Kiwitron
SMART INDUSTRY SOLUTIONS

Edition 30.04.2025

KiwiShield

K007340

Manual for installation, use and maintenance

Kiwitron
SMART INDUSTRY SOLUTIONS

CE

Declaration of Conformity - (DoC)

We

Manufacturer:	Kiwitron S.R.L.
Address:	Via Vizzano 44, 40037 Sasso Marconi (BO) - Italy

Declare that the DoC is issued under our sole responsibility and belongs to the following product:

KiwiShield K007340;

Object of the declaration:

Device for perimeter protection

The subject of the above declaration is in accordance with the following rules:

Electromagnetic Compatibility Directive 2014/30/EU

Directive RED 2014/53/EU

and therefore complies with the following norms / standards:

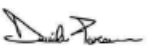
UNI EN 12895:2019 Industrial trucks - Electromagnetic compatibility

and related standards / ETSI standards

Place: Sasso Marconi (BO) - Italy **Valid from:** 03/18/2025

Last update: 03/18/2025

Person authorized to compile the technical file: Daniele Parazza



Legal representative: Andrea Filippini

Kiwitron
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UK CA

UKCA Declaration of Conformity - (DoC)

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Statutory Instruments: S.I. 2016:1091

Statutory Instruments: S.I. 2017:1206

and therefore complies with the following norms / standards:

UNI EN 12895:2019 Industrial trucks - Electromagnetic compatibility

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Index

Revisions

Version	Comments	Chapters edited
00	First issue	All

Tab.1 - Document revisions

Purpose and field of use

Users	• Installer; • Operator of the vehicles on which it is installed; • Qualified personnel authorised to maintain the device.
Purpose	• Provide information needed for: • The correct installation of the device; • The correct awareness of operators to safety issues; • Using the device under safe conditions.

Tab.2 - Purpose and field of use

Key

	Warning/Caution - Important safety information
	General information and suggestions
	PROHIBITION: Operations or actions NOT permitted.

Tab.3 - Key

Safety instructions and warnings

The device must be operated by appropriately trained and qualified personnel.

Before installing and operating the device, please read and understand this manual carefully to avoid damaging the product and putting your own safety at risk.

The technical information in this document is provided for information purposes only and does not constitute a contractual commitment.
Kiwitron s.r.l. reserves the right to make any graphic or functional changes to devices and/or software without prior notice.

The Kiwitron device **cannot** replace the safety devices of the vehicle on which it is installed.

The Kiwitron device **must** be installed in compliance with general safety regulations.

It is forbidden to install the device to inhibit or alter the operation of the safety systems already on the vehicle.

It is forbidden to use the system to operate contactors, as opening them while current is passing would cause an electric arc.

Warn the operator of the vehicle before carrying out any remote operation (web cloud or remote connection via PC) to prevent dangerous situations.

Where the device is installed in such a way that a maximum/minimum performance limit can be activated dynamically, the safety of the machine and the operators **must** be respected. In any case **it is forbidden** to command the complete stop of the vehicle but only a reduction of its speed. Any change in the operating parameters of the vehicle **shall not** create potential danger situations. In any case, connection and calibration operations external to the systems provided by Kiwitron are the sole and complete responsibility of the installer, including any risk analysis that may be necessary.

Do not use the device in the presence of flammable gases or fumes, in the vicinity of filling stations, fuel depots, chemical plants or during blasting operations. **Avoid any potentially explosive atmosphere.**

Warnings on the emission of radio waves

The device receives and emits radio waves.

The maximum power radiated by the device is below the thresholds imposed by the regulations.

The wireless modules used for GPRS and Wi-Fi transmissions meet all the security requirements required in the field of high frequency radio wave communications.

Interference may be generated if used in the vicinity of equipment such as TVs, radios, computers or any unshielded electrical and/or electronic equipment.

Observe the restrictions imposed on the use of electronic devices if the vehicle on which the device is installed is used in hospitals (or other health facilities) or near an airport. In all areas where there are restrictions imposed due to the use of electronic devices.

Intended use

The device is designed for use only on self-propelled forklifts or industrial vehicles with electric, endothermic or hybrid drive that comply with the Machinery Directive 2006/42/EC.
It is also designed for use on agricultural and forestry machinery.

Use not permitted

Any use of device not expressly described in this manual is not permitted.
And in particular:

It is not permitted to install Kiwitron device on vehicles that can travel on public roads.

On forklifts crossing tracks unless a vehicle restraint system is already fitted on the starting consent.

Kiwitron device and its accessories and additional sensors are assistance systems.

Kiwitron device and its accessories and additional sensors are not safety devices as they are not covered by Annex IV of Directive 2006/42/EC and therefore cannot be used for residual risk reduction.

Kiwitron device is not an explosion-proof device.

Kiwitron device cannot be installed on two- or more-axle vehicles with electric traction, with an endothermic engine, such as cars, trucks, mopeds, motorcycles and public-service operating machines.

Risk assessment

It is the obligation of the operator (owner of the vehicle) to carry out an environmental risk analysis prior to installation.

During the installation phase, it is mandatory to ensure that any malfunctioning of the device does not compromise either the safety or the productivity of the operators and the plant.

It is essential to assess the situation should the device be malfunctioning.

It is possible that the machine is not activated following a correct login, or that the slowdown is activated without a collision having occurred.

Limitations on liability

Kiwitron s.r.l. disclaims any liability for damage caused by:

- Misuse of the device.
- Use by unqualified and/or trained personnel.
- Incorrect installation.
- Power supply defects.
- Improper maintenance.
- Unauthorised changes or interventions.
- Incorrect manoeuvres.
- Use of non-original spare parts.
- Use of accessories not foreseen or not authorized in writing.
- Total or partial non-compliance with the instructions.
- Unusual cases.
- Cases not in accordance with the regulations and legislation currently in force in the country of installation.

Kiwitron s.r.l. is not aware of the specific ways in which its buyer will use the sold device and is therefore not able to know whether such use may violate the rights of third parties. In addition, the sold device is not usable in a single mode but can be configured according to customer needs. Therefore, Kiwitron s.r.l. is not liable in any way for any unlawful use of the sold device that violates the rights of third parties resulting from patent rights or other industrial property titles.

Kiwitron s.r.l. is relieved of any responsibility in the case of installation of the device on vehicles also authorised for use on public roads: it is in fact the responsibility of the operator to decide on the installation and use of the device on the vehicle. In this case it is absolutely mandatory to disable the blocking function of the vehicle (immobilizer) and slowing down in the event of a collision, to avoid creating situations of hindrance or danger (for example blocking the vehicle while crossing railway tracks).

Technical assistance and manufacturer's warranty

Technical assistance
In the event of faults, please contact Kiwitron technical assistance department.

Kiwitron s.r.l.

Customer service

Tel. +39 051 1889 3470

Mail: support@kiwitron.it

web site: www.kiwitron.it

Warranty

The warranty is not applicable following breakages and/or defects caused by:

- Misuse of the device.
- Use by unqualified and/or trained personnel.
- Incorrect installation.
- Power supply defects.
- Improper maintenance.
- Unauthorised changes or interventions.
- Incorrect manoeuvres.
- Use of non-original spare parts.
- Use of accessories not foreseen or not authorized in writing.
- Total or partial non-compliance with the instructions.
- Unusual cases.
- Cases not in accordance with the regulations and legislation currently in force in the country of installation.

The warranty does not extend to parts that wear out following normal use such as:

- Electrical cables and connectors.
- Membrana Touch Pad

Refer to the sales documentation to find out all the contractual warranty terms.

General description

Glossary

Term	Definition
CAN bus	The Controller Area Network, also known as CAN bus, is a multicast fieldbus serial standard (mainly in the automotive environment), introduced in the 1980s by Robert Bosch GmbH, to connect different electronic control units (ECUs). CAN has been expressly designed to operate flawlessly even in highly electromagnetically disturbed environments and can use a balanced potential difference line such as RS-485 as the transmission medium.

Tab.4 - Glossary

Device description

The device is a perimeter protection system designed for integration with forklifts and other industrial vehicles.

Uses advanced VCSEL ToF (Time of Flight) technology to detect obstacles and improve operational safety.

Fig.1 - Device overview KiwiShield - Sensor strip

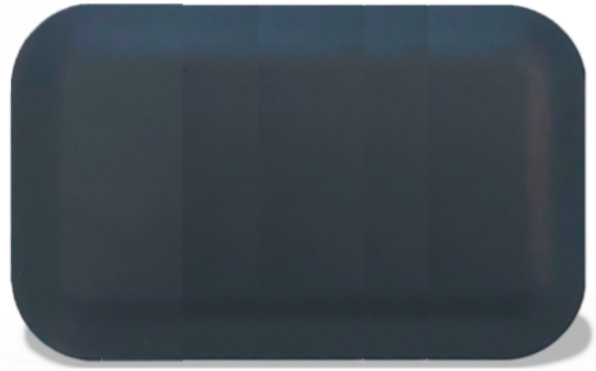


Fig.2 - Device overview KiwiShield - Control unit

Operating principle

The KiwiShield Kit is a perimeter protection system designed for integration into industrial vehicles. It employs a linear array of VCSEL ToF (Vertical Cavity Surface Emitting Laser Time-of-Flight) sensors, embedded along a sensor strip. These sensors provide continuous monitoring of the area immediately surrounding the vehicle.

Each sensor can detect objects within a programmable field of view. The system is capable of detecting both the presence of physical obstacles and the intentional or accidental covering of the sensors themselves.

The sensor data is processed in real time by a dedicated control unit. The control unit communicates over CAN BUS using the CANOpen protocol.

Visual feedback is provided through RGB LEDs.

Technical data

Mechanical specifications - Sensor strip			
Dimensions	Strip: 15x1200 mm Cable: 1000 mm	Material	Strip: TBD Cable: TBD
Weight	TBD g		

Mechanical specifications - Control unit			
Dimensions		Material	Strip: TBD
Weight	TBD g		

Ambient specifications			
Storage/working temp	TBD	IP	Strip: TBD Control unit: TBD

Electrical specifications						
Power supply (Vdc)	**min**	**max**	Power consumption (W)	**typ.**	**max**
	12	48		7	10

CAN-BUS
CANOpen

Technical data

Sensor specifications			
Sensor type	VCSEL ToF 940 ± 30 nm	FOV	programmable up to 27°
Number of sensors	20 (1 every 60 mm)	Sensor covering detection	YES
Minimum measurable distance	25 mm	Maximum measurable distance	2000 mm
LED specifications			
LED type	RGB	Number of LEDs	20 (1 every 60 mm)
Input/Output			
4 x 2A High side Outputs with Short circuit and overload protection, Undervoltage Lock Out protection, Reverse polarity protection, Thermal shutdown, Open Load and Short Circuit detection			
2 x High impedance digital input (1,5~60V max)			

Tab.5 - Technical data

Installation

Strip Installation

The KiwiShield sensor strip can be installed on the vehicle using one of the following methods, depending on the application requirements and environmental conditions.

Direct Installation with Adhesive Tape

In the standard configuration, the sensor strip is installed directly onto the vehicle body using a high-strength double-sided adhesive tape. This method is suitable for applications where mechanical impacts are unlikely to happen, and a minimal, low-profile integration is preferred.

Installation steps:

- Clean and degrease the mounting surface on the vehicle to ensure optimal adhesion.
- Remove the protective film from the double-sided adhesive pre-applied on the back of the strip.
- Position the strip carefully along the desired edge, ensuring a straight and even application.
- Press firmly along the entire length of the strip to guarantee full adhesion.
- Route the sensor cable toward the control unit, securing it along the way with clips or cable ties to avoid movement or mechanical stress.

Ensure the sensor strip is not installed on flexible or moving parts of the vehicle to avoid misalignment or damage.

Installation with Shock-Resistant Support

For applications requiring higher protection against mechanical impacts, the sensor strip can be inserted into a dedicated shock-resistant support before being mounted on the vehicle.

Installation steps:

- Clean the area on the vehicle where the support will be installed.
- Fix the support to the vehicle using either high-strength adhesive tape, screws, or a combination of both
- Ensure that the support is aligned correctly and that the sensor strip surface remains unobstructed.
- Insert the sensor strip into the designated channel within the shock-resistant support, verifying correct alignment and secure positioning.
- Route the sensor cable toward the control unit, securing it as needed.

The use of the protective support is highly recommended in environments where the vehicle may be exposed to frequent collisions, impacts, or abrasive materials.

Control unit installation

Use the fixing flanges to secure the unit using appropriate screws or bolts

Make sure that there is no electrical voltage before carrying out the assembly steps.

Ensure the unit is installed in a position that allows easy access for wiring, maintenance, and diagnostics.

Select a stable, vibration-resistant surface on the vehicle chassis or frame that is protected from direct impacts and external elements.

Avoid mounting the unit on moving parts, panels subject to deformation, or locations exposed to intense heat sources (e.g., exhaust pipes).

In case of installation or use of device by personnel equipped with medical devices (e.g. pacemakers, etc...) follow the instructions of the medical device manufacturer.

It is forbidden to place device near sources of strong heat or exposed to bad weather.

It is forbidden to install the device in positions that influence or limit the safety and visibility of the driver.

Do not use pressure washers; in case of sanitization or cleaning interventions inside the cabin that require the use of water and detergents, it is recommended to protect the wiring, disconnect, and remove the device during the operations. Reconnect it once the cleaning is completed.

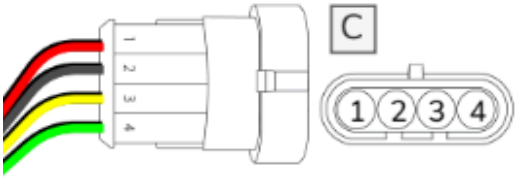
It is forbidden to make fixing holes on the vehicle structures in order to install the device. Use brackets or fastening systems that do not compromise the structure of the vehicle.

Connections

Connect the sensor strip to the control unit.

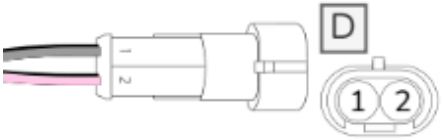
Follow the pinout specified below to connect the control unit to the vehicle.

Pinout



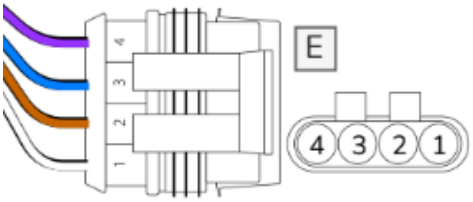
Position	Function
1	Vin (12 - 48 Vdc)
2	GND
3	CAN H
4	CAN L

Tab.6 - Pinout - C



Position	Function
1	High impedance digital input 1 (1,5~60V max)
2	High impedance digital input 2 (1,5~60V max)

Tab.7 - Pinout - D



Position	Function
1	2A High side Output 1
2	2A High side Output 2
3	2A High side Output 3
4	2A High side Output 4

Tab.8 - Pinout - E

Use and maintenance

Maintenance

It is advisable to clean the device periodically, using a soft, bobbles-free cloth.

It is advisable to periodically check the physical state of the various components such as control units, connection cables and external sensors.

Do not use abrasive cloths, towels, paper towels or similar.

Do not rub surfaces excessively

Do not use alcohol, solvents or chemicals.

Do not spray cleaning agents directly onto the product.

Do not allow moisture to enter the openings

Do not wash with water jets or pressurized water jets

What to do if

Since this is a fully customizable system, there may be installation examples not currently included in this version of the document.

For further details you can contact the Kiwitron technical assistance service.

Technical assistance

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