

# RSS R1 / P1

## RECEIVER RSS R1

## TRANSMITTER RSS P1



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Do you have further questions? You may contact us at any time – even after purchase. You can reach us directly at the below mentioned addresses.

Kindest Regards,

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# 1 Safety

## 1.1 Symbol key



- hazards for persons or damage to the product are possible



- important information on the product or its handling

## 1.2 Appropriate use

The RSS radio system serves to transmit the sensor states via a radio link from the transmitter unit to the receiver in the switching cabinet.

For the RSS P1 system, this specifically involves monitoring the pressure in the chuck. The system's task is to detect a proper working pressure when clamping the work piece from the outside. This way, a secure clamping can be ensured. Furthermore, it is possible to detect pressure loss in the system in due time.

The unit must only be used within the scope of its technical data. Appropriate use also includes compliance with the conditions the manufacturer has specified for commissioning, assembly, operation, environment and maintenance. Using the unit with disregard to even a minor specification will be deemed inappropriate use. The manufacturer assumes no liability for any injury or damage resulting from inappropriate use.

## 1.3 Safety information

This manual describes the function, application and safety considerations of this product. This manual must be read and understood before any attempt is made to install or operate the product, otherwise damage to the product or unsafe conditions may occur.


**This device complies with part 15 of the FCC Rules and with RSS-210 of Industry Canada. 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.**



1. The radio link established by the system can experience temporary or permanent interference through external influences. As a result, the states of the sensors are not updated at the receiver for the duration of the interference. The interference is only reported by the receiver after the watchdog time has lapsed. Ensure that such interferences cannot cause any damage. Adjust the watchdog time to a time suitable for your process.

The customary standards for sensor systems must be observed. Installation and commissioning may only be performed by qualified staff trained for electrical system.

2. In the 824 MHz range, the system does not comply with the EMC regulation for interference immunity to incoming radio waves. Losses of radio telegrams may occur in this range.  

Disturbances become more likely if the antenna is further than 25 cm away from the receiver. The application must therefore be tested each time before being integrated.
3. **The radio switch receiver must not be used in combination with devices that are directly or indirectly used to safeguard the health or life of persons, or devices which, when in operation, could cause danger to persons, animals or property! This is due to the radio switch receiver's classification as "Class 2 Equipment" in accordance with ETSI EN 301 489-3 V1.4.1 (2202-08) "Specific conditions for short-range devices (SRD)".**
4. When the chuck is in operation, sudden surges in pressure may occur in the piston area of the chuck. If the switching pressure set is exceeded due to these pressure fluctuations, then the system sends this information. Thus, a very short "Pressure IO" message may arise during the clamping process.
5.  Even if the air supply is switched off, there may still be pressure present at the pressure switch if the chuck was not bled. It is imperative that the pressure chamber be bled before the pressure switch is disassembled. The chuck must be opened for this purpose.  

The time between evaluable telegrams must be at least 50ms.
6. The RSS R1/P1 receiver/transmitter has been built according to the current state of the art and is operationally safe. The unit can only pose hazards if, for example:
  - the unit is used, assembled or maintained inappropriately.
  - the unit is used for purposes other than those for which it is intended.
  - the EC Machine Directive, the accident prevention regulations, the VDE guidelines, or the safety information and assembly notes are not observed.
7. All persons responsible for assembly, commissioning and maintenance of the unit are obliged to have read and understood all the operating instructions, in particular the **Safety** chapter. We recommend that the customer have this confirmed in writing
8. The installation and deinstallation, connection and commissioning of the unit may only be performed by authorized, appropriately trained personnel.
9. Modes of operation and work methods that adversely affect the function and/or the operational safety of the unit are to be refrained from.
10. The RSS R1/P1 receiver/transmitter may only be used to control chucks within the scope of its technical data. Any use outside this scope is deemed to be inappropriate. The manufacturer assumes no liability for any injury or damage resulting from such inappropriate use.
11. **Always disconnect the power supply lines during assembly, conversion, maintenance and adjustment work.**
12. **Additional holes, threads or attachments which are not supplied as accessories by SCHUNK may only be applied after obtaining the prior consent of SCHUNK.**

13.  To avoid severe personal injury or substantial property damage, only qualified persons may work on the devices. These persons must conscientiously read the operating instructions and observe the safety notes before installation and commissioning. (Cf. IEC 364 or CENELEC HD 384 or DIN VDE 0100 and IEC report 664 or VDE 0110 and national accident prevention regulations or VBG 4.)
14. Repairs to the RSS R1/P1 receiver/transmitter may only be carried out by the manufacturer or repair centers authorized by the manufacturer. Unauthorized opening and inappropriate tampering may lead to personal injury or property damage.
15.  Make absolutely sure that the operator is not injured (crushed) while clamping or unclamping the chuck. We recommend you enable the >>Clamping<< or >>Unclamping<< functions of the chuck only when the system door is closed.
16. Warning: Changes or modifications made to this equipment not expressly approved by SCHUNK may void the FCC authorization to operate this equipment.



**Note**

Above and beyond that, the safety and accident prevention regulations in force at the location of use apply.

## 2 Warranty

The warranty period is 24 months after delivery date from the production facility assuming use in single-shift operation and that the recommended maintenance and lubrication intervals are observed.

Components that come into contact with workpieces and wearing parts are never included in the warranty. In this context, please also see our General Terms and Conditions.

## 3 Required Components

The following components are required for proper use:

Sensors:	One pressure switch that is incorporated into the chuck
Radio transmitter:	One RSS P1 transmitter is required per transmitter/chuck
Radio receiver	One RSS P1 radio transmitter is required per RSS R1 radio receiver
Antenna:	One RSS-R-A antenna per radio receiver

## 4 Technical Data

Refer to our catalog for additional technical data.

The latest version is valid in each case (as per Chapter 2.3 General Terms and Conditions).



#### 4.1 General technical data - RSS R1

Description	Technical data	RSS R1
Supply		
Voltage supply	DC 12...24V (-10...+20%)	
False polarity protection	Yes	
Current input	< 45 mA + load control	
Radio protocol / data		
Receiving frequency	868.3 MHz	
Receiving protocol	EnOcean Standard	
Telegram analysis	STM data	
Outputs		
Output voltage	^= Supply voltage	
Output current (per channel)	max. 500 mA at 24V	
Load type	Resistive	
Type of outputs	Semiconductor = OP output PNP	
Potential isolation	No	
Short-circuit proof, overload protection	Yes	
General data		
Permitted ambient temperature	0 to 50°C	
Storage temperature	-25 to +85°C	
Protection class	IP20	
Installation position	Vertical	
Connection method	CAGE CLAMP® connection 0.08...2.5 mm <sup>2</sup> WAGO multi-plug system series 722	
Housing material	Polycarbonate	
Electromagnetic compatibility	CE conforming with EMC- guideline 89/336/EWG	
Electromagnetic radiation	EN 61000-6-4	
Electromagnetic interference	EN 61000-6-2	
Radio permit EnOcean	CETECOM Test report 2_3041-01-02/02	
Receiver RCM 100	DAR Test report P0ZNNP1P	
Installation type	Snapping on to DIN track (EN50022)	
Dimensions (WxHxD)	35 mm x 55 mm* x 90 mm ;* from upper edge TS35	
Required accessories		
Antenna (ID No. 0377730 )	Not included in scope of delivery	

#### 4.2 General technical data - RSS P1

Description	Technical data	RSS-P1
Transmission frequency	868.3 MHz	
Sensor connection	Two-wire to pressure sensor	
Housing material	Araldite cast resin	
Protection class	IP67	
Voltage supply	Lithium batteries, life for 1 transmission/10 seconds, longer than 7 years	
Transmission protocol	EnOcean Standard	
Permitted ambient temperature	0 to 50°C	
Storage temperature	0 to 50°C	
Electromagnetic compatibility	CE conforming with EMC- guideline 89/336/EWG	
Electromagnetic radiation	EN 61000-6-4	
Electromagnetic interference	EN 61000-6-2	
Radio permit EnOcean	CETECOM Test report 2_3041-01-02/02	
Transmitter STM	DAR Test report P0ZNNP1P	
Installation type	Screw connection in chuck	

Description	Technical data	Pressure switch
Pressure range	1 – 10 bar	
Pressure type	Positive excess pressure	
Pressure connection	G1/8 B	
Measuring principle	Spring-loaded diaphragm	
Change of load	1 million pressure cycles	
Switching output	1 closer	
Hysteresis	<10% from the value set	
Reproducibility	<5% from the value set	
Temperature range	-5°C to +75 °C	
Weight	30 g	
Burst pressure	20 bar	

### 4.3 Information on radio link and range

The transmitter sends telegrams with 868 MHz to the receiver. The receiver checks the incoming telegrams and uses them to control its outputs.

This radio link is principally prone to interferences by other radio systems or systems emitting radio signals. For reasons of availability, the presence of systems emitting radio waves – such as wireless or mobile phones or PCs – in the immediate proximity of the transmitter is to be avoided. We recommend observing a minimum air distance of at least one meter between receiver and interference source or between transmitter and interference source.

Since the radio signals represent electromagnetic waves, the signal is damped on its route to the receiver. This means, the signal strength decreases with increasing distance between transmitter and receiver. Thus, the radio range is limited. In particular, the range will also be significantly limited in case of irradiation above 400 MHz.

It must also be noted that the radio range is reduced by materials between transmitter and receiver. For the practical application, this means that the construction materials used in buildings and facilities (machines) play an important role for the evaluation of the radio range. Some reference values that can be used to estimate the range are:

#### Line of sight

- Typically 30 m range

#### Concrete or brick walls

- Typically 20 m range

#### Steel-reinforced concrete walls

- Typically 10 m range

#### Fire protection walls, elevator shafts.

- Can be considered blockages.



#### Turning centers

- The radio waves penetrate to the outside through various slots and especially through the viewing glasses. It is difficult here to make an exact statement on the range. Based on our experience, a range of at least 3 m must be expected.

#### Cordless telephone at a distance of less than 1m

- Range approx. 25 cm

The distance from the receiver to other transmitting devices also radiating high-frequency signals (computers, video systems, etc.) should be at least 0.5 m.

Using the receiving strength LED (SI) to our receiver it is easy to decide whether the system provides secure transmission for the intended location or if strong interferences are present.

## 5 First Steps

### 5.1 Assembly

#### 5.1.1 Assembly of the RSS P1 transmitter module

You have received the system completely assembled. The following assembly instructions are intended for maintenance that may be needed.

- Roll out pressure monitoring kit MATCH code "DAF..." (transmitter unit 8703653, pressure switch 9941145, seal and cover for pressure switch).
- An electrostatic discharge via the cable at the transmitter unit must be prevented. The installation engineer must ground himself/herself at the chuck accordingly. During the entire assembly process, the chuck must remain on a grounded base.
- Lay the cable of the transmitter unit in the bores of the chuck body so that the end can be pulled out in the bore in the side for the pressure switch.
- When you pull out the cable, it must not be pulled over sharp edges.
- The cable must not be laid taut in the chuck body; otherwise it will be damaged during the rotation.
- Push the transmitter unit carefully into the recess in the chuck. In the process, feed the cable accordingly to the bores at the chuck to the recess for the pressure switch. Make sure the cable is not pinched or damaged.
- Install the pressure switch into the chuck using the proper wrench and solder on the 'brown' and 'black' wires at the pressure switch.

### 5.1.2 Assembly and electrical connection of the RSS R1 receiver

- Mount the receiver in a switching cabinet located less than 10 m from the transmitter by snapping it onto a DIN track (EN50022).
- Connect the receiver:

#### Antenna socket X1:

- SMA socket for external antenna (we recommend our RSS-R-A antenna, ID°No. 0377730)

#### Connector X2:

- **X2.1 FE** Function ground
- **X2.2 +** Supply DC 24DCV+external
- **X2.3 -** Supply DC 24V-external

#### Connector X3:

- **X3.1 WD** Output watchdog, high signal, if radio IO
- **X3.2 LC** Output limit value, high signal, if battery IO, i.e. has still more than 2 weeks capacity remaining.
- **X3.3 DO1** Output 1, reserve, no function here.
- **X3.4 DO2** Output 2, high signal, if clamping pressure is insufficient.
- **X3.5 GND** Reference ground for the outputs, type

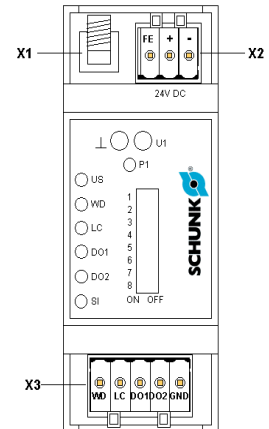


Figure 1:  
Receiver RSS R1



#### Recommendation:

If the clamping pressure is insufficient (D02=High), or if the radio link is interrupted (WD=Low), it is imperative to shut down the spindle for safety reasons.

Connector WAGO MULTI-PLUG SYSTEM series 722.


- Mount the antenna on the top of the switching cabinet **using the magnetic base.**

### 5.1.3 Switching suggestions on connecting to your system

**Variant 1**, if your system has digital inputs available.

**WD on Input 1.** This must be high; otherwise the radio communication is interrupted.

**D02 on Input 2.** If this is high, then the pressure is insufficient.



Adapt the system's software so that the spindle can only turn if E1= High and E2= Low. Continue to check for each cycle that E2= High must be the case if the chuck is opened. This way the proper function of the inputs and outputs can be ensured.

**Variant 2**, if your system only has the preprogrammed input 'Release spindle'.

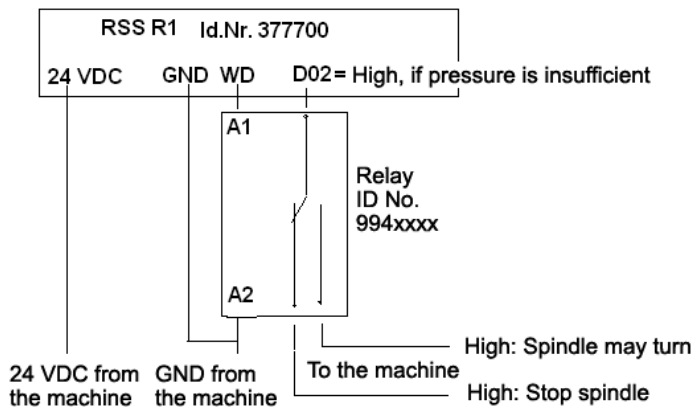


Figure 2: Circuit diagram - Variant 2

**Variant 3**, if your system has no inputs available.

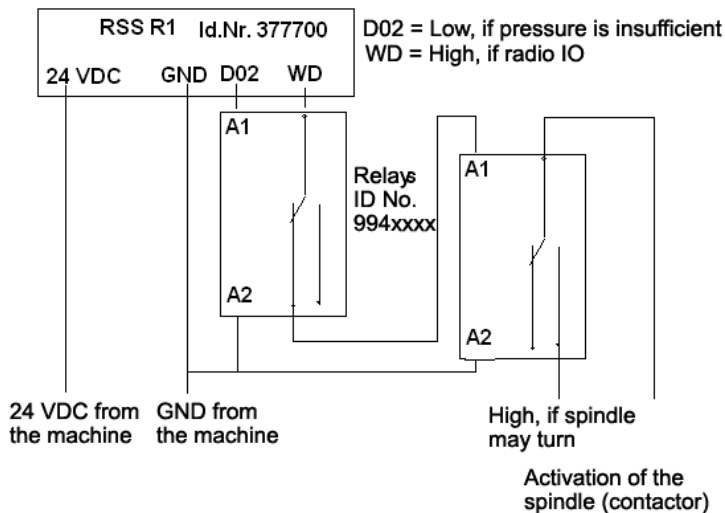


Figure 3: Circuit diagram - Variant 3

## 5.2 Commissioning

### 5.2.1 General information

Before commissioning, please check the device for any transport damages. Do not start up the device if it is mechanically damaged. Please read this assembly and operating manual carefully and observe the technical information as well as the legal requirements relevant to your country.



#### ESD Information

The components are equipped with electronic elements which could be destroyed in case of an electrostatic discharge. When handling the components, it must be ensured that environment (persons, workstation and packaging) are properly grounded. Do not touch conductive elements.

#### Notes on installation

When installing the antenna and antenna cable assembly group, it is imperative to avoid any proximity to sources with transient disturbances such as fluorescent tubes with a faulty starter, frequency converters or power cables. They could result in interrupted communication and therefore lead to incorrect initial states.

#### Notes on connecting the antenna

Only use suitable antennas (e.g. WAGO 758-910 incl. 2.5 m RG174 connection cable and SMA connector; see accessories).

The antenna must be fixed on a plate with the minimum dimensions of 25 cm x 25 cm.

The antenna and the antenna cable must be at least 30 cm away from sources of interference and the antenna must be at least 35 cm away from the next wall at the side.

The antenna cable must under no circumstances be bent sharply as this could result in permanent damage to the antenna cable (RG174 bending radius > 15 mm).

#### Preconditions for commissioning

The voltage supply must be applied and the external antenna must be connected prior to commissioning.

### 5.2.2 Programming the transmitter to the receiver

- (1) Switch DIP 1 to 'on' and immediately back to 'off'.
- (2) Open and close the chuck completely twice.
- (3) Wait for 15 seconds.
- (4) The transmitter and the receiver should now be taught. Check this by observing whether the WD LED lights up briefly approx. every 10 seconds. Carry out a second test by completely opening and completely closing the chuck. The WD LED should then light up once briefly in each case. Furthermore, the status should be displayed on the LED D02.



- The LED D02 indicates: Off if the pressure set is exceeded. Pressure switch closed.  
à It is safe to work. If the LED lights up: Warning, the pressure is too low or the chuck is open.
- Please try a second time if the learning procedure has failed. Ideally, no second RSS system should radio in the immediate vicinity during the learning phase.

### 5.2.3 Testing the antenna position

- Observe the LED 'SI'. This LED signals the current quality of the radio link. This LED should preferably light up or blink green.
- If necessary, move the antenna closer to the transmitter or reposition the antenna to avoid any solid obstacles between antenna and transmitter.

### 5.2.4 Adjusting the watchdog time at the receiver

- You should adapt the watchdog time to your process in a useful manner. Every 10 seconds, the transmitter transmits a presence signal to control the radio link. If no signal is received after the watchdog time set has elapsed, the LED 'WD' lights until the next signal is received. The 'WD' output then signals the failure of the radio link through 0 VDC.
- The production facility has preset a time of about 15 seconds. This value should be optimal for applications of the radio system in the chuck.
- Switch DIP 4 to 'on'.
- To increase the time, turn the potentiometer clockwise. The time set can be identified by the blinking frequency of the WD LED. When DIP 8 has been switched off, the time can be adjusted between 0 and 1 second; when DIP 8 has been switched on, the time can be adjusted between 0 and 30 seconds.
- Switch DIP 4 to 'off'. (Keep DIP 8 in the position selected.)

### 5.2.5 Adjusting the switching point of the pressure switch

The pressure switch is preset to a switching point of 5.5 bar. If the pressure falls below 5.5 bar, the system issues a warning with a High at Output D02 and the LED D01 lights up.

If you require a different switching point, e.g. because your working pressure is only 4 bar, then refer to Chapter 6.3 on adjusting the pressure monitors.

## 6 Detailed Function description

### 6.1 RSS R1

#### 6.1.1 LED

LED color	Status	Meaning
US (green)	Off On	Status of voltage supply - No voltage supply present - 24 V DC OK
WD (red)	Off / Flash  0.5 Hz blinking 2 Hz On	Status system check and operating mode - Operating status active (reception active) "Flashing" of 15 ms indicates reception of a "taught" telegram - Learning status - Missing assignment; Sensor must be "taught" - Watchdog addressed (non-saving), neither of 2 data telegrams of the taught sensor were received within the monitoring time. (The output behaves inversely.)
LC (yellow)	Off On 0.5 Hz blinking 2 Hz blinking	Status of limit value message (MIN indicator) - Limit value fallen below - output LOW - Limit value not reached - output HIGH - Learning mode active via DIP6 and DIP7 - Faulty adjustment of the DIP switches
DO1 (yellow)	Off On	Status of Sensor 1 - Status 0 output LOW - Status 1 output HIGH
DO2 (yellow)	Off On	Status of Sensor 2 - Status 0 output LOW - Status 1 output HIGH
SI (yellow/red)	LED green continuous light LED green blinking LED orange continuous light LED orange blinking LED red continuous light LED red blinking	Indication of the signal strength Signal optimal Signal excellent Signal good Signal medium Signal poor Signal critical  Definition of 'blinking': 200 ms on and 200 ms off, alternating

#### 6.1.2 Measuring jacks

Description	Type	Meaning
P1	Potentiometer	Adjustment of time and limit value (value accepted with DIP switch)
U1	Jack	Measuring jack to adjust the watchdog and limit values according to voltage diagram
_L	Jack	Reference potential

### 6.1.3 General discription

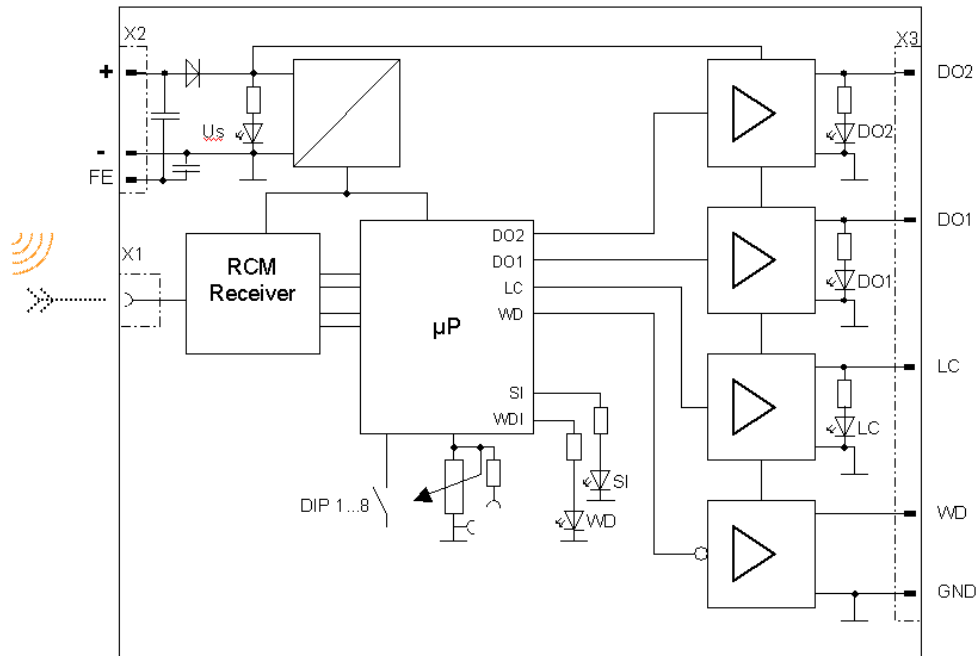


Figure 4: Block diagram of the receiver

A supply voltage of 12 – 24 VDC is required to operate the radio receiver. The connection is established using Cage Clamp® connectors. An external magnetic antenna for the frequency range of 868 MHz is required to receive the radio telegrams.

The radio receiver is based on the EnOcean radio receiver RCM 121, whose received data is processed with a downstream microcontroller.

The program in the microcontroller can be divided into the learning mode and the operating mode.

#### Learning mode

In the learning mode (activated by DIP 1 ON/OFF), the ID of a detected EnOcean telegrams<sup>1</sup> is stored in the receiver and the learning mode is automatically closed. If no valid telegram of a transmitter is received in the learning mode, this is signalled as a faulty status after 15 s. Alternatively, the transmitter ID can be taught manually by actuating the DIP switches 6 and 7 (simultaneously).

The adjustment of the monitoring time and the limit value is done by specifying default values or adjustments with the potentiometer based on a diagram. The diagrams and the DIP switches are described in the following chapters.

#### Operating mode

In the operating mode, the receiver monitors the incoming signals of the transmitter with the watchdog function. The watchdog LED (WD) indicates each incoming telegram of the taught transmitter by blinking briefly. When the watchdog time set is exceeded, the WD LED signals an error by staying lit continuously; the WD output switches to the LOW status.


The LEDs and Outputs DO1 and DO2 directly indicate the status of the two-channel sensor.

The level control monitors the current battery status for an adjustable limit value with each telegram. When the limit value is fallen short of, the output switches to the LOW status and the LED is OFF.

The signal strength of incoming telegrams is indicated by blinking codes of the SI LED; this allows an optimum radio connection to be established already during commissioning.

### 6.1.4 Function description devilery condition

After first switching on the voltage supply, the receiver module is in the "INACTIVE" mode. For the commissioning, the ID of a transmitter needs to be "LEARNING".



**Note**

**A transmission needs to be activated at the transmitter during the "Learning phase". During the learning phase, telegrams from EnOcean sensors are evaluated on STM basis. . The transmitter with the largest signal strength is trained.**

- None or only a few transmissions of other transmitters should therefore take place in the reception range of the module to prevent faulty teaching.

### 6.1.5 Status definition

Status	Description
INACTIVE	<p>During commissioning, the switching actuator signals a missing assignment (status: inactive) to the sensor by a blinking watchdog LED (2Hz).</p> <p>No ID of a sensor has been "learned" yet.</p> <p>The "inactive" status can be restored by switching on the DIP switch "Delete ID" if no ID has been learned within the 15-second learning time following actuation.</p>
LEARNING	<p>In the learning mode, the receiving range is reduced to approx. 5 m (if DIP 5 = OFF) to exclude the learning of other receivers as much as possible.</p> <p>To teach a new radio sensor, the "learn switch" (DIP 1) must be actuated on the receiver. The learning status is signalled by a slow (0.5 Hz) blinking watchdog LED. The DIP switch should be reset immediately.</p> <p>After a telegram has been received from a transmitter, its ID is stored in the receiver, safe from power failures, and the learning mode is subsequently exited.</p> <p>In the learning mode, each received (detected) signal of any ID is indicated on the SI LED. The signal strength of a telegram is indicated until the next telegram is received.</p> <p>If no new sensor is learned within 15 seconds, the switching actuator returns to the "active" or "inactive" status.</p>
ACTIVE	<p>In the "active" status, the switching actuator monitors all IDs received and compares them with the ID learned. If the sensor is detected as "assigned", the data bytes received (Data_Byte 0...3) are processed and ouput.</p> <p>In the operating status "active", only signals from taught transmitters are indicated on the SI and WD LED.</p>
System monitoring / WATCHDOG	<p>The system check is only switched on in the "active" state. A timer (watchdog abbrev. WD) is used to monitor whether new data telegrams of the taught sensor have been received within the system time set. The system time can be adjusted with the system check potentiometer or the DIP switch.</p> <p>If the time between two telegrams is greater than the monitoring time, the system LED signals this fact with a continuous light. The associated output of the system monitoring (output WD) switches to the LOW status. The status outputs of the sensor maintain the last status.</p> <p>The output behaviour with addressed system monitoring is non-saving.</p> <p>When the WD is addressed, the last value of the signal strength is not saved (SI LED); the current signal strength of the taught sensor continues to be evaluated.</p>



### 6.1.6 Time response

The time between evaluable telegrams must be at least 50ms.

### 6.1.7 Function of the DIP switches

Switch Type / Function / Short description	Meaning
DIP switch 8 pins	
.1 OFF / ON	Delete transmitter ID and activate learning mode = ON *
.2 OFF / ON	OFF = SI LED indicates the signal distance ON = SI LED indicates the signal level
.3 OFF / ON	Setting - Battery Limit Value ON = ACTIVE
.4 OFF / ON	Setting - Watchdog Time ON= ACTIVE
.5 OFF / ON	OFF = Learning mode with reduced range ON = Learning mode with full range
.6 OFF / ON	Accept current battery value as limit value * / Set transmitter ID (DIP 6+7)
.7 OFF / ON	Accept current battery value -0.5 V as limit value * / Set transmitter ID (DIP 6+7)
.8 OFF / ON	System time setting OFF = 1 SECOND / ON = 35 SECONDS 0-2.5V = 0...1s / 0-2.5V = 0...35s
	* = edge-controlled

### 6.1.8 Delete transmitter ID

To learn a new transmitter, the DIP 1 must be momentarily switched to “ON” (assignment function). Any previously learned transmitter will be deleted and can not be learned for approx. 30 minutes thereafter (see list of deleted transmitters). For further behaviour, see “Status definition / LEARNING”

When actuating DIP 1, the ID of the transmitter last learned is stored in a list comprising a maximum of 10 entries “List of deleted transmitters”. These IDs are stored in the RAM for up to 30 minutes. The purpose of this is to prevent repeated learning for up to 30 minutes after an incorrect learning followed by deletion.

The “list of deleted transmitters” is reset (i.e. deleted) either by switching off the supply voltage or if no other transmitters have been deleted for 30 minutes (retriggerable timer).

### 6.1.9 Signalling of the signal distance or the signal strength

In the as-delivered condition (DIP 2 = “OFF”), the signal distance of the useful signal and the noise signal is displayed by the blinking SI LED. The ‘noise level’ is measured every 20 ms (watchdog time 0..1 s), or approx. every  $t = (\text{adjusted watchdog time} / 64 \text{ measurements})$  (watchdog time 0..35 s). The average determination for the noise signal is carried out once a new telegram is available.

LED	Signalling	Signal strength	Signal distance (dBm)	Signal level (V)
SI (green/red)	LED green continuously lit	Signal optimal	>70	> 2.5
	LED green blinking	Signal very good	58...70	2.43 < RSSI < 2.5
	LED green/orange blinking	Signal good	46...58	2.37 < RSSI < 2.43
	LED orange/red blinking	Signal medium	34...46	2.00 < RSSI < 2.37
	LED red continuously lit	Signal bad	22...34	1.60 < RSSI < 2.00
	LED red blinking	Signal critical	<22	< 1.6

### 6.1.10 Setting the limit value for battery monitoring

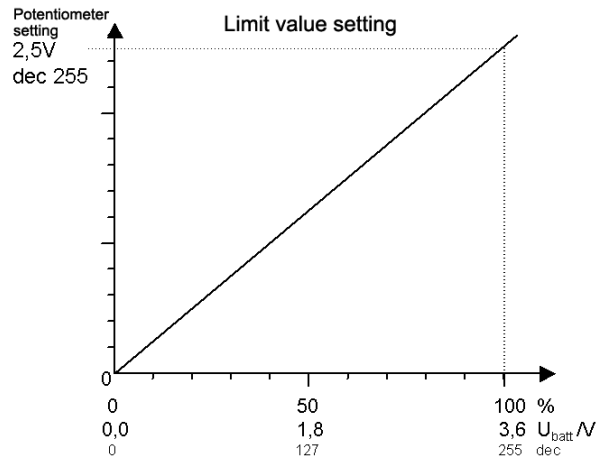
The current potentiometer value is stored when switching on DIP switch 3. During the setup mode (DIP 3 ON), the LED responds directly to a changing potentiometer value.

Hint on setting the limit value to approx. 5% below the current battery level:

- Turn potentiometer until the LED extinguishes.
- Then turn back by 1 turn (LED lights up again).
- Set DIP 3 to OFF.

A 3-step hysteresis (approx. 1 %) ensures a steady function of the indicator in the limit value range.

**If the DIP switch is switched back without the POTI value having changed outside of its 'oscillation range', no new value is accepted as system time or limit value (to avoid faulty operations).**



### 6.1.11 Teaching the limit value (teching threshold)

#### Accept analog value currently sent

DIP6: The current value of the analog value minus the set hysteresis of 3% is accepted as limit value for battery monitoring.

#### Analog value currently sent – 0.5V

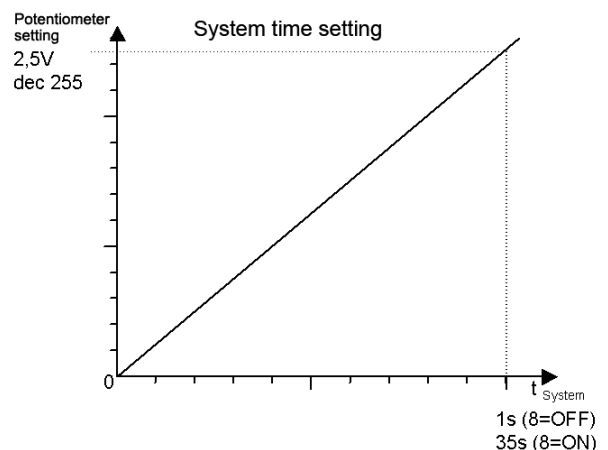
DIP7: The current value of the analog value minus 0.5 V is accepted as limit value for the battery monitoring.

### 6.1.12 Setting the watchdog time

DIP4: The current POTI value is saved. During the setup mode (DIP 4 moved), the LED responds directly to a changing POTI value (and DIP 8 setting) by changing the blinking frequency.


The setting occurs using the "System time setting" characteristic curve. System time = f (DIP8 and POTI value). The acceptance occurs only when DIP 4 is switched back.

If the DIP switch is switched back without the POTI value having changed outside of its 'oscillation range', no new value is accepted as system time or limit value (to avoid faulty operations).



### 6.1.13 Function of the DIP 5 Extension of the reception range during the learning procedure

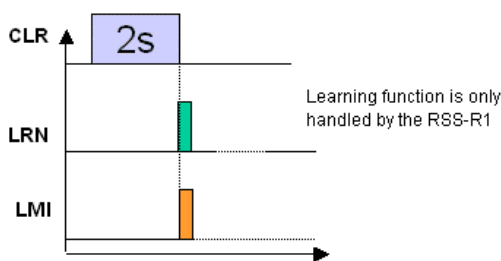
By switching on DIP 5, the range reduction to 5 m in learning mode can be switched off, i.e. the full reception range of the receiver is then used for learning, e.g. in order to learn more remote transmitters with a good signal strength.



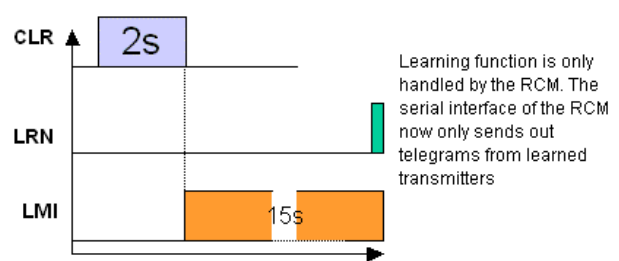
All incoming EnOcean telegrams are (internally) transferred via the serial interface. The response time of the receiver can thereby be permanently reduced. (special function of the RCM121DB is not used during this)

**It is therefore imperative to switch the DIP 5 back to OFF after the learning!**

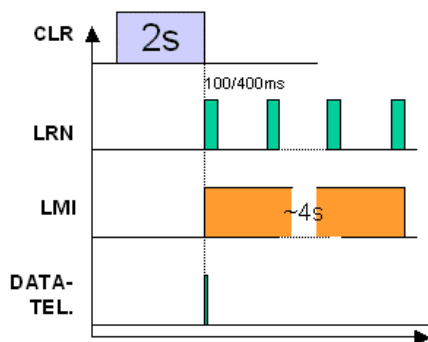
DIP5 = ON >5 m range in LRN



DIP5 = OFF ~5 m range in LRN



Telegram active during LM



If a telegram is received at this time, the transmitter is learned in the RCM and no other telegram will pass through the RS232. Reason: RCM is blocked for approx. 4 seconds after the learning. The controller tries to switch the RCM out of the learning mode as quickly as possible.

### 6.1.14 Manual setting of the transmitter ID (programming)

By simultaneously activating DIP6 and DIP7, the switching actuator is placed in the programming mode.

While setting the first ID byte (ID0), the LC LED (incl. output) blinks for 10 s with 0.5 Hz. The LC LED then lights for 2 s to accept the DIP combination.

The input of the ID bytes 1, 2 and 3 is done in the same manner, whereby at the end (accepting ID3) the LC LED lights for 10 s to have sufficient time to set the output DIP combination.

 Observe the sequence of ID0... ID3 while teaching.

**Example ID**

00 | 00 | 09 | 88 = 00000000 | 00000000 | 00001001 | 10001000  
 ID3 ID2 ID1 ID0  
 DIP 1|2|3|4|5|6|7|8

6.1.15 Monitoring the DIP switches

To avoid faulty operation of the DIP switches, they are monitored per software and faulty settings are signalled. Faulty settings are indicated by 2 Hz blinking of the limit value LED (LC). The limit value output also signals this fact at 2 Hz intervals.

6.1.16 Output behaviour of the watchdog

Operating mode	Cause	Behaviour (Output S)	LED
Operation	Watchdog addressed	Output LOW	On
	Watchdog not addressed	Output LOW	Off
Learning		Output HIGH	On
Inactive		Output LOW	On

6.1.17 Software block diagram

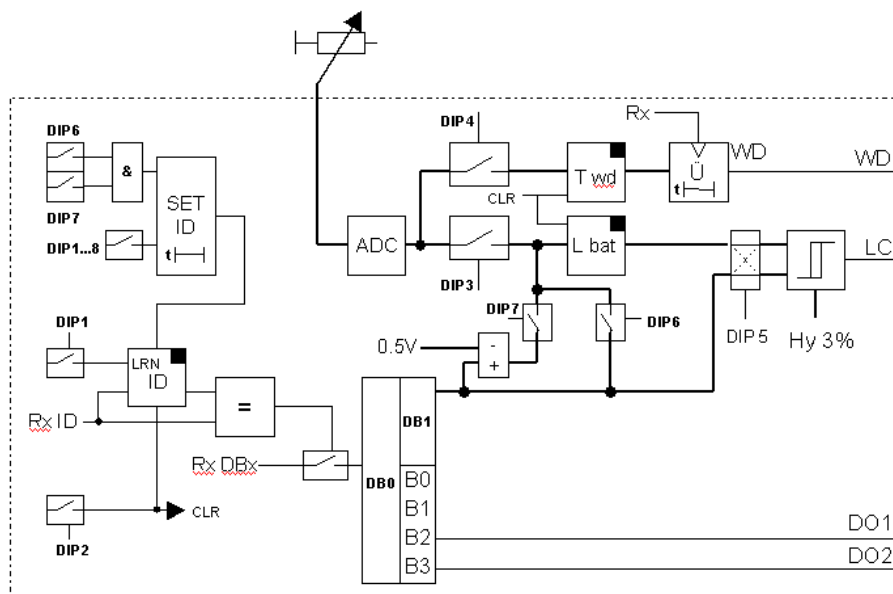


Figure 5: Block diagram

## 6.2 RSS P1

### Operation

The RSS P1 transmitter module does not contain any controls. Every 10 seconds, it transmits a signal independently. Furthermore, it transmits a signal if the status of the input changes.

## 6.3 Incorporated pressure switch - Adjusting the switching point

The incorporated pressure switch must be adjusted according to your working pressure:

- By turning **clockwise**, the switching point is adjusted to a point with a higher level of pressure.
- By turning **counterclockwise**, the switching point is adjusted to a point with a lower level of pressure.
- If the **pressure is higher** than the switching point set at the pressure switch, **then the LED D02 does not light up → Securely clamped**.  
The output behaves the same: Low if the pressure is o.k.; High if the pressure is too low.
- If the **pressure** in the chuck is too **low** (lower than the switching point set at the pressure switch, then **LED D02 lights up**. → Pressure warning or chuck open.



### Important:

If the red LED WD at the radio receiver lights up for longer than 0.2 seconds, the radio contact is interrupted. You must stop the adjustment process and check what is disrupting the radio contact.

### 6.3.1 Adjusting a defined minimum pressure, Method 1

- Set the preferred minimum pressure at the maintenance unit. The system will then issue a warning (LED D02 lights up, Output is set if this pressure is not met in the process).
- If the LED D02 is not off, then the Allen screw on the pressure switch must be turned counterclockwise until the LED D02 is extinguished.
- Now slowly turn the Allen screw at the pressure switch clockwise until the LED D02 lights up again.
- You can now increase the pressure at the maintenance unit back to its normal working pressure.
- Check the function: If you then close the chuck with your working pressure, the LED D02 must extinguish after a short while. If you then open the chuck again, the LED D02 must light up again after a short while. If you adjust the pressure to a value less than your minimum pressure and then close the chuck, the LED D02 may no longer extinguish, even for a closed chuck.

### 6.3.2 Adjusting a minimum pressure not exactly defined, Method 2

- Adjust the normal working pressure and close the chuck.
- If the LED D02 is not off, then the Allen screw on the pressure switch must be turned counterclockwise until the LED D02 is extinguished.
- Now slowly turn the Allen screw at the pressure switch clockwise until the LED D02 lights up again.
- You can now turn the Allen screw at the pressure switch counterclockwise until the LED is extinguished, and then turn a little more.



**Unfortunately, the relationship of turns of the Allen screw is not linear to the change of the switching point in bar.**

**Basically, a change of the switching pressure of approx. 0.9 bar per ¼ counterclockwise turn can arise for 6 bar output pressure.**

### 6.3.3 Check the function

- (1) If you then close the chuck with your working pressure, the LED D02 must light up after a short while.
  - (2) If you then open the chuck again, the LED D02 must extinguish again after a short while.
  - (3) If you adjust the pressure to a value less than your minimum pressure and then close the chuck, the LED D02 may no longer light up, even for a closed chuck.
- For reasons of safety, you may now have to fasten the screw at the pressure switch using glue and then tighten the screw the cover over the pressure switch to seal the chuck.
  - To adjust the switching pressure subsequently, you only have to remove the middle screw from the cover. Through the resulting hole, you can now adjust the screw at the pressure switch using the appropriate Allen wrench.
  - The locking screw in the cover must be pressure tight; otherwise, cooling lubricant may penetrate the system.

## 7 Maintenance and Care

- The system is completely maintenance-free.
- Only the life of the transmitter is limited by the built-in battery.
- Life when transmitting once per 10 seconds: < . 7 years

### 8 Assembly drawings

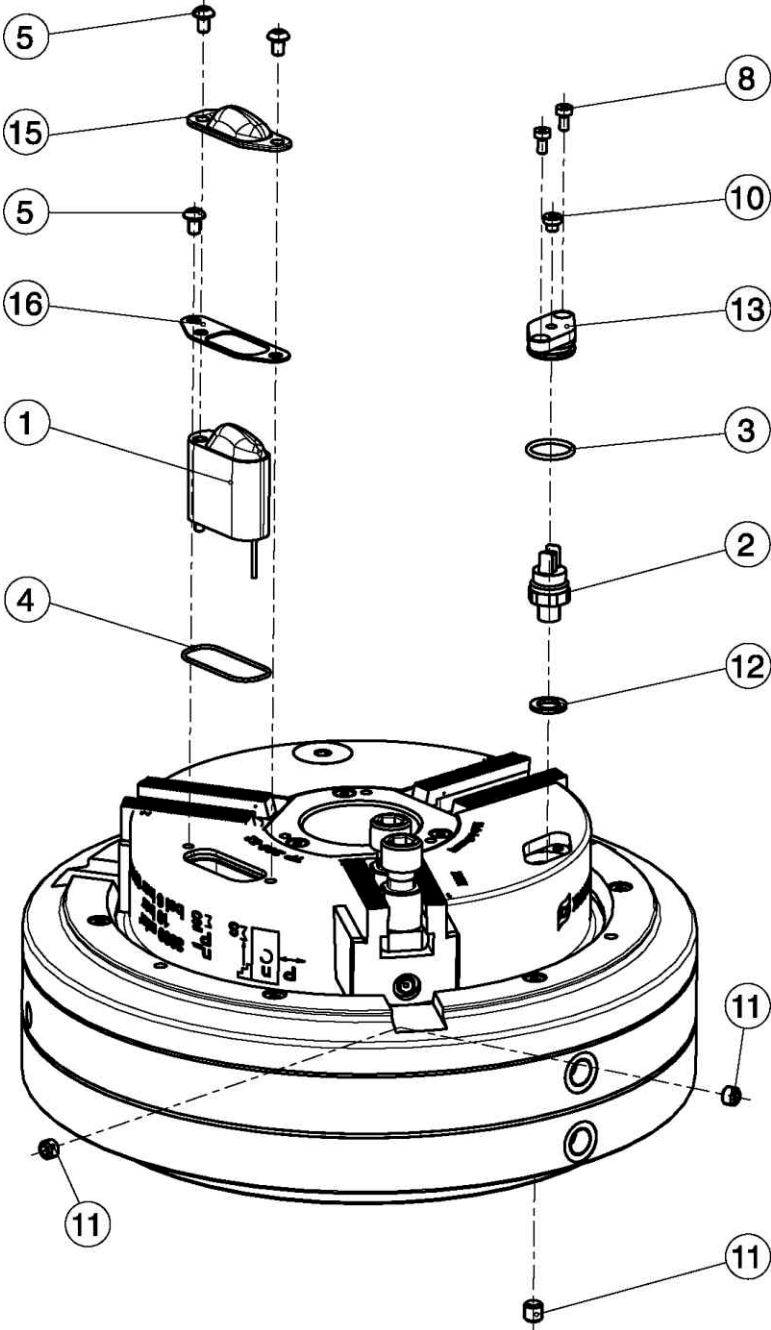


Figure 6: Assembly - Part1

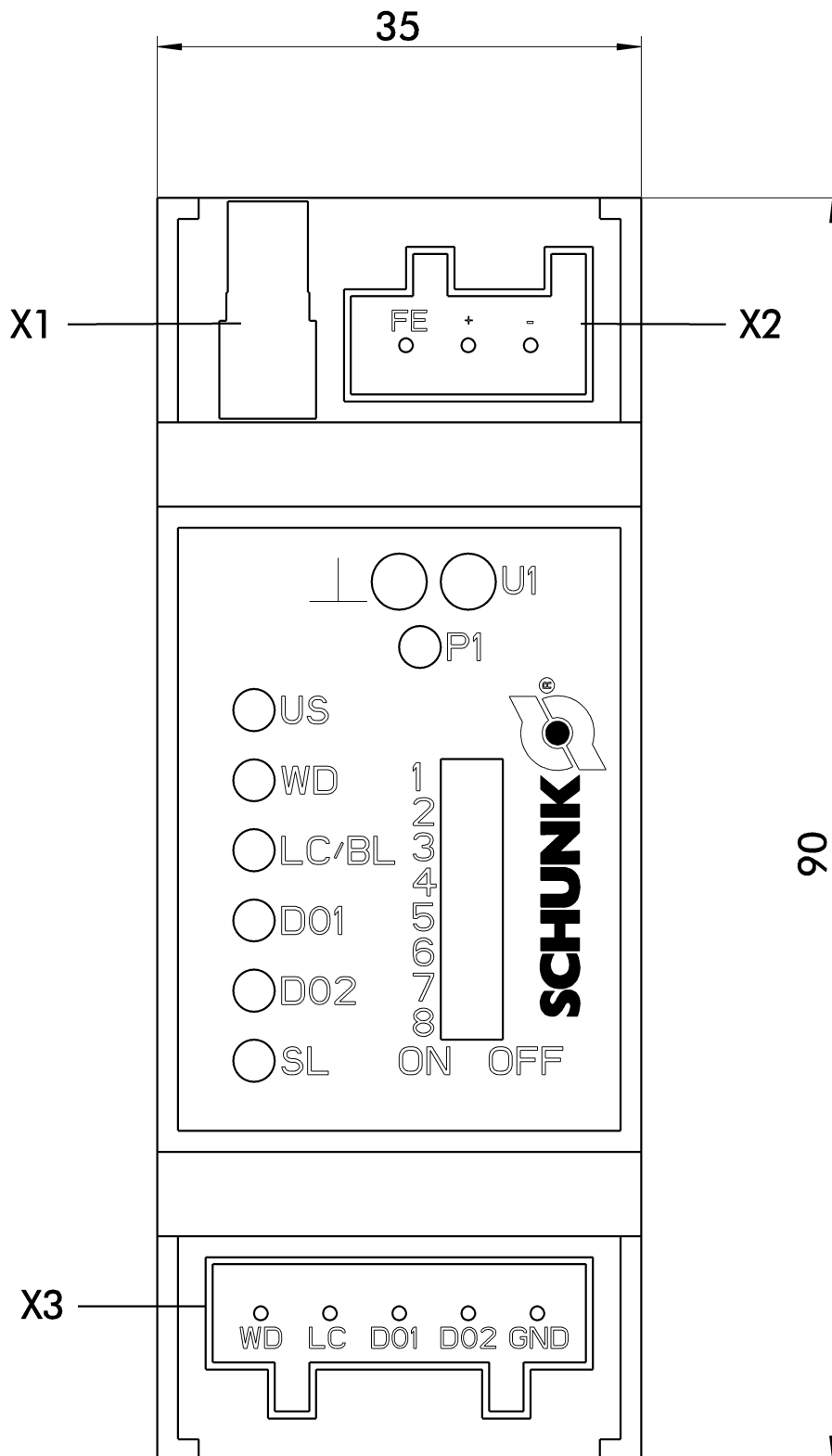


Figure 7: Assembly - Part2





## 9 Bills of material

Item	ID No.	Quantity	Description	Wearing part?	Notes
1	8703653	1	RSS P1	Yes, battery	Transmitter unit
2	9941145	1	Pressure switch - Miniature	No	Pressure switch
3	9900575	1	O-ring 17*2	Yes	O-ring for cover
4	9936336	1	O-ring 36*2	Yes	O-ring for transmitter
5	9982315	3	Oval-head screw M5*8 10.9	No	Oval-head screw for transmitter
8	9907269	2	Screw M4*8 8.8	No	Screw for cover
10	9659005	1	Locking screw M8*8	No	Locking screw for cover
11			Set screw	No	Set screw for chuck body
12	9907771	1	Fiber seal	Yes	Seal for pressure switch - miniature
13	8703651	1	Cover	No	Cover for pressure switch
14	8703652	1	Wrench	No	Wrench for pressure switch - miniature
15	8703733	1	Cover	Yes	Cover for transmitter
16	8703766	1	Cover plate	No	Cover plate for transmitter
20	0377700	1	RSS R1	No	Receiver
21	0377730	1	RSS-R-A	No	Antenna for receiver
22	9982765	2	Relay with changer	No	Relay with changer



## 10 Declaration by the manufacturer

### Declaration by the manufacturer as defined by machinery directive 98 / 37 / EC, Annex II B

We hereby declare that the following products...

Name of product:	Radio - Pressure Monitoring RSS R1, RSS P1	
Product type:	RSS-R1	0377700
	RSS-P1	8703653
	RSS-R-A	0377730
	RMS 22-S-M8	0377720
	RMS 80-S-M8	0377721

are designed to be incorporated into machinery and must not be put into service until it has been determined that the machinery, into which these products are to be incorporated, conforms with the provisions of the EC machinery directive 98 / 37 / EC.

Applied harmonised standards in particular:

DIN EN ISO 12100-1 and DIN EN ISO 12100-2

Date/Signature of  
manufacturer:

June 2006

Title of the signatory:

Development Manager

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