EN - Quick start guide

NOTE

Read the operating instructions

You can find detailed instructions and comprehensive information in the full user manual for the product. This document is available on the manufacturer's homepage www.feig.de.

NOTE

Read and keep instructions

Read this document before you use the product for the first time, and keep it in a safe place for future reference.

NOTE

Maintenance and repairs

This product does not require any maintenance or servicing.

In the event of malfunctions and faults, please contact the vendor or the manufacturer.

WARNING

Improper use

The device is subject to the manufacturer's guarantee conditions valid at the time of purchase. The manufacturer will not accept any responsibility for incorrect manual or automatic parameter settings performed on a device or the inappropriate use of a device.

Improper repairs

Repairs may only be performed by the manufacturer. Failure to comply results in endangering the safety of the device and renders the warranty null and void.

Permitted power sources

The power supply must meet the requirements for safety extra-low voltage (SELV).

Essential safety equipment

The device may not be used as a safety component as defined by the Machinery Directive 2006/42/EG, the Construction Products Regulation 305/2011/EU or other safety regulations. Systems posing a threat of danger require additional safety equipment.

At the end of its service life, dispose of the product in accordance with the valid legal specifications.

1 Product overview

Product components
Traffic detector VEK MNH1-R24-A
Plug-in terminal blocks: 1x supply, 1x loops, 2x relays
Quick start guide

Tab. 1: Scope of delivery

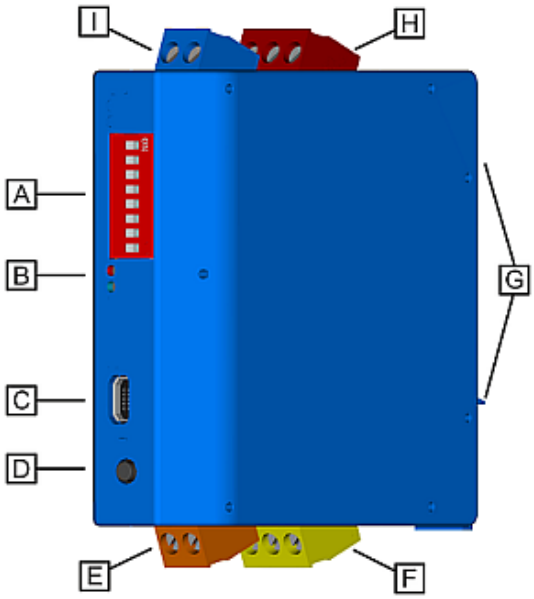


Fig. 1: Traffic detector VEK MNH1-R24-A

Index	Component
A	DIP switch
B	Loop channel LEDs (red + blue)
C	USB interface
D	Reset button
E	Loop channel input (orange)
F	Relay output 1 (yellow)
G	Mounting device for TS35 DIN rail
H	Relay output 2 (red)
I	AC/DC connector (blue)

Tab. 2: VEK MNH1-R24-A component list

Specifications	
Dimensions	22.5 x 79.0 x 81.0 mm (W x H x L, without terminals)
Power supply (1x blue, 2-pole)	10 – 30 VDC / 10 – 26 VAC, max. 2 W (SELV)
Protection type	IP20
Permitted operating temperature	-37 – +70 °C
Relative humidity	< 95 % (non-condensing)
Loop input	1x orange, 2-pole
• max. inductivity range	20 - 700 µH (see note 1)
• recommended inductivity range	100 – 300 µH
• operating frequency	30 – 130 kHz
• cable length	200 m
• internal resistance	20 Ω (including cable)
Signal outputs	1x yellow+ 1x red, each 3-pole
• 2x relays	max. 48 V (AC/DC), 2 A, 60 W, 125 VA (SELV) min. 1 mA / 5 V (see note 2)
Configuration switch	8-pole DIP switch
LED status indicator	1x blue + 1x red

Specifications	
Reset	Push button
PC interface	USB port, type mini AB

Tab. 3: Specifications

NOTE

1) **Restrictions with loop inductivity**
If loop inductivities are outside the recommended range, it may be possible that only one frequency stage is available. With very low loop inductances, the maximum loop resistances are lower.

2) **Relay contact current load**
The rigid gold plating on the relay contacts will be destroyed if the switching current exceeds 100 mA. Relays with contacts that are prestressed in this manner can only reliably switch currents over 100 mA!

2 Product description

Induction loop detectors such as traffic detectors are electronic sensors for inductive detection of metallic objects. Using induction loops, for example, vehicles are detected, and depending on the device, their design and direction of movement.

The traffic detectors are operated in combination with various induction loops and electronic controller, such as frequency converters or PLC controller.

The areas of application are, for example, the detection, monitoring and counting of vehicles in the areas of traffic engineering, door and barrier controller, parking and tunnel monitoring as well as traffic light systems.

The traffic detectors have the following characteristics:

- 1 loop channel
- 2 potential-free relay outputs
- 8-pole DIP switch for configuration
- 2 LEDs for indication of detector and loop states
- USB interface for diagnostics and expanded configuration
- Reset button for restoring the settings
- Connection for power supply (AC/DC)
- Galvanic isolation between loops and electronics
- Automatic alignment of the system after switch-on
- Continuous adjustment of frequency drifts to suppress environmental influences
- Sensitivity independent of loop inductivity
- Fixed hold times independent of the loop coverage
- Compact plastic housing for mounting on DIN rail in control cabinet

The traffic detectors offer the following setting options:

- Switching between two frequency levels
- Output as presence or pulse signal or of loop faults (with *Detector Tool*)
- Response threshold adjustable in 255 steps with *Detector Tool*, in 4 steps with DIP switch
- Hold time adjustable from 1 to 255 minutes and infinite with *Detector Tool*, 5 minutes or infinite with DIP switch
- Counter for loop occupation and travel direction with *Detector Tool*
- Minimum signal duration for output signal with *Detector Tool*
- Switch-in and switch-off delay adjustable with *Detector Tool*
- Hysteresis (drop in threshold value) adjustable from 20 - 80% on each channel with *Detector Tool*
- Detector channels can be switched off with *Detector Tool*
- Comprehensive diagnostic function with *Detector Tool*

3 Description of connections

3.1 Power supply

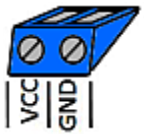
The detector can be operated with direct or alternating current , according to the requirements for Safety Extra-Low Voltages (SELV) of Protection Class III.

WARNING

Note the permitted power supply

Comply with the technical data and safety instructions!

The power supply is connected to the blue terminal block.



VCC Plus

GND Ground

Fig. 2: Power supply connection (blue)

3.2 Loop inputs

Up to two analogue inputs for the induction loops on the terminal block are located on the underside of the traffic detector. The terminal block is either 2-pole or 4-pole, depending on the product variant.

The induction loops are connected to the orange terminal blocks as shown in the illustration.

L1a
L1b Induction loop channel 1 connections

Fig. 3: Loop connections (orange)

3.3 Signal outputs

Each signal output can be inverted. In this case, when the power supply is turned on, normally open contacts function as normally closed contacts, and vice versa. This happens by switching between open circuit and closed circuit principle.

Loop faults can also be interpreted as *loop covered* or as *loop free*.

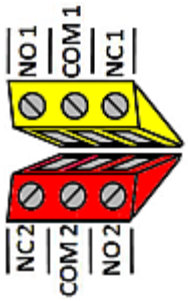
Status	Normally closed contact (NC)		Normally open contact (NO)	
	Not inverted (open circuit)	Inverted (closed circuit)	Not inverted (open circuit)	Inverted (closed circuit)
Voltage off				
Detector ready, loop free				
Loop covered				
Loop failure	(*loop covered* by default, configurable as *loop free* with *Detector Tool*)			

Tab. 4: Switching states of the signal outputs

3.3.2 Relay outputs with changeover contact

The relay outputs are designed as changeover contacts. This allows the contacts to be connected as normally closed (NC) or as normally open (NO) contacts. The relays are potential-free and suitable for many different switching modes.

The analogue outputs of the (R24) relay variants are connected to the red and yellow terminal blocks as shown in the following illustration.



NO1 **NO2** Normally open contact to output 1 or output 2

COM1 **COM2** Common contact to output 1 or output 2

NC1 **NC2** Normally closed contact to output 1 or output 2

Fig. 4: Relay connections 1 (yellow) and 2 (red)

4 Description of functions

4.1 LED status indicators

The LEDs (light emitting diodes) on the front side indicate the state of the loops and the detector.

There are two LEDs for each loop channel:

- The red LED indicates the coverage status of the respective loop
- The blue LED indicates the operating status of the detector

Red LED	Blue LED	Description of status
○	○	No power supply, detector inactive
○	●	Detector ready, loop connected, no object detected
●	●	Detector ready, loop connected, object detected
●	○	No loop connected, loop break, loop closure
	✳ 1 Hz	Ready for operation following earlier, now rectified, loop error or settings changed with *Detector Tool* (DIP switch not up-to-date)
	✳ 5 Hz	Frequency alignment is running
✳ ⎍	✳ ⎍	After frequency adjustment, both LEDs simultaneously display the set loop frequency in a flash code (see *Flash code* illustrated example)

Tab. 5: LED signal colours

Key to LED symbols

● Lit up ○ Off

✳ Flashing ⎍ Frequency

LED flash code following a frequency alignment

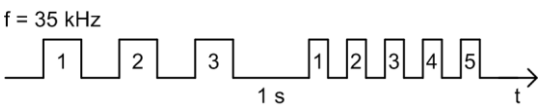


Fig. 5: LED display of loop frequency

4.2 Reset button

The device is reset using the reset button on the front as follows:

Function	Description	Press button	LED
reset / readjustment	runs a frequency readjustment and clears the LED fault messages	1 second	red LED flashes
factory settings	resets the device to factory settings (DIP switch default settings)	5 seconds	blue LED flashes

Tab. 6: Reset functions

4.3 DIP switch settings

Depending on the output function settings, presence, pulse and loop fault signals are output.

For the pulse signal, it is also possible to select whether an output should occur when a loop is driven past or vacated.

In addition to inversion of the output signal, both outputs can individually be permanently switched on or off.

Function	Description
Sensitivity	Switch-on threshold for the signal output when a loop is covered
Frequency level	Frequency of the loop oscillating circuit in two levels
Hold time until readjustment	Maximum duration of the output signal up to the automatic frequency readjustment of the loop channel
Output signal 2 mode	Switching between continuous and pulse signal on output 2
Output signal 2 time	Time of output signal for activated pulse signal on output 2
Output signal inversion	Switching between open circuit (not inverted) and closed circuit principle (inverted) for the output signals
Direction detection	Switching between presence and travel direction detection for both outputs (dual-channel variants)
Direction Logic	Evaluation logic of the travel direction when loops are covered, depending on the application (see full operating manual!)

Tab. 7: Description of the settings

The single-channel variants have an 8-pole DIP switch for configuring the detector.

DIP	Designation	Function
1	Sense a	Loop 1 sensitivity
2	Sense b	Loop 1 sensitivity
3	Frequency	Frequency step
4	Hold time	Hold time until readjustment
5	Output 2	Output signal 2 mode
6	Edge 2	Output signal 2 time
7	Inv. Out 1	Output signal 1 inversion
8	Inv. Out 2	Output signal 2 inversion

Tab. 8: DIP switch assignment (default)

The following parameters can be adjusted with the DIP switch:

DIP switch	Position	Value
Sense a	ON	0.01% (high)
Sense b	ON	
Sense a	OFF	0,04%
Sense b	ON	
Sense a	ON	0,16%
Sense b	OFF	
Sense a	OFF	0.64% (low)
Sense b	OFF	
Frequency	OFF	low
	ON	high
Hold time	OFF	5 minutes
	ON	infinite
Output 2	OFF	Pulse signal
	ON	Continuous signal
Edge 2	OFF	on entering
	ON	on leaving
Inv. Out 1	OFF	inverted
	ON	not inverted
Inv. Out 2	OFF	not inverted
	ON	inverted

Tab. 9: Settings via DIP switch (single-channel)

4.4 USB interface

Detailed configuration and diagnosis of the detector data are possible via the USB interface.

The free *Detector Tool* service program can be downloaded from the customer area at www.feig.de. In addition, a computer and a USB cable of the Mini-AB type are required.