

\\USER MANUAL

SALTO WRLUD24Bxx | Long Distance Reader

The SALTO Long Distance Reader is a complementary unit that connects to the XS4 2.0 online Controller to automatically identify users flows at long range.

Long Distance Reader WRLUD24Bxx

SALTO
inspired**access**



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Regulatory Notices

Europe

Hereby, SALTO Systems S.L. declares that this equipment - if used according to the instructions - is in compliance with the essential requirements and other relevant provisions of the RTTE Directive 1999/5/EC.



A full declaration of conformity can be requested at:

info@saltosystems.com

Approved for use in all European countries.

FCC Digital Device Limitations

Radio and Television Interference

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense. This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. In order to maintain compliance with FCC regulations, shielded cables must be used with this equipment. Operation with non-approved equipment or unshielded cables is likely to result in interference to radio and television reception. Caution! Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

FCC Notice

To comply with FCC Part 15 rules in the United States, the system must be professionally installed to ensure compliance with the Part 15 certification. It is the responsibility of the operator and professional installer to ensure that only certified systems are deployed in the United States. The use of the system in any other combination (such as co-located antennas transmitting the same information) is expressly forbidden.

FCC Radiation Exposure Statement

This equipment complies with the FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20 cm between the radiator and the human body.

Industry Canada

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:

- (1) this device may not cause interference, and
- (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

1. TECHNICAL DATA

Dimensions:

mm (inch) W x H x D 200 x 175 x 60 (7.87 x 6.89 x 2.36)

Weight:

kg (lbs) 1.2 (2.6)

Housing Material:

ABS/PC, Al (powder-coated)

Protection Class:

IP65

Operating Temperature:

°C (°F) -20 ... 50 (-4 ... 122)

Relative Humidity:

% 5...95, non-condensing

Power Requirement:

12...28 +20 % VDC / max. 1 A

Frequencies:

MHz 865 – 868 (EU)

MHz 902 – 928 (US)

MHz 916 – 921 (JP 4W E.I.R.P.)

MHz 916 – 924 (JP 0.5W E.I.R.P.)

Transmit Power:

E.R.P. max. 1 W (configurable)

Antennas with Beam width/Polarization:

90° circular

Transponder Protocols:

ISO18000-6 C (EPC Class1 Gen2)

Reading Distance:

m (ft.) up to 7 (23)

Writing Distance:

m (ft.) up to 50% of reading distance, depending on transponder, antenna configuration and environmental conditions

Interface:

RS485 (deBus Protocol)

Electrical Connection:

M12-Connector with 4 Pins

Conformity:

EN 50346

EN 301489

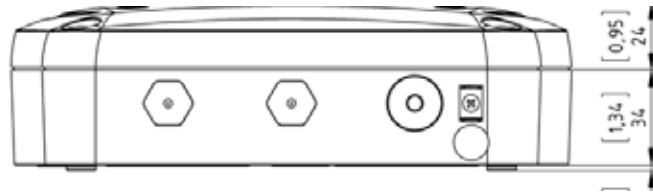
Air Interface (EU):

EN 302208 (DRM)

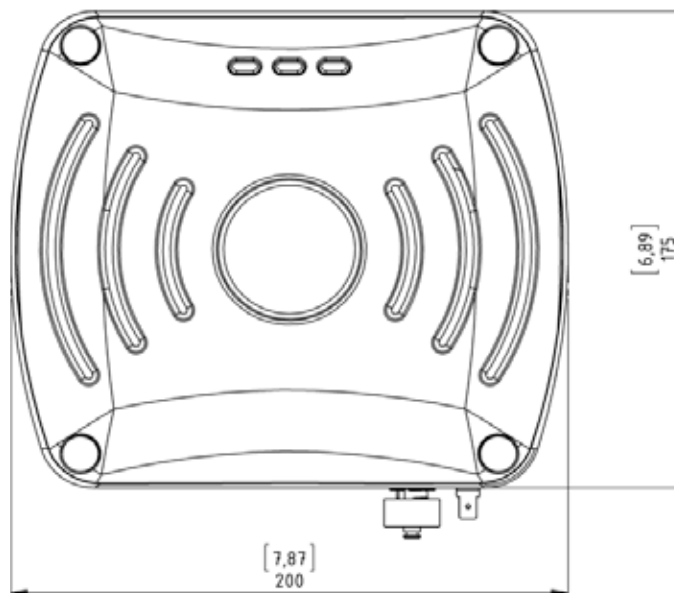


2. MECHANICAL DIMENSIONS

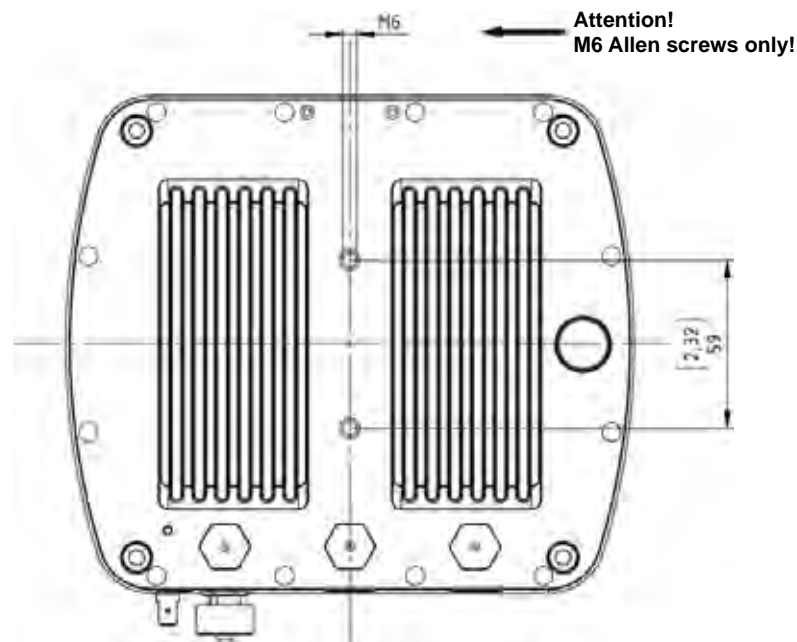
2.1 Side view



2.2 Front View



2.3 Rear view



3. WIRING

3.1 Installation notes

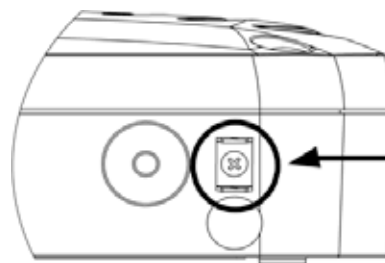
3.1.1 Installing the earth terminal:



The earth terminal is supplied with the unit and can be installed at the prepared location when needed, for example when the unit is installed outdoors.

IMPORTANT:

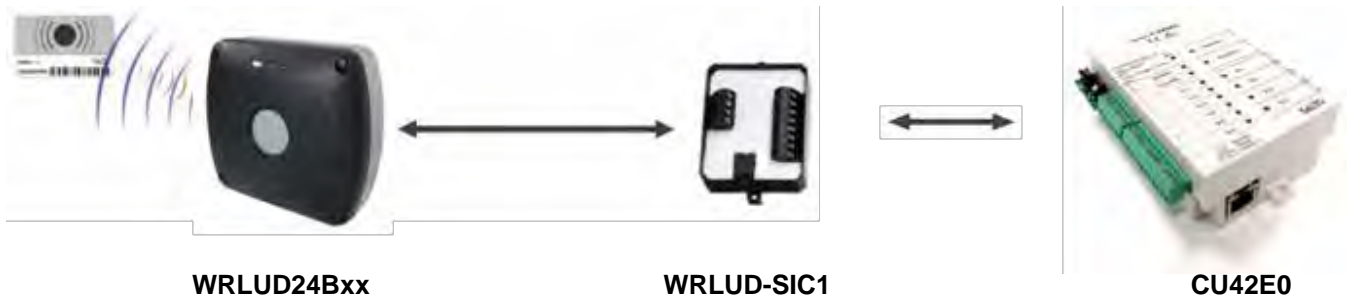
When installing the reader, make sure the tab connector (as shown) is professionally grounded with a flexible line with at least 0.75 mm² (0.11 inch²) (18 gauge) cross section.



Connect the earth cable here after installing the earth terminal provided.

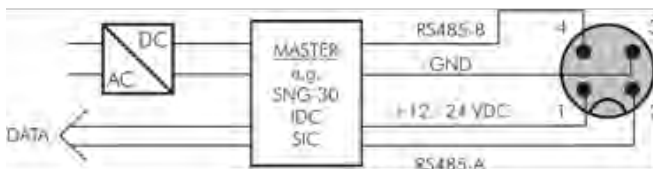
3.2 Connection to SALTO CU42E0 control unit

The WRLUD24Bxx uses the WRLUD-SIC1 converter to connect to the CU42E0 following the above drawing. The long distance reader must be power supplied externally.



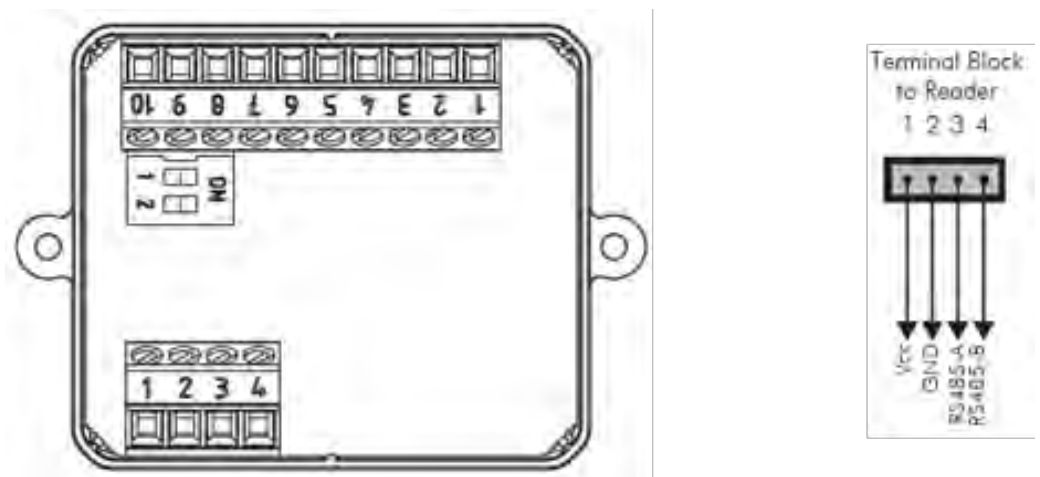
The 4 wires cable connects the WRLUD24Bxx to the WRLUD-SIC1 using the following PIN configuration:

4 pins cable connector:



BROCHE	Description
1	+Vcc
2	RS485-A
3	GND
4	RS485-B

WRLUD-SIC1 connection:



Because of the line resistance, certain cable lengths should not be exceeded. The data wires 485-A and 485-B should be twisted together, particularly when using long cables (twisted pair cable).

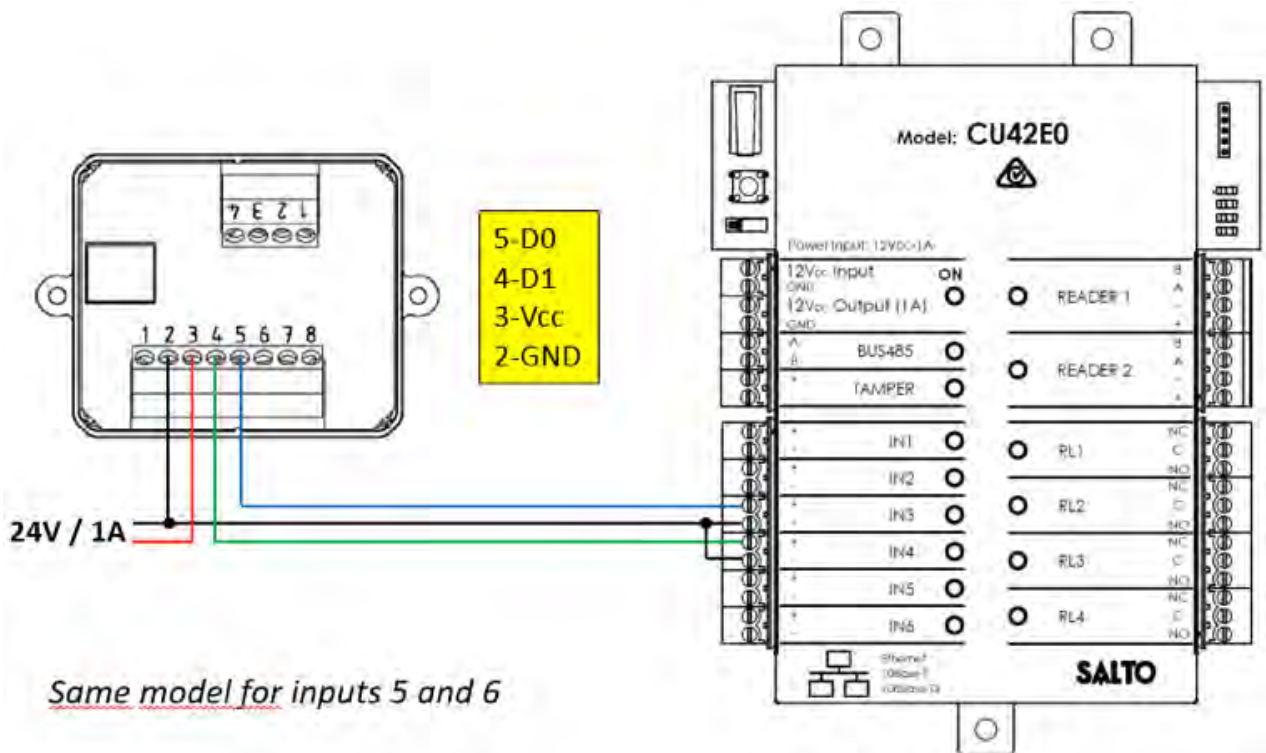
Example:

Power Supply Voltage	Wire Diameter	Maximum Cable Length
12V	AWG24 (0,22mm ²)	5 m (16.4 ft.)
24V	AWG24 (0,22mm ²)	50 m (164 ft.)
12V	AWG20 (0,5mm ²)	10 m (32.8 ft.)
24V	AWG20 (0,5mm ²)	100 m (328 ft.)

The power supply is not delivered with the product.

The WRLUD-SIC1 uses a 4 wires cable to connect to the CU42E0: max. distance 5m

Connection to the CU42E0 (using IN3-IN4)



4. MOUNTING

4.1 *Mounting on poles and pipes*

For installation on a mast or tube, the baseplate (included in scope of supply, see Section 5.1.1) must be mounted on the rear of the WRLUD24Bxx, so that it can be adjusted vertically or horizontally. Its serrated rear face ensures that the reader can be securely mounted and adjusted through 360°. For greater flexibility of installation and adjustment of the WRLUD24Bxx on masts or tubes, we recommend use of the ball-joint mounting.

4.1.1 *Mounting the base plate for mast mounting*



4.2 *Monting on walls and ceilings*

For mounting on walls or ceilings the ball joint bracket WRLUD-MB1 (optional, see chapter 5.2.1) can be mounted directly onto the back of the reader. This mounting aid allows to adjust the reader in any desired position. Both ends of the ball joint bracket are ball-bearred and connected via a rotatable axis. The desired position can be fixed with the included 3/8" Allen wrench.

4.2.1 *Mounting with ball joint bracket WRLUD-MB1*



4.2.2 *Direct Mounting*

To mount the unit directly use the holes provided in the front face of the unit.



4.3 Function Principle and Environmental Influences

The reader sends a high-frequency carrier signal. The transponder that is located within the area of this transmitted carrier transmits the signal back with its own transponder data in a modulated way. This very weak signal is being analyzed by the reader. Because of the particular small-bandwidth and the high carrier frequency this system is almost fail-safe. Nevertheless the range of the reader can be negatively influenced. The following list shows what to pay attention to:

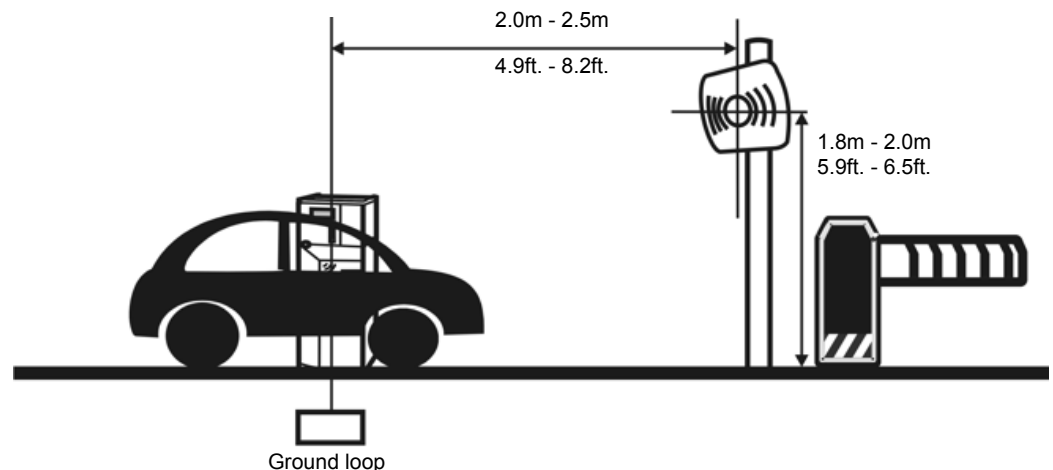
1. The reader must have visual contact to the transponder. There must not be any walls or other devices between reader and transponder. Reading through plastic film, card board, papers or glass windows may be possible, but will reduce the reading range depending on the condition of the material.
2. Water, ice and snow will absorb the carrier signal. Therefore the installer has to make sure that the front of the reader and the transponder is not covered with water, ice or snow.
3. Reflections within the surroundings of the reader can influence the reading result in a negative way. Therefore the reader should be mounted as free-standing as possible. We strictly discourage from sunk-in installations.
4. In Multi-Reader Environment (EU only), you must assign different channels to the readers. To accomplish this, the parameter "preferred channel" should be adjusted accordingly and you have to choose the highest possible channel spacing! When using UHF readers that are installed close together (e.g. entrance and exit lane) it is recommended to pair channels such as Channel 4, 10 and channel 7, 13 etc.

5. INSTALLATION NOTES

For a standard installation in a passenger-car car park, a WRLUD24Bxx can be installed either beside the roadway, or above it.

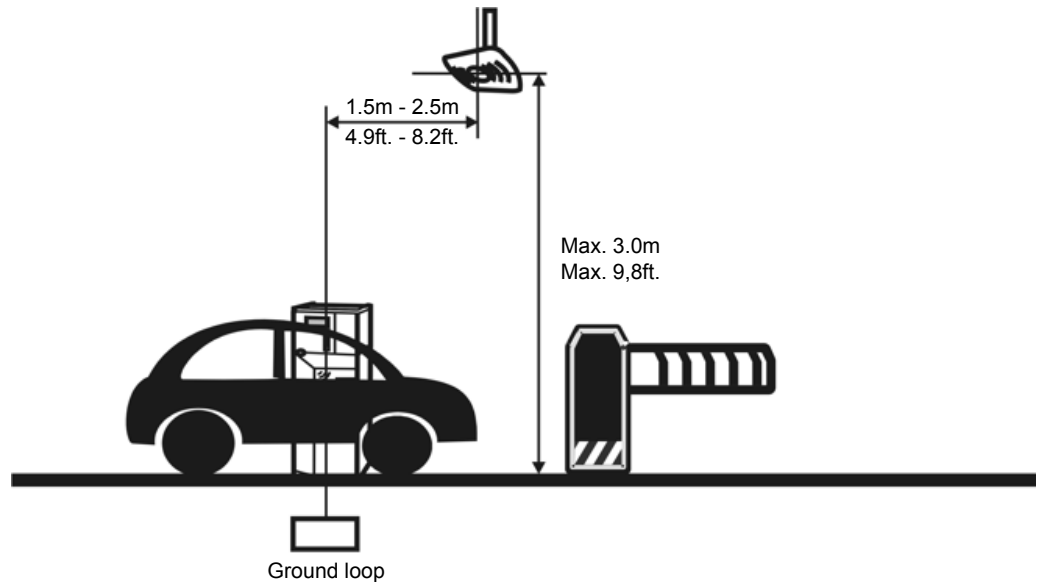
5.1 Installation on the side of the road:

The reader is mounted on a pole on the driver's side next to the road at a height of 1.8 m – 2.0 m (5.9 – 6.5 ft.). Then the reader is aligned towards the transponder/car windshield. When a ground loop is present, it should be used to trigger the reader. The distance from the reader to the ground loop should be in the range of 2.0 m - 2.5 m (6.5 – 8.2 ft.).



5.2 Installation above the road:

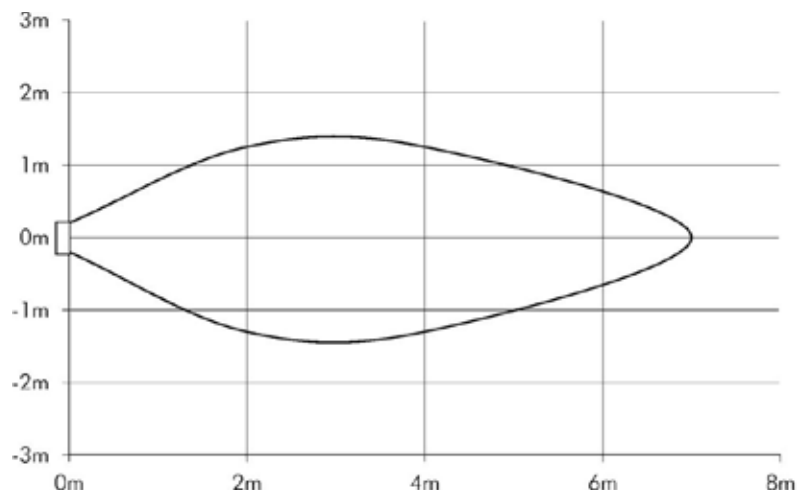
The reader should not be installed higher than 3.0 m (9.8 ft.) above the road. The distance from the reader to the ground loop should be in the range of 1.5 m - 2.5 m (4.9 – 8.2 ft.). The reader is slightly tilted towards the vehicle windshield, so that the reader is almost vertically aligned with the windshield.



Note: The antenna beam of the reader shall in no case be restricted by objects above or below the reader. Flush mounting is not recommended! If other types of vehicles (trucks, small cars etc) need to be identified, the reader must be installed and aligned individually.

5.3 Reading Distance

Given the condition that the transponder is aligned towards the reader, a detection range as shown in the figure below is the result when the reader is operated detached. The reading range varies due to environmental influences. For example, reflections on the ground can increase the maximum reading range. Walls, which are next to a reader, and a different transponder orientation will lead to a deformation of the reading field. It is therefore recommended to check the reading range after installation of the reader. See Chapter 7 "Test Mode".



6. TEST MODE

The WRLUD24Bxx has an integrated test mode for checking the performance of UHF transponders, and to automatically adapt the unit's antenna to local environmental conditions. This simplifies alignment of the unit and its adaptation to specific local circumstances of the application. The test mode can be activated with the test transponder (WRLUD-4TT08 kit) within 30 seconds after the unit is switched on. After activation the antenna is first automatically adjusted. During this adjustment there must not be any object directly in front of the antenna. Following this, for a period of five minutes, each transponder in the field will be signaled by the three LEDs and the beeper. Using the test transponder, the specified reading distance in an installed system can be checked at any time.

Notification	Status WRLUD24Bxx
Yellow LED on for 30 seconds after switching on	Waiting for test transponder
Red, green, yellow LED light sequence	Test mode
All LEDs blink, beeper	Transponder read in test mode
AWG20 (0,5mm ²)	100 m (328 ft.)

7. CONFIGURATION OF WEBCONFIG SOFTWARE

The WebConfig software is used to change the default frequency channel when two or more readers are installed nearby (less than 15m).

7.1 Preparations

A virtual serial COM port is set up via the USB port. The driver installation is described in the manual of the WRLUD-SNG3.

7.2 WRLUD-SNG3 Interface Converter



The interface converter WRLUD-SNG3 can be used for connecting a reader to a host/ PC via USB. Powering of the reader is carried out by the WRLUD-SNG3 as long as it is connected to a power supply unit itself. To do so, a special wall power supply is available.

The drivers can be downloaded from www.saltosystems.com.

WRLU	Description	Description	WRLUD24
Pin1	+VCC	Supply voltage for WRLUD24Bxx (12...24 V/DC)	Pin1
Pin2	GND	Ground	Pin3
Pin3	RS485 - A	RS485 interface, data line A	Pin2

Connect as follows:



7.3 Starting WebConfig

Download the WebConfig software from **www.saltosystems.com**.

Run the WebConfig software. Copy the file "WebConfig.exe" into a suitable directory on your local hard disk and open it by double-clicking.

The configuration of the "WRLUD24Bxx" must be carried out as follows:

Step	Configuration Software "WebConfig."	Reader WRLUD24Bxx
1		Connect the reader to the WRLUD-SNG3 (see table page 16), connect the WRLUD-SNG3 to the PC via the USB cable, connect wall power supply to WRLUD-SNG3
2	Start configuration software "WebConfig"	
3	Select USB Serial Port	
4	Click on "Device" – "Search addresses"	
5	Software searches for the reader which is connected to the selected COM Port	
6	After successful search the reader found will be indicated	
7	Current reader configuration will be read	
8	Configuration menu will open	
9	Configuration can be modified by user	
10	Transfer changed configuration to the reader by clicking on "Apply Changes"	
11		Reader will store the new configuration within its internal non- volatile memory
12	End connection by clicking on "Offline"	
13	Program will be closed by "File" – "Exit"	

7.3.1 Summary

This menu shows a summary of the current reader configuration.

Device info	
Serial number:	Serial number of device
Device:	Identification code of device
Version:	Firmware version (SW) and hardware version (HW) of device
Region:	Region the device is authorized for
Hardware configuration:	Hardware configuration code of device

Note: The picture shows the frequency settings for a European unit. In countries such as e.g. the United States the frequency setup may vary.

7.3.2 Frequency Setup

This menu allows you to change the default frequency channel.

Preferred channel:

This value defines the preferred channel number before the reader uses another channel. In a multi-reader environment (EU only), use different channels for the readers. Use the “Preferred channel” parameter to make this setting. Select the greatest possible separation!

Channel mask

This mask defines the channels to be used by the readers. Each activated checkbox enables use of the appropriate channel.

Recommendation for configuration of UHF readers (EU only):

If several readers are installed close together (e.g. entry and exit lanes), then channel pairs should be set up for them, for example, channels 4 and 10, and channels 7 and 13.

7.3.4 Frequency Setup

ETSI 302 208 v1.2		
Channel No.	Frequency	E.R.P.
4	865.7 MHz	≤ 2.00 W
7	866.3 MHz	≤ 2.00 W
10	866.9 MHz	≤ 2.00 W
13	867.5 MHz	≤ 2.00 W

FCC Part 15 (US)		
Channel No.	Frequency	E.I.R.P.
1	902.75 MHz	≤ 4.00 W
2	903.25 MHz	≤ 4.00 W
3	903.75 MHz	≤ 4.00 W
4	904.25 MHz	≤ 4.00 W
...
47	925.75 MHz	≤ 4.00 W
48	926.25 MHz	≤ 4.00 W
49	926.75 MHz	≤ 4.00 W
50	27.25 MHz	≤ 4.00 W

Brazil		
Channel No.	Frequency	E.R.P.
1	915.25 MHz	≤ 2.00 W
2	915.50 MHz	≤ 2.00 W
3	915.75 MHz	≤ 2.00 W
4	916.00 MHz	≤ 2.00 W
...
47	926.75 MHz	≤ 2.00 W
48	927.00 MHz	≤ 2.00 W
49	927.25 MHz	≤ 2.00 W
50	927.50 MHz	≤ 2.00 W

Singapore		
Channel No.	Frequency	E.R.P.
1	920.25 MHz	≤ 2.00 W
2	920.75 MHz	≤ 2.00 W
3	921.25 MHz	≤ 2.00 W
4	921.75 MHz	≤ 2.00 W
5	922.25 MHz	≤ 2.00 W
6	922.75 MHz	≤ 2.00 W
7	923.25 MHz	≤ 2.00 W
8	923.75 MHz	≤ 2.00 W
9	924.25 MHz	≤ 2.00 W
10	924.75 MHz	≤ 2.00 W

Japan High Power		
Channel No.	Frequency	E.I.R.P.
5	916.8 MHz	≤ 4.00 W
11	918.0 MHz	≤ 4.00 W
17	919.2 MHz	≤ 4.00 W
23	920.4 MHz	≤ 4.00 W

Japan Low Power		
Channel No.	Frequency	E.I.R.P.
5	916.8 MHz	≤ 5.00 W
11	918.0 MHz	≤ 5.00 W
17	919.2 MHz	≤ 5.00 W
23	920.4 MHz	≤ 5.00 W
24	920.6 MHz	≤ 5.00 W
25	920.8 MHz	≤ 5.00 W
26	921.0 MHz	≤ 5.00 W
27	921.2 MHz	≤ 5.00 W
28	921.4 MHz	≤ 5.00 W
29	921.6 MHz	≤ 5.00 W
30	921.8 MHz	≤ 5.00 W
31	922.0 MHz	≤ 5.00 W
32	922.2 MHz	≤ 5.00 W
33	922.4 MHz	≤ 5.00 W
34	922.6 MHz	≤ 5.00 W
35	922.8 MHz	≤ 5.00 W
36	923.0 MHz	≤ 5.00 W
37	923.2 MHz	≤ 5.00 W
38	923.2 MHz	≤ 5.00 W

Korea		
Channel No.	Frequency	E.I.R.P.
2	917.1 MHz	≤ 4.00 W
5	917.7 MHz	≤ 4.00 W
8	918.3 MHz	≤ 4.00 W
11	918.9 MHz	≤ 4.00 W
14	919.5 MHz	≤ 4.00 W
17	920.1 MHz	≤ 4.00 W

China		
Channel No.	Frequency	E.R.P.
1	920.625 MHz	≤ 2.00 W
2	920.875 MHz	≤ 2.00 W
3	921.125 MHz	≤ 2.00 W
4	921.375 MHz	≤ 2.00 W
5	921.625 MHz	≤ 2.00 W
6	921.875 MHz	≤ 2.00 W
7	922.125 MHz	≤ 2.00 W
8	922.375 MHz	≤ 2.00 W
9	922.625 MHz	≤ 2.00 W
10	922.875 MHz	≤ 2.00 W
11	923.125 MHz	≤ 2.00 W
12	923.375 MHz	≤ 2.00 W
13	923.625 MHz	≤ 2.00 W
14	923.875 MHz	≤ 2.00 W
15	924.125 MHz	≤ 2.00 W
16	924.375 MHz	≤ 2.00 W

Notes:

A large area of the page is filled with horizontal dashed lines, serving as a template for taking notes.

SALTO Systems HQ, Spain

Oiartzun, Spain

Tel.: +34 943 344 550
email: hospitality@saltosystems.com
www.saltohospitality.com

SALTO Systems, UK

Southam, United Kingdom

Tel.: +44 01926 811979
email: hospitality.uk@saltosystems.com
www.saltohospitality.com

SALTO Systems, USA

Norcross GA, USA

Tel.: +1 770 452 6091
email: hospitality.us@saltosystems.com
www.saltohospitality.com

SALTO Systems, Canada

Vaudreuil-Dorion QC, Canada

Tel.: +1 514 616 2586
email: hospitality.ca@saltosystems.com
www.saltohospitality.com

SALTO Systems, Mexico

Cancún, México

Tel.: +52 (998) 892 8752
email: hospitality.mx@saltosystems.com
www.saltohospitality.com

SALTO Systems, Colombia

Bogota, Colombia

Tel.: +57 1 810 7013
email: hospitality.co@saltosystems.com
www.saltohospitality.com

SALTO Systems, Australia

Waterloo - Sydney, Australia

Tel.: +61 1 3007 39959
email: hospitality.au@saltosystems.com
www.saltohospitality.com

SALTO Systems, Australia

Melbourne, Australia

Tel.: +61 1 3007 39959
email: hospitality.au@saltosystems.com
www.saltohospitality.com

SALTO Systems, Middle East

Dubai, United Arab Emirates

Tel.: +971 48 811 050
email: hospitality.me@saltosystems.com
www.saltohospitality.com

SALTO Systems, France

Nanterre, France

Tel: +33 (0)1 55 17 13 70
email: hospitality.fr@saltosystems.com
www.saltohospitality.com

SALTO Systems, Germany

Wuppertal, Deutschland

Tel.: +49 (0)202/ 769 579-0
email: hospitality.de@saltosystems.com
www.saltohospitality.com

SALTO Systems, Switzerland

Eschlikon, Switzerland

Tel: +41 71 973 72 72
email: hospitality.ch@saltosystems.com
www.saltohospitality.com

SALTO Systems, Netherlands

Amsterdam, The Netherlands

Tel: +31 206 353 100
email: hospitality.nl@saltosystems.com
www.saltohospitality.com

SALTO Systems, Belgium

Brussels, Belgium

Tel: +31 206 353 100
email: hospitality.be@saltosystems.com
www.saltohospitality.com

SALTO Systems, Poland

Warszawa, Polska

Tel: +48 609 01 7777
email: hospitality.pl@saltosystems.com
www.saltohospitality.com

SALTO Systems, Slovakia

Bratislava, Slovakia

Tel: +48 609 01 7777
email: hospitality.sk@saltosystems.com
www.saltohospitality.com

SALTO Systems, Czech Republic

Prague, Czech Republic

Tel: +48 609 01 7777
email: hospitality.cz@saltosystems.com
www.saltohospitality.com

SALTO Systems, Denmark

Kalundborg, Denmark

Tel.: +45 48 44 88 11
email: hospitality.dk@saltosystems.com
www.saltohospitality.com

SALTO Systems, Norway

Jessheim, Norway

Tel.: +47 46 747 884
email: hospitality.no@saltosystems.com
www.saltohospitality.com

SALTO Systems, Sweden

Stockholm - Malmö, Sweden

Tel.: +46 (0)8-555 982 00
email: hospitality.se@saltosystems.com
www.saltohospitality.com

SALTO Systems, Finland

Vantaa, Finland

Tel: +35 892 316 5639
email: hospitality.fi@saltosystems.com
www.saltohospitality.com

SALTO Systems, Italy

Bologna, Italy

Tel: +39 342 55 67 739
email: hospitality.it@saltosystems.com
www.saltohospitality.com

SALTO Systems, Portugal

Lisboa - Porto, Portugal

Tel.: +351 220 937 508
email: hospitality.pt@saltosystems.com
www.saltohospitality.com

SALTO Systems, Singapore

Singapore

Tel: +65 6557 22 55
email: hospitality.sg@saltosystems.com
www.saltohospitality.com

SALTO Systems, China

Shanghai, China

Tel: +86 (8621) 3157 6115
email: hospitality.cn@saltosystems.com
www.saltohospitality.com

SALTO Systems, Hong Kong

Hong Kong

Tel: +65 6557 22 55
email: hospitality.hk@saltosystems.com
www.saltohospitality.com

SALTO Systems, South Africa

Johannesburgo, South Africa

Tel: +27 (83) 293 07 96
email: hospitality.za@saltosystems.com
www.saltohospitality.com

