

IG315/2

User manual



Subject to technical modifications.

www.swarco.com/sts

1 Introduction

On the following pages you will learn how to install and operate the device in an appropriate way. We attach great importance to the safe, appropriate and effective handling of this device. It is therefore important to read this manual thoroughly before using the device.

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IG315_2_BE_20

In the manual you will find important instructions helping you to avoid danger and to prolong the reliability and durability of the device and the accessories.

For your own safety you should read the safety instructions. Follow the instructions closely in order to avoid danger for yourself and others or damage to the device.

If you have any questions about the IG315/2, which are not answered in this manual, or if you have problems understanding the descriptions, please contact:

SWARCO TRAFFIC SYSTEMS GMBH
Business Unit Detection
Niederkircher Straße 16
D-54294 Trier
detection@swarco.de

1.1 Usage according to regulations

The IG315/2 is solely suited for the detection of vehicles. Any further usage is not appropriate. Do not use the IG315/2 for any other purpose.

1.2 Label

The IG315/2 is provided with a quality label / serial number. You will need these indications when talking with the customer service, e.g. ordering accessories or spare parts.

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Note here the serial number and name of the device in order to have them available when needed:

Serial number:

Voltage version:

CE-label:

1.3 Further documentation

Notes on loop installation

1.4 Symbols

In several places throughout this manual you will find the following symbols stating important safety instructions:



ATTENTION!

This symbol indicates dangers which might cause damage to people or property.



Note

This symbol indicates information for installation and function of the device.

1.5 Safety instructions

Read the following safety instructions thoroughly and observe them carefully. They are stated to ensure your own safety and the safety of others and to avoid damage to the device or accessories.

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ATTENTION!

Danger of electricity! Make sure that no liquid may get inside the device. If this happens, interrupt the power supply to the device at once.

If you notice any damage, e.g. broken or crushed cables, damaged plugs, enclosures etc., turn off the device at once, interrupt the power supply and make sure that the device cannot accidentally be turned on again.

The device may only be installed, brought into service and repaired by an electro-technical expert. Inappropriate operation, improper maintenance or not observing the instructions in this manual can lead to danger.

Any malfunction of the device which may limit the safety of its users or others must be removed immediately. All warning and safety labels on the device must be observed and kept complete and legible.

The appropriate usage must be observed by all means. For damage resulting from inappropriate usage the manufacturer will not undertake any liability.

The device must not be used as a safety component in the sense of the European Directive 98/37/EC ("Machinery Directive"). In systems with high risk additional safety measures are necessary.

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The operator of the device must ensure that the chosen means of operation will not cause damage to material or danger to people and that all security and safety installations are present and functioning.

Before installation and first operation, please observe the instructions in the manual.

The manual must be available at the site of usage at any time. It must be read thoroughly and applied appropriately by the person responsible for the operation, maintenance and service of the device.



Note

Our products are in a constant process of improvement and advancement. Because of this, read the current manual thoroughly before installation and first operation.

Without prior consent of the manufacturer, no modifications, neither mechanical nor electrical, may be done. Only parts that have the consent of the manufacturer may be used for backfitting or as accessories. Any violations will lead to the termination of conformity and the manufacturer's warranty. The user will subsequently bear the risk (the Declaration of Conformity is available at www.swarco.com/sts).

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2 Product description

2.1 Features

The induction impulse transmitters IG315/2 evaluate the loops in the ground. Those depict the inductivity of a high-frequency oscillator circuit. If a vehicle crosses the loop, its metal components cause a change of frequency in the oscillator circuit. These are analysed by the loop detector, transmitted as switching signals via floating relay contacts and displayed on the front LEDs. The analysis of the loop frequency is done via a micro-processor system which aligns automatically to the according loop and compensates changes of the loop inductivity caused by temperature, humidity or aging of components. The induction impulse transmitter IG315/2 is a 1-channel unit, which means that this device can connect to and evaluate one induction loop.

2.2 Switching outputs

The switching output is coupled with the LED display (A) on the front panel (see 4). There are two switching outputs available. Relay A is switched as static signal or impulse for the mode "loop occupied". Relay B emits an additional impulse or can be activated as switching output for the failure report (ERROR) via the operating units on the front. All switching outputs are equipped with electro-mechanical relays.

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2.3 Parameter adjustment

Via the DIP-switches on the front the following parameters can be adjusted:

- sensitivity
- hold time
- frequency of the measuring system
- switch-off delay
- B-relay as fault report, (instead impulse relay)
- impulse when leaving the loop
- switch-on delay
- automatic alignment
- detection by fault

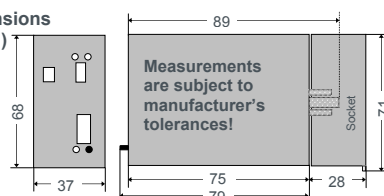
2.4 Technical data

Technical data		
	IG315/2 S.T. / IG315/2 W.T. / IG315/2 ST.T.	IG315/2 S.V. / IG315/2 W.V. / IG315/2 ST.V.
Power supply	230 V AC: (-10 - +6) % / 4,5 VA (50 Hz: +/-0,5 %) resp. 24 V AC/DC: +/-10 % / 3 VA	
Operating temperature	-25°C to +70°C	
Storage temperature	-40°C to +80°C	
Safety	IP30	
Enclosure (plastic)	l = 75 mm, w = 37 mm, h = 68 mm	
Connection	via 11-pin connector (type 78-S 11); dimension of socket manufacturer-dependent	
Weight	240 g	
Inductivity range	15 µH to 2000 µH (see also 6.1), recommended range: 100 µH to 300 µH at max. 30 Ω	

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Technical data		
	IG315/2 S.T. / IG315/2 W.T. / IG315/2 ST.T.	IG315/2 S.V. / IG315/2 W.V. / IG315/2 ST.V.
Sensitivity adjustable per channel	7 levels adjustable from High 0.01 to Low 0.9 (adjustment of frequency in %)	per channel adjustable in 4 levels from High 0.01 to Low 0.9
Hold time	impulse mode 100 ms (optional 1 s) and static hold time	per channel in 4 levels adjustable: 0.1 s; 4.5 min; 2 h; ∞
Alignment	automatically after switch-on of power supply, after pushing reset switch	
Output	floating relay contact $U_{max} = 250 \text{ V}$, $I_{max} = 2 \text{ A}$, $P_{max} = 60 \text{ W}$ (ohm resistive load)	
Displays	LED red = loop failure, LED green = detection, LED yellow = blinking when alignment / power	
Safety circuit loop input	galvanic separation by transmitter, glow lamp	

2.5 Dimensions (in mm)



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2.6 Pin connection

Standard model 315/2 SV / ST *



N.C. = not connected
 U_N = power supply device *
Contact position: Detector on, loop not occupied

* indicated on right label of device

Special model

315/2 WV / WT *



9 = N.C.

315/2 STV / STT *



9 = N.C.

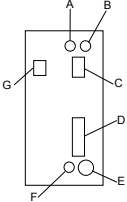
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3 Installation of the IG315/2
For the use of the device in a surrounding with higher protection requirements, SWARCO TRAFFIC SYSTEMS offers special enclosures (type GHIG300 / GHIG301).

Before switching on the power supply, the device must be plugged onto the socket.

3.1 Special notes on the loop
The safe functioning of the device depends essentially on the technically proper installation and laying of the loops, since the loops are the sensors of the device. The loop feed cable must be drilled approx. 20 – 50 times per meter and must be laid in distance from life wires. For further information see notes on laying of loops (available at www.swarco.com/sts).

4 Device adjustments
After every device adjustment a new alignment must be effected by pushing the reset-button (E).



4.1 Adjustment of sensitivity and hold time
IG315/2 Version „Tor“ (gate)
(Type: IG315/2S.T. / IG315/2W.V. / IG315/2ST.T.)*
* indicated on right label of device

channel switch (C)	S1	S2	S3	hold time: S4
sensitivity 7 (high)	on	on	on	on=impulse / off=static
6	off	on	on	"
5	on	off	on	"
4 (med)	off	off	on	"
3	on	on	off	"
2	off	on	off	"
1 (low)	on	off	off	"
test mode relay released	off	off	off	off
test mode relay tightened	off	off	off	on

default setting: sensitivity **4 (med)** and **static** hold time.

sensitivity:
adjustable in 7 levels
channel switch (C) S1-S3

hold time:
static (presence)
or impulse 100 ms
channel switch (C) S4

IG315/2 Version „Verkehr“ (traffic)
(Typ: IG315/2S.V. / IG315/2W.V. / IG315/2ST.V.)*
* indicated on right label of device

channel switch (C)	S1	S2	S3	S4	hold time
sensitivity 4 (high)	on	on	on	on	0,1s
3	off	on	on	on	4.5min.
2	on	off	on	on	2h
1 (low)	off	off	off	off	∞
test mode relay released	off	off	off	off	
test mode relay tightened	off	off	off	on	

default setting: sensitivity **3** and **2h** hold time.

sensitivity:
adjustable in 4 levels
channel switch (C) S1-S2

hold time:
adjustable in 4 levels
channel switch (C) S3 - S4

4.2 Adjustment of frequency
with the frequency switch (G) S1-S2 in order to avoid couplings caused by nearby loops. Two or more detectors must not operate on the same frequency.


frequency switch (G)	S1	S2
frequency 4 (high)	left*	left*
3	right*	left*
2	left*	right*
1 (low)	right*	right*

*position of switches (see also front panel)
default setting: **4 (high)**

4.3 Function selection switch (D)

Switch 1 on Switch-off delay on	The switching signal is switched-off with a delay of 2 seconds after the loop is vacant (not in impulse mode).
Switch 2 on B-relay as fault report	B-relay switches when detector fault. The function B-relay as impulse relay is invalid. The "impulse output" or "impulse when leaving the loop" can be emitted on the main relay (channel switch (C) switch 4 on / function selection switch (D) switch 3 on).
Switch 3 on Impulse when leaving the loop active	The detector switches the B-relay only after the loop is vacant. The channel adjusted to impulse mode and the additional switch-off delay has no influence on the "impulse when leaving the loop". In static mode the impulse is only emitted after the A-relay is released.
Switch 4 on Switch-on delay on	The switching signal is emitted when the loop is attenuated for more than one second.
Switch 5 on Automatic alignment active when fault	When there is a loop fault, the detector aligns anew automatically after approx. 12 seconds. If the fault lasts for a longer period of time, the detector keeps trying to align until the fault is eliminated. The relays and LEDs stay in "fault" position until the alignment is effected.
Switch 6 on Detection by fault active	A loop fault is indicated on the LEDs and additionally the according channel relay is switched on. For a combination with switch 6 on , switch 5 must by all means rest on off , since otherwise the detector aligns anew after 12 seconds and a vehicle which might stand on the loop will not be detected anymore.

5 Alignment and fault diagnosis
5.1 Alignment
When switching on the power supply, when there are voltage interruptions or when the reset switch (E) is pushed, the loop detector automatically aligns itself to the connected loops and switches the relays to switching position "loop not attenuated". During the alignment period the yellow power-LED (F) is blinking for a few seconds. With a low sensitivity the detector is ready for operation at once. After the alignment the power-LED (F) keeps glowing.

 During the alignment phase there may be no vehicle on the loop since it will not be detected.

Display of switching and failure status
The switching mode "loop occupied" is indicated by a glowing green channel-LED (A).
Loop failure caused by a short-circuit, an interruption or a loop inductivity outside of the permitted range is indicated by a glowing red channel-LED (B).

5.2 Detection and correction of errors

Description	Possible cause	Correction
Detector does not align, yellow LED does not glow	There is no power supply for detector	Check connection to power supply
Red LED glowing, green LED blinking long, long, long	Detector detects "loop interrupted"	Check loop and loop connection
Red LED glowing, green LED blinking short, long, short	Detector detects "loop short-circuited"	Check loop and loop connection
Yellow and green LEDs glowing, relay permanently tightened	Test mode relay tightened is active Loop is moved mechanically	Deactivate test mode (see table Adjustment of sensitivity and hold time) Control laying of loop, observe documentation "Laying of loops"
Detector does not switch in spite of effected alignment	Test mode relay released is active Chosen sensitivity is too low	Deactivate test mode (see table Adjustment of sensitivity and hold time) Progressively increase sensitivity until vehicles are detected correctly

Description	Possible cause	Correction
Yellow LED continuously blinking	Vehicle movement on the loop	Keep loop clear during alignment
	Loop is moved mechanically	Control laying of loop, observe documentation "Laying of loops"
	Electromagnetic coupling onto the loop	Eliminate cause of coupling, observe documentation "Laying of loops"

After every change of adjustment resp. correction of error the reset button (E) must be pushed!

6 EC Conformity



6.1 Requirements for the usage according to regulations
Requirements acc. to ETSI EN 300330-1 (2002-12)
For the antenna factor (loop area A in m² multiplied by the number of loop windings N) the following is imperative: **N*A ≤ 60 m²**

Product Class 2:	Product Class 3:
Maximum length / width	30 m
Area	< 30 m ²
Number windings	≥ 1

Constraints for the compliance with EN 300330-1
According to the stated formula, the following loop windings in dependence to the loop area are recommended:

Product Class acc. to EN 300330-1	Area	Number windings	L _{loop} [μH]
2	(1 – 3) m ²	6	100 – 300
	(3 – 5) m ²	5	80 – 260
	(5 – 10) m ²	4	160 – 320
	(10 – 15) m ²	3	180 – 280
	(15 – 30) m ²	2	80 – 180
3	(30 – 60) m ²	1	40 – 100

Operating frequency range (L = 15 μH – 400 μH)
20.05 kHz < f < 70 kHz

Total inductivity (loop + feed cable):
Specification: L_{total} < 400 μH

Example:
Loop inductivity 200 μH; feed cable inductivity < 200 μH with 100 μH / 100 m: length of feed cable < 200 m

Requirements acc. to DIN EN 60950
The device has basic insulation.

6.2 EC Declaration of Conformity

EG-Konformitätserklärung
EC-Declaration of Conformity

Hersteller / manufacturer: Weiss Elektronik GmbH
Adresse / address: Niederkircher Str. 16
54284 Trier

erklärt, dass das Produkt / declares that the product:
Typ / type: Induktiver Schleifen-detektor / inductive loop detector
Modell / model: IG315/2 und IG320/2
Verwendungszweck / intended use: Fahrzeugdetektion / vehicle detection for gate and barrier control

bei bestimmungsgemäßer Verwendung den grundlegenden Anforderungen gemäß Artikel 3 der RÄTTE-Richtlinie (2004/108/EG) entspricht und dass die folgenden Normen angewandt wurden: complies with the essential requirements of Article 3 of the RÄTTE (2004/108/EC) Directive / used for its intended use and that the following standards have been applied:

1. Sicherheit / Gesundheit (Artikel 3.1.a der RÄTTE-Richtlinie)
safety / health (Article 3.1.a of the RÄTTE Directive)
Angewandte Norm(en) / Applied standard(s): DIN EN 60950 1995-11

2. Elektromagnetische Verträglichkeit (Artikel 3.1.b der RÄTTE-Richtlinie)
electromagnetic compatibility (Article 3.1.b of the RÄTTE Directive)
Angewandte Norm(en) / Applied standard(s): EN ETS 300 683 1995-11

3. Effiziente Nutzung des Funkfrequenzspektrums (Artikel 3.2 der RÄTTE-Richtlinie)
efficient use of the radio frequency spectrum (Article 3.2 of the RÄTTE Directive)
Angewandte Norm(en) / Applied standard(s): ETSI EN 300330-1 2002-12
ETSI EN 300330-2 2001-09

Trier, 21.07.2006
(Gefährdeter / Danger) (Technische Leitung / Technical Director) (Qualitätsmanagement / Quality Management)
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