Manual
WaveNet Network 3065

08.2015

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1 Introduction

In the following, when speaking of the components (locking cylinder, smart relay, block lock) of the System 3060, we always mean lock(s) and door(s). Unless explicitly stated otherwise, this also applies for all other components of System 3060.

Programming the System 3060 with laptop and SmartCD is practical for objects up to a certain size or customers with a low number of doors, as there are generally only a few changes that need to be made to the configurations of the locking devices.

For medium- and large-sized objects that are more frequently confronted with lost keys, authorization of new transponders or organizational changes, repair and maintenance of the lock system is more practical via the network. Not all doors have to be networked for this reason. The entire system can be designed for mixed operation (network/standalone).

In a networked system, not only can all maintenance and programming tasks be performed from one central PC, the current status of the entire network can also be queried. For instance, the locking and door statuses, such as door open - door closed - door unlocked - door locked, battery warning, access list, can be queried centrally. This makes it possible to respond to an event directly from one central location.

WaveNet is an easy to install "plug-and-play" network for use in the field of building automation. Due to its wireless installation, it is particularly suitable for the online administration and control of the electronic locking and organization System 3060 by SimonsVoss in existing buildings and can also be deployed in new builds (e.g. for flexible room units).

The transfer of data within a WaveNet network is largely independent of transmission medium. Data can be transferred e.g. via RS485 interfaces, Ethernet interfaces (TCP/IP), USB interfaces, RS232 interfaces, radio interfaces (868 MHz) or WLAN.

In summary, one can say that by networking, the entire access control system can be configured and monitored from one central PC. This makes it possible for the user to directly respond to critical situations.

We recommend taking part in WaveNet training at SimonsVoss or perform a WaveNet project with a SimonsVoss service technician.

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2 Nomenclature

WN	WaveNet
LN	LockNode
RN	Router node
RP	RepeaterNode
CN	Central node
S	Serial (RS232)
R	Radio (868 MHz)
C	Cable (RS485)
I	Inside
U	USB
E	Ethernet (TCP/IP)
W	WLAN
X	Place holder for freely selectable transmission medium

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3 Transmission media

WaveNet supports the following transmission media for the transmission of data within the system:

– RS485 bus cabling for the connection of individual WaveNet routers and repeaters as network backbone (line type: CAT 5, stripped, cable length up to max. 900 m). WN.RN.(X)C, WN.RN.C(X), WN.RP.CC, WN.CN.(X)C.

– RS485 bus cabling for the connection of individual WaveNet LockNodes as cabled WaveNet. WN.LN.C.

– Internet or Intranet via TCP/IP for data transmission within an Ethernet network (10/100 Base T) or WLAN from various WaveNet networks. WN.RN.EC, WN.RN.ER, WN.RN.WC, WN.RN.WR.

– USB for data transmission between a PC and the WaveNet CentralNode. WN.CN.UC, WN.CN.UR (cable length 1.5 m).

– RS232 for data transmission between a PC and the WaveNet CentralNode. WN.CN.SC, WN.CN.SR (cable length max. 2 m).

– 868 MHz radio (radio range approx. 20 - 40 m, depending on building structure) WN.RN.(X)R, WN.RN.R(X), WN.CN.(X)R, WN.LN.R/I.

– B-field 25 kHz (radio range approx. 30 cm) for data transmission between the WaveNet LockNode and the SimonsVoss locking device (e.g. locking cylinder, smart relay, etc.).

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4 Available radio band

When we talk about modern radio technologies for security technologies nowadays, we shouldn't mistake this for what one would usually expect in the automotive field or in house communication of the future. This is why radio transmission in terms of access control systems must comply with the required security standards.

Since the year 2000, a special SRD band (short range device) is available in the 868 MHz range. The benefit of the SRD band is that clear specifications have been made for sub-bands in terms of usage duration per time unit. This means that a radio device (e.g. RouterNode), which makes use of a frequency channel in the band range 868 MHz, can only transmit 36 seconds per hour. The provision is laid down in the so-called "duty cycle requirements". Therefore devices put to continuous use, and thus disruptors in terms of secure radio transmission, such as wireless headphones and amateur radio operators, are ruled out from the outset. There are also ranges that are only reserved for security-related applications. On the basis of fundamental information and specification from system technology, such as size of the components, minimum ranges, battery life, etc., 868 Mhz bands are sufficiently secure for the use of WaveNet. The 915 MHz band is used in the United States, which of course is also available at SimonsVoss.

Technical realization
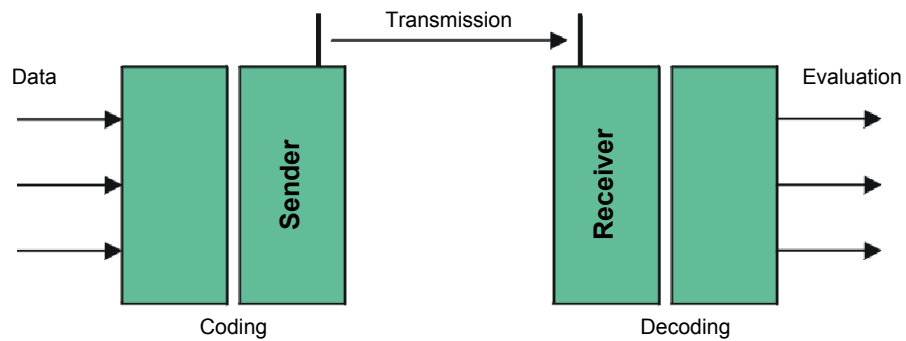
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5 Basic information

Irrespective of the manner of transmission, radio transmission is subject to various environmental factors, which could impair or prevent transmission. Device properties also affect the range.

Which factors influence range?

– Transmission power

– Antennas

– Receiver sensitivity

– Environment (humidity, temperature, interference fields via external events)

– Installation location

– Frequency

– Structural environment (walls, ceilings, etc.)

In addition, the range is also restricted by objects. The following table depicts the respective reference values:

Material	Energy transmission
Wood, gypsum, drywall	90-100 %
Brick, pressboard	65-95 %
Reinforced concrete (transmitter to metal)	10-70 %
Metal, mesh, aluminium cladding, floor heating	0-10 %

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6 Messaging reliability

Messaging reliability via radio transmission in WaveNet depends on:

– Radio transmission security in terms of data telegram management.

– Potential incidental disruptors of the transmission path.

– Intentional disruption, i.e. manipulation or sabotage of the transmission path.

– Finding intelligent measures to avoid disruptors and to find alternative paths.

The speed of data transmission and messaging as well as the loss of a portion of messages are influenced by various factors.

These factors may be:

– High data traffic within WaveNet.

– External disruption of the radio range of WaveNet.

– Power failure in segment areas of WaveNet.

– Transmission failure or disruption in an external network (e.g. LAN).

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7 WaveNet System 3065 network components

WaveNet network components generally have two independent interfaces. This way, it is possible to connect two different network segments via WaveNet network components. WN.CN.(XX), WN.RN.(XX)

Definition: For one, network segments are characterized by a certain transmission medium (e.g. RS485 cable, Ethernet (TCP/IP), USB, RS232 cable, 868 MHz radio, WLAN) and, on the other hand, by an individual incoming and outgoing segment address (GID = Group ID --> Slave or master address)

The following SimonsVoss WaveNet network components are available:
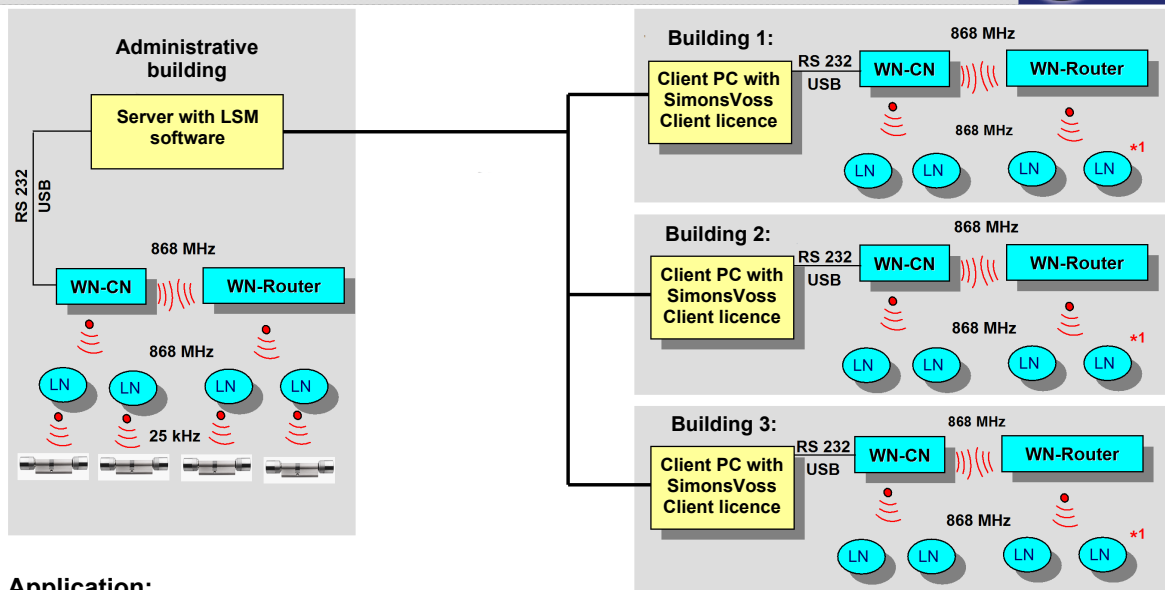
7.1 Computer (PCs)

Via a special communication node software (CommNode) computers can be integrated in WaveNet

– between user interface and RS232 interface

– between user interface and TCP/IP (Internet, Intranet)

– between user interface and USB interface

.

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WaveNet

WaveNet via Ethernet (Intranet)

Application:

Administration of various buildings/halls (at one location) via existing Ethernet (Intranet)

*1:
LN (LockNode) communicates via 25kHz with the respectively assigned
locking device (see administrative building)

7.2 RouterNodes (general)

Basically, WaveNet RouterNodes are used to interconnect different network segments, that either share the same transmission medium (e.g. RS485-RS485) or that have different transmission media (e.g. RS485 cable/radio 868 MHz, Ethernet/RS485 or radio 868 MHz, WLAN/RS485 or radio 868MHz).

Further, the data flows coming from the segments are filtered by the WaveNet router node so that only data is forwarded to the segment after the WaveNet route node that is also to be processed in this segment. All other data is therefore blocked by the WaveNet router node for the segment after it.

WaveNet router nodes can currently connect the following transmission interfaces between the segments: RS485 CAT 5 cable, Ethernet TCP/IP, USB, RS232 cable, radio 868 MHz, WLAN.

Do not mount router nodes with a radio or WLAN interface directly to metal or reinforced concrete! A distance of approx. 30 cm. should be maintained.

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7.3 RouterNodes (special variants)

WaveNet CentralNodes are RouterNodes, that enable the interconnection

– between PC (RS232 interface) and radio 868 MHz

– between PC (RS232 interface) and CAT 5 cabling (RS485)

– between PC (USB interface) and radio 868 MHz

– between PC (USB interface) and CAT 5 cabling (RS485)

.

WaveNet RouterNodes are used for the interconnection

– between Ethernet (TCP/IP) and radio 868 MHz

– between Ethernet (TCP/IP) and CAT 5 cabling (RS485)

– between WLAN and radio 868 MHz

– between WLAN and CAT 5 cabling (RS485)

.

7.4 RepeaterNodes

WaveNet RepeaterNodes are amplifiers that can be used within a segment to increase range (line length). This means that when a cable within a network exceeds the predefined length (up to 900), it can be extended with the **WaveNet Repeater Node (WN.RP.CC)** in line with the system specification.

Representation of a WaveNet scheme:

WN.RP.CC in Backbone

RS485 (max. 900 m)

868 MHz

WN.RN.CR Router

LN

LN

WN.RN.CR Router

RS485 (max. 900 m)

868 MHz

WN.RN.CR Router

LN

LN

RS232
USB

WN.CN.SC or WN.CN.UC
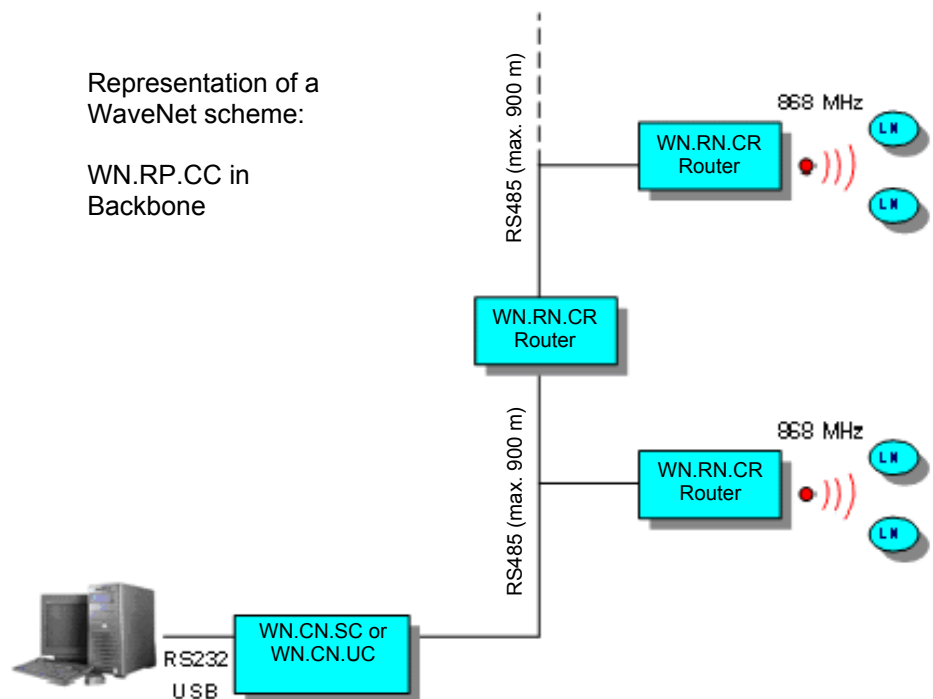
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7.5 RouterNodes

WaveNet RouterNodes as converters of radio (868 MHz) to cable (RS485) or cable to radio. WN.RN.RC or WN.RN.CR.

– The transmission medium can be freely selected depending on the transmission medium.

WN.RN.CR
with
WN.RN.R
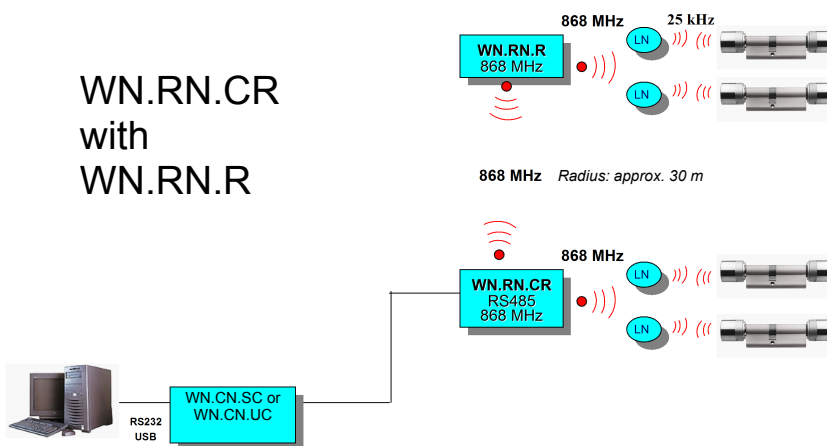
– If a radio range is required for a LockNode, that exceeds the radio range of the WaveNet RouterNode (the radio signal is then sent from a WaveNet RouterNode (868 MHz) to another WageNet RouterNode and then forward to LockNode (LN). WN.RN.R
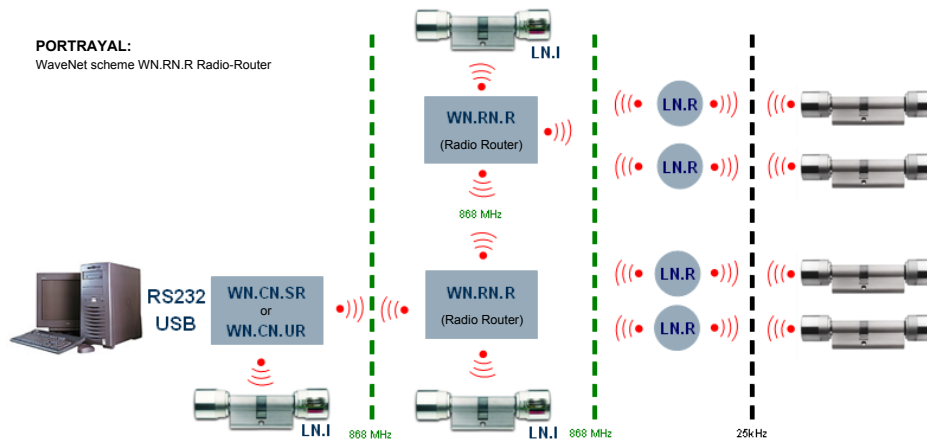
WaveNet RouterNodes can be used,

– If there is a customer side computer network (LAN) or Internet/Intranet. The transmission media can be freely selected. WN.RN.E(X)

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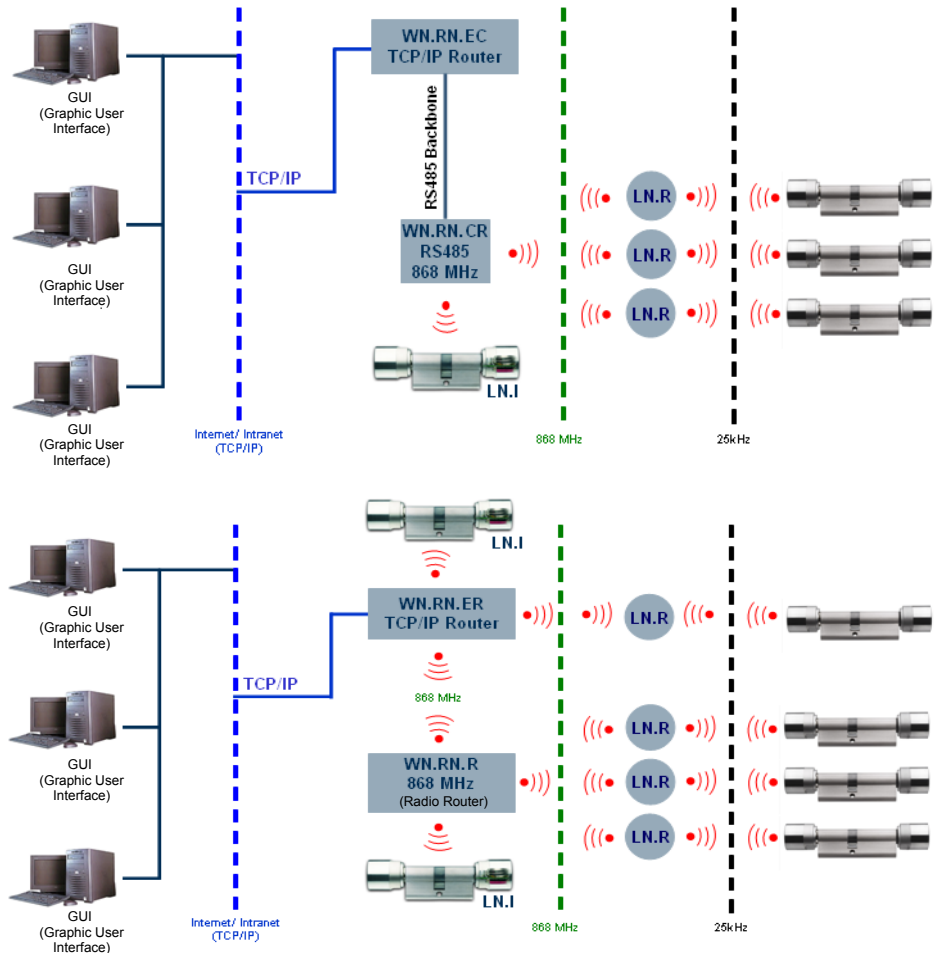
WaveNet RouterNodes can be used,

– if there is a customer side computer network (LAN) or Internet/Intranet. The transmission media can be freely selected. WN.RN.W(X)
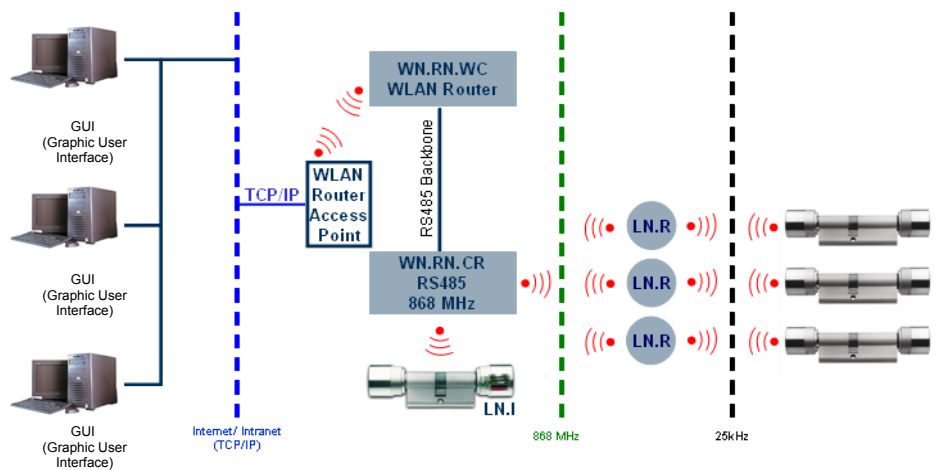
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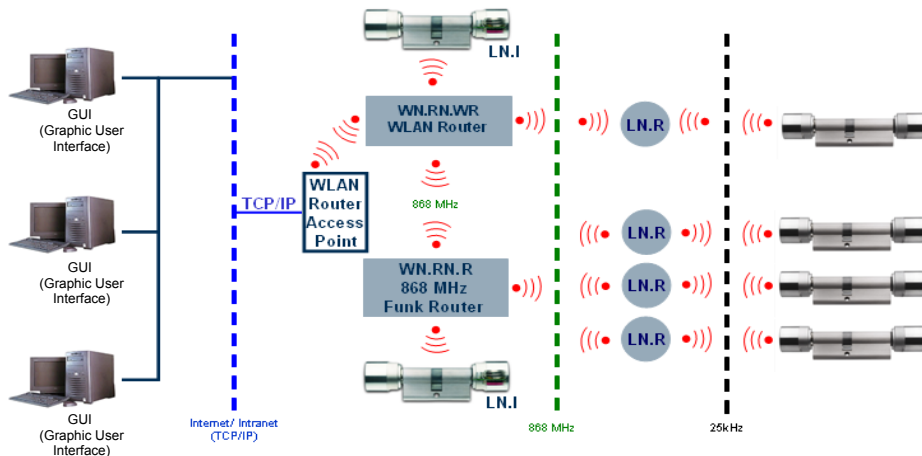
7.6 CentralNodes

WaveNet CentralNodes can be used,

– if there is a customer side computer network (LAN) or Internet/Intranet. The selection of the next transmission media is free. The CentralNode WN.CN.S(X) or WN.CN.U(X) are connected by PC. A communication node (Comm Node) is installed on this PC. This way, the CentralNode can be addressed by any location (GUI = Graphic User Interface) in the network. Of course, a CentralNode can also be connected to a PC "locally".
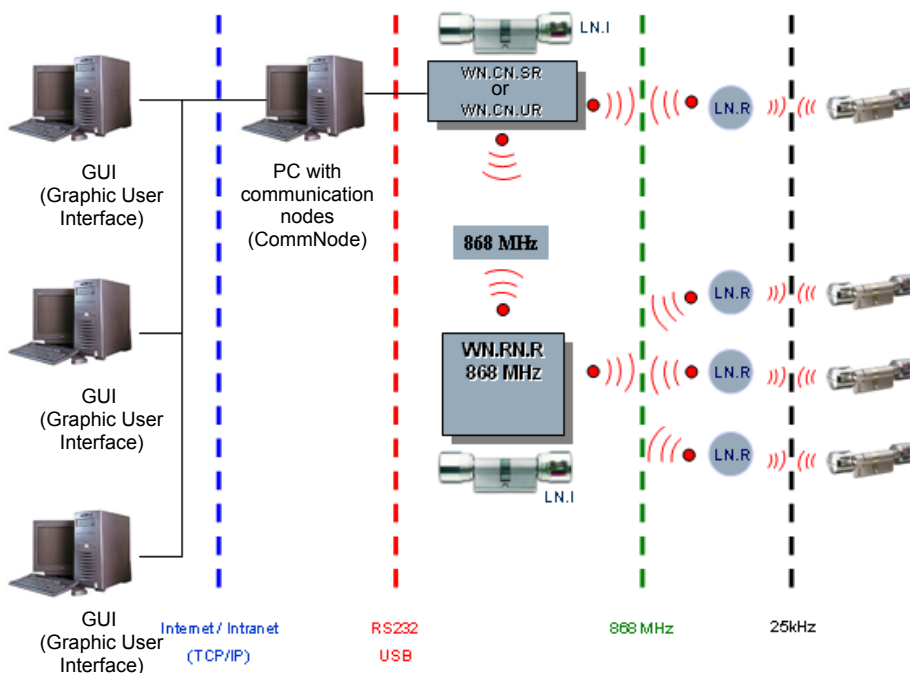
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7.7 LockNode with RS485 interface

WaveNet LockNodes with integrated RS485 interface enable a "wired" WaveNet. The connection type should be CAT 5 or better. As there is a connection for external energy supply (max. 24 VDC), the LockNodes are not battery operated (see 7.9). 250 LockNodes can be administered per segment. A WN.RN.CC is required for each segment extension. The maximum line length per segment is restricted to 900 m. If the line length is exceeded, a WN.RP.CC is required. This high speed repeater is used to transmit signals in both directions (up-/down link). The repeater does not perform a segment extension.
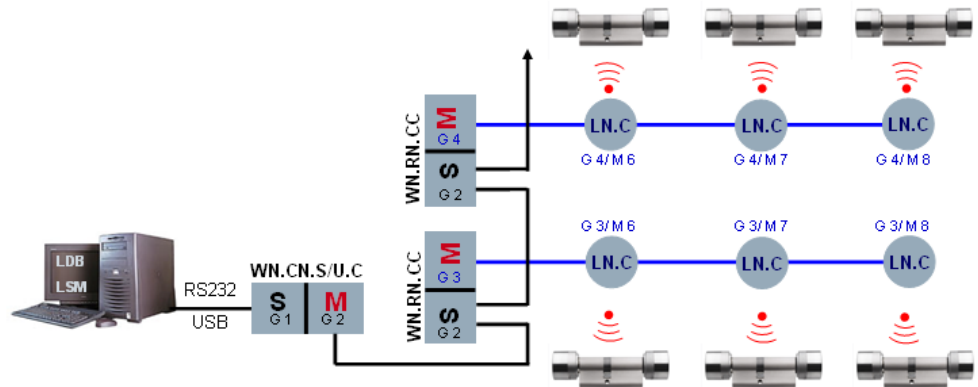
7.8 Backbone cabling router / repeater node

The cabling of the RS485 segments (backbone) is done by a bus line, with stripped standard CAT 5 cables. The bus line consists of two data lines (Data+, Data-) as well as an earth connection (shielding). The bus line is connected to each RS485 module of the WaveNet router belonging to this segment. The RS485 modules contact the bus line by means of a green-orange-coloured 8-pole Phoenix plug:
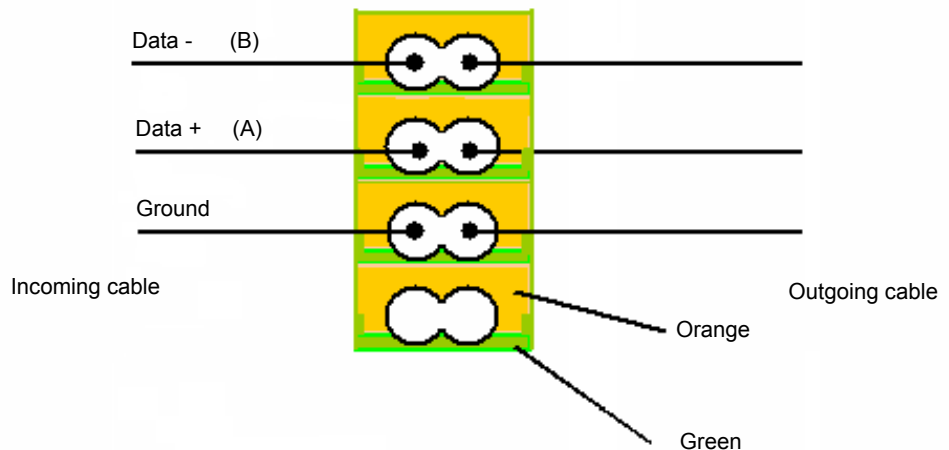
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7.9 Connection requirement wired LockNode (WN.LN.C)
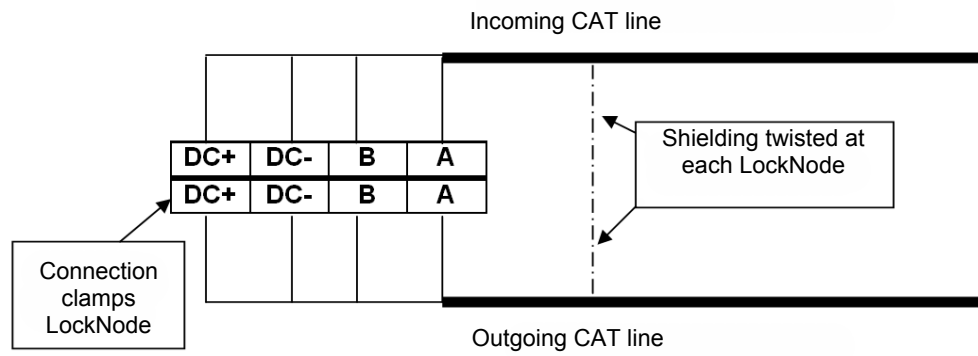
DC	Connection of energy supply 6-24 V DC, polarity dependent. Power consumption of LockNode: 15 mA
A	Connection to data cable D+, polarity-dependent!
B	Connection to data cable D-, polarity-dependent!
Shielding	Shielding has to be connected at each LockNode/ RouterNode, stripped and contacted at a point to earth potential.

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8 New router WN(M).RN2.ER.(IO)

The new WaveNet Router WN(M).RN2.ER.(IO) can be used in clients' own computer networks (LAN = Local Area Network). This allows existing network structures to be used for installation. The router can converter TCP/IP signals to the 868 MHz frequency --> media converter. You need to configure the following IP settings to integrate the media converter into the client's LAN. These settings need to be made using the media converter's web server, for example (DHCP is switched on in storage mode).

1. IP address, e.g. 192.168.1.100

2. Subnet mask, e.g. 255.255.255.0

3. Gateway, e.g. 192.168.1.1

The end customer or LAN operator must provide these settings. The IP address used (per media converter) is saved in LSM, thus enabling data communication between the application software and the WaveNet Router. A static configuration should be created between the IP address and the MAC address on the DHCP server.

The router does not feature a visible external antenna for the 868 frequency – the antenna is on the circuit board inside the housing.

The input/output configuration for the WNM.RN2.ER.IO protective function is described in the WaveNet Manager manual. WaveNet Manager --> free download online at www.simons-voss.com.

Protective functions to configure on the router:

– selecting the 'Block lock'

A relay output (NO, isolated), e.g. an intruder detection system (IDS), can be wired to the input. Once the IDS is armed, all selected LNs or locking devices are deactivated within about a second and reset at the output. It is no longer possible to open doors inadvertently. When the IDS is disabled, the IDS relay contact reopens, the locking devices are activated within about a second and can be opened again using an ID medium. This function is not VdS-approved.

– Selecting the 'Gunman attack function'

Any contact (NO, isolated) can be wired to the input. After this function is activated, all selected locking devices are deactivated within about one second and remain deactivated even if the contact is reset. The locking devices can only be re-activated using LSM or an activation transponder or card.

– Selecting 'Emergency release'

A relay output (NO, isolated) in a fire alarm system can be wired to the input. If the fire alarm system is triggered, all selected locking devices are permanently enabled within about one second. The locking devices are returned to their normal mode by transmitting a remote opening signal in this segment.

– Selecting 'Remote opening'

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A temporary release (NO, isolated, e.g. button) enables the selected locking device for five seconds, for example.

– WNM

WaveNet Manager (auto-configuration)

– RN2

RouterNode2 (new generation circuit board + housing)

– ER

Ethernet / radio (media converter / router)

– IO

Input /Output

8.1 Images and dimensions
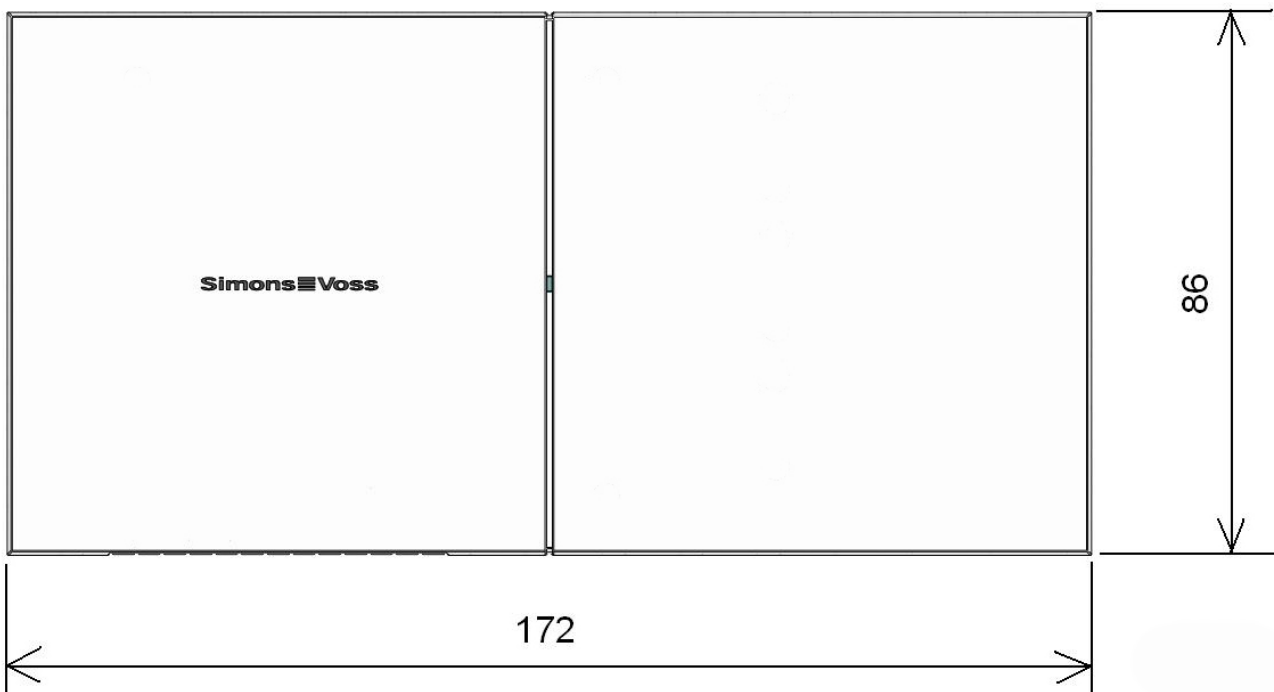
(dimensions in mm)

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8.2 Opening the housing lid

You do not need a tool to open the upper shell. Apply slight pressure to the centre of the base plate on the left- or right-hand side and then you can remove the upper shell.

8.3 Surface installation of wiring

Carefully separate the ribs on the lower housing shell from one another with a saw and move the web up and down until it breaks off. Remove any sharp edges with a file.

8.4 Dimensions of lower housing shell
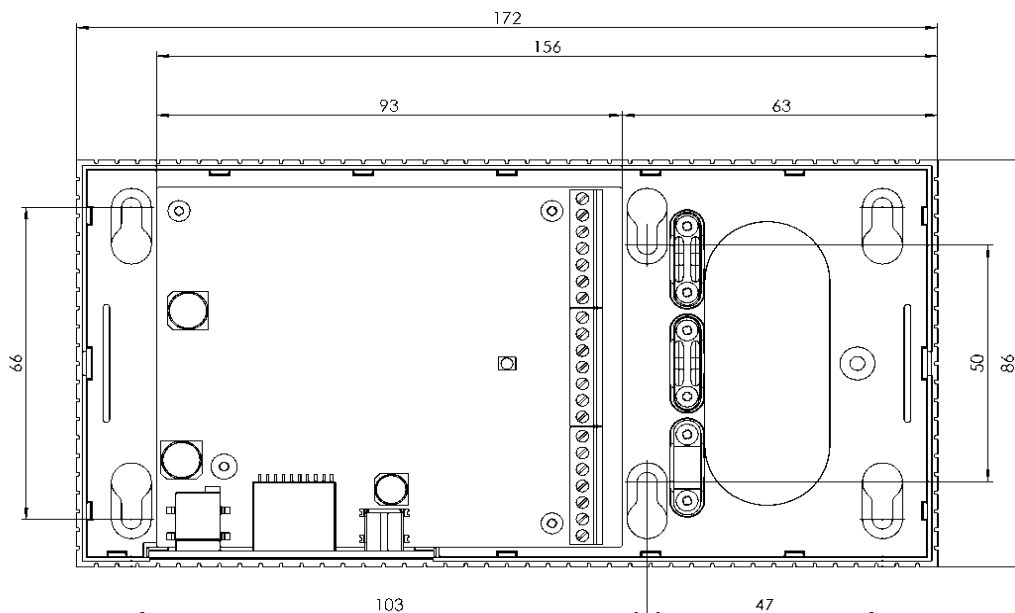
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8.5 Technical specifications for WN(M).RN2.ER.IO

General information

Order number	WNM.RN2.ER.IO --> protective function
Housing dimensions (L x W x H)	ABS plastic, UV-stable, 172 x 86 x 33 mm (L x W x H)
Frequency range	868.xx-870 MHz
Colour	9/118645, same as RAL 9016 (Traffic white)
External power supply	9-32 V DC, DC connector, round 5.5/2.1 mm
PoE	Power-over-Ethernet, supports IEEE 802.3af
Output	Max. 3 VA
Transmitting power	10 dBm (10 mW) to the antenna socket
Wiring to device	Surface or in-wall installation
Strain relief clamp	3 x in housing
LED	In centre of housing
Wall mount	Housing can be mounted in horizontal or vertical position. Do not install on metal. Keep away from electric or magnetic sources of interference.

Power supply

External power supply (mains adapter)	Input voltage: 9 V DC min., 32 V DC max.; (min. 3 W)
	Input current: depends on the input voltage (300 mA @ 9V)
	Polarity-dependent: no
PoE (power-over-Ethernet)	IEEE802.3af, floating, V_{in}:36 V to 57 V, P_{out} max. 10 W
Power outputs	1 x 3.0 – 3.3 V at 200 mA max.

Environment

Temperature	Operational: -10 °C to +55 °C
	Storage: 0 °C to +30 °C
Humidity	Max. 90%, non-condensing
Environmental Class	IP20

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Interfaces

TCP/IP	10T/100T, HP Auto_MDIX, DHCP client, IPv4
	TCP service: 1x at Port 2101
	UDP service: 1x for Digi-Scan
	DHCP: on
	WebServer: enable
	Connector: RJ45
Frequency	WaveNet 868-870 MHz, 10 mW max. (10 dBm)

Signalling

LED	A three-colour LED: red, green, blue

Programming

Interfaces	Via TCP/IP
Memory	1 MB, internal

Relay for Output 1

Quantity	1 x
Operating mode	Changeover contact
External output via relay contact	1 x C, 1 x NO, 1 x NC.
	Max. switching current: 30 V DC/24 V AC (ohmic load)
	Max. switching current: 1A (ohmic load)

Digital inputs

Quantity	3 x
Input voltage	Low: 0 to 0.5 V / high: 2 V to 3.3 V max
Ext. contact	Isolated contact can be connected between output (I1, I2, I3) and I_+

Digital outputs

Quantity	2 x
Type	Open collector
Switching voltage	12 V DC/100mA (max. ohmic load)
Power supply	A pull-up resistor (about 1 KOhm) can be connected between each output and $output_+$ ($V_{out} = V_{in} - 1V$)

Analogue inputs

Quantity	1 x
Resolution	12 bit
Input voltage	0 to 3.3V

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8.6 Resetting the TCP/IP configuration WN(M).RN2.ER.(IO)

Proceed as follows to reset the WN(M).RN2.ER.(IO):

1. Pull out the power plug.
2. Use a paper clip to press down the reset button.
3. Re-insert the power plug.
4. Hold the reset button down until the red and green LEDs flash alternately.
5. Then release the reset button.
6. The TCP/IP configuration has now been reset to the default settings.

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9 IO connector wiring

Simple contact analysis
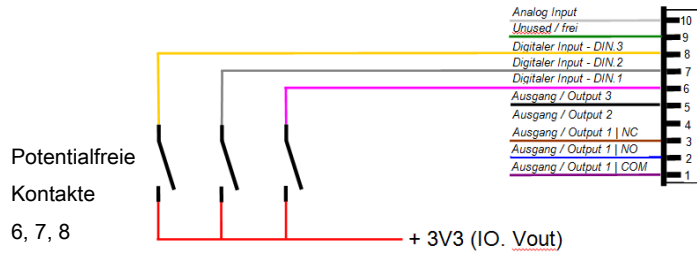
Wiring for digital input (DIN 1-3): to analyse/wire isolated contacts (relay, reed contacts). Opening external contacts can change inputs to carry out certain functions.

Analogue input wiring
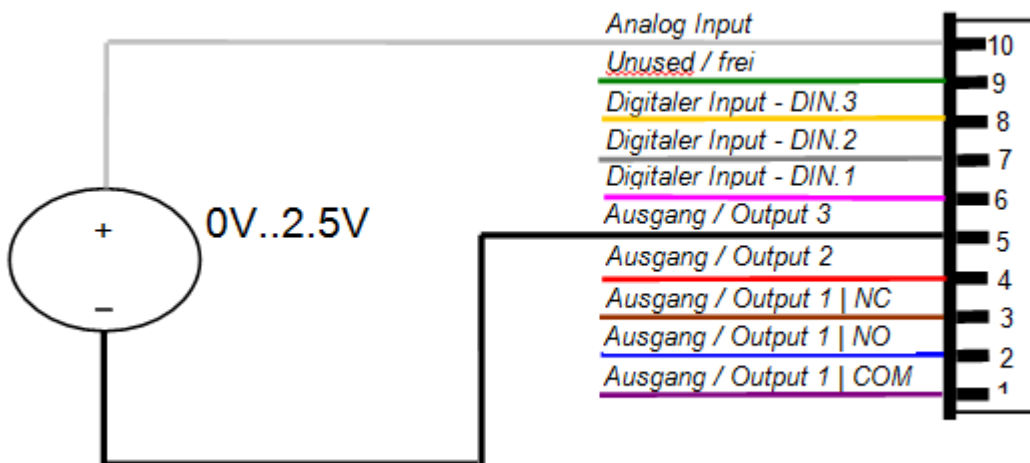
Relay contact wiring (Output 1)
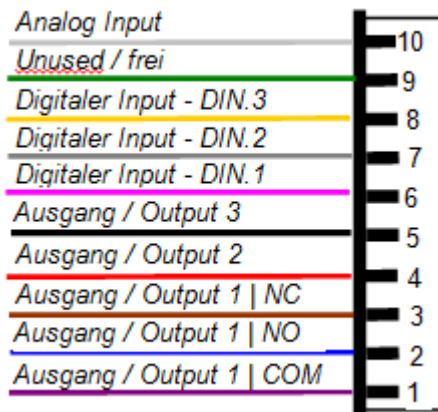
Output 1 (isolated relay output)

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1 --> Common

2 --> Normally open

3 --> Normally closed

Wiring for Outputs 2/3
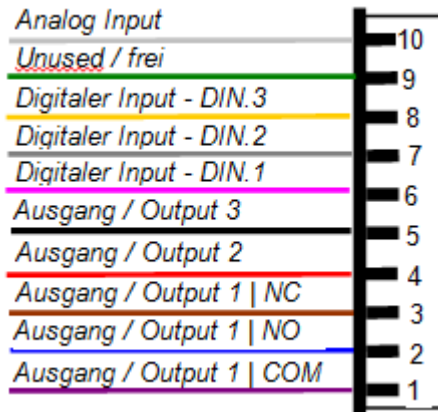
Output 2/3

2 --> Ground contact

3 --> Ground contact

The user has three open drain outputs at their disposal for use. These may be exposed to a maximum current of 200 mA each. We recommend using a recovery diode, such as a 1N4148, when connecting larger inductances. The router's earth must be connected to the system earth without fail. Maximum line length of the IO wiring: 30 m. Applies to DIN 1-3 + Output 2/3

Item	Explanation
Power jack (5.5 mm)	Jack plug from external source, 9-24 V DC, polarity-independent
Circuit board dimensions (L x W)	93 x 76 mm (L x W)
RJ45 Ethernet 10/100	Ethernet interface with PoE 802.3af
RST button	Reset button accessible from outside, can be tripped using paper clip or similar

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IO connector	Explanation
1. O1.COM	Output 1: C-contact relay (C = common), isolated
2. O1.NO	Output 1: NO-contact relay (normally open)
3. O1.NC	Output 1: NC-contact relay (normally closed)
4. O2	Output 2: Open collector
5. O3	Output 3: Open collector
6. DI 1	Digital Input 1
7. DI 2	Digital Input 2
8. DI 3	Digital Input 3
9. Not in use	Not in use
10. Analogue input	Input for analogue input signals

Item	Explanation
IO.Vout	IO connector for power supply
+3V3	Positive contact max. 3.3 V; can be used as an input signal for DI1-3
GND	Negative contact

Item	Explanation
RS485 (not assigned)	Interface
V in	Power supply from external source 9-24 V DC
GND	Negative contact
A	Data cable, max. 900 m
B	Data cable, max. 900 m

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10 Initial operation WN(M).RN2.ER.(IO)

The required IP settings with the SimonsVossAdmin Tool. For this, you have to be in the same sub-network. This program is available for free download --> www.simons-voss.com.

10.1 SimonsVoss device

The device type 'SimonsVoss device' is displayed for second generation RouterNodes. Right-click on the IP address to start the configuration. If no DHCP is used, the router is displayed with the address 192.168.100.100.
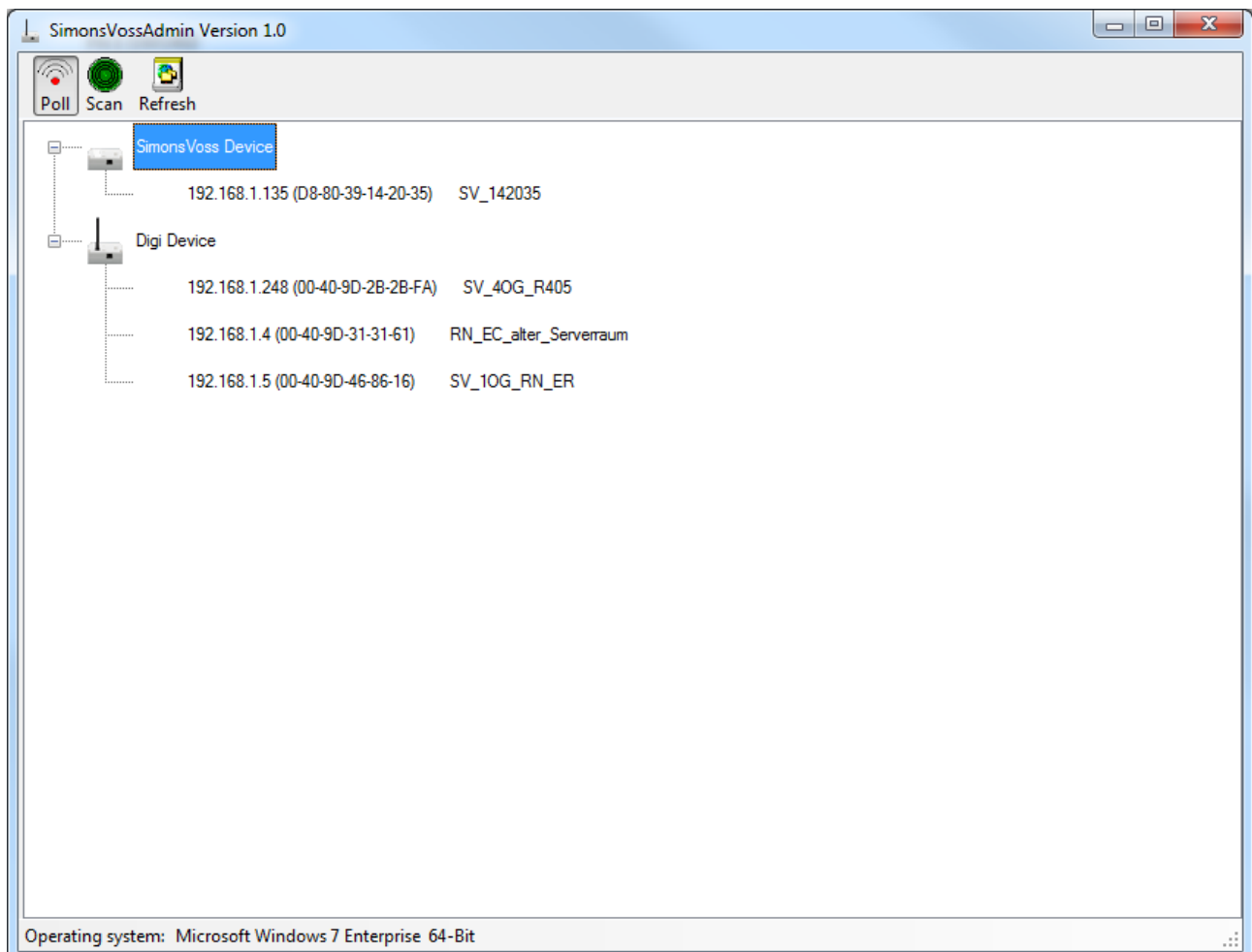
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Poll (disable/enable): If the function is enabled (Poll icon is highlighted), all newly added routers are automatically displayed in the SimonsVoss Admin tool using SNMP --> Simple Network Management Protocol (Broadcast!). Once all routers have been added, the Poll function can be deactivated again --> disable. The Poll icon is no longer highlighted.

Scan: you can use the scan to search for an IP address or individual IP addresses.
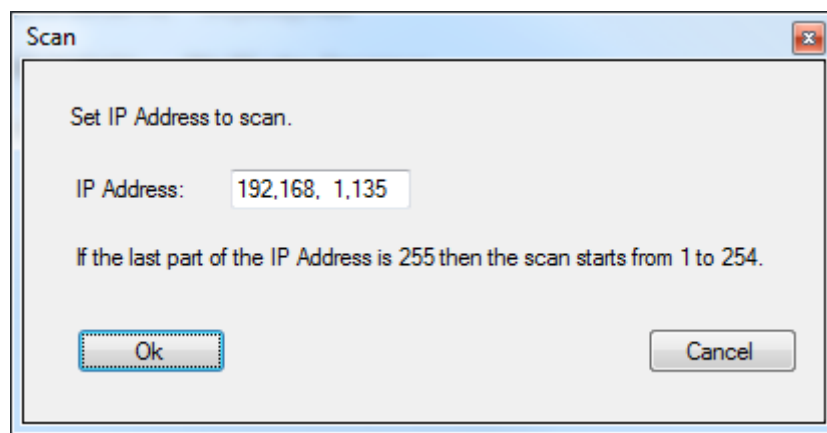
Refresh: the screen is refreshed.

Set IP (right-click on the IP address with the mouse): this is where the IP settings are changed.
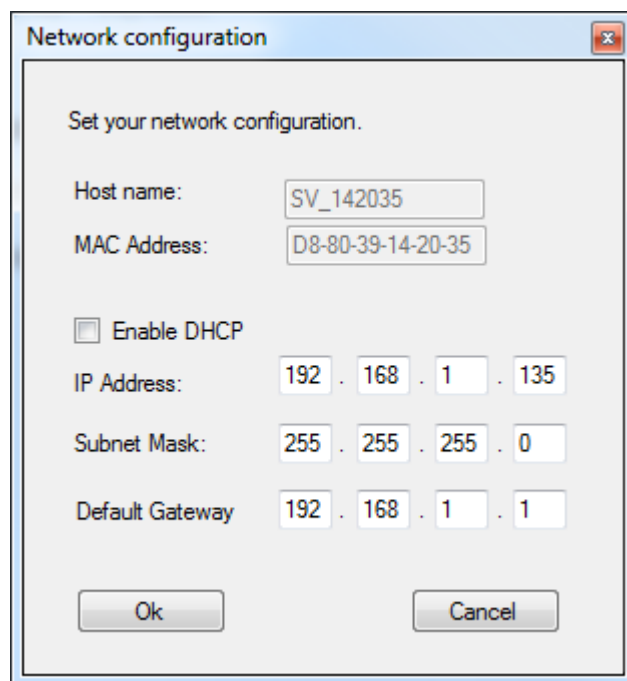
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Browser (right-click on the IP address with the mouse): this is where you can use the system's default browser to establish a link with the router/media converter.

Login:

User: SimonsVoss

Password: SimonsVoss
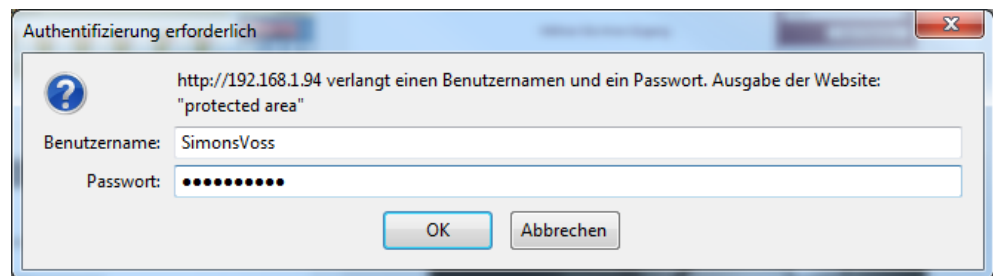
10.2 System connections
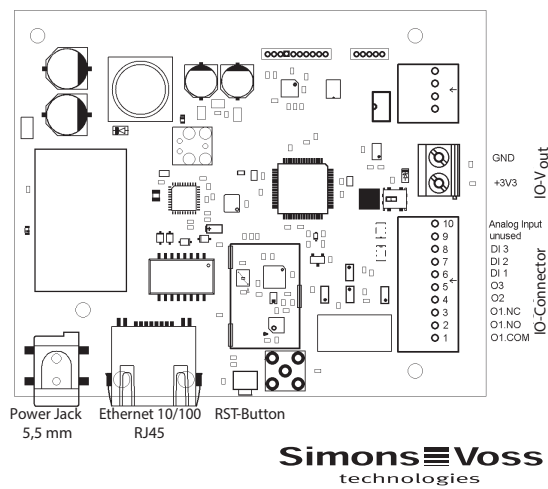
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10.3 LockNode
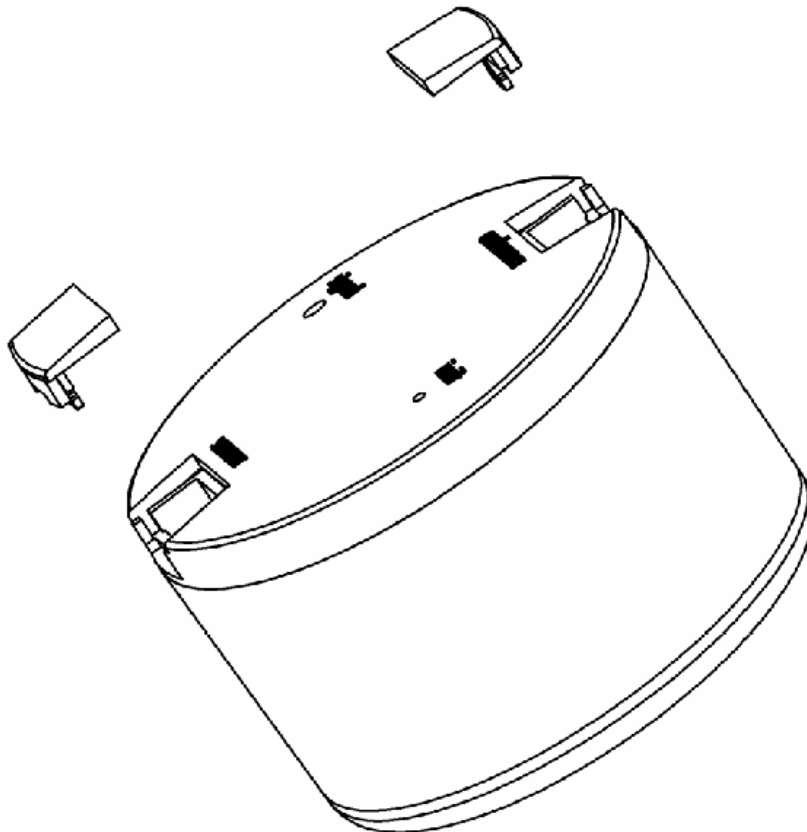
WaveNet LockNodes serve as the interface between WaveNet and the locking devices contained in the digital locking and organization system 3060 (e.g. locking cylinder, smart relay, etc.).

They always have:

– A special B-field interface via which communication takes place to the SimonsVoss locking devices (e.g. locking cylinder, control units/ SmartRelay, furniture simple.

– A radio interface (868 MHz) to ensure data transmission to the WaveNet Nodes (e.g. WaveNet RouterNodes, WaveNet RepeaterNodes or WaveNet CentralNodes) or

– a RS485 interface and connection for external power supply to operate in a wired WaveNet" (WN.LN.C)

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In the system, WaveNet LockNodes can only be assigned to one locking device (e.g. locking cylinder or Smart Relay or a furniture lock, etc.). The distance between the WaveNet LockNode and a digital cylinder /furniture lock may be max. 30 cm. A minimum distance of 40 cm must be observed between LockNode and Smart Relay. We recommend a cable connection between both components with WN.KAB.WIRED-BF; in this case, no minimum distance (only with SREL.ADV)

WaveNet LockNodes are located in a radio network and are battery-operated and can therefore be integrated within SimonsVoss Wave Net without the use of any wires. The use of the system is therefore ideally suited for subsequent installation within a building.

With the wired Variant of the LockNodes (WN.LN.C) the connections specified for the RS485 bus as well as further connections for the external power supply are available.

To keep installation work as low as possible, the housing of the WaveNet LockNodes has been designed for integration within a standard flush mounted box (60 mm deep, Ø 60 mm) in accordance with DIN 49073 part1. (e.g. for the installation of a light switch strip).

Note

It is recommended to project-install an empty hollow wall/switch box. This serves as a spatial separation between LockNode and the switch unit. A switch unit, such as a dimmer or electronic ballast can have negative effects on the communication between the LockNode and the locking device. Furthermore, no switched-mode power supply units (e.g. power supply for the LockNodes) may be used. Distance of switched-mode power supply units to LockNode/ Router Node ≥ 2 m. Some switch programs have less space available due to the cover fastening.

LockNode Input/ Output:

Every WaveNet LockNode also has a output and three inputs, e.g. monitoring door (except WN.LN.R.O.I/O and WN.LN.I)

The three inputs enable the connection of up to three external isolated contacts. This enables the central monitoring of e.g. door or bolt contacts – but also motion detectors, light bars, etc. – via the WaveNet network.

The statuses of switched contacts can be queried (polled) by the central computer at any time, changes to the contacts (events) can also – with the respective configuration of the LockNode – be automatically reported to headquarters.

The output is used to transfer signals to external systems, such as transducers, heating, light, etc. The outlet is realised by an electronic switch (Open Drain), which can switch up to 25 V and up to 650 mA.

For the optional switching of the I/Os, a 6-pole colour-coded cable is available (WN.LN.SENSOR.CABLE). The cable is inserted into the sleeve marked "sensor" on the LockNode. For monitoring tasks, up to

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three isolated contacts, each between the green "in-common" line and one of the coloured (pink, grey, yellow) lines can be connected (see illustration).
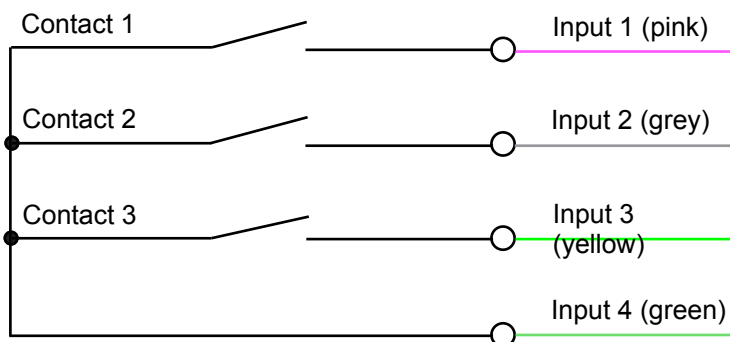
In the LDB/LSM user interface, an open contact has the value 0, a closed contact has the value 1. If e.g. in the drawing about, contact 1 is used to monitor the door. "Input1 transition from 1 to 0", if contact 1 closed when door is closed and open when door is open.

The ouput is realised internally with a transistor in open-collector switching. There are white and brown lines available for the connection to external devices, e.g. buzzer). In doing so, they may Out = brown, earth = white. Connection examples for possible output. Circuits:
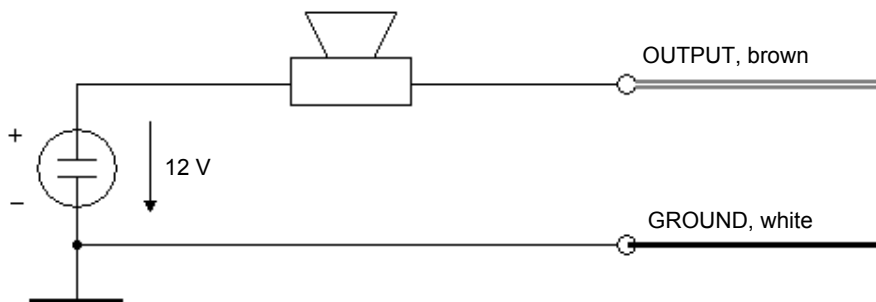
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10.4 Network Inside
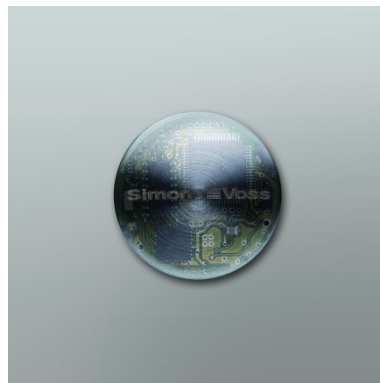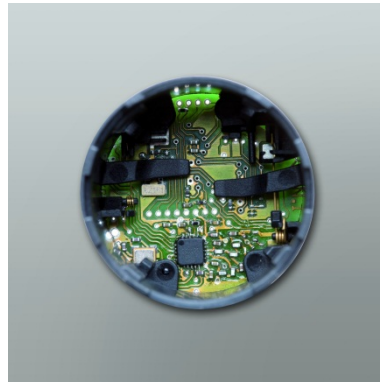
"Network Inside" is also known by the term direct networking. The LockNode required for this is in the knob closing (bottom) of the cylinder knob on the electronic side. LockNode electronics are connected by means of hardware contacts with the TN4 electronics. This enables a network connection to the cylinder without installation on or next to the door. An "offline" cylinder can be retrofitted to an "online" variant, merely by exchanging the knob closing. Order code: WN.LN.I. You can determine an "offline" cylinder as follows.
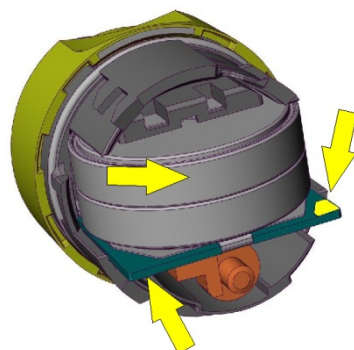
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The three yellow arrows on the TN4 electronics represent contacting WN.LN.I. The contact surface (arrow 2/3) on the TN4 circuit board indicate the possibility for "Network Inside" (cylinders manufactured starting 2008, software version: 10.5.10.53)

You can recognize a cylinder with direct networking by the black circumferential black ring.
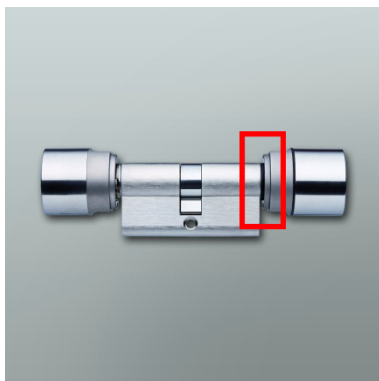
The cylinder with Network Inside is integrated like a WN.LN.R in a WaveNet and requires a segment address as well as a member ID. The range to a Central-or RouterNode amounts to up to 30 meters (depending on the building structure). After contact to a TN4 cylinder, four brief signal tones follow.

The temperature range is between – 15°C (for a residual battery capacity of 45%) to 50° C.

10.5 Networking SmartHandle

Each SmartHandle is networked with WN.LN.I.SH.
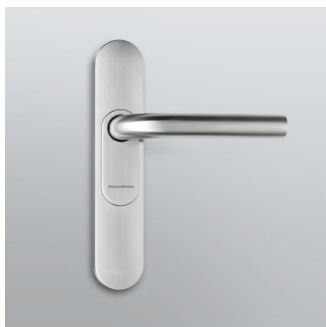
The LockNode is integrated (also possible retroactively) on the outer side of the foundation of the fittings and is therefore not visible. The inlay with the SimonsVoss logo is an antenna in our case.

Installation: Please read the SmartHandle manual for further information on the disassembly of inlay and cover. Avoid direct contact with the components on the circuit board. Prior to installation, make sure that there is no electrostatic charge, e.g. by touching the radiator.

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The WN.LN.I.SH (circuit board) is slid into the designated opening at an angle of about 15° to the sub-assembly of the outer fitting into the respective opening --> Metal clamp. The metal clamp ensures a secure mechanical fit at the fitting and represents the positive pole. If the circuit board has been correctly installed, it is situated flat on the sub-assembly. Spring-loaded pin makes contact with inlay at later stage (with SimonsVoss logo) The inlay serves as an antenna. Before reinstalling the covers, connect the connecting cable from the WN.LN.I.SH to the fitting electronics using the 2-pin plug. Insert excess cable into sub-assembly. Make sure that the connecting line is not damaged and that the covers can be easily reassembled.

Technical values like WN.LN.I.

Outside sub-group

WN.LN.I.SH

Connecting cable with plug
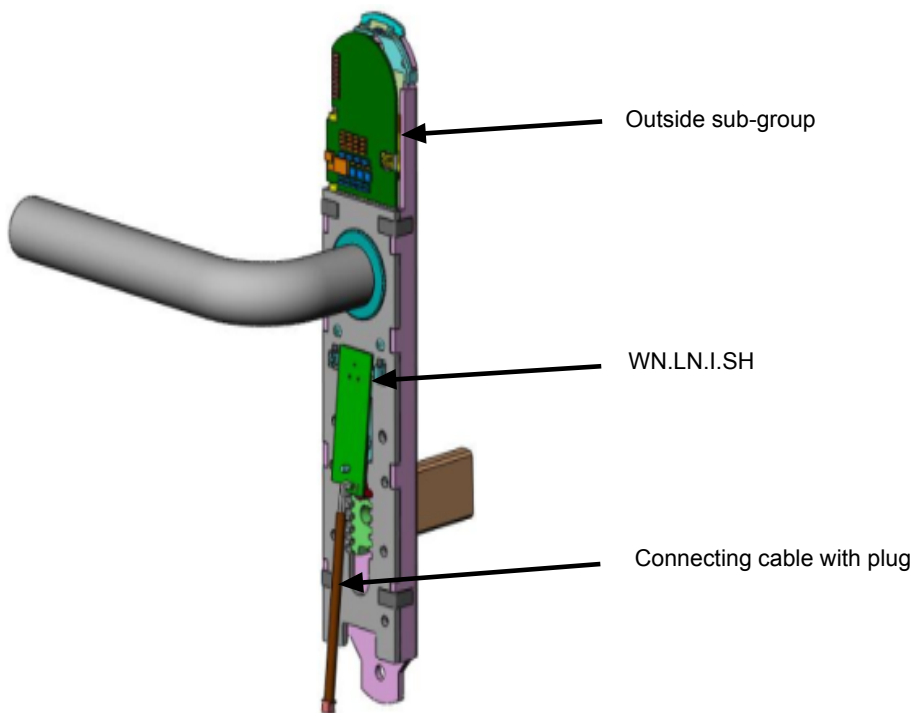
10.6 Networking SmartRelay G2

The SmartRelay G2.W can be networked with a WN.LN.I.SREL.G2 .

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The LockNode is stuck to the circuit board of the SmartRelay G2 (can also be done retroactively). There is a plug beneath the horizontal SmartRelay antenna which must be connected to the housing section in the WN(M).LN.I.SREL.G2 Insert the SmartRelay circuit board in the appropriate size into the housing part. Carefully press on the two circuit boards to connect them to one another Avoid direct contact with the components on the circuit board. Prior to installation, make sure that there is no electrostatic charge, e.g. by touching the radiator. The power supply for the LockNode is provided by SmartRelay G2 or the connected power supply unit. Do not use any switch-mode power supply units! Battery operation with SREL.BAT is not permitted! Technical values like WN.LN.I.

Plug to connect SmartRelay and LockNode

WN.LN.I.SREL.G2 with housing section

Connecting terminal with power supply
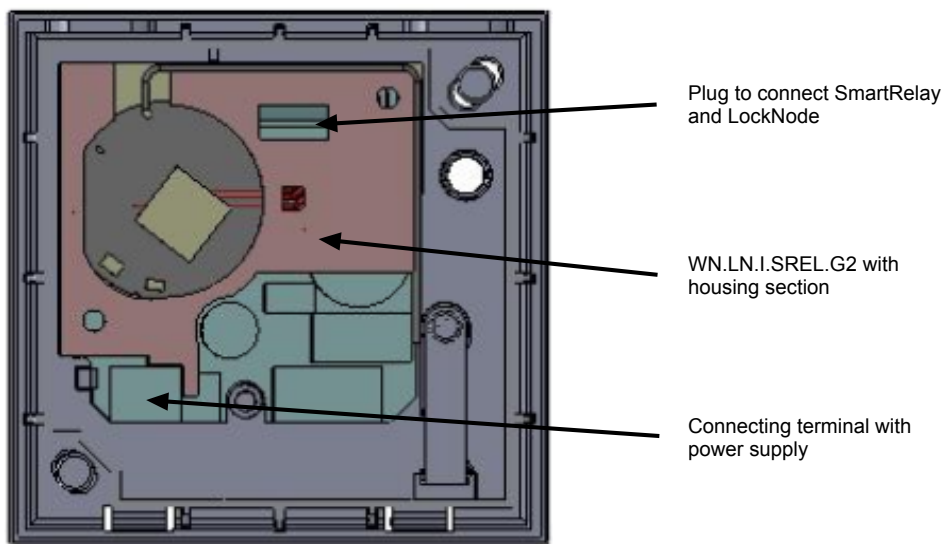
10.7 Networking SmartRelay 2 G2

The SmartRelay 2 G2.W can be networked with a WN.LN.I.SREL2.G2 .

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The LockNode is stuck to the circuit board of the SmartRelay G2 (can also be done retroactively).

Slot on SREL2 for WN(M).LN.I.SREL2.G2

Position for space between LockNode and SREL2 circuit board

LockNode WN(M).LN.I.SREL2.G2
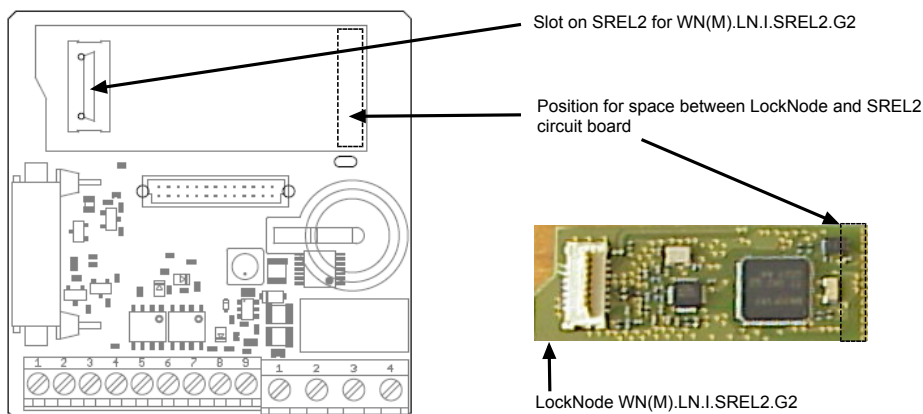
Remove protective foil from the adhesive surface on the spacer. Insert WN(M).LN.I.SREL2.G2 in the designated slot in the spacer. Plug the WN(M).LN.I.SREL2.-G2 into its slot in the SREL2 with the SREL2 disconnected and press the spacer's adhesive surface onto SREL2 circuit board. Four short flashes will indicate that the LockNode is ready to operate once the power supply has been connected. The locking device can now be operated online. Avoid electromagnetic interference, other frequencies in the range of 868 MHz or e.g. frequency converters in the direct vicinity of SREL2 /LockNode.

Avoid direct contact with the components on the circuit board. Prior to installation, make sure that there is no electrostatic charge, e.g. by touching the radiator. The power supply for the LockNode is provided by SmartRelay G2 or the connected power supply unit. Do not use any switch-mode power supply units! Battery operation with SREL.BAT is not permitted! Technical values like WN.LN.I.

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10.8 Networking CompactReader

The Compact Reader cannot be networked! The LockNode is situated in the housing of the Compact Readers. If the Compact Reader is to be networked, this should be taken into consideration when ordering. Order code: TRA.CR.MIFARE.WN(M), TRA.CR.MIFARE.W.WN(M) also available as a WP variant.

10.9 Networking with Smart Card Cylinder .MP using WN(M).LN.I.MP

LockNode slot   LockNode   Thumbturn cover
                                          (with inner antenna foil 86
                                          MHz)

Cylinder electronics
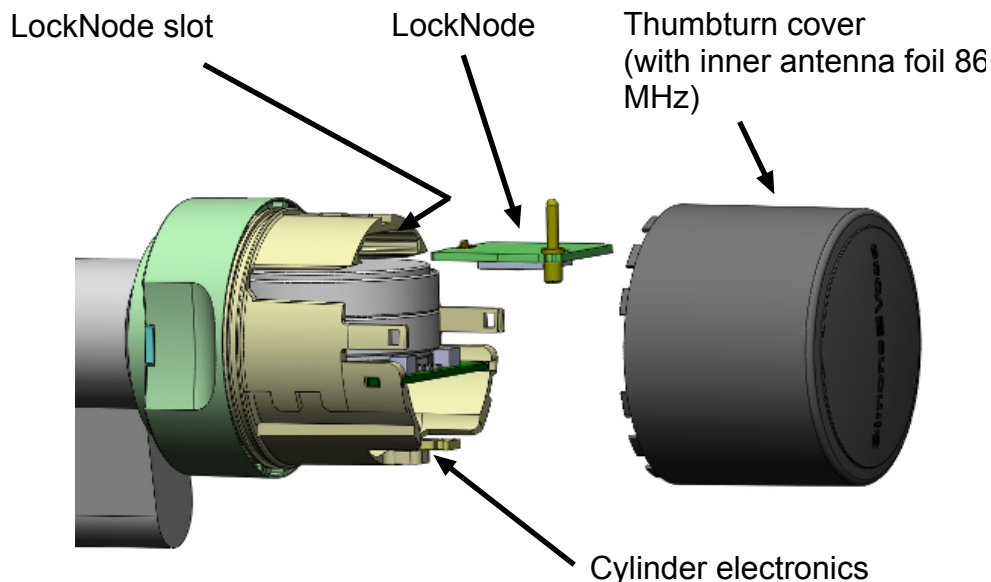
The latest Lock Node Generation WN(M).LN.I.MP can be used to add networking capability to a new .MP Cylinder SmartCard. To do so, the Lock Node is inserted into the slot above the batteries. The spring-loaded antenna pin is then connected to the antenna foil inside the knob cover.

Networking capability can be added to all .MP Cylinder SmartCards.

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– Conventional: Hex address programmed in Production --> WN.LN.I.MP

– WN-Manager 2.4: WNM.LN.I.MP (auto-configuration)

– LSM 3.2 and higher

– Packaging unit: LockNode circuit board with knob cover + integrated antenna foil Technical specifications

Technical specifications:

LockNode	Circuit board with antenna pin
Dimensions	Approx. 16 x 16 mm + antenna pin
Power supply	3 V from cylinder battery
Lock Node transmitting capacity	Max. 10 dBm (6.3mW) to the antenna socket
Transmission frequency	868-870 MHz

Product versions

Description	Order code	G2
WaveNet Lock Node circuit board and knob cover with antenna foil to retrofit direct networking (conventional).	WN.LN.I.MP	Yes
WaveNet Lock Node circuit board and knob cover with antenna foil to retrofit direct networking with auto-configuration.	WNM.LN.I.MP	Yes

Installation and configuration

Follow the procedure below to fit the WN(M).LN.I.MP:

– First remove the knob cover on the electronics side of the locking cylinder.

– You then need to release the card reader or the antenna bracket from its mount. Carefully press the battery holder together where you see three small arrows, so that the antenna bracket disengages. Carefully fold the antenna bracket out; do not apply any mechanical force to it.

– Carefully slide the Lock Node halfway into its designated slot above the inserted batteries. The spring-loaded antenna pin must be pointing upwards towards the knob cover.

– Now re-attach the card reader/antenna bracket, replace the knob cover with the integrated antenna foil and re-lock.

– The .MP Cylinder is now directly networked. Also read the operating instructions for the .MP Cylinder Smart Card.

NOTICE	The knob cover on offline .MP Cylinders does not feature an inserted antenna foil for an 868 MHz wireless network. You must therefore replace the knob cover

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Antennenstift

WN(M).LN.I.MP

Kontaktfedern

Einsteckplatz für WNM.LN.I.MP

Richtig eingesetzter LockNode

Richtig eingesetzter
LockNode mit Kartenleser / Antennenhalterung
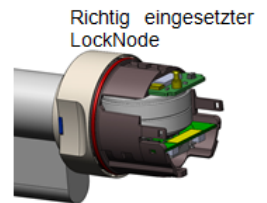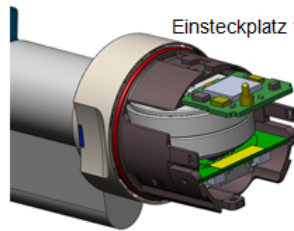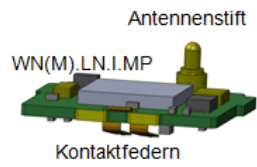
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11 WaveNet Manager

The WaveNet Manager enables the automatic addressing (hex address) of all network nodes (central nodes, router nodes and LockNodes) within a SimonsVoss wireless/cable network. Only products that start with "WNM.XX.YY" (order code) are suitable for autoconfiguration. Further information can be found in the WaveNet-Manager manual at www.simons-voss.de/Downloads

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12 Network structure with LSM
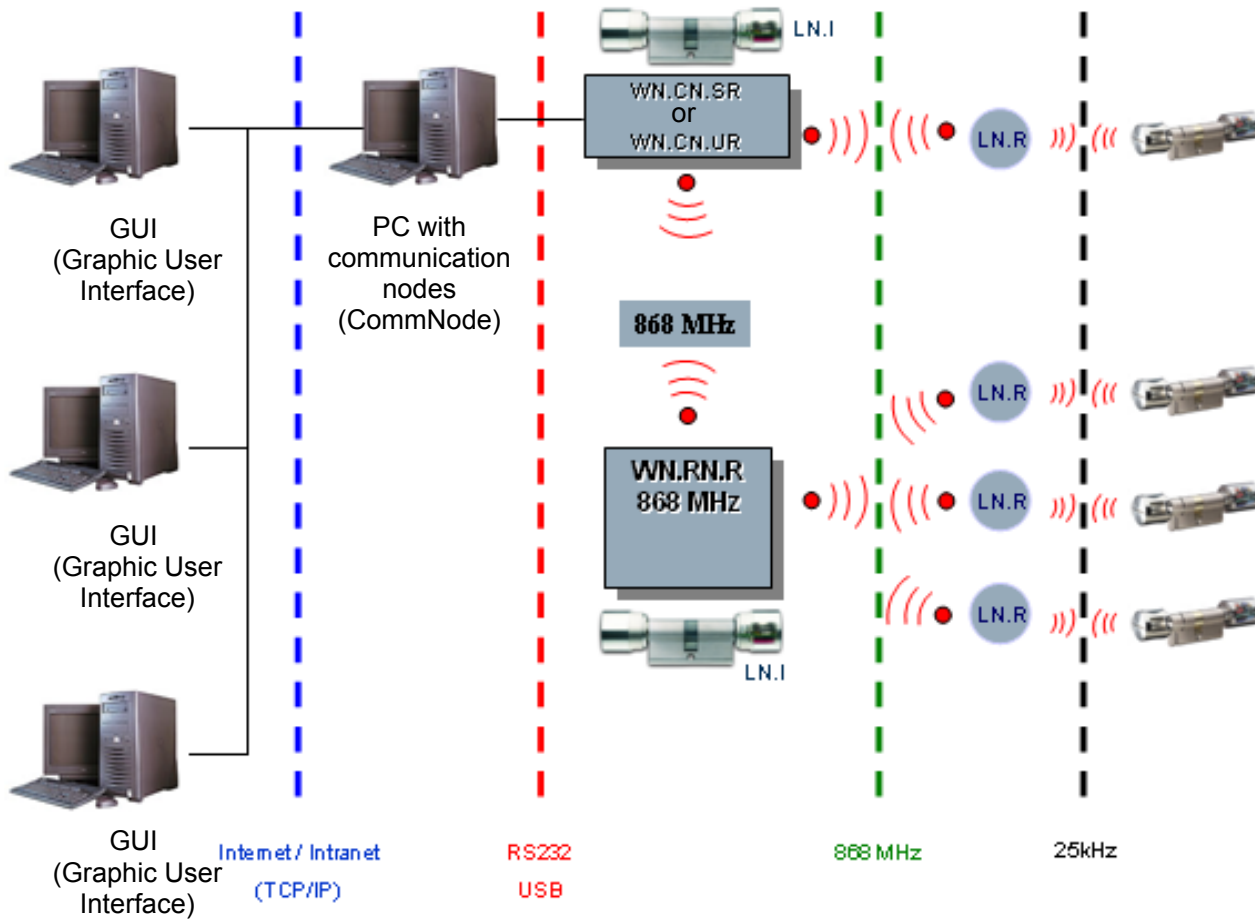
By means of the network structure above, various users with individual authorisations can access the common server with the aid of SimonsVoss WaveNet communication software (CommNode) and the GUI graphic user interface. It works like a so-called communication node and is connected via an RS232 cable or USB cable to the WaveNet CentralNode.

In the example shown above, the WaveNet CentralNode, which is connected to the server, communicates via radio (868 MHz) directly with a LockNode, which in turn uses radio transmission (25 kHz) to exchange data with the digital compoments (locking cylinder). All other LockNodes in the above example are outside the radio range of the WaveNet CentralNodes and are addressed indirectly via a WaveNet Router Node.

The above structure can be elegantly realized with the multi-user and multi-client capable, database-capable LSM locking system management software by SimonsVoss. In the above example however, there is only one single CommNode and thus also only one CentralNode with local sub-network. Actually virtually any number of CommNodes can be distributed in

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the Internet and Intranet. In this manner e.g. a "branch operation" can be created, i.e. from headquarters via Intranet/Internet any number of branches can be addressed with local CentralNodes and their subnetworks.

In the LSM, virtually any number of WaveNet Ethernet Routers WN.RN.E(X) or. WaveNet WLAN Routers (Wireless Local Area Network) WN.RN.W(X) can be integrated into a customer-side computer network (LAN or WLAN). Installation input of a Backbone (RS485 bus cabling) is not available where there is no Ethernet/WLAN.

The WN.RN.E(X) is PoE capable (Power over Ethernet). If PoE is used, a so-called midspan power feed is required, e.g. Phihong PSA 16 U. Of course, the WN.RN.E(X) as well as all WN.RN.(XX) can alternatively be operated with a plug-in power supply. --> WN.POWER.SUPPLY.PPP (not included in the delivery!).

The much easier to install (and respectively easier to master) file-based LDB locking system management software by SimonsVoss enables the direct integration of the transmission medium Intranet/Internet. For this purpose a WaveNet RouterNode is connected to the customer-side LAN and configured by means of LDB or additional software (Digi connect) (see manual p. WN.RN.E(X)). A maximum of four WaveNet Routers can be administered on one LDB, whereby only one can be activated. --> applies to WN.RN.E(X) and WN.RN.W(X)

Networks are divided into segments. A WaveNet CentralNode can cater to up to 252 segments, whereby each segment can have up to 250 WaveNet LockNodes/ WaveNet RouterNodes.

NOTICE	If you are working with the LSM software, a division can be made between 2030/30 and 250/250 (segments/ LockNodes per segment). During project planning it can be decided whether more segments or more LockNodes per segment are made available.

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13 Security

As WaveNet records and protocols critical data, it has to be reliably protected against unauthorised access. This poses a major challenge in terms of information and manipulation security.

13.1 Secure communication between the WaveNet Nodes

Network communication is protected against intercepting and monitoring data by means of extensive cryptography.

13.2 Automatic testing of the individual system components

As the individual system components are installed distributed through large parts of a building, the system must be able to automatically recognize malfunction, manipulation and the opening of a door and report this to the control PC.

NOTICE	If a door is to be equipped with door monitoring, it must at least have a door contact that recognizes the status of the door!

13.3 Alarms

Alarms are messages that call for a direct response (e.g. burglary, fire). WaveNet is not suitable as a replacement for fire or burglary alarms!

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14 Battery warning

Should the battery power required by the LockNodes be too low, this may result in communication malfunctions between LockNode and the respective locking device, as well as between LockNode and the router Node (WaveNet Router Node, WaveNet CentralNode).

If these malfunctions should occur, an "N" or a "W" appear behind the respective locking device in red (communication error). If the red "N" or "W" fail to turn yellow or blue, please check whether the batteries need replacing. Before the new batteries are put into a WN.LN.R, the new batteries should be put in the wrong way around for about 1 second. This leads to a reset and the battery warning ion the LockNode is taken back. Then insert batteries with the correct polarity.

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15 Network "N"/"W"

Locking devices/doors are marked 'N'/'W' in LDB/LSM if they are equipped
with a LockNode. The following coloured 'Ns'/'Ws' are available to show
different statuses.

Red 'N'/'W'	Not connected to the LockNode.
Yellow 'N'/'W'	Connected to the LockNode but not the locking device (door may be open)
Blue 'N'/'W'	Connected to the LockNode and the locking device
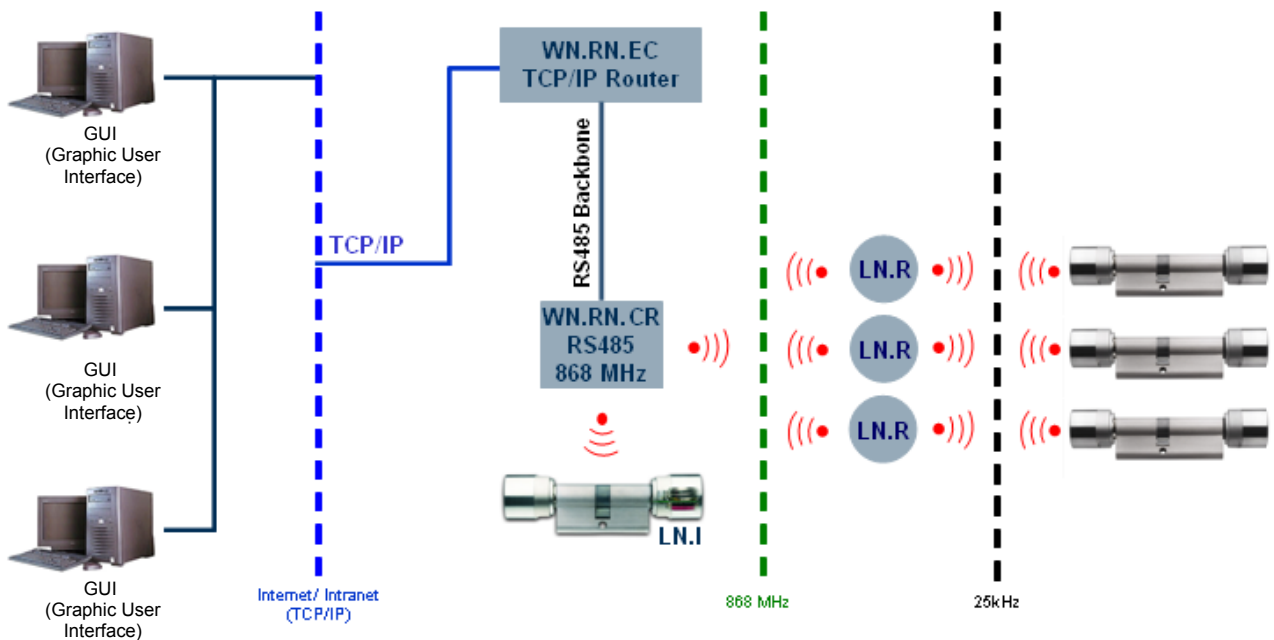
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16 Exchanging the LockNode batteries

To change the LockNode batteries, it must be removed from its installation position and the rear lid screwed off.

The positioning of the two batteries is clearly marked out in the battery compartment. Only batteries that have been approved by SimonsVoss may be used.

When putting in new batteries please keep an eye on the LED. Directly after inserting the first new battery in the empty battery compartment, the LED must briefly flash twice. This means that the node is operable (power-on reset). If the LED does not light up, please reove the baterry again, short circuit the battery contact of the LD and then insert the batteries again.

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17 Installation of WaveNet-LockNodes

← min. 30 mm

The distance between the
locking cylinder has to be
kept as small as possible. A
minimum distance of 30 mm
to the frame has to be
maintained.

The WaveNet LockNode
should be mounted at the
height of the locking cylinder.
Installation generally takes
place in a flush-mount switch
box or a light strip frame with
blind cover.
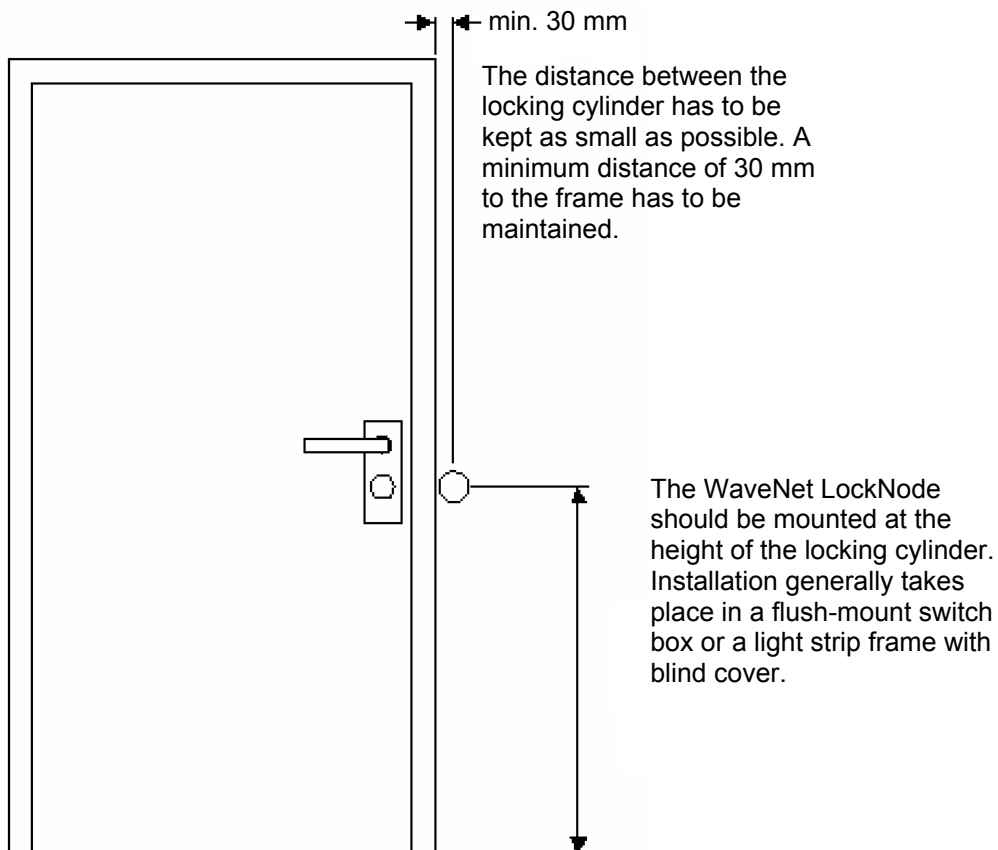
The radio range of RNs and LNs is generally optimal when RouterNodes
are mounted so that the antenna points vertically upward (or downward).
The "Init" button on the LockNode should always point to the digital
cylinder. If the LockNode e.g. is installed to the right of the cylinder, the
SimonsVoss logo will appear to be standing on its "head".

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18 Visualization of the operating statuses

18.1 WN.RN.(XX), WN.LN.C

– Power-On Reset: 2x brief red flashing

– Link quality between WN.RN.R by pressing button on baseboard:

1-2 times flashing of the signal LED --> Sending and receiving performance poor.

3-4 times flashing of the signal LED --> Sending and receiving performance all right.

5-6 times flashing of the signal LED --> Sending and receiving performance optimum.

18.2 WN.RN.R, WN.CN.(X)R, WN.RN.ER

– If the green LED flashes slowly the listen mode is active.

– Flashes quickly because their still is communication stkl established

– Red LED stays off.

18.3 Node Defect (identified by self-test)

– Red continuous light: Hardware defect

18.4 WN.RN.(X)C, WN.CN.(X)C: Master

– Red flickering, green LED off: No segment slave found (cable is defective or not a functioning slave.

18.5 WN.RN.C(X), WN.LN.C: Slave

Red flickering, green LED off: No segment slave found (cable is defective or not a functioning slave.

The following applies for 14.4-5: If both LEDs are flickering everything is OK!

18.6 1WN.LN.R

– Power-On Reset: 2x brief red flashing.

– Battery status (after Power On Reset):

– 1x short red flashing --> Battery fully charged.

– 1x long red flashing --> Battery critical.

– 1 x continuous light > four seconds -_> battery empty

– Link quality between WN.(X)N.(X)R and LockNode by pressing button on baseboard of LockNode:

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1-2 times flashing of the signal LED --> Sending and receiving performance poor.

3-4 times flashing of the signal LED --> Sending and receiving performance all right.

5-6 times flashing of the signal LED --> Sending and receiving performance optimum.

18.7 WN.RN.CC

– Power-On Reset: Yellow LED is lit.

– Upstream data traffic (towards master): Green LED is lit.

– Downstream data traffic (from master): Dark green LED is lit.

18.8 WN.CN.U(X)

– Recognized USB and power-on reset. Yellow LED is lit.

– If the green LED flashes slowly, the listen mode is active or

– it is flashing quickly, then communication is established to the LockNode.

– Red LED off.

18.9 WN.RP.CC

– Voltage exists: Yellow LED is lit.

– Upstream data traffic: Green LED is lit.

– Downstream data traffic: Dark green LED is lit.

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19 Technical specifications

19.1 WaveNet plug-in power supply

Order code	WN.POWER.SUPPLY.PPP
Description	Externally run 230V AC / 9V DC / 250 mA plug-in power supply for WaveNet CentralNode, WaveNet Repeater Node & WaveNet Router Node (PPP = Plug Power Pack)
Order code	WN.POWER.SUPPLY.LNC
Description	Externally regulated 230V AC / 24V DC / 1,25A plug-in power supply only for WN.LN.C, WN.RP.CC, with various network adapters UK/US/AU.

19.2 WaveNet CentralNode, RS232 connection cable

Order code	WN.CN.RS232.Cable
Description	RS232 connection cable between PC and WaveNet CentralNode
Length	2 m

19.3 WaveNet CentralNode, RS232- / RS 485 interface

Order code	WN.CN.SC
Description	WaveNet CentralNode to connect to a PC/Serversr CentralNode with integrated RS485 interface for backbone
Dimensions (LxWxH)	100x65x40 mm (applies for all routers with out antenna)
Power supply	9 - 12 V DC regulated plug-in power supply
Performance (for all routers)	Min. 3 VA (250 mA for continuous load*) * - power peaks at both ends in backbone

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NOTICE	The depiction of the housing may deviate from the original.

19.4 WaveNet CentralNode, USB- / RS485 interface

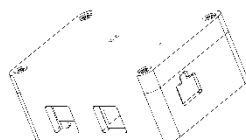|	
Order code	WN.CN.UC
Description	WaveNet CentralNode to connect to a PC/Serversr CentralNode with integrated RS485 interface for backbone
Dimensions (LxWxH)	100x65x40 mm (applies for all routers with out antenna)
Power supply	From USB port
Performance (for all routers)	Min. 3 VA (250 mA for continuous load*) * - power peaks at both ends in backbone

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NOTICE	The depiction of the housing may deviate from the original.

19.5 WaveNet CentralNode, RS232- / 868 MHz interface

Order code	WN.CN.SR
Description	WaveNet CentralNode with 868 MHz radio interface and external antenna
Dimensions (LxWxH)	100 x 65 x 40 mm or 100 x 65 x 130 mm (with antenna)
Power supply	9 -12 V DC regulated plug-in power supply
Performance (for all routers)	Min. 3 VA (250 mA for continuous load*) * - power peaks at both ends in backbone
For all routers with radio module	
Maximum transmission speed	5 dBm (3.16 mW) to the antenna socket
Sensitivity	-90 dBm at 19.2 kBd
Frequency band	868 MHz
Power consumption in receiving mode	12 mA at 9 V

NOTICE	The depiction of the housing may deviate from the original.

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WaveNet Network 3065**

19.6 WaveNet CentralNode, USB- / 868 MHz interface

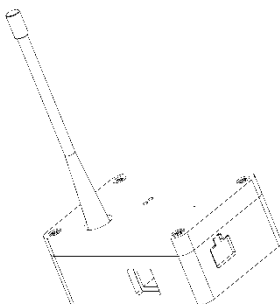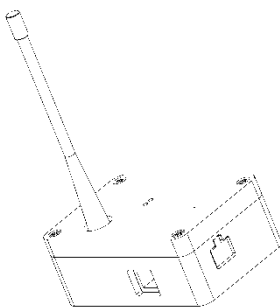|	
Order code	WN.CN.UR
Description	WaveNet CentralNode with 868 MHz radio interface and external antenna
Dimensions (LxWxH)	100 x 65 x 40 mm or 100 x 65 x 130 mm (with antenna)
Power supply	From USB port
Performance (for all routers)	Min. 3 VA (250 mA for continuous load*) * - power peaks at both ends in backbone
For all routers with radio module	
Maximum transmission speed	5 dBm (3.16 mW) to the antenna socket
Sensitivity	-90 dBm at 19.2 kBd
Frequency band	868 MHz
Power consumption in receiving mode	12 mA at 9 V

NOTICE	The depiction of the housing may deviate from the original.

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19.7 WaveNet Router Node for segment extension RS485

Order code	WN.RN.CC
Description	WaveNet Router Node as RS485 router with two RS485 interfaces for segment extension incl. connection clamp for external plug-in power supply
Dimensions (LxWxH)	100 x 65 x 40 mm
Power supply	9V - 12 V DC regulated plug-in power supply
Performance (for all routers)	Min. 3 VA (250 mA for continuous load*) * - power peaks at both ends in backbone
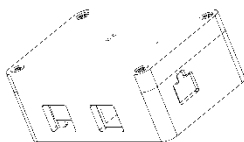
NOTICE	The depiction of the housing may deviate from the original.

19.8 WaveNet RouterNode 868 MHz

Order code	WN.RN.R
Description	WaveNet Router Node with 868 MHz radio module. Incl. connecting terminals for an external plug-in power supply and an external transmission and receiver antenna
Dimensions (LxWxH)	100 x 65 x 40 mm or 100 x 65 x 130 mm (with antenna)
Power supply	9 - 12 V DC regulated plug-in power supply
Performance (for all routers)	Min. 3 VA (250 mA for continuous load*) * - power peaks at both ends in backbone
Frequency band	868 MHz

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NOTICE	The depiction of the housing may deviate from the original.

19.9 WaveNet Repeater

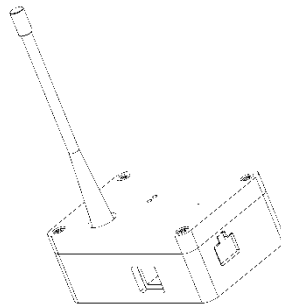|	
Order code	WN.RP.CC
Beschreibung	WaveNet Repeater Node with two RS485 interfaces for line extension, including connecting terminals for external plug-in power supply
Dimensions (LxWxH)	100 x 65 x 40 mm
Power supply	9V - 40 V DC regulated plug-in power supply
Performance (for all routers)	Min. 3 VA (250 mA for continuous load*) * - power peaks at both ends in backbone

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NOTICE	The depiction of the housing may deviate from the original.

19.10 WaveNet RouterNode as converter RS485/868 MHz

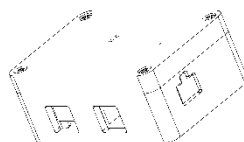|	
Order code	WN.RN.CR
Description	WaveNet Routing Node to convert from the RS485 interface to 868 MHz interface, to allow the routing node to be used as a backbone; includes connecting terminals for external plug-in power supply and an external transmission and receiver antenna
Dimensions (LxWxH)	100 x 65 x 40 mm or 100 x 65 x 130 mm (with antenna)
Power supply	9 -12 V DC regulated plug-in power supply
Performance (for all routers)	Min. 3 VA (250 mA for continuous load*) * - power peaks at both ends in backbone
Frequency band	868 MHz

NOTICE	The depiction of the housing may deviate from the original.

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19.11 WaveNet RouterNode as converter RS485/868 MHz

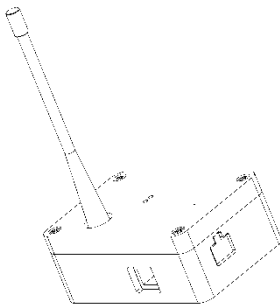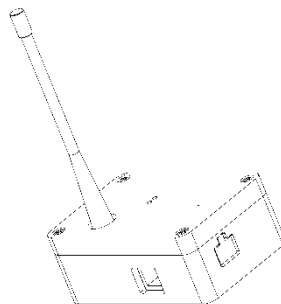|	
Order code	WN.RN.RC
Description	WaveNet Routing Node to convert from 868 MHz and the RS485 interface, to allow the routing node to be used as a backbone; includes connecting terminals for external plug-in power supply and an external transmission and receiver antenna
Dimensions (LxWxH)	100 x 65 x 40 mm or 100 x 65 x 130 mm (with antenna)
Power supply	9 -12 V DC regulated plug-in power supply
Performance (for all routers)	Min. 3 VA (250 mA for continuous load*) * - power peaks at both ends in backbone
Frequency band	868 MHz

NOTICE	The depiction of the housing may deviate from the original.

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19.12 WaveNet RouterNode as converter Ethernet/RS485

Order code	WN.RN.EC
Description	WaveNet Router Node to convert between Ethernet interface and RS485 interface , to allow the routing node to be used as a backbone; includes connecting terminals for external plug-in power supply and an external transmission and receiver antenna
Dimensions (LxWxH)	100 x 65 x 40 mm
Power supply	9V - 48 V DC regulated plug-in power supply
Performance (for all routers)	Min. 3 VA (250 mA for continuous load*) * - power peaks at both ends in backbone

NOTICE	The depiction of the housing may deviate from the original.

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19.13 WaveNet Router Node as converter Ethernet/868 MHz

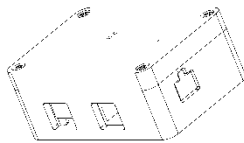|	
Order code	WN.RN.ER
Description	WaveNet RouterNode as converter between the Ethernet interface (TCP/IP) and the 868 MHz interface. Incl. connecting terminals for an external plug-in power supply and an external transmission and receiver antenna
Dimensions (LxWxH)	100 x 65 x 40 mm or 100 x 65 x 130 mm (with antenna)
Power supply	9 - 48 V DC regulated plug-in power supply
Performance (for all routers)	Min. 3 VA (250 mA for continuous load*) * - power peaks at both ends in backbone
Frequency band	868 MHz

NOTICE	The depiction of the housing may deviate from the original.

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19.14 WaveNet RouterNode as converter WLAN/RS485

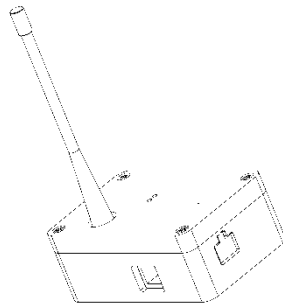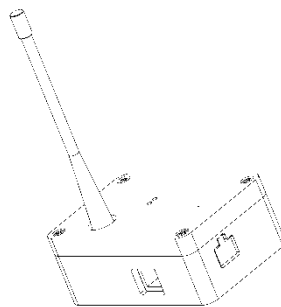|	
Order code	WN.RN.WC
Description	WaveNet Router Node to convert between WLAN interface and RS485 interface , to allow the routing node to be used as a backbone; includes connecting terminals for external plug-in power supply and an external transmission and receiver antenna
Dimensions (LxWxH)	100 x 65 x 40 mm or 100 x 65 x 130 mm (with antenna)
Power supply	9 - 48 V DC regulated plug-in power supply
Performance (for all routers)	Min. 3 VA (250 mA for continuous load*) * - power peaks at both ends in backbone
Frequency band	868 MHz

NOTICE	The depiction of the housing may deviate from the original.

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19.15 WaveNet Router Node as converter WLAN/868MHz

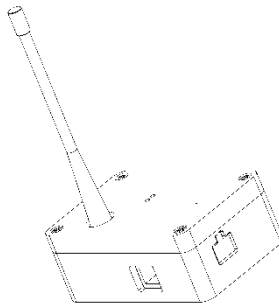| Order code	WN.RN.WR
Description	WaveNet RouterNode as converter between the WLAN interface (TCP/IP) and the 868 MHz interface. Incl. connecting terminals for an external plug-in power supply and an external transmission and receiver antenna
Dimensions (LxWxH)	100 x 65 x 40 mm or 100 x 65 x 130 mm (with antenna)
Power supply	9 - 48 V DC regulated plug-in power supply
Performance (for all routers)	Min. 3 VA (250 mA for continuous load*) * - power peaks at both ends in backbone
Frequency band	868 MHz

NOTICE	The depiction of the housing may deviate from the original.

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19.16 WaveNet LockNode

Order code	WN.LN.R
Description	Battery-operated WaveNet LockNode (nodes for PC networking for PC networking of digital components) with 3 inputs and one output
Dimensions (H x d)	37 mm x 53 mm
Power supply	2 batteries CR2/3AA, lithium 3,6 V Fa. tadiran, SL761
Power consumption	Send radio: 32 mA:
	Radio receiving 18 mA:
	Power consumption without data traffic: approx/.20 µA
	Note: Dependent on data traffic and traffic in general.
Maximum transmission speed	approx. 1mW
Sensitivity	-95 dBm
Frequency band	868 MHz
Input (3x)	Isolated (current pulse approx. 35 µA for 1ms all 0.5 sec)
Output (Open Drain)	Maximum switching current: 25 V DC
	Maximum switch-on current: 2 A
	Continuous current: 650 mA
	Internal resistance (AN): 0.5 Ω
Battery life	approx. 6 years

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Order code	WN.LN.R.O.I/O
Description	Battery-operated WaveNet LockNode (nodes for PC networking of digital components) with 3 inputs and one output
Dimensions (H x d)	37 mm x 53 mm
Power supply	2 batteries CR2/3AA, lithium 3,6 V Fa. tadiran, SL761
Power consumption	Send radio: 32 mA:
	Radio receiving 18 mA:
	Power consumption without data traffic: approx/.20 µA
	Note: Dependent on data traffic and traffic in general.
Maximum transmission speed	approx. 1mW
Sensitivity	-95 dBm
Frequency band	868 MHz
Battery life	approx. 6 years

Order code	WN.LN.C
Description	WaveNet LockNode with RS485 interface for use in " wired" WaveNet. (Nodes for PC networking of digital components) with 3 inputs and one output
Dimensions (H x d)	37 mm x 53 mm
Power supply	Connection clamp for external power supply 6-24 V DC
Maximum transmission speed	approx. 1mW
Sensitivity	-95 dBm
Input (3x)	Isolated (current pulse approx. 35 µA for 1ms all 0.5 sec)
Output (Open Drain)	Maximum switching current: 25 V DC
	Maximum switch-on current: 2 A
	Continuous current: 650 mA
	Internal resistance (AN): 0.5 Ω
Battery life	approx. 6 years

Note on size of power supply unit for WN.LN.C An imputed value of 15 mA per LockNode can be charged. 15 mA (0.015 A) x no. LockNode = Overall electricity --> see 15.1

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Order code	WN.LN.I
Description	Network knob as retrofitting knob to network a TN4 cylinder (direct networking)
Dimensions (H x d)	26 mm x 30 mm
Power supply	3 V DC battery(ies) of TN4 cylinder
Power consumption	Power consumption without data traffic: approx.6 µA
	Power consumption without data traffic: approx. 30 mA
Max. transmission performance (effective ERP)	approx. 0.4 mW at – 4dBm
Sensitivity	-95 dBm
Battery life	Up to 5 years standby or 150,000 closing operation
Reach to Central/ RouterNode:	Up to 30 m (dependent on building structure)
Separate antenna	Is no longer needed!
Input / Output	None
Ambient conditions	Up to – 15°C with 45% residual battery capacity/ up to + 50°C
Weatherproof (.WP)	Available as weatherproof variant
Special knobs	None

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20 Declaration of Conformity

You can access documents such as declarations of conformity and other certificates online at .

**Manual
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21 Help & Contact

Instruction manuals	You will find detailed information on operation and configuration online on our homepage at www.simons-voss.de in INFOCENTER > DOWNLOADS
Hotline	If you have any questions, the SimonsVoss Service Hotline will be happy to help you on +49 (0)89 99 228 333 (German fixed network; call charges vary, depending on the operator)
E-mail	Would you prefer to send us an email? hotline@simons-voss.com
FAQs	You will find information and help for SimonsVoss products in the FAQ section www.simons-voss.de in INFO CENTRE > FAQ SECTION

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