FEIG Sensors

Instruction Manual

Radar Motion Detector – MWD BP

FEIG
ELECTRONIC

General

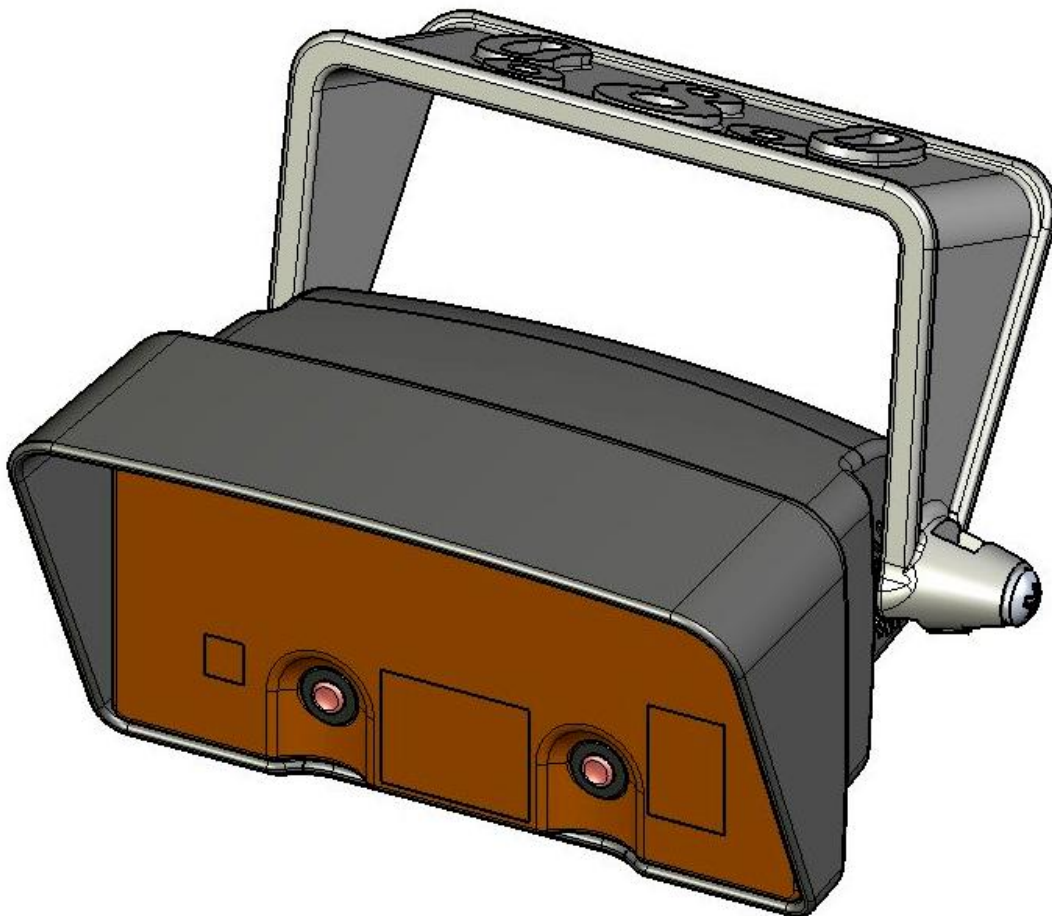© Copyright 2006 by   **FEIG ELECTRONIC GmbH**
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The indications made in these operating instructions may be altered without previous notice.

With the edition of these instructions, all previous editions become void.

Composition of the information given in this manual has been done to the best of our knowledge. FEIG ELEC-TRONIC does not guarantee the correctness of the details given in these instructions and may not be held liable for damages ensuing from incorrect installation.

Since, despite of all our efforts, errors may not be completely avoided, we are always grateful for your useful tips.

The installation instructions given in this manual are based on advantageous boundary conditions. FEIG ELEC-TRONIC does not give any guarantee promise for perfect function of the traffic detector in a cross surrounding.

Please read the operating- and safety instructions thoroughly before putting the motion detector into operation !

Contents

1 Functional description

The MWD BP is a radar motion detector with direction identification, which has been especially designed for applications in the area of industrial gate- and barrier systems. In some cases, the operational parameters may also be adjusted with an infrared remote control.

Motion detection is done according to the Doppler's principle. The sensor sends out 24 GHz microwaves. These microwaves are reflected by objects in motion and thus their frequency changes. The sensor receives these altered frequencies and analyses them. Thus, each motion within the detection range is recorded, analyzed by a logic and transmitted to the gate- resp. barrier control by connecting potential-free change-over contacts.

Range of application:

Entry-/access recognition for the drive of industrial gate- and barrier systems

Special features:

- Insensitive to fluctuations of temperature and humidity
- Distinction vehicles/persons
- Suppression of cross traffic
- Object tracking for slow objects
- Reversible and cutoff direction logic
- Adjustable sensitivity
- Application specific parameter profiles
- Two channel with individual parameter setting
- Two potential-free relay contacts
- Large supply voltage range - AC or DC
- Adjustment of operational parameters by key buttons or infrared remote control and 7-segment display
- Compact plastic housing
- IP 65 housing
- Easy and fast installation with mounting bracket

2 Installation

2.1 Place of installation

The device is centrally mounted above the area to be monitored. Both wall- and ceiling mounting are possible. The maximum mounting height is 7m.

2.2 Hints for planning and installation:

- The device has to be mounted *vibrationless*.
- In order to avoid incorrect release, there must not be *any objects in motion within the radiation field.*
- There must not be *any fluorescent tubes* within the radiation field of the detector.
- It should be avoided that the radiation fields of two motion detectors overlap, since this may lead to incorrect releases.
- Do not install behind objects, building coverings or elements.
- If the motion detector is exposed to rain or snow, it should be adjusted to directional recognition.
- If *conductive floors* are used and the radiation direction is almost vertical, incorrect releases may be caused by reflections.

3 Parameter Entry

3.1 Open Parameter Entry

a) Remote Control MWD RC

	Symbol	Key	Key-press	Description	Action	Display Example
1.	**i**	i-Button	short	Channel 1: displayed address Channel 2: displayed address + 1	Actual device address is displayed with blinking digit and decimal point	≥ l.≤
2a.	1..4	value 1..4	short	Direct confirmation of device address	Display first parameter name	L.
	or					
2b.	◢	Volume +	short	Select address value	Increment or decrement value. Changed values doesn't blink !	2.
	◣	Volume -				F
3b.	⏻	On/Off	short	Indirect confirmation of device address	Display first parameter name	L.

b) Buttons on Motion Detector MWD BP

The left button is functionally assigned to the On/Off-button ⏻ on remote control MWD RC.
Right button is equivalent to the Volume +- button ◢.

	Key	Key-press	Description	Action	Display Example
1.	Right or Left	short	Channel 1: displayed address Channel 2: displayed address + 1	Actual device address is displayed with blinking digit and decimal point	≥ l.≤
2.	Right	short	Select address value	Increment or decrement value. Changed values doesn't blink !	2.
3.	Left	short	Confirmation of device address	Display first parameter name	L.

3.2 Change Parameter

Before changing parameter values you have to open the parameter entry as described above.

a) Remote Control MWD RC

	Symbol	Key	Key-press	Description	Action	Display Example
1.	◢	Volume +	short (long)	Change parameter name (long: quick selection)	Display parameter name with character and decimal point.	d.
	◣	Volume -				P.
2.	⏻	On/Off	short	Return to display parameter value	Actual parameter value is displayed without decimal point.	l
3.	◢	Volume +	short (long)	Change parameter value (long: quick selection)	Display changed parameter value with *blinking decimal point.*	2.≤
	◣	Volume -				0.≤
4a.	⏻	On/Off	short	Undo changes	Display actual parameter value again (without decimal point)	l
	or					
4b.	⏻	On/Off	long	Save new parameter value	Decimal point expires after successful saving.	2
5.	⏻	On/Off	short	Return to display parameter name	Display parameter name with character and decimal point.	d.

b) *Buttons on Motion Detector MWD BP*

	Key	Key-press	Description	Action	Display Example
1.	Right	short (long)	Change parameter name (long: quick selection)	Display parameter name with character and decimal point.	d.
2.	Left	short	Return to display actual parameter value	Actual parameter value is displayed without decimal point.	1
3.	Right	short (long)	Change parameter value (long: quick selection)	Display changed parameter value with *blinking decimal point.*	2.
4a.	Left	short	Undo changes	Display actual parameter value again (without decimal point).	1
or					
4b.	Left	long	Save new parameter value	Decimal point expires after successful saving.	2
5.	Left	short	Return to display parameter name	Display parameter name with character and decimal point.	d.

3.3 Close Parameter Entry

a) *Remote Control MWD RC*

	Symbol	Key	Key-press	Description	Action	Display Example
1.	⏻	On/Off	long	Close parameter entry from standard parameter menu service parameter menu	display off	

b) *Button on Motion Detector MWD BP*

	Key	Key-press	Description	Action	Display Example
1.	Left	long	Close parameter entry from standard parameter menu service parameter menu	display off	

c) *automatic*

60 s after last keypress on the remote control or directly on the motion detector parameter entry is closed automatically.

3.4 Show Service Parameter

To display the Service Parameter you have first to open the parameter entry as described in chapter 3.1.
Service Parameter names are displayed with blinking character and *static decimal point.*
Menu navigation is conform to the navigation of standard parameter.

a) *Remote Control MWD RC*

	Symbol	Key	Key-press	Description	Action	Display Example
1.	F+ or F-	-	long	Activate service parameter from standard parameter menu	Display first service parameter name	A.

b) *Button on Motion Detector MWD BP*
The left button is functionally assigned to the On/Off-button on remote control MWD RC.
The right button is equivalent to the Volume +- button.

	Button	Key-press	Description	Action	Display Example
1.	Left and Right	long	Activate service parameter from standard parameter menu	Display first service parameter name	A.

4 Standard Parameter List

Parameter Name	7-Segment Display		Parameter Definition
	Parameter Name	Value Range	
Sensitivity Level	L .	1..9, A..F	1 = low : 7 = middle : 9 * : F = high
direction	d .	0..2	0 = off 1 = approaching * 2 = departure
human detection	h .	0..3	0 = off * 1 = low : 3 = high
vehicle detection	u .	0..3	0 = off * 1 = low : 3 = high
Cross traffic suppression	C .	0..3	0 = off * 1 = low : 3 = high
Object tracking	O .	0..3	0 = off * 1 = low : 3 = high
relay function	r .	0..4	0 = off 1 = channel 1 * (*for* channel 1) 2 = channel 2 * (*for* channel 2) 3 = channel 1 OR channel 2 4 = channel 1 AND channel 2
output on delay time	t .	0..F	0 = 0s * 1..F = 0.2s .. 3.0s (value x 0.2s)
output off delay Time	T .	0..F	0 = 0s 1 = 0.2s (value x 0.2s) 2 = 0.4s * 3..F = 0.6s .. 3.0s
relay operating mode	o .	0..1	0 = normally de-energized * 1 = normally energized
Profiles	P .	0..9	0 = parameter changed after profile setting (only displayed !) 1 = Profile No 1: *initiate Factory Setting* * 2..9 = Profile No. 2..9

* factory setting

Note:
Resetting to factory values can be effected by parameter name "profile" with parameter value "1". Alternatively press both keys while switching power supply on.

5 Service Parameter List

Parameter	7-Segment Display		Parameter Definition
	Parameter Name	Value Range	
device **A**ddress	A .	1.. 9, b.. d	1 = 1 * : (only odd address) d = 13
miscellaneous **S**ettings	S .	0.. 3	0 = all off ** 1 = key operation on, display relay output off 2 = only display relay status off ** 3 = key operation and display relay output on *
firmware **i**nformation	i .	–	show Firmware-Version on display: - manually, with „◀◀◀“-Button for each character - automatically, with „i“-Button one character per second

* factory setting

** Key operation is always available in the first 15 minutes after power on regardless of the parameter setting. If the display of the relay output is deactivated, only the decimal point is commonly used to show the relay status of both channels.

6 Profiles

Profile No.	1		2		3		4		5		6		7		8		9	
Channel	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
Detection — Sensitivity Level	9		9		9		9		9		9		9		9		9	
Direction	appr.		appr.		appr.		appr.		appr.		appr.		appr.		appr.		appr.	
Human Detection	-		-		-		= 2	-	-		-		= 2	-	-		-	
Vehicle Detection	-		-		-		-	= 2	-		-		-	= 2	-		-	
Cross Traffic Suppr.	-		-		-		-		-	= 2	-		-		-	= 2	-	
Object Tracking	-		-		-		-		-		-	= 2	-		-		-	= 2
Relay — On delay	-		-		-		-		-		-		-		-		-	
Off delay	400 ms		400 ms		400 ms		400 ms		400 ms		400 ms		400 ms		400 ms		400 ms	
Assignments (Logic)	Ch1	Ch2	Ch1	-	Ch1	Ch2	Ch1	Ch2	Ch1	Ch2	Ch1	Ch2	Ch1	Ch2	Ch1	Ch2	Ch1	Ch2
Working Principle	AP		AP		AP		AP		AP		AP		RP		RP		RP	
Remarks	Factory Setting: additional parameter (e.g. device address =1) will be initialized too.		Channel 2: Relay output off		same as Factory Setting without initializing additional parameter		Channel 1 : only persons Channel 2 : only vehicles		Channel 1 : all objects Channel 2 : cross traffic suppression		Channel 1 : all objects Channel 2 : slow motion object tracking		Profile No. 4, but with RP		Profile No. 5, but with RP		Profile No. 6, but with RP	

Ch1 = Channel 1   Ch2 = Channel 2
AP = normally de-energized   RP = normally energized   appr. = approaching direction

7 Notes

- The MWD BP is a 2 channel device. While opening parameter entry first the odd address used to open chan-nel 1 will displayed. The following even device address activates channel 2.

- In factory settings relay 1 with change over contacts is assigned to channel 1 (display „ᶦ.") and relay 2 with normally open contact is assigned to channel 2 (display „ᶦᶦ."). It is possible to change relay assignments via parameter entry.

- Only the odd device address of channel 1 can be changed. The address of channel 2 results from the following even address.

- Common parameter (e.g. firmware info, profiles...) can be displayed/changed with even or odd device ad-dress.

8 Connections
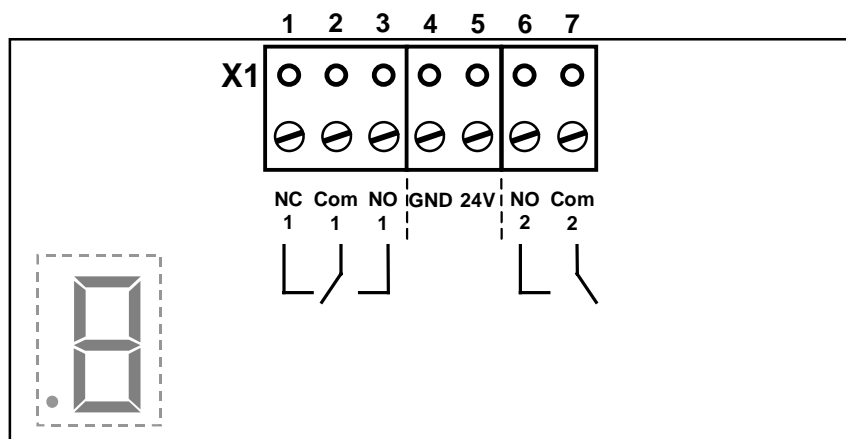
Backside view, Contact status for power off

9 Technical data

Dimensions	135x65x130mm (BxHxT)
Protective system	IP 65
Power supply	12-27 V AC / 12-30 V DC
Power consumption	typ. 1,0 W, max. 2,4 W
Admissible working temperature	-20 °C .. +60 °C
Storing temperature	-30 °C .. +75 °C
Air moisture	< 95 % not condensing
Transmit frequency	typ. 24,125 GHz
Output power (EIRP)	typ. 40 mW, max. 100 mW
Output relay	
max. switching load	1 A / 30 V AC/DC (resistive load)
min. switching load	1 mA / 5 V DC
	Use external protective wiring for inductive load !
Maximum mounting height	7 m

10 Type Approval

10.1 Europe (CE)

When used according to regulation, this radio equipment conforms with the basic requirements of article 3 and the other relevant provisions of the R&TTE guideline1999/5/EC dated March 99.

- Certificate -

10.2 USA (FCC) / Canada (IC)

FCC ID: PJMMWDBP

IC: 6633A-MWDBP

This device complies with part 15 of the FCC Rules and with RSS-210 of Industry Canada.

Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

Warning: Changes or modifications made to this equipment not expressly approved by *FEIG ELECTRONIC GmbH* may void the FCC authorization to operate this equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and receiver.

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

- Consult the dealer or an experienced radio/TV technician for help.

11 Safety instructions

- This device shall only be used for the purpose intended by the manufacturer.

- The operating instructions have to be handed out to each user and accessible at any time.

- Improper changes and spare parts resp. special features which are not sold or recommended by the manufacturer of the device may cause fires, electric shock and injuries. Such measures therefore lead to nonliability of the manufacturer and no guarantee will be given.

- For this device, the indemnity contract applies in the version valid at the time of purchase. We exclude liability for improper or wrong manual or automatic adjustment of parameters resp. improper use of the appliance.

- Repair work should only be carried out by the manufacturer.

- Connection, initiation, maintenance, measuring and adjustment of the motion detector should only be carried out by electrical engineers with accident prevention skills.

- When handling appliances which get into contact with electric current, VDE-rules have to be observed - especially VDE 0100, VDE 0550/0551, VDE 0700, VDE 0711, VDE 0860, VDE 0105 as well as the fire – and accident prevention standard VBG4.

- Please switch off current supply prior to opening the device and make sure that it remains off.

- If an indicator lamp goes out, this is not a proof that the device is without electricity and disconnected from power supply. All work that is carried out at the device as well as installation has to be carried out in conformance with the national electric regulations and the local rules.

- The user has to make sure that the appliance is mounted and connected according to the technical rules of the country of installation as well as other regional regulations. This applies especially to cable dimensioning, protection, earthing, cutoff, disconnection, isolation supervision and excess current cut-out.

- Low-voltage operation is not allowed at the relay outputs.

- According to machine rule 89/392/EWG, appendix IV, the device may not be used as a *safety component*. In facilities with a high danger potential, additional safety devices are necessary !

- The hard gold alloy of the relay contacts is destroyed if switching currents of more than 100 mA are used. Relays with such pre-damaged contacts may only switch currents of more than 100 mA reliably!

- If the place of operation is located in direct proximity to foil gates, suitable measures have to be taken to branch off the electrostatic charging of the gate foil.