

Connection and installation manual

Induction loop detector ISD 5



tousek[®]
G A T E A U T O M A T I O N





Important warning and safety notes

- These installation and operating instructions form an integral part of the product. They have been specifically written for professional installers trained and skilled in the trade and should be carefully read in their full length before carrying out the installation. It concerns the control only, not of the overall device "automatic gate". After the installation this manual has to be handed over to the user.
- **Installation, connection, adjustments, putting into operation, and servicing may only be carried out by trained professionals in full accordance with these installation and operating instructions.**
- **Before carrying out works on the gate system, the power supply has to be turned off.**
- **ATTENTION! Risk due to electric power!** Ensure that no liquid enters the interior of the device. If it does occur, immediately disconnect the power supply from the unit. If you notice a damage, e.g. kinked / crimped cables, a damage of the plug or housing, etc., immediately switch off the device, interrupt the power supply and prevent the device from being switched on again. Improper operation, poor maintenance or non-observance of the instructions in this manual may result in a hazard.
- Any malfunctions on the device that affect the safety of the user or of third parties must be rectified immediately. All warnings and safety instructions attached to the devices must be observed and kept in readable condition. It is essential that the appliance is used as intended. The manufacturer assumes no liability for damages that result from improper use. The device must not be used as a safety component as defined in the Machinery Directive 2006/42 / EC. Additional safety devices are required in plants with an increased danger potential. The operator must ensure that the chosen mode of operation does not lead to damage to the material or to personal injury, and that all protective and safety devices are in place and functional. Before installing and commissioning read and understand this operating manual, and the safety information. The operating instruction manual must always be available at the location of the devices. It must be thoroughly read and used by the person, who is responsible for the operation, maintenance and servicing of the device.
- The EU Machine Directive, laws and rules concerning the prevention of accidents, and laws and standards which are in force in the EU and in the individual countries have to be strictly followed.
- The TOUSEK Ges.m.b.H. can not be held liable for any claims resulting from disregards of the laws and standards in force during the installation and operation.
- The packaging materials (cardboard, plastic, EPS foam parts and filling material etc.) have to be properly disposed of in accordance with the applying recycling and environmental protection laws. They may be hazardous to children and therefore have to be stored out of children's reach.
- The product is not suitable for installation in explosion-hazardous areas.
- The product may only be used in accordance with its original purpose, for which it has been exclusively designed, and which is described in these installation and operating instructions. The TOUSEK Ges.m.b.H. rejects any liability if the product is used in any way not fully conforming to its original purpose as stated herein.
- Children have to be instructed that the gate facility as well as the belonging parts may not be used improperly, e.g. for playing. Furthermore handheld transmitters have to be kept in safe places and other impulse emitters as buttons and switches have to be installed out of children's reach.
- Before beginning with the installation the installer has to make sure that all mechanical components of the gate facility, like carrier profile/rail, gate frame and panels, guiding elements etc. are sufficiently supportive and resistant for the purpose of gate automation.
- All electrical installations have to be made in full conformity with the applying rules and laws (e.g. using a fault current circuit breaker, proper grounding etc.)
- **An all-pole disconnecting main switch with a contact opening-gap of minimum 3 mm has to be foreseen.**
- After installation the proper function of the gate facility and the safety devices has to be checked!
- The TOUSEK Ges.m.b.H. rejects any liability for claims resulting from usage of the product in combination with components or devices which do not fully conform to the applying safety laws and rules.
- Only original spare and replacement parts may be used for repair of the product.
- The installer has to inform the user about all aspects of the automatic operation of the complete gate facility, as well as about emergency operation. The installer further has to supply to the user all instructions relating to the safe operation of the gate facility. The installation and operating instructions also have to be handed over to the user.

Declaration of conformity:

The company TOUSEK Ges.m.b.h., Zetschegasse 1, 1230 Wien, declares that the product ISD 6 complies with the R & TTE Directive 1999/5 / EC with the purpose of „vehicle detection“ in accordance with Article 3 and that following standards were applied:

1. Security / health (Article 3.1.a of the R & TTE Directive)
Applied standards: IEC 60950-1 2005 (2nd edition) + A1: 2009EN 60950-1 2006 + A11: 2009 + A1: 2010 + AC: 2011 + A12: 20112
2. Electromagnetic compatibility (Article 3.1.b of the R & TTE Directive)
Applied standards: ETSI EN 301 489-1 V1.9.2
ETSI EN 301 489-3 V1.4.13
3. Efficient use of radio spectrum (Article 3.2 of the R & TTE Directive)
Applied standards: ETSI EN 300 330-1 V1.7.1
ETSI EN 300 330-2 V1.5.1

Juni 2013

Characteristics

- 1-channel detector
- Fast autom. self-adjustment, thus simple commissioning
- Continuous adjustment of frequency drift (e.g. temperature and humidity changes)
- Loop break or loop short-circuit messages through LED display
- Selectable functions::
 - Adjustable response sensitivity
 - Permanent or pulse signal
 - Switch-on delay of 1 sec.
 - Switch-off delay of 2 sec.
 - Pulse when leaving the loop
 - Occupied message in case of a fault (the corresponding channel relay switches also in a fault occurs)
 - Two frequency settings



Function and operation of the detector

The induction impulse ISD 6 (2-channels) evaluates laid loops in the ground. These represent the inductance of a high frequency oscillator circuit. A vehicle passing the loop causes due to its metal parts, a change in frequency of the resonant circuit. These are evaluated by the loop detector, a switching signal via potential-free relay contact output and displayed on the LEDs on the front side.

The analysis of the loop frequency is performed by a microprocessor system that automatically adjusts to the corresponding loop and compensate automatically changes in the loop inductance due to temperature, humidity or component aging.

The ISD 5 is a 1-channel evaluator: an induction loop can be connected to this device and evaluated therefrom. Since the device automatically adjusts itself, it is extremely easy to operate and does not require any maintenance. The switching outputs are coupled to the LED display (DET) on the front side. There are two switching outputs available. The A relay is switched as a static signal or as a pulse by the „loop occupied“ state. The B relay gives an additional pulse and can be activated as a switching output for the fault report (ERR) using the front panel operation control.

technical details

Induction loop detector ISD 5			
supply voltage	230V a.c. +6%, -10% < 4,5VA	frequency range	2 steps (LOW or HIGH)
operating temperature	-25°C to +70°C	operating frequency	20kHz – 70kHz
storage temperature	-40°C to +80°C	adjustment	autom. after switching on the power supply, after pressing the reset switch, after any parameter change
protection class	IP 20	switch output	potential-free relay contacts: U _{max} = 250 V I _{max} = 5 A
connection	11 pole connector (type 78-S 11)	displayed elements	LED red (ERR) = loop defect LED green (DET) = detection LED yellow (PWR) = Power indicator
inductance range	20µH–2000µH		
recomm. inductivity	100µH–300µH		
loop resistance	max. 30Ω	suppressor circuit	Galvanic isolation by means of transformers, glow lamps
measuring time per channel	min. 5ms – max. 25ms	loop input	
cycle time	measurement time Channel 1	art.no.	13430130

2. Settings and display

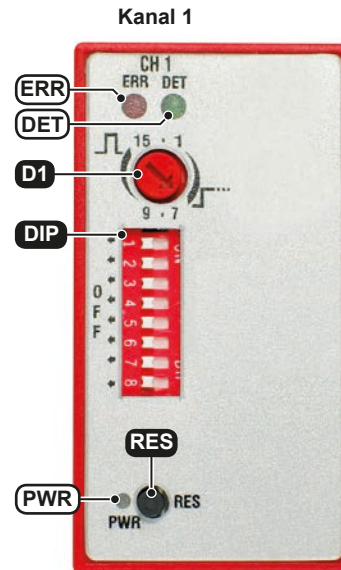
Induction loop detector ISD 5

- All settings are performed using rotary coding switches (**D1**) or dip switches (**DIP**).



important

- A new adjustment is carried out automatically after every device adjustment, except after a change in the frequency (DIP switch 1 (DIP) OFF / ON), the reset button (RES) must be pressed.



2.1 Switch and fault status display

Settings and display

- The switching status „loop occupied“ is indicated by the green channel LED (**DET**).
- A fault is signaled by the red channel LED (**ERR**).
- A detector perturbation, e.g. Short circuit, is indicated by cyclic flashing of the green channel LED (**DET**).
- A defined number of LED flashes is specified for each error, which occurs repeatedly every 5s.

Channel-LED (DET): Switch and fault status display


number of flashes	Channels-error
1	loop short-circuit
2	loop open, loop break
3	frequency not adjustable
4	breakdown
7	maximum adjustment period exceeded


2.2 Setting with rotary encoder switch (D1)

Settings and display

Setting with rotary encoder switch (D1)



Symbol	function
	Pulse (Pulse mode): With this setting, the relay switches only one pulse independently of the vehicle detection time. Pulse length 100 ms
	Static (Static Hold Time): with this setting, the relay switches into "Static", ie, as long as a vehicle is detected in the coverage area.
position	function
	Off (switch off) Using this switch the corresponding detector channel can be switched off.
	Test mode Relay This switch position makes it possible to check the devices / controls connected to the detector: As long as the switch (D1) is set to this switch position, the two relay contacts can be switched on and off alternately by pressing the reset button (RES). => keystroke (RES): only relay A. Initial position: relays A and B not active => keystroke (RES): only relay A active => keystroke (RES): only relay B active => keystroke (RES): both relays active => keystroke (RES): => Initial position

Static holding time			
position		function	
	1	min. sensitivity	0,3*
	2	sensitivity	0,17*
	3	sensitivity	0,1*
	4	sensitivity delivery state	0,035*
	5	sensitivity	0,02*
	6	sensitivity	0,012*
	7	max. sensitivity	0,007*

pulse operation			
position		function	
	9	min. sensitivity	0,3*
	10	sensitivity	0,17*
	11	sensitivity	0,1*
	12	sensitivity	0,035*
	13	sensitivity	0,02*
	14	sensitivity	0,012*
	15	max. sensitivity	0,007*

*(Frequency change in %)

2.4 DIP switches (DIP)

DIP switches (DIP)			
DIP 1		Frequency setting: This setting avoids couplings caused by adjacent loops:	
Frequency		OFF = Freq. HIGH ON = Freq. LOW	 Two or more detectors should not operate at the same frequency
DIP 2	ON	Boost - Increased sensitivity: the boost function causes an automatic increase of sensitivity, only limited to the max. sensitivity allowed. For example: this way truck drawbars can be easily detected. After the vehicle leaves the loop, the sensitivity returns to the originally set value. This function is disabled when in pulse mode.	
BOOST - Sensitivity boost			
DIP 3	ON	Switch-on delay activated: the switching signal is given when the loop is damped for more than one second.	
Switch on delay		 This function must not be selected when the detector is used as a security device for barriers and gates! !	
DIP 4	ON	Switch-off delay activated: the switching signal is switched off with a delay of 2 seconds after the loop is released (not when in pulse mode).	
Switch off delay			
DIP 5	ON	Pulse on exit/ when leaving the loop: This setting only affects the B relay. The detector does not switch the B relay until the loop has been exited. The pulse operation and the additional switch-off delays have no effect on the length of the setting „pulse on exit/ when leaving the loop“. In static operation, the pulse is given only after releasing the A relay.	
Pulse on exit			
DIP 6	ON	Relay output activated in case of fault: a loop fault is indicated by the corresponding LEDs (ERR). In addition, the corresponding channel relay is switched.	
Detection by fault			
DIP 7		Relay mode: OFF = open-circuit-principle ON = closed-circuit-principle see page 6 „Switching states“	
Relay mode			
DIP 8	ON	B-relay as fault report: In the event of a detector fault, the B relay switches. The function B-relay as pulse relay is canceled. The „pulse output“ or „pulse when leaving the loop“ can be given on the main relay.	
B-relay as fault report			

2.5 Reset button (RES)

The reset button (RES) has two functions, depending on how long the push button is pressed:

- **Adjustment:** short keystroke (<2s), initialization of all activated loop channels.
- **Reset:** average duration of the keystroke (> 2s), reset of the detector, subsequent initialization of all channels.



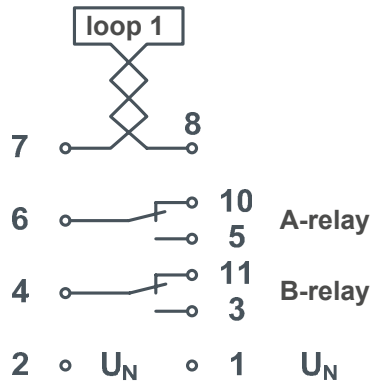
Adjustment

- When the operating voltage is applied, in case of power interruption or when pressing the reset key (RES), the loop detector adjusts itself automatically to the connected loops and switches the relays to the „loop not damped“ position. During the adjustment the power LED (PWR) flashes at a frequency of 5 Hz and lights up when the adjustment is completed. This operation is usually completed within <2 seconds.
- During the adjustment phase no vehicles shall be on the loops, otherwise these will be no longer recognized!

3.1 terminal assignment plug-in socket

Anschluss und Installation

11 pole plug-in socket



potential free relays A,B

U _{max} = U _{eff}	250V a.c.
I _{max} = I _{eff}	5A

UN = power supply ISD 5

A-relay



The switching contacts of the A relay connected to the control transmit the status of the loop (safety loop through the contact 6/10 or loop for OPEN pulse via contact 6/5).

B-relay = pulse relay
(See DIP switch, page 5)

Contact:

Detector on, loop not occupied
DIP switch (DIP) S7 = OFF active

Power supply and connection
on the left side label.



Attention

- For the versions with a 230VAC voltage supply, only voltages which are not in the voltage range of an extra-low (SELV) voltage and do not exceed 250 VAC may be connected to the relays!
- Only loops with the following additional insulation characteristics may be connected:
 - A) Insulation $\geq 0,4\text{mm}$
 - B) Voltage rating $\geq 1,5\text{kV}$

Switch states

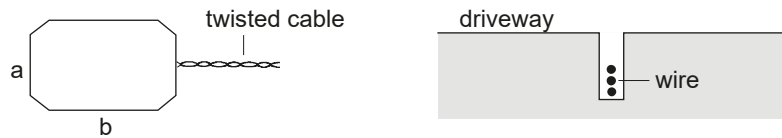
Switch states (eg channel relay A)

Voltage-free state		
DIP 7 = OFF (open-circuit-principle):	loop not occupied	loop occupied
DIP 7 = ON (closed-circuit-principle):	loop not occupied	loop occupied

loop geometry

- The safe function of the device depends essentially on the technically perfect installation and laying of the loops, since these are the sensors of the device. The loop must not be loaded or moved mechanically. The loop wire lines have to be twisted approx. 20 to 50 times per meter and laid separately from voltage-carrying cables.
- the loop form should always be a rectangle. The number of turns/windings of the loop depends on the size of the loop circumference.

loop extent	number of turns
4–5 m	5
5–6 m	4
6–15 m	3
15–25 m	2



The table shows the required number of windings at various extent areas (for an aspect ratio $b: a = 3: 1$)

laying the loop

- Before laying the loop, cut a groove approximately 5-8mm wide and at least 30-40mm deep into the roadway.
- At the corners the loop should not be laid at a right angle but at approx. 45 °.
- If possible, the long side of the loop should be parallel to the direction of travel.
- After carefully inserting the wire (PTFE 1.02) into the groove, this has to be protected against moisture.



- The loop has to be laid and shed in such a way that no mechanical change occurs when driving onto it.
- 230V lines may not be installed in the I-loop (at least 1 m away)!

laying the loop layout

- The supply line to the loop must be firmly twisted (at least 20 twists per meter) and can run either in an empty pipe or in a groove to the detector.



cable length > 30m should be avoided. If a longer lead is required, or if there is a likely influence by a 230V (400V) lines, then a twisted pair of cable with screen has to be used (for example, A-2YF telecommunications cable 0,8 mm²).

foreign influence on the loop

To avoid function disturbances, the following minimum distances must be observed:

- Rolling gates, sliding gates, etc.: 1m
- Steel reinforcements in the roadway at least 15 cm below the loop
- Non moving metal parts (hydrants, channel covers, ...): 0,5m
- Minimum distance to supply lines $\geq 230V$: 1m

**Attention**

- Mount undismount the device only when no voltage is present!
- Installation, connection, commissioning and maintenance may only be carried out by qualified personnel, observing the assembly instructions, the practical rules of conduct and in compliance with the applicable standards. Incorrect assembly can lead to serious injuries and property damage!
- Do not use the connector as a mechanical attachment!
- Observe the general rules for loops installation.

- Before switching on the supply voltage, the device must be plugged into the socket. To use the device in an environment with higher protection class requirements you need to use a suitable housing.
- The frequency setting can be selected freely in case of operation with a loop.



If two or more induction loop detectors are used, different frequencies must be selected in order to avoid mutual interference.

- **Adjustment:** When the operating voltage is applied, in case of power interruption or when pushing the reset key (**RES**), the loop detector adjusts itself automatically to the connected loops and switches the relays to the „loop not damped“ position. During the adjustment the power LED (**PWR**) flashes at a frequency of 5 Hz and lights up when the adjustment is completed. This operation is usually completed within < 2 seconds. Longer adjustment periods are caused by frequency instabilities, whose causes must be identified and eliminated.

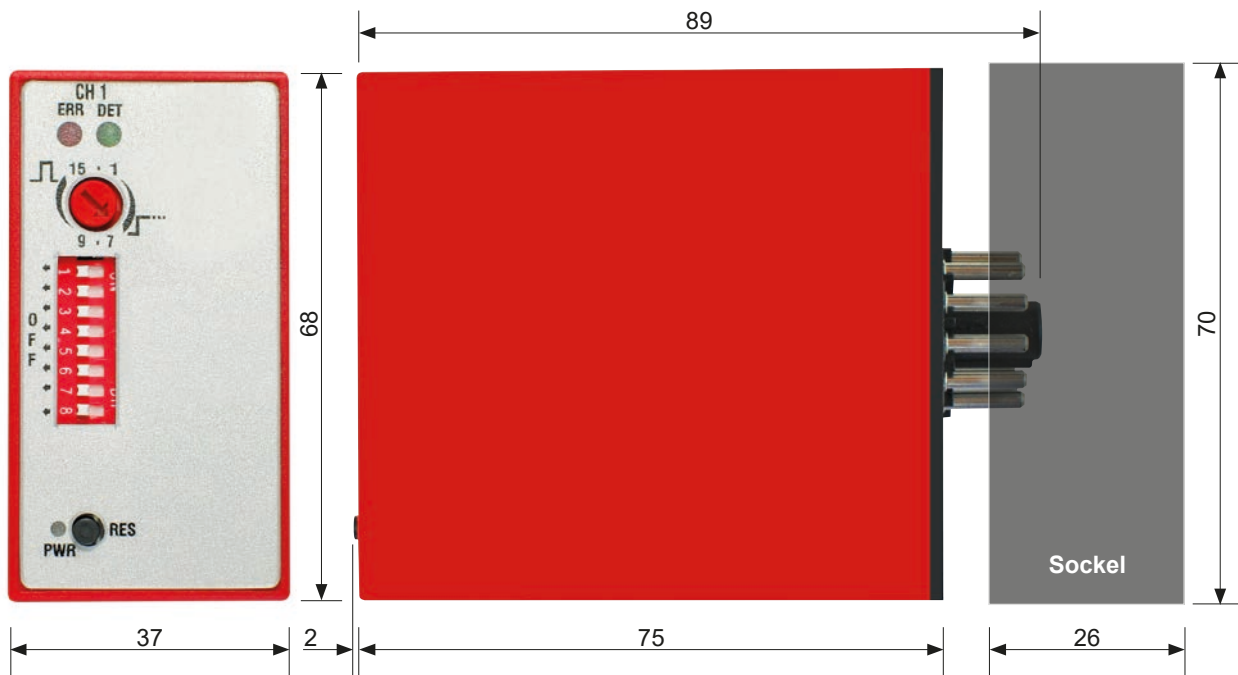


During the adjustment phase no vehicles shall be on the loops, otherwise these will be no longer recognized!

- If a different frequency is set during operation, the detector must be re-adjusted by pressing the RESET button (see point 2.5)
- The sensitivity is adjusted by means of the rotary coding switches (**D1**).

error	possible cause	remedy
Detector does not match, yellow LED (PWR) does not light up	no power supply for the detector	Check connection of the power supply
Red LED (ERR) lights up, Green LED (DET) flashes cyclically twice	Detector finds „break in the loop“	Check loop and loop connection
Red LED (ERR) lights up, Green LED (DET) flashes cyclically once	Detector finds „Loop short-circuited“	Check loop and loop connection
Green LED (DET) is continuously on	„Relais Testmodus“ angezogenes Relais ist aktiviert, Drehcodierschalter (D1)-8	Deactivate relay „test mode“ (see „Setting for sensitivity and hold time „)
Yellow LED (PWR) flashes with approx. 5 Hz after adjustment / reset	Vehicle movement on the loop	Release the loop during the adjustment
	Loop is moved mechanically	Check the loops, observe the instructions for loops
	Channel switched off „Rotary coding switch (D1) -0 or“ Test mode „Rotary coding switch (D1) -8	Activate the channel (see „settings for sensitivity and hold time „)
Detector does not switch despite adjustment	Sensitivity too low Increase sensitivity step by step	Increase sensitivity step by step until vehicles are detected

• size in mm



We reserve the right to change dimensions and technical specifications without prior notice.

tousek PRODUCTS

- sliding gate operators
- cantilever systems
- swing gate operators
- garage door operators
- folding door operators
- traffic barriers
- electronic controls
- radio remote controls
- key operated switches
- access control
- safety devices
- accessories

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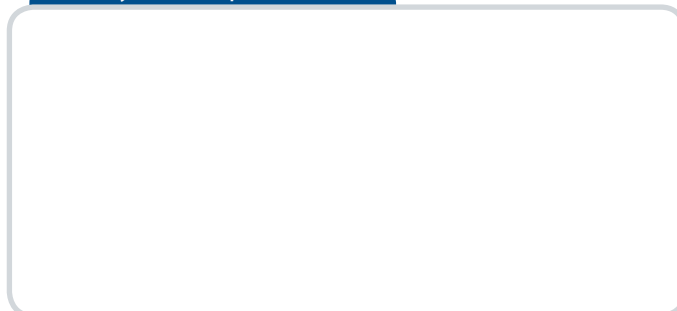
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