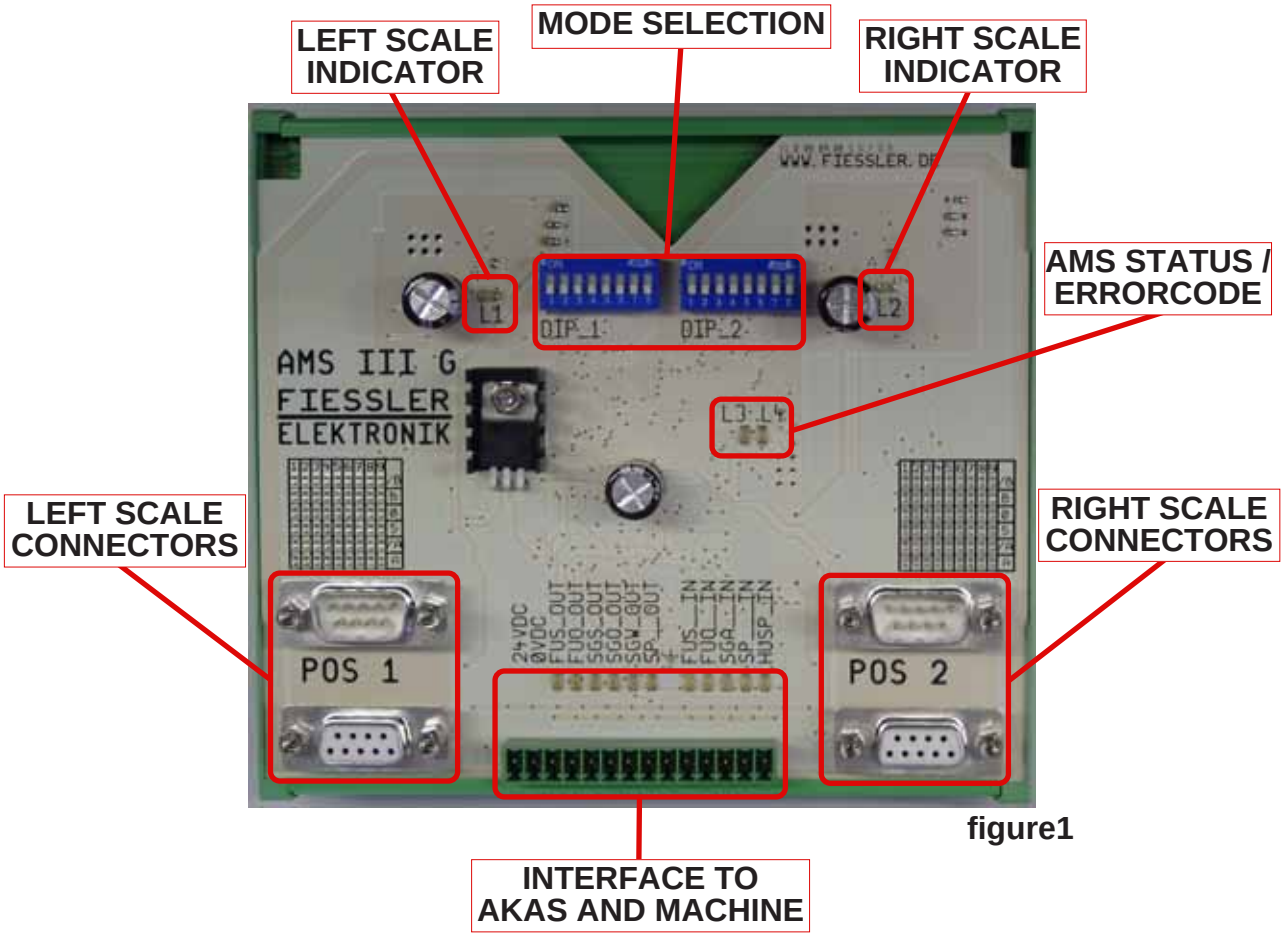


figure1

The AMS can be used with AKAS LC **F,** AKAS II **F**, and AKAS 3 **F.** You can also select if AMS3 should do the overrun measurement at the first stroke. New in Softwareversion 1.4 is the operating mode with overrun measurement at every stop of machine (footpedal / AKAS interruption). If AKAS II or AKAS 3 is selected, it is possible to set the max. allowed overrun to increase the performance of the machine in combination with AKAS. Values for the overrun are :
AKAS LC max 15mm (fixed value, dipswitches 3, 4 and 5 not in use)
AKAS II / LC II 5mm to 14mm
AKAS3 4mm to 13mm

On AKAS II F and AKAS 3 F, the dipswitches in the receiver support must be switched accordingly.
Example : AMS 3 = off, off, off, off, off, off, off, on => 50mm fast down,
13mm max. overrun, AKAS3,overrun active, SP_IN optional
AKAS3 dipswitch setting = off, off, off => **13mm overrun**

To be able to work also with short stroke machines, you can determine the distance before AMS3 will stop the machine for overrun measurement. Highspeed down movement before STOP: 25mm or 50mm

You can also deactivate the overrun measurement if you don't need this function.
This should only be done if the machine is doing a safe overrun measurement on it's own.
For a safe operation you must have a safe overrun measurement at the first stroke.

The mode selection will be done with two 8-pole dipswitch DIP_1 and DIP_2.
For each operating mode without permanent overrun measurement at every stop both dipswitches must be set to the same value (see fig. 1)
For each operating mode with permanent overrun measurement at every stop both dipswitches must be set inverted to DIP_1 value (see fig. 2)

fig. 1

fig.2

When operating mode is SP optional and SP_IN is not connected, you should avoid following values for TDC.
SP --> SP + 4mm
Example: SP=15mm --> no TDC between 15-19mm possible.
As soon as SP_IN is connected to the DNC you can set the TDC to any desired value.

In operating mode SP required, AMS will not activate muting until SP_IN = 1 (+24V DC) and slow speed is detected.

Operating mode table see next page (page 6)

Operating mode table

Dip 1	Dip 2	Dip 3	Dip 4	Dip 5	Dip 6	Dip 7	Dip 8	Operation mode
					OFF	OFF		AKAS 3 F
					OFF	ON		AKAS II F / LC II F
					ON	OFF		AKAS LC F
							OFF	without overrun measurement
							ON	with overrun measurement
								Function of the SP_IN Signal
OFF								SP_IN optional
ON								SP_IN required
								The following modes are only possible if overrun measurement is active
	OFF							50mm fast down movement before overrun measurement starts
	ON							25mm ast down movement before overrun measurement starts
								The following modes are for AKAS 3 F
		OFF	OFF	OFF				13mm maximum overrun
		OFF	OFF	ON				11mm maximum overrun
		OFF	ON	OFF				9mm maximum overrun
		ON	OFF	OFF				8mm maximum overrun
		OFF	ON	ON				7mm maximum overrun
		ON	OFF	ON				6mm maximum overrun
		ON	ON	OFF				5mm maximum overrun
		ON	ON	ON				4mm maximum overrun
								The following modes are for AKAS II F / LC II F
		OFF	OFF	OFF				14mm maximum overrun
		OFF	OFF	ON				12mm maximum overrun
		OFF	ON	OFF				10mm maximum overrun
		ON	OFF	OFF				9mm maximum overrun
		OFF	ON	ON				8mm maximum overrun
		ON	OFF	ON				7mm maximum overrun
		ON	ON	OFF				6mm maximum overrun
		ON	ON	ON				5mm maximum overrun

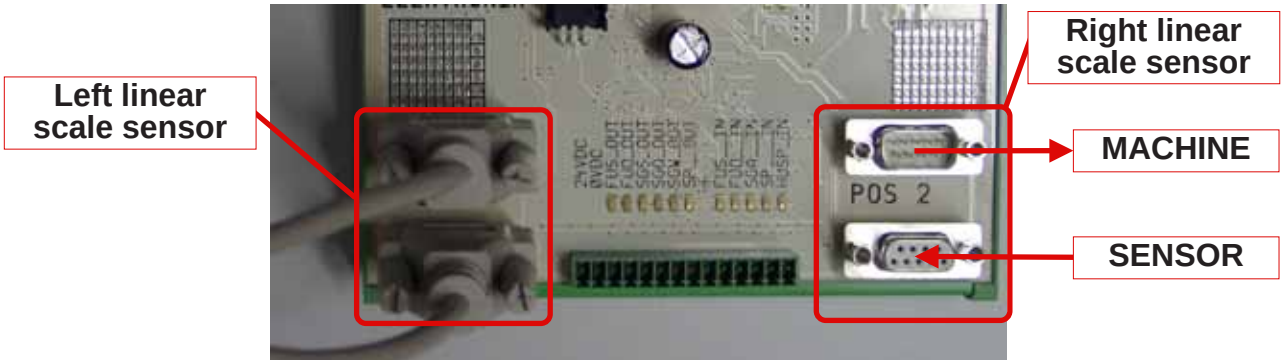
The mode selection will be done with two 8-pole dipswitch DIP_1 and DIP_2.
For each operating mode without permanent overrun measurement at every stop both dipswitches must be set to the same value (see fig. 1)
For each operating mode with permanent overrun measurement at every stop both dipswitches must be set inverted to DIP_1 value (see fig. 2)

fig. 1

fig.2

4.1 Connecting the scale sensors to AMS 3 G

AMS 3 G is able use use the signals from the machines linear scale sensors. The left sensor will be connected to POS_1 and the right sensor to POS_2. All pins of the female and the male D-SUB connector are directly conneted together 1:1. If you are using scale sensors with a 15 pole D-SUB connector FIESSLER provides you adapter cables with D-SUB 15 > 9 and D-SUB 9 > 15 pole.



AMS 3 G basic scale resolution is signal period = 100µm. Linear scale sensors with higher resolutions can also be connected to AMS 3 G. The maximun resolution is 2µm / signal period.
Following AMS 3 G versions are available: **order code AMS3/G/00.A.0**

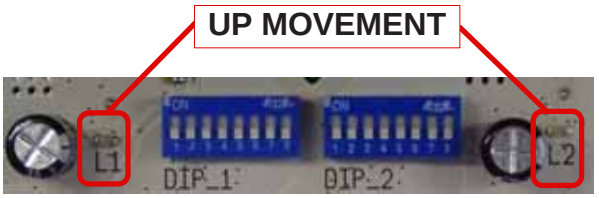
D-SUB linear scale input

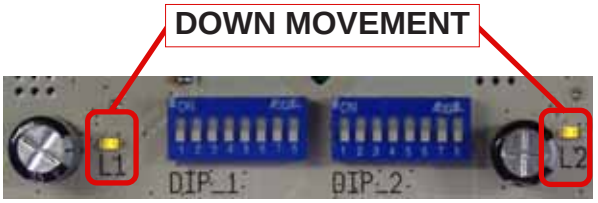
Scale sensor tpye.
When you order AMS 3 G you have to tell Fiessler Elektronik which sensor manufactor/type you are using and also the D-SUB pin assignment.
Fiessler Elektronik will tell you the order code.
For example:
Order code for HEIDENHAIN LS 1679, 9pole D-SUB for Delem Controller is .00

Scale sensor mounting.
Both sensors inputs normal counting direction = N
Both sensors inputs inverted counting direction = I
Sensor input POS_2 inverted counting direction = A

SCALE SENSOR RESOLUTION		
Signal Period	Edge to edge	Order code
100µm	25µm	/0
20µm	5µm	/1
4µm	1µm	/2
2µm	0,5µm	/3

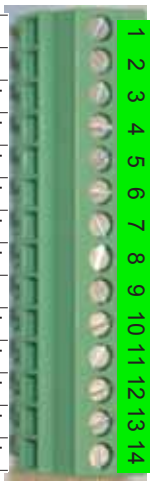
The indicators for the movement detection are LED L1 an L2. When they turn on, AMS 3 G detected closing movement. If they turn off again AMS 3 G detected opening movement. As long as the machine is in stop, the LEDs will not change. See following pictures :

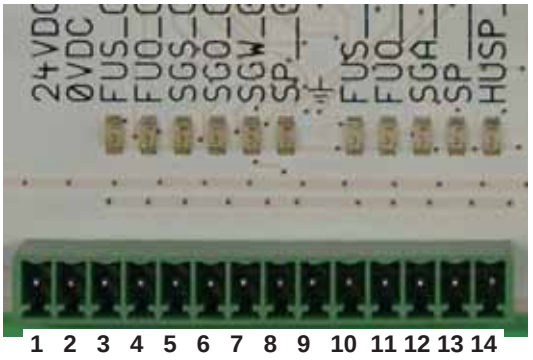




4.2 AMS 3 G interface to AKAS / machine

		+Ub 24V DC
		-Ub 0V
output	24V if FUS_I is HIGH 0V if FUS_I is LOW	FUS_OUTPUT
output	24V if FUO_I is HIGH 0V if FUO_I is LOW	FUO_OUTPUT
output	24V if AMS detects slowspeed down 0V if highspeed down or stop	SGS_OUTPUT
output	0V if AMS detects slowspeed down 24V if highspeed down or stop	SGO_OUTPUT
output	24V if AMS detects slowspeedway 0V if highspeed down or stop	SGW_OUTPUT
output	24V inside slowspeed area 0V above slowspeed area	SP_OUTPUT
	ground	⏚
input	24V if footpedal is pressed 0V if footpedal is not pressed	FUS_INPUT
input	0V if footpedal is pressed 24V if footpedal is not pressed	FUO_INPUT
input	24V highspeed allowed (AKAS) 0V slowspeed request (AKAS)	SGA_INPUT
input	OPTIONAL safetypoint from NC controller	SP_INPUT
input	24V if boxbending selected (AKAS3) 0V if flatbending selected (AKAS3)	HUSP_INPUT

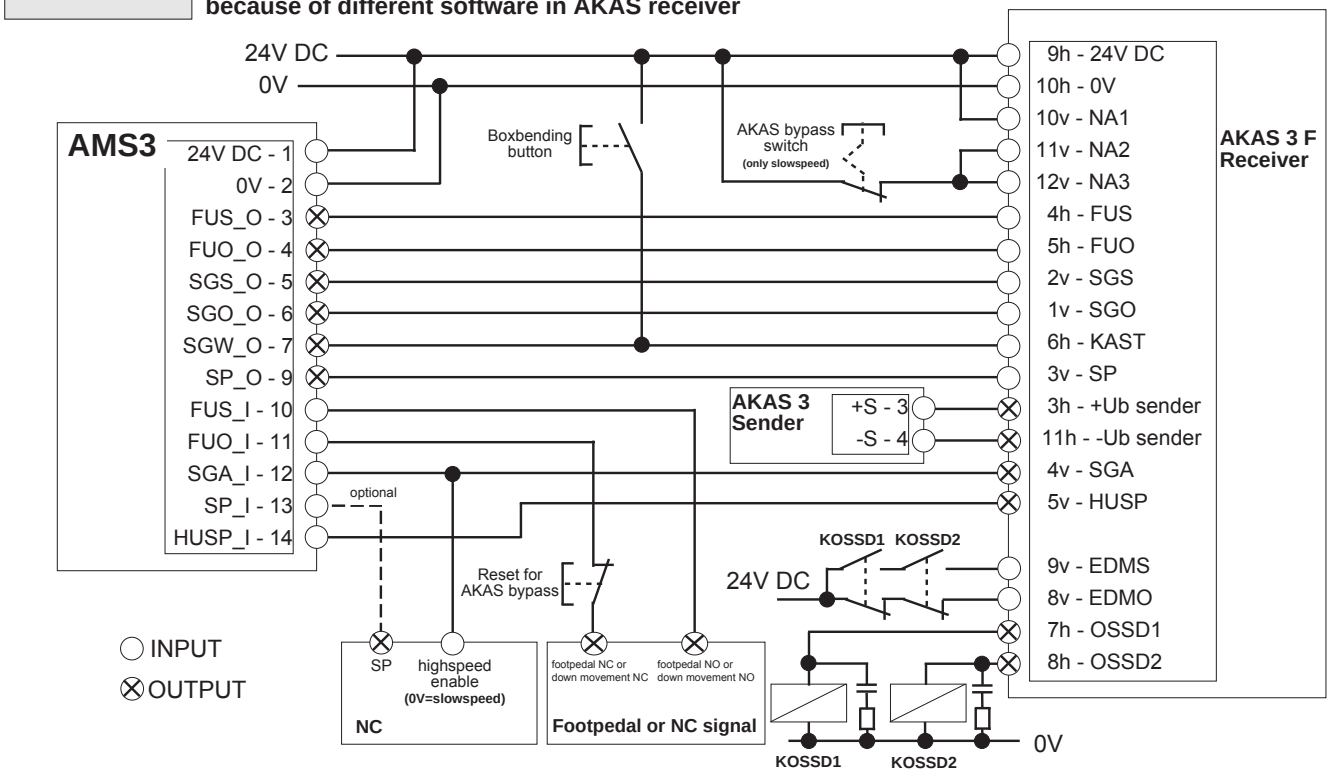




4.3 AMS3 operating mode without permanent overrun measurement with AKAS 3 F

Operation mode for AKAS is : 9, C, 9, C
or if EDM feedback is too slow : 9, D, 9, D for +100ms time delay

Only AKAS systems with serial number before 57650
must use operation mode D,C,D,C or D,D,D,D
because of different software in AKAS receiver



4.4 AMS3 operating mode without permanent overrun measurement with AKAS II F

Operation mode for AKAS is : 9, C, 9, C
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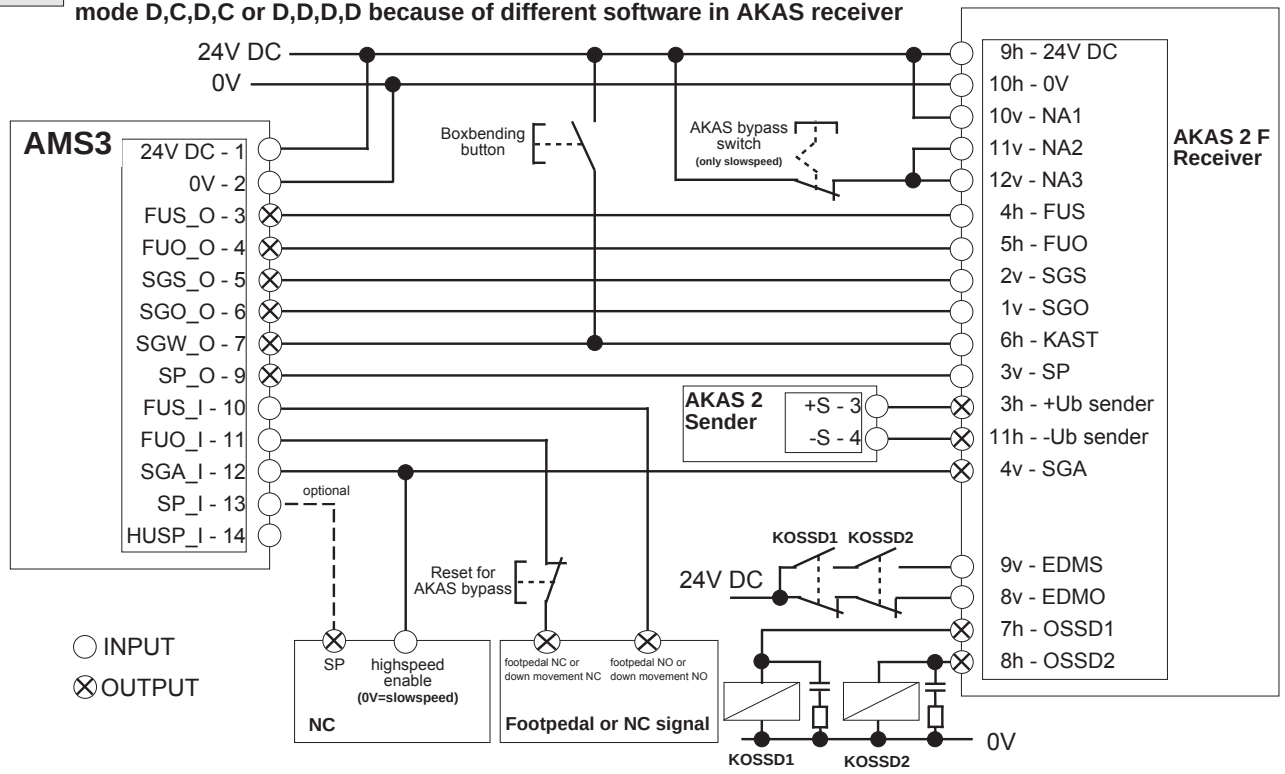

4.5 AMS3 operating mode without permanent overrun measurement with AKAS LC F / LC II F

Operation mode forAKAS is : 9, C, 9, C
or if EDM feedback is too slow : 9, D, 9, D
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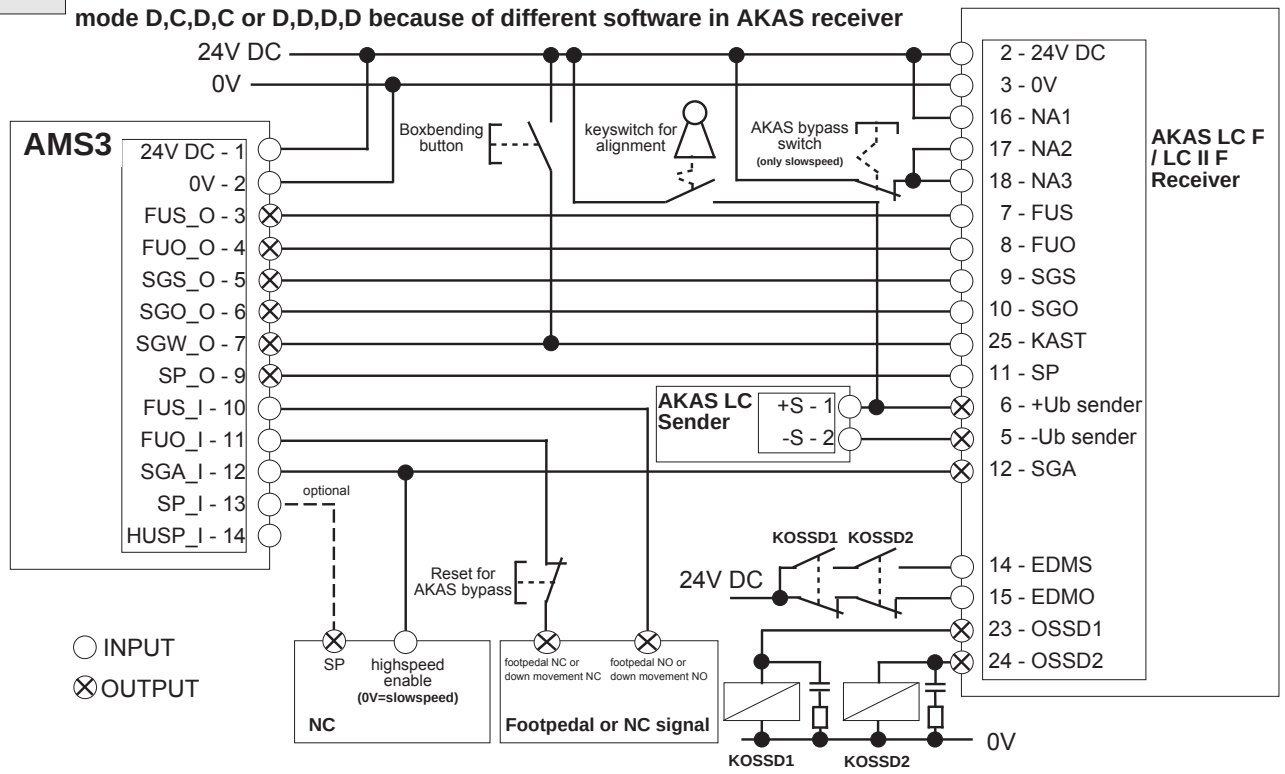

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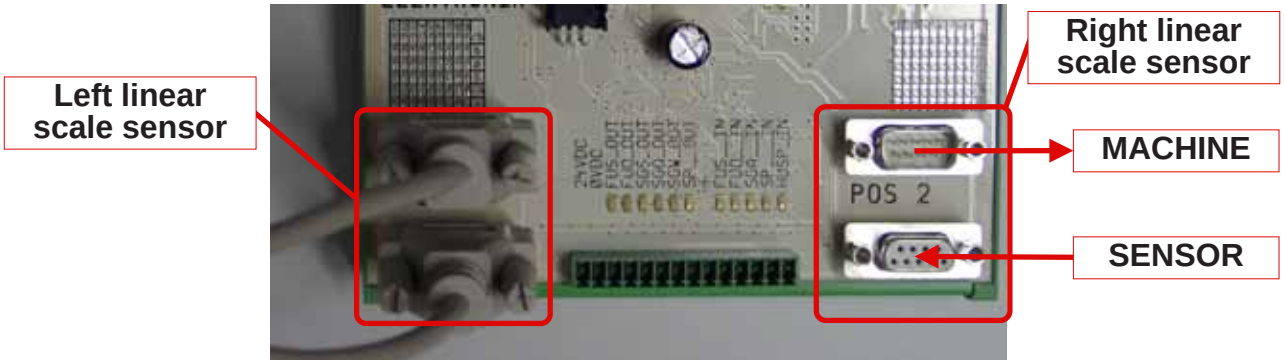

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D-SUB linear scale input

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Signal Period	Edge to edge	Order code
100µm	25µm	/0
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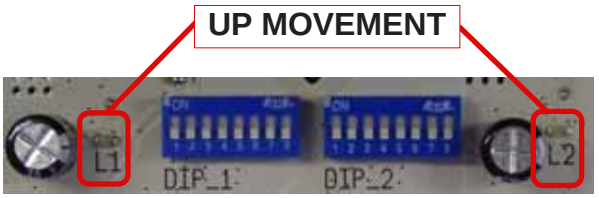
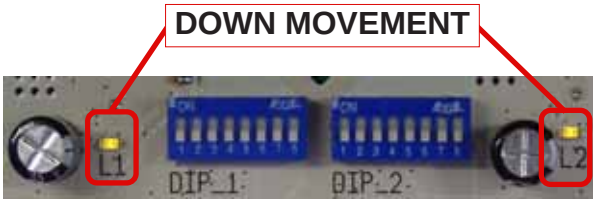
The indicators for the movement detection are LED L1 an L2. When they turn on, AMS 3 G detected closing movement. If they turn off again AMS 3 G detected opening movement. As long as the machine is in stop, the LEDs will not change. See following pictures :





5.2 AMS 3 G interface to AKAS / machine

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output	24V if AMS detects slowspeed down 0V if highspeed down or stop	SGS_OUTPUT
output	0V if AMS detects slowspeed down 24V if highspeed down or stop	SGO_OUTPUT
output	24V if AMS detects slowspeedway 0V if highspeed down or stop	SGW_OUTPUT
output	24V inside slowspeed area 0V above slowspeed area	SP_OUTPUT
	ground	⏚
input	24V if footpedal is pressed 0V if footpedal is not pressed	FUS_INPUT
input	0V if footpedal is pressed 24V if footpedal is not pressed	FUO_INPUT
input	24V highspeed allowed (AKAS) 0V slowspeed request (AKAS)	SGA_INPUT
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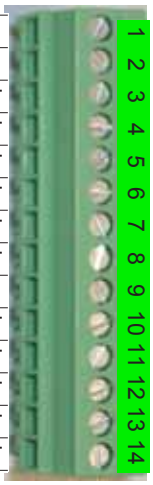
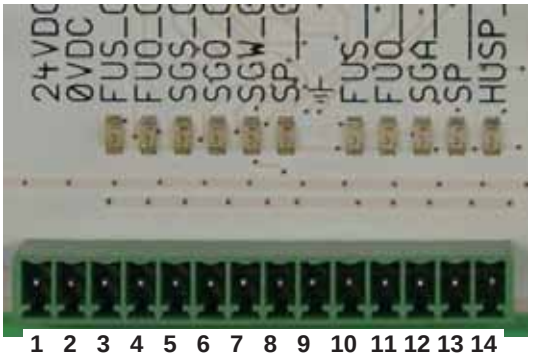
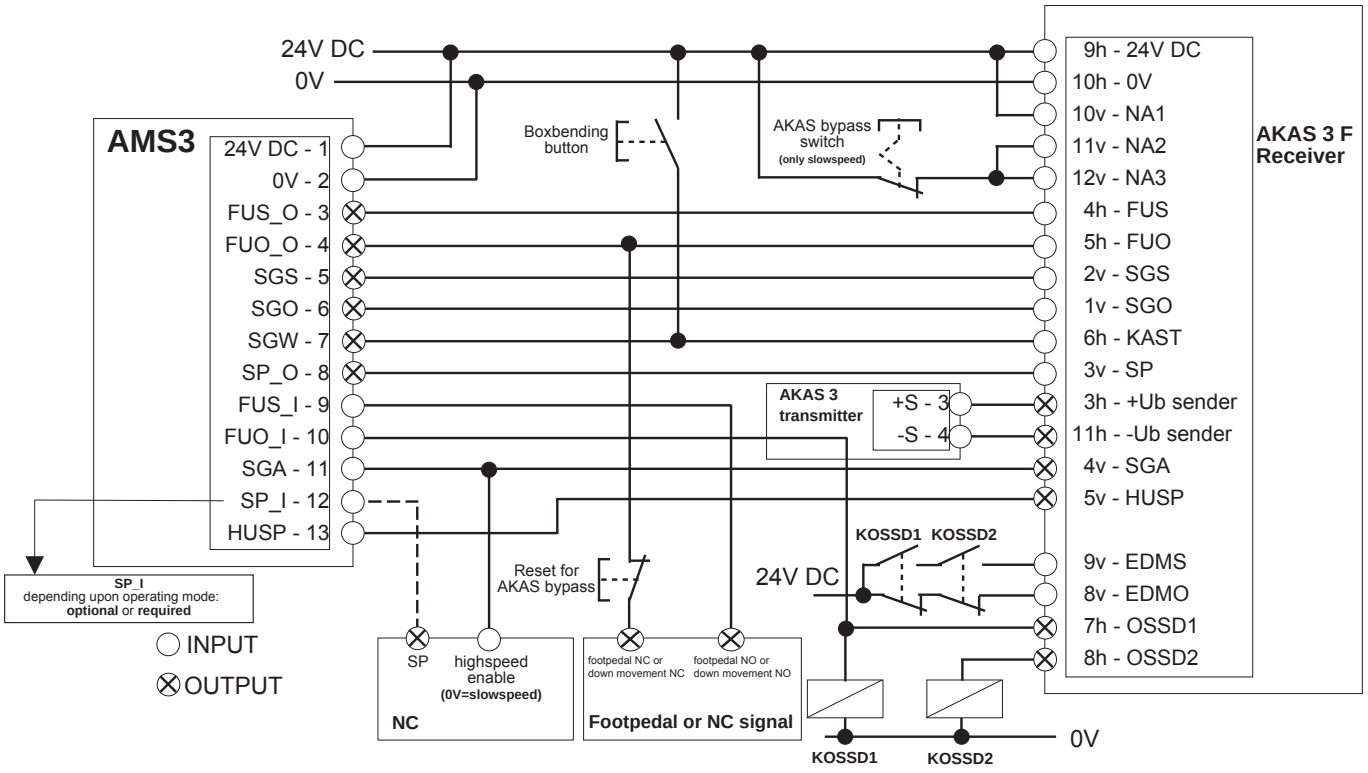




5.3 AMS3 operating mode with permanent overrun measurement with AKAS 3 F

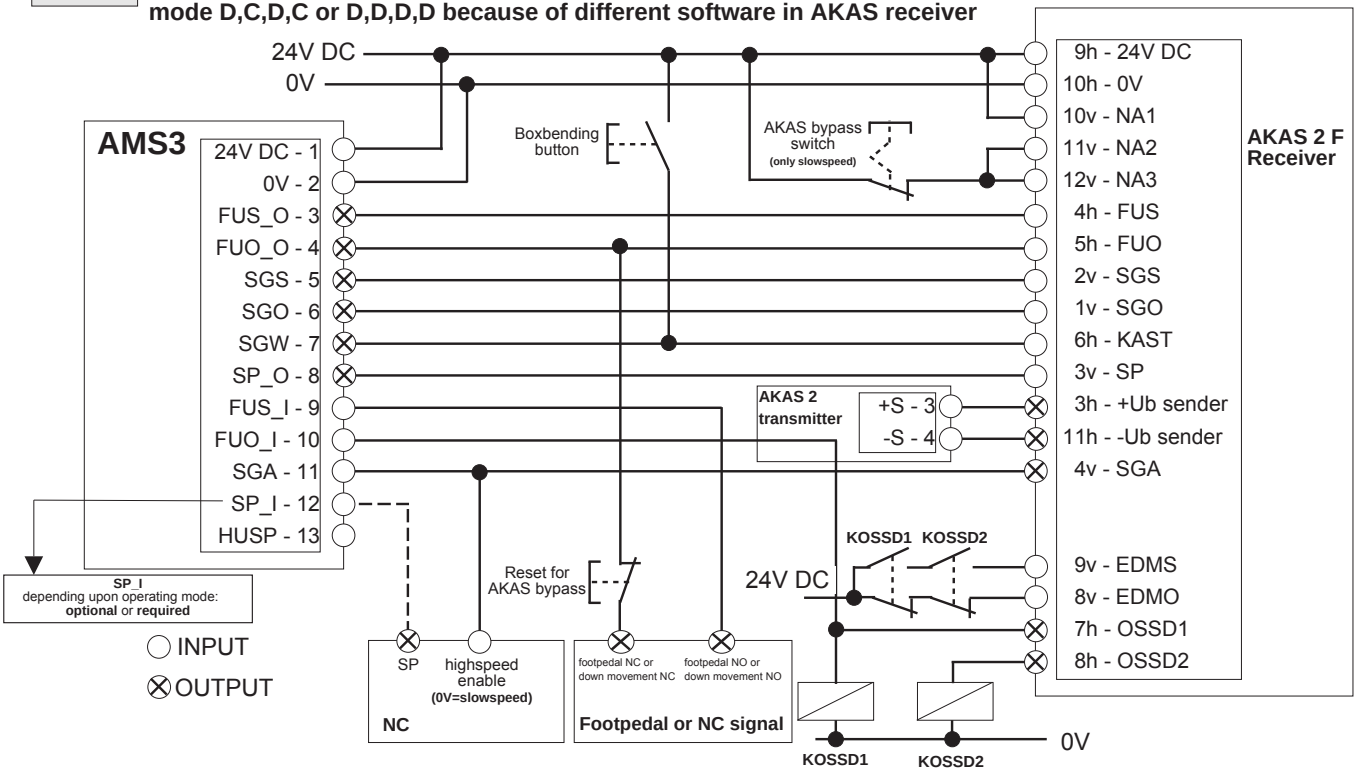
Operation mode for AKAS is : 9, C, 9, C
or if EDM feedback is too slow : 9, D, 9, D for +100ms time delay

Only AKAS systems with serial number before 57650
must use operation mode D,C,D,C or D,D,D,D
because of different software in AKAS receiver



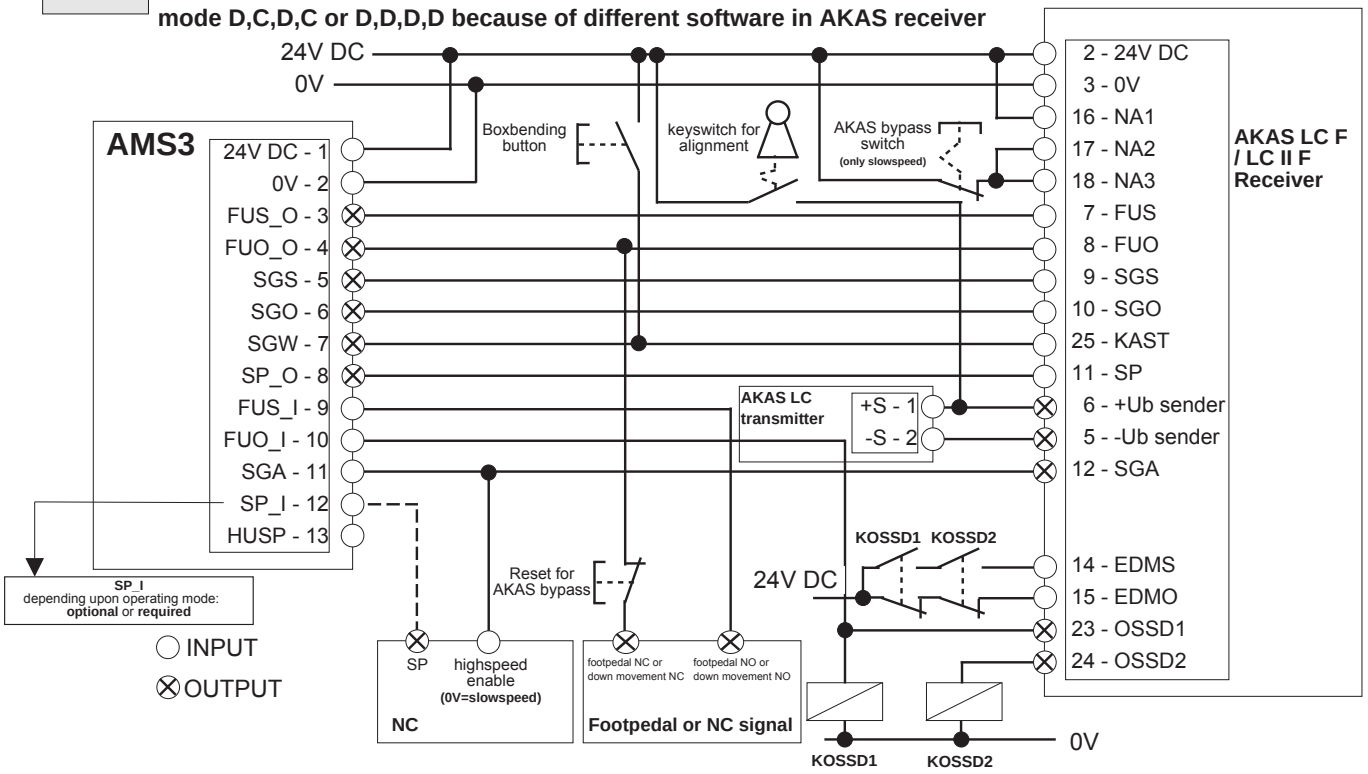
5.4 AMS3 operating mode with permanent overrun measurement with AKAS II F

Operation mode for AKAS is : 9, C, 9, C
or if EDM feedback is too slow : 9, D, 9, D for +100ms time delay
Only AKAS systems with serial number before 57650 must use operation mode D,C,D,C or D,D,D,D because of different software in AKAS receiver



5.5 AMS3 operating mode with permanent overrun measurement with AKAS LC F / LC II F

Operation mode forAKAS is : 9, C, 9, C
or if EDM feedback is too slow : 9, D, 9, D
Only AKAS systems with serial number before 57650 must use operation mode D,C,D,C or D,D,D,D because of different software in AKAS receiver



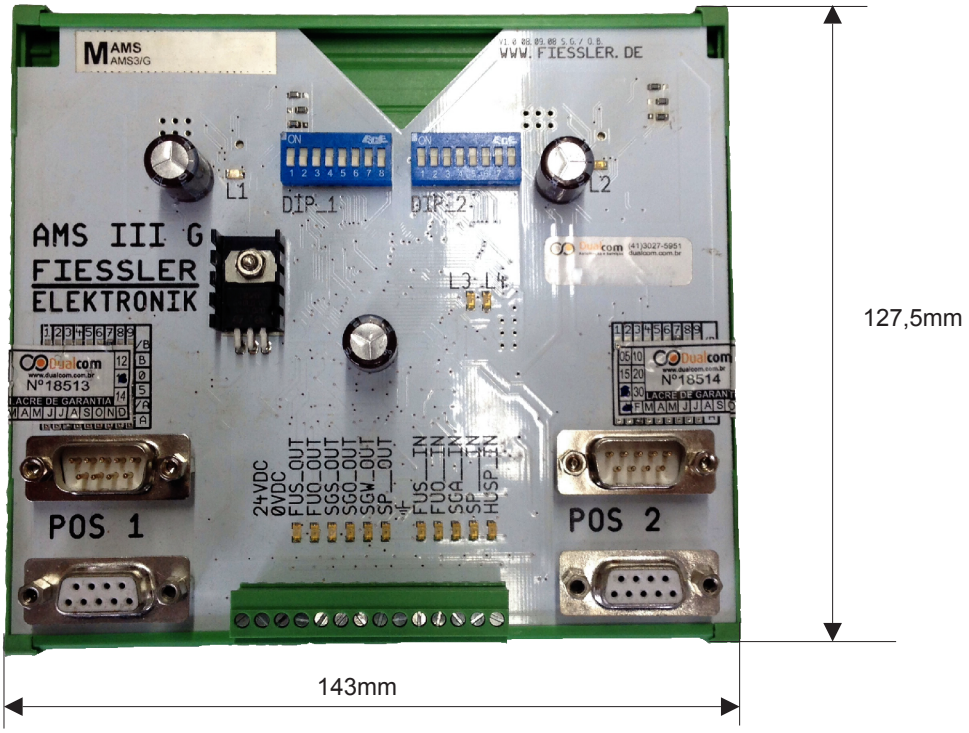
6. Technical data

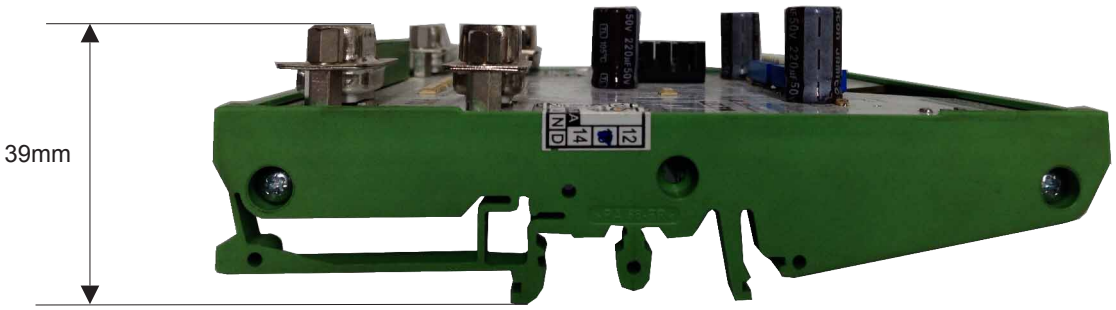
Safety category	4
Protection type	AMS3 must be mounted inside a cabinet of protection type IP54
Protection class	III
Ambient operating temperature	-10 to 50 °C
Storage temperature	-25 to 70 °C
Supply voltage	24 V DC, ±20%, (SELV). The external supply voltage must be able to bridge brief power failures for up to 20 ms according to EN 60 204.
Current consumption	Max. 250 mA.
Outputs	**FUS_o, FUO_o, SGS, SGO, SGW and SP_o :** PNP outputs, max. 0.5 A,
Inputs	**FUO_i, FUS_i, SGA, SP_i and HUSP** : 0 V / 24V DC +/- 20 %, 10 mA
Connection cable	max. 1.5 mm^2
protection from incorrect connection	Protection against all possibilities of errors is **not** provided
cable arrangement	Cables to be laid separately from high-voltage calbes. The cable laying must be arranged in a way that no mechanical damage is possible.

7. Faults / Possible causes / Remedies

Fault	Possible causes	Remedies
Overrun test does not show the measurement result.	Footpedal was released after the machine stopped	Keep footpedal activated to see the measurement result (L3/L4 flashing).
After overrun test is finished, SP_OUTPUT is flashing.	After AMS showed the overrun value with L3/L4 footpedal is still pressed.	Release the footpedal. Press footpedal again for down movement.
After overrun test has stopped the machine, SP_OUTPUT is flashing.	Overrun test failed. Machine did not stop within the limit.	Repeat the overrun test. If it fails again you can reduce the machine speed.
AMS LEDs L3 and L4 flashing 12 times after power on	Different operation modes selected on DIP_1 and DIP_2	Select the same operation mode on both dipswitch and restart AMS
AMS LEDs L3 and L4 flashing 1 time after at least two complete strokes	Machine fast down movement Y1 and Y2 is more than 15mm out of sync	Check machine hydraulic. Maybe also one scale sensor out of order.

8.1 Dimensions





8.2 Mounting/disassembly

The AMS3 must be mounted in an enclosure rated to IP54.
It is mounted on a DIN rail.

Mounting: To mount hang the cabinet with the bottom, inclined slightly forward, in the DIN rail and press it then upwards until it clicks into place.

Disassembly: For the disassembly use a screwdriver down the retaining spring on the lower edge of the housing down and the casing then removed from the top.

Service

If you have any questions that cannot be answered by reading this operating manual, please contact us directly.

When calling, please have the following details ready:

- Device designation
- Serial number
- Fault symptoms and description

Fiessler Elektronik
Kastellstraße 9
D-73734 Esslingen

Phone +49-711-919697-0
Fax +49-711-919697-50
E-mail info@fiessler.de

Returning a unit

If a unit proves defective and needs to be returned, the following details will greatly help us in repairing the fault quickly:

- Exact fault description
- Has the machine furnished with the AMS exhibited other faults?
- Have you noticed any other failures in the past?
- In which operating mode was the unit last used?

The more precise the fault description, the more efficiently and reliably we will be able to pinpoint and eliminate the fault.

Download area

The latest operating manuals, device descriptions etc. can be downloaded free-of-charge from our homepage.

http://www.fiessler.de

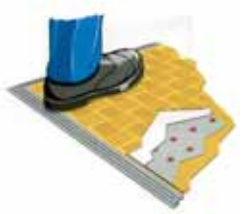
10. Documentation of mode settings

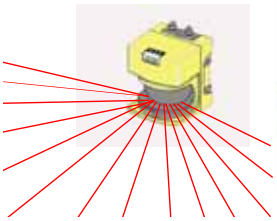
Mode settings can be entered here for the purpose of reference and comparison.

Setting operating mode Dip switch setting 1 2 3 4 5 6 7 8	**Set by**	**Date**

Additional safety products

Apart from the safety controllers described here, Fiessler Elektronik supplies further components for ensuring workplace safety.





Laser scanners

Parametrizable safety controller FPSC

Press brake protection system AKAS

Light curtains for safety, control and measurement

Service

Safety seminars and integration support by our service team.

Certification

A quality management system was introduced at an early stage to guarantee the high quality of Fiessler safety equipment. Fiessler Elektronik is certified according to DIN ISO EN 9001. The company's own electromagnetic compatibility laboratory tests products on a regular basis. All safety equipment complies with national and European standards. Development takes place in consultation with the relevant trade associations. Certification is received followed rigorous tests by the Technical Inspection Board.

Recognition

by Baden Württemberg's ministry of economy of outstanding performance by the innovative AKAS safety system.

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D-73734 Esslingen

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Fax: +49(0)711-91 96 97-50
Email: info@fiessler.de
Internet: www.fiessler.de

Represented in all major countries