



Handbook



 OPTO-ID LONG RANGE READER STACK 1

- English -

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1. Introduction

This manual was created by Picosens GmbH as a guide for

OPTO-ID Long Range Reader STACK 1

installation. It contains technical information for the installation, montage and operation of the CAR-ID System as well as the product features.

The contents of the guide could be changed without further notice. Further information and graphical contents are available on the Internet under this link www.picosens.com/opto-id/.

- **Read the installation instructions carefully before starting to install the Long Range Reader.**
- **The Long Range Reader should be installed and connected by electrically or mechanically qualified personnel.**

2. CAR-ID System Description

2.1 Basis: OPTO-ID Technology

The CAR-ID and CARGO-ID System is based on OPTO-ID Technology. It is an Ultra-Low-Power Infrared Data Communication Technology for the long range identification of people, vehicles and objects.

The following Figure 1: illustrates the general functional principle of OPTO-ID Systems.

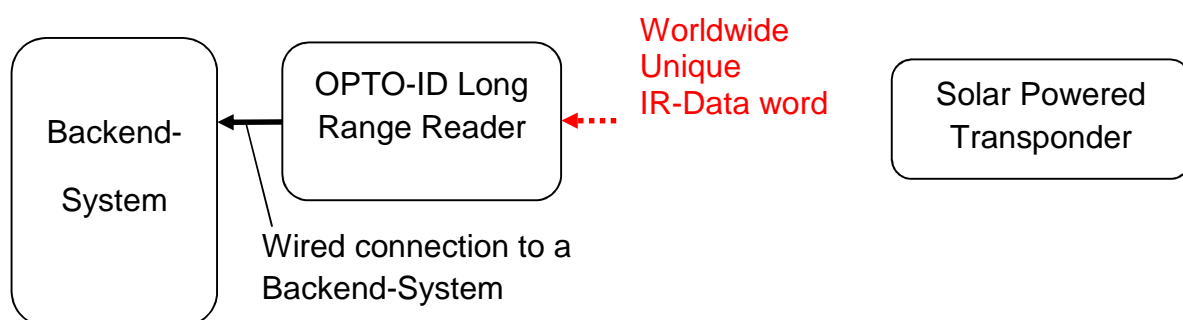


Figure 1: Block diagram of OPTO-ID functional principle

Each OPTO-ID Transponder periodically sends out a worldwide unique ID preset at factory. It is decoded by OPTO-ID Long Range Reader and further sent to a Backend-System.

2.2 Operation CAR-ID System

CAR-ID Systems can be realized by the Long Range Reader

- OPTO-ID Long Range Reader BOX 1 and/or
- OPTO-ID Long Range Reader STACK 1

in combination with the solar powered Transponder

OPTO-ID Transponder TYP 1018-CAR-03

Error! Reference source not found.: demonstrates the functionality of the standard CAR-ID Systems.

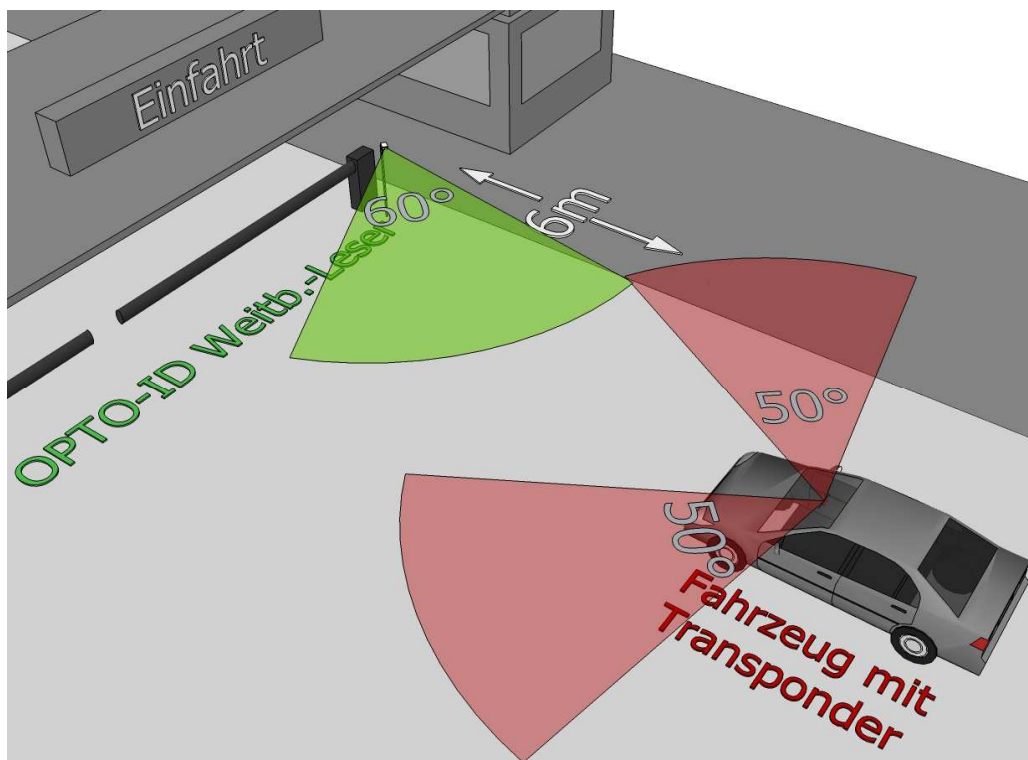


Figure 2: Functionality of CAR-ID System

As soon as the Line-of-sight connection between the Long Range Reader and the Transponder is established, the Transponder is read. With a positive permission, the gate as depicted in Figure 2: will be opened. (see other options „Section 6. al Function“).

The Transponder features a transmission angle of 2x 50°. The detection angle of the CAR-ID Long Range Reader is 60°.

The detection range of the Transponders TYP 1018-CAR-03 in combination with the Long Range STACK 1 is up to 12 m (with the Transponder installed behind the thermally-insulated windshield, the detection range is about 6 m).

Further information and technical specification of the CAR-ID Transponder are described in the manual “OPTO-ID Transponder TYP 1018-CAR-03“.

3. Component Overview Transponder STACK 1

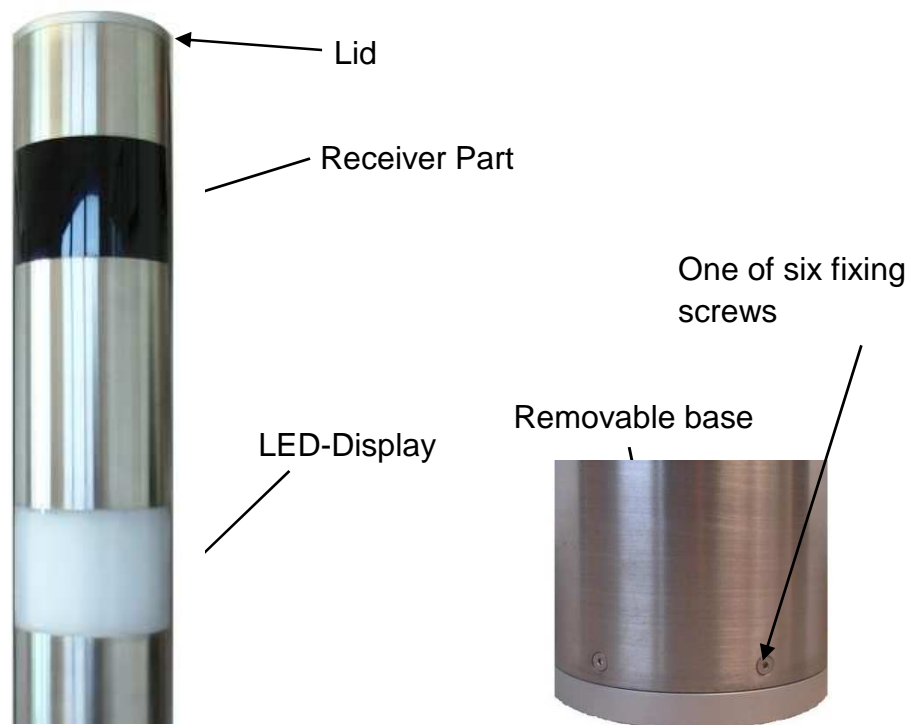


Figure 3: Overview of Reader components (left Upper part; right: Lower part)

4. Inbetriebnahme

The Long Range Reader STACK 1 is delivered as standard with 10m and can be directly connected to the Backend System.

The recommended **installation height** of the receiver part of the column for the access control of cars is **1.7m** from the road surface. The Reader can be positioned on the left or right-hand side of the roadway.

Anchoring of the Reader

To anchor the Reader, firstly remove the base and screw this firmly to the ground. Ensure that the ground is level and if necessary use additional material to level the base. The cable is fed through the hole provided in the base and on to the point of connection. The cable guide should be kept to a minimal size in order to maintain anchorage stability. Lastly the column can be fixed to the base using the threaded holes for aligning the column, and screws provided to fix the column to the base. (see Fig 4.)

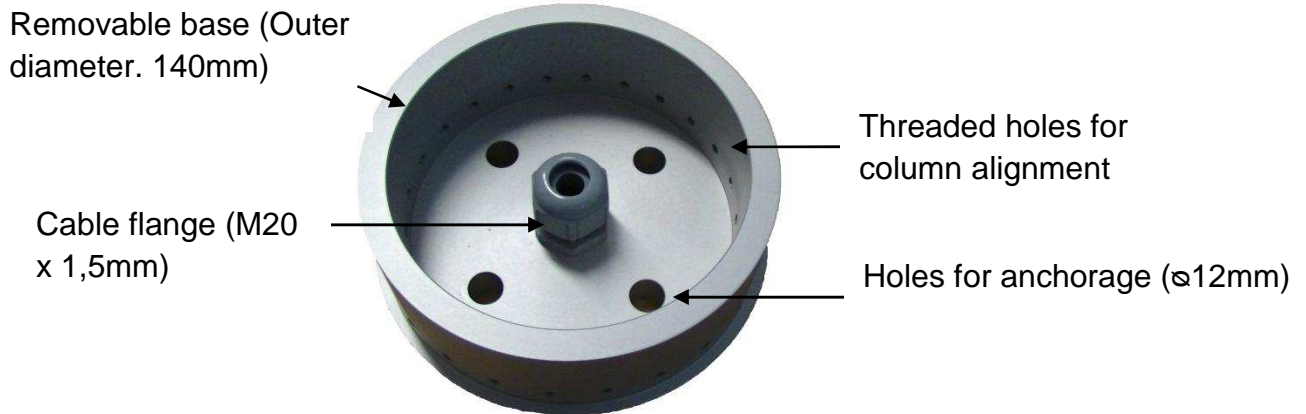


Figure 4: Description of the base

Alignment of the Reader

Rotate the front of reader to the roadway to approx. **35°** (see Fig 5). Dependent on the situation this angle can vary.

After Alignment, the column can be fixed to the base using the screws provided. Threaded holes are provided in the base to suit any positioning requirements. (see Fig 4.)

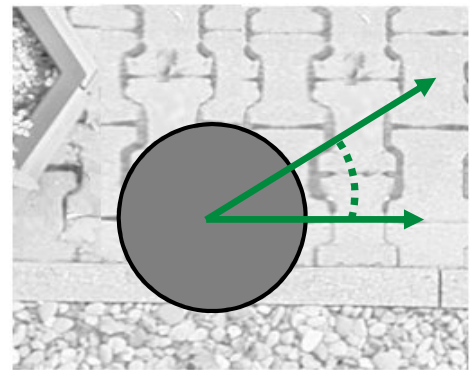


Figure 5: Alignment of Reader to Roadway

Connecting the Reader to the Backend System

Connect the Reader to the Backend System according to Table 1.

Use only Class-B rated switched-mode power supply or linear power supply for the Long Range Reader.

Wire Color	Meaning
White	GND
Brown	15 VDC
Grey	GND (Wiegand)
Yellow	D0
Green	D1

Table 1: Connecting Reader to Backend System

Important!

The cable shield should be electrically connected to a large and flat area on the Backend-System's case. All of these should be electrically grounded.

Finally the column and the base should be sealed with a silicon sealing mastic.

5. Scope of Delivery

The shipped package contains the following items:

- OPTO-ID Long Range Reader STACK 1 (see Figure 3)
- 10 m shielded cable for power supply and data communication
- Handbook for OPTO-ID Long Range Reader STACK 1

Not in the scope of delivery: is the fixing material for anchorage to the ground.

Further accessories for installation, power supply and data interface are available on request.

6. Operational Function

As soon as a CAR-ID Transponder is in reading range of the reader (see Section 2.2 „Operational Function CAR-ID“) the number sent by the Transponder is decoded and sent once to the Wiegand interface (see also “Section 8. Transmission protocol Protocol“). The same number is regenerated by Wiegand only when the Transponder is once again brought back into the reception range. Up to 10 Transponders can be processed in parallel. The generation of the number takes place sequentially.

The number for the backend system can be found on the Transponder label. (See appropriate Handbook).

7. LED Indication

The housing features a two color LED (red/green). A red-glowing LED indicates that the receiver is on standby. As soon as a CAR-ID or CARGO-ID Transponder is in the reception range, the LED turns to green. The received number is sent through the Wiegand interface.

8. Transmission protocol

The interface to the Backend System complies with the “Standard Wiegand“. This is specified in Figure 7:

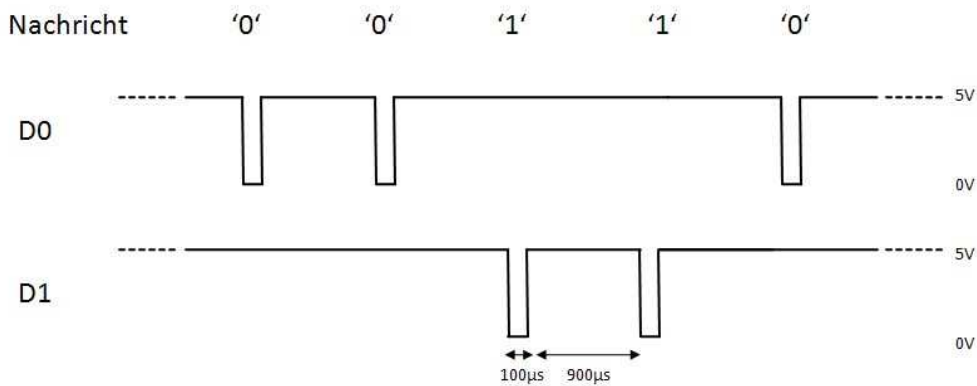


Figure 6: Standard-Wiegand

The standard 37-bit data format is specified as follows:

```
PAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAP
EXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXO
```

Index:

P = Parity; O = Odd parity; E = Even parity

A = Personal Code (PC)

Formats other than the Wiegand as shown below are supported on request

- 26 bit Format (H10301): 8 Bit CC, 16 Bit PC
- 35 bit Format (corporate 1000 Format): 12 Bit CC, 20 Bit PC
- 37 bit Format (H10320): 16 Bit CC, 19 Bit PC
- 40 bit Format: 16 Bit CC, 16 Bit PC

CC = Customer Code; PC = Personal Code

9. Wiegand Interface

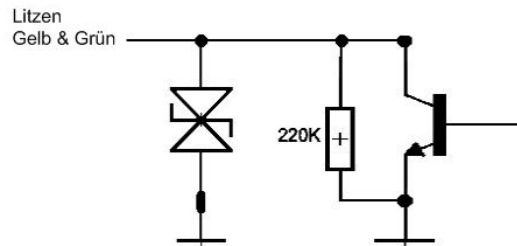


Figure 7: Circuit diagram of Wiegand Interface

10. Maintenance

To ensure an optimal detection range, it is recommended to clean the Long Range Reader occasionally with moist wipes. So can the optimal line-of-sight between Transponder and Reader be assured.

11. Technical Data

Reader Range:	bis zu 12 m
Reception Angle:	60° (vertical), 15° (horizontal)
Transmission Type:	Infrared (850 nm)
Transponder Type:	1018-CAR-03
Anti-Collision:	Identification of up to 10 Transponders within reading range
Interface:	Standard Wiegand
Power Supply:	15 – 18 VDC
Input Current:	max. 500 mA
Electrical Protection:	Transient & reverse voltage protection
Operational Temperature:	-20°C...85°C
Dimensions: (Ø x H)	140x1820 mm
Weight:	25 kg
Housing Material:	Stainless Steel, V2A
Protection Class:	IP65
Conformity:	EN 50133-1:1996 + A1:2002