

User Manual

RSS 3000



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Table of Contents

1	Version history	7
2	Safety Related Application Conditions	8
3	Introduction	10
3.1	Purpose of the User Manual	10
3.2	Convention	11
3.2.1	Symbols	11
3.3	Intended use	12
3.3.1	Key uses	12
3.4	Roles and Responsibilities	13
3.5	User requirements	13
4	Product specification	14
4.1	Key features	14
4.2	Terms of use	14
4.2.1	Environment	14
4.3	Identification	15
4.4	Physical specification	16
4.4.1	Faces and dimensions	16
4.4.2	Other physical specifications	16
4.5	Technical specifications	17
4.5.1	Internal Data Storage	17
4.5.2	User Interface	18
4.6	Use case	19
5	Safety	20
5.1	General safety instructions	20
5.2	User certification	20
5.3	Worksite	20
5.4	Personal protective equipment	20
5.5	Residual risks	20
5.6	Regulatory compliance	21
6	Logistics	22
6.1	Transport	22

6.2	Storage.....	22
6.3	Unpacking.....	23
7	Installation	25
7.1	Before installation.....	25
7.2	Mounting.....	25
7.2.1	Materials used for mounting.....	25
7.2.2	Mounting steps.....	25
7.3	Inserting the relay cable.....	26
7.3.1	Materials for inserting the relay cable.....	26
7.3.2	Steps to insert the relay cable	26
8	Setup in MTinfo 3000	30
9	Switching.....	31
9.1	Device indication lights.....	31
9.1.1	Cloud light.....	32
9.1.2	Green LED	32
9.1.3	Key switch positions.....	32
9.2	Manual switching.....	33
9.2.1	Manually switched ON.....	33
9.2.2	Manually switched OFF.....	35
9.3	Remote switching.....	37
10	Functional test.....	38
11	Troubleshoot.....	40
11.1	General issues.....	40
11.2	Notifications.....	41
11.2.1	General notifications.....	42
11.2.2	Warning codes.....	42
11.2.3	Error codes.....	43
11.2.4	Reminders.....	43
11.3	Emergency plug.....	44
11.3.1	Installing the emergency plug.....	44
12	Lifecycle management.....	46
12.1	Maintenance.....	46

12.2 Security update.....	46
12.3 Replacement.....	46
12.4 Quarantine.....	46
12.5 Disposal.....	46
12.5.1 Shipping box disposal.....	46
12.5.2 RSS 3000 disposal.....	46
13 Support and legal information.....	48
13.1 DI Technical Support.....	48
13.2 Legal notice.....	48
14 Warranty.....	49
15 Abbreviations.....	50
16 Glossary.....	51

List of Tables

Table 1 Symbols used in the User Manual.....	11
Table 2 Roles and Responsibilities.....	13
Table 3 Technical specifications.....	17
Table 4 Residual risk.....	21
Table 5 Pinout diagram	28
Table 6 Cloud light indications.....	32
Table 7 General issues and solutions.....	40
Table 8 General notifications.....	42
Table 9 Warning codes and actions.....	42
Table 10 Errors codes and actions.....	43
Table 11 Reminders.....	44

List of Figures

Figure 1 Identification (Front face).....	15
Figure 2 Faces and dimensions.....	16
Figure 5 RSS 3000 and accessories.....	23
Figure 6 Relay cable gauge.....	28
Figure 7 Switching & indication lights RSS 3000	31
Figure 8 Operator key positions.....	33
Figure 9 Manually switched 'ON'.....	33
Figure 10 The device is 'Switched ON' in RTS.....	34
Figure 11 Manually switched 'OFF'.....	35
Figure 12 The device is 'Switched OFF' in RTS	36
Figure 13 Emergency plug.....	45
Figure 14 RSS 3000 seal	49

1 VERSION HISTORY

VERSION NO.	DATE	CHANGE LOG	REFERENCE	APPROVED
1.0.0	29.10.2024	<ul style="list-style-type: none"> • Revised and restructured content. • Added new SRACs, new renders, Cyber Resilience Act, Reach, RoHS content and updated links. • Rebranded for a consistent and updated look. 	All	<u>Alex Ruijs</u>

2 SAFETY RELATED APPLICATION CONDITIONS

Safety Related Application Conditions OR SRAC(s) are essential requirements that must be fulfilled to ensure the safe integration and operation of the RSS 3000. You will find references to SRACs throughout the User Manual.

1. Please ensure that you read the User Manual in its entirety, ensuring that you understand its contents before operating the device ([SRAC I4](#)).
2. After training, the Installer, MTinfo 3000 Planner and Switcher receive a certificate to correctly install the RSS 3000 ([SRAC I1](#)).
3. Check the RSS 3000 for any visible damage upon receipt ([SRAC M1](#)).
4. For maintenance and repairs, please report to the Dual Inventive service department ([SRAC M1](#)).
5. The RSS 3000 contains no user-serviceable parts. Opening the device will void the warranty. It could also pose a risk to both personal safety and has the potential to cause damage to the RSS 3000 and its surroundings ([SRAC I7](#)).
6. The installer's safety must be ensured during installation. Follow the process described in national regulations ([SRAC I11](#)).
7. If the connection to MTinfo 3000 is lost, ensure the operator key to switch the RSS 3000 is available at the work site ([SRAC A12](#)).
8. RSS 3000 must only be used if a person is certified to do so ([SRAC I5](#)).
9. Transport the antenna cable in protective packaging ([SRAC T2](#)).
10. Transport the RSS 3000 in protective packaging ([SRAC T1](#)).
11. Take action when damage is detected. Please contact Dual Inventive Support ([SRAC S1](#)).
12. The RSS 3000 shall be placed either in a relay room or location cabinet to prevent vandalism ([SRAC I13](#)).
13. Before use, visually inspect the RSS 3000 for damage or flaws. If any are present, do not use the system ([SRAC I6](#)).
14. During on-site checks, the RSS 3000 should not show major damage (a slight scratch is acceptable). If it does, replace the device to ensure availability ([SRAC M3](#)).
15. Without the operator key, web/mobile app, or computer connection, the RSS 3000 cannot be operated ([SRAC A13](#)).
16. When the RSS 3000 is offline (with no errors), do not use the RSS 3000 if it remains in this state and contact [DI Technical Support](#) ([SRAC I12](#)).
17. The red cloud light shows that the RSS 3000 is in an *error state*. Do not use the device if it remains in this state ([SRAC I10](#)).
18. Perform a functional test of the RSS 3000 to verify that the device is working as intended ([SRAC I9](#)).


19. At initial placement, always follow the installation procedure as described in the RSS 3000 User Manual ([SRAC I8](#)).
20. The RSS 3000 reports if something is not done according to the safety regulations. The system manages this and all notifications are communicated in the user's native language. These notifications can be read via the user's mobile or the MTinfo 3000 mobile app ([SRAC A10](#)).
21. The predictive maintenance period for the RSS 3000 is **10 years**. After this time, you will receive a notification. Send the RSS 3000 back to Dual Inventive for service ([SRAC M2](#)).

3 INTRODUCTION

3.1 Purpose of the User Manual

This User Manual is a guide and reference for the proper use of the *Remote Safety Switch 3000* (RSS 3000). The RSS 3000 is designed to both *enhance safety and optimise rail capacity*. This User Manual covers all aspects of RSS 3000 product management, including safety, logistics, installation, lifecycle management, and other relevant details.

Please ensure that you read the User Manual in its entirety, ensuring that you understand its contents before operating the device ([SRAC 14](#)).

 This User Manual was originally written in English. If anything is unclear or different in a later translated version, the original English version prevails.

3.2 Convention

To alert the reader to safety-critical and essential information, this User Manual uses the following symbols and terms:

3.2.1 Symbols






S/N	SYMBOLS	MEANING
1.		DANGER Indicates a hazardous situation that <i>will</i> result in death or serious injury if the safety instructions are not followed.
2.		WARNING Indicates a hazardous situation that <i>could</i> result in serious injury, and/or significant damage to the product or the surrounding area if the safety instructions are not followed.
3.		CAUTION Indicates a hazardous situation that <i>might</i> result in minor or moderate injury, and/or minor damage to the product or the surrounding area if the safety instructions are not followed.
4.		ADDITIONAL INFORMATION Provides additional information or tips to enhance understanding or give more context.
5.		REFERENCE Points to additional documentation or resources for further information.

Table 1 Symbols used in the User Manual

3.3 Intended use

The RSS 3000 is a *remote control switch* that secures railway signalling equipment in a safe state. It ensures the safety of the railway worksite, including plant equipment and track workers, and creates a safe working environment.

The RSS 3000 Safety Integrity Level 4 (SIL4) standards.

3.3.1 Key uses

1. **Signal Interlocking Activation:** The RSS 3000 activates and deactivates railway signal interlocking relays, setting track signals to a 'danger' or 'safety' state.
2. **Remote and Manual Operations:** Operates remotely or manually, providing flexibility.
3. **Seamless Electronic Integration:** Connects electronically to existing railway signal interlockings.
4. **Enhanced Coverage:** Can work in combination with other RSS 3000 and ZKL 3000 RC devices to protect larger areas.
5. **Cloud Control:** Switched and monitored through Dual Inventive's encrypted cloud platform, [MTinfo 3000](#).



WARNING

Using the product in any way other than its intended use is not allowed. Misuse may cause personal injury and damage the RSS 3000 and its surroundings.

3.4 Roles and Responsibilities

The table below outlines the typical roles and responsibilities associated with the use of the RSS 3000:

S/N	ROLE	RESPONSIBILITY	REFERENCE
1.	Infrastructure maintainer	Determines the need for the RSS 3000 installation on specific infrastructure assets to ensure additional protection. Creates signalling design principles.	Installation
2.	Installer	Installs the RSS 3000 in the relay room.	Installation
3.	Signalling designer	Designs the interface connections and wiring connections between the RSS 3000 and signal interlocking systems, following signalling design principles set by the Infrastructure maintainer.	Inserting the relay cable
4.	MTinfo 3000 planner	Develops safety plans based on the currently installed RSS 3000 devices. Preferably uses the MTinfo 3000 web application.	Setup in MTinfo 3000
5.	Switcher	Switches and manages the protection zones that contain the RSS 3000. Preferably uses the MTinfo 3000 mobile application.	Setup in MTinfo 3000

Table 2 Roles and Responsibilities

3.5 User requirements

1. After training, the Installer, MTinfo3000 Planner and Switcher receive a certificate to correctly install the RSS 3000 ([SRAC II](#)).
2. The user company authorizes and certifies users to access MTinfo 3000. After *certification*, the user gets a personal MTinfo 3000 account with specific *user rights*.
3. Certified users are responsible for keeping their username, password, and/or PIN code strictly confidential.

 The RSS 3000 must only be used by trained, certified, and competent users.

4 PRODUCT SPECIFICATION

4.1 Key features

1. **Location:** The RSS 3000 connects to one relay in a relay room or lineside location cabinet. It can switch the connected relay on or off.
2. **Communication:** The RSS 3000 comes equipped with an antenna to ensure a telecommunications connection.
3. **Status Indication:** The Cloud Light on the RSS 3000 shows its status, including connectivity (online or offline) and error state.
4. **Remote control:** Users can activate or deactivate the RSS 3000 remotely, reducing the need to visit the work site. This improves safety, saves time, and reduces manual effort and CO2 emissions.

4.2 Terms of use

For safe use of the RSS 3000, the following conditions are applicable:

1. Check the RSS 3000 for any visible damage upon receipt ([SRAC M1](#)).
2. Do not use the RSS 3000 if it shows signs of major damage. Quarantine the device immediately.
3. Install the RSS 3000 according to its specifications, paying attention the input and output voltages.
4. For maintenance and repairs, contact the Dual Inventive service department ([SRAC M1](#)).



WARNING

The RSS 3000 contains no user-serviceable parts. Opening the device will void the warranty. It could also cause personal injury and damage the RSS 3000 and its surroundings. ([SRAC I7](#)).

4.2.1 Environment

The RSS 3000 is not dustproof and waterproof and must be protected from particulates that can damage it.



CAUTION

Ensure the installation locations are *dustproof and waterproof*.

If the RSS 3000 is not installed in the location, Dual Inventive will not be held responsible for any damage caused, and the warranty will be void.

4.3 Identification

Each RSS 3000 has a unique 'Serial Number', shown on a type plate on the front and back face of the device.

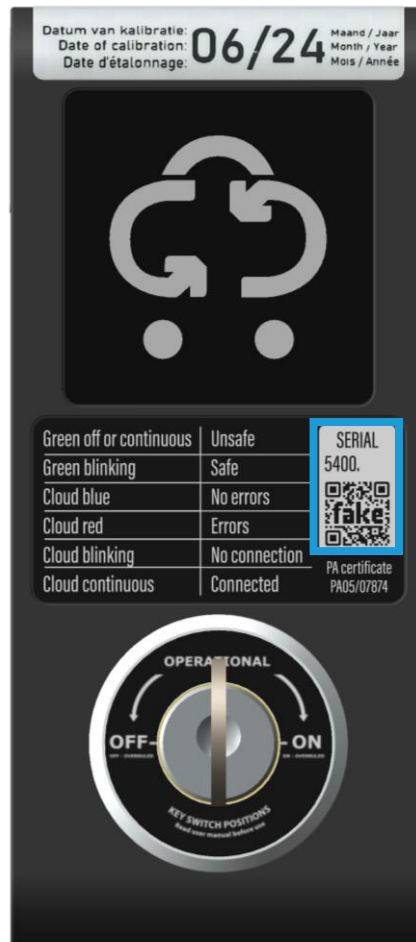


Figure 1 Identification (Front face)

4.4 Physical specification

4.4.1 Faces and dimensions

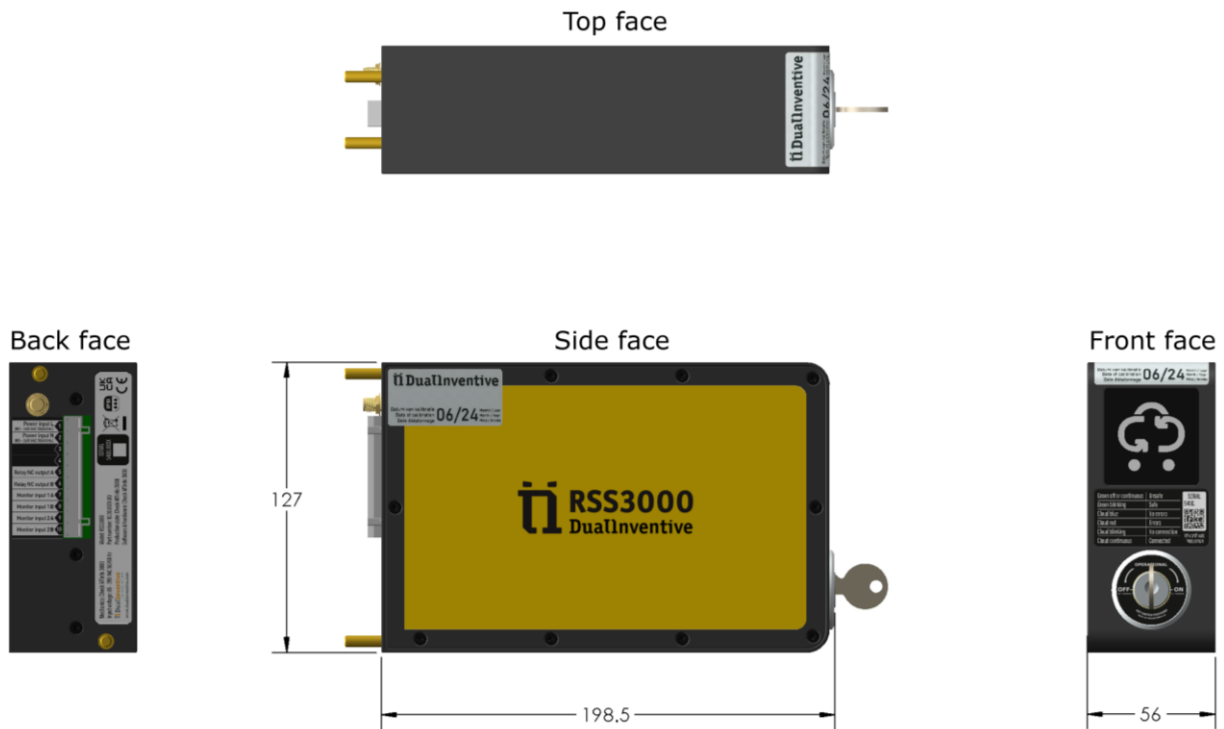


Figure 2 Faces and dimensions

All dimensions are in mm.

4.4.2 Other physical specifications

S/N	SPECIFICATION	VALUE
1.	Weight	760 g

4.5 Technical specifications

S/N	SPECIFICATION	VALUE
1.	Safety Integrity Level	SIL 4
2.	Switch Properties	
	a. Latching relays	NCC
	b. Contact rating	4 A DC
	c. Switching voltage	250 VAC
	d. Breaking capacity	1250 VAC (Resistive)
3.	Power input range	85 - 265VAC 50Hz / 60Hz
4.	Telecommunication	
	a. Default	4G network
	b. Fallback	2G network
5.	IP protection level	IP 51
6.	Operating temperature range	-20 to 60 °C

Table 3 Technical specifications

4.5.1 Internal data storage

1. The RSS 3000 has internal data storage.
2. Users cannot access this data directly; only Dual Inventive can read it. Users can access the data from the RSS 3000 through [MTinfo 3000](#).
3. The internal data is a backup retrieving data if it is not available on MTinfo 3000.
4. The internal data storage is not safety-critical.
5. All memory is encrypted.

4.5.2 User interface

4.5.2.1 Hardware user interface

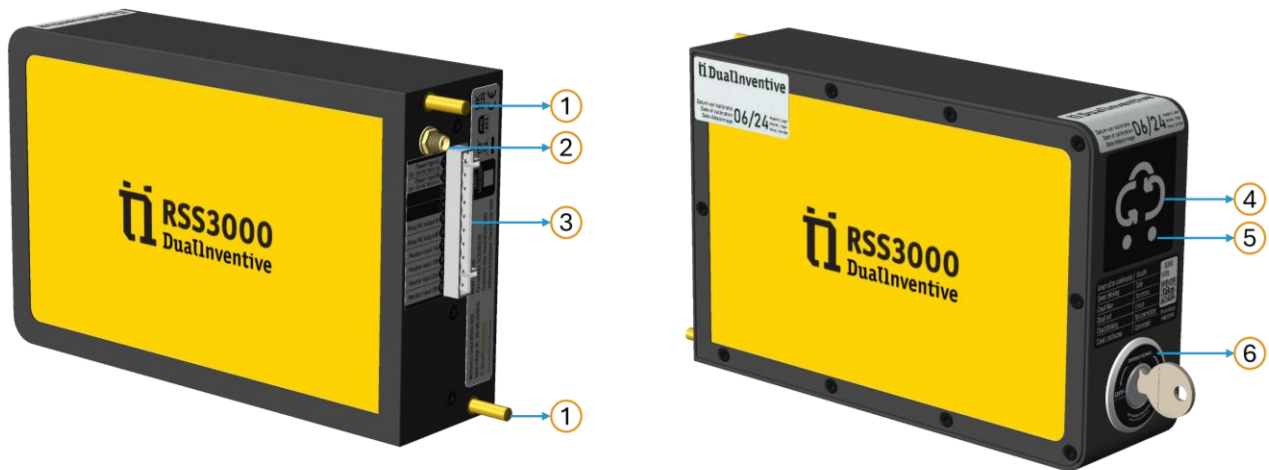


Figure Hardware user interface

KEY	DESCRIPTION
①	Installation bolts
②	Antenna connector
③	Power and relay connector
④	Cloud light
⑤	LED indicator
⑥	Switch/Operational status indicator

4.5.2.2 Software user interface MTinfo 3000

The RSS 3000 works with Dual Inventive's cloud-based control system, *MTinfo 3000*. You can use *MTinfo 3000* to manage and monitor the real-time status of the RSS 3000.

REFERENCE



1. [User Manual_MTinfo 3000 web app](#)
2. [User Manual_MTinfo 3000 mobile app](#)

A stable network connection is required for both the RSS 3000 and the your device to use MTinfo 3000.

4.6 Use case

The RSS 3000 is permanently installed in a *relay room, lineside location cabinet or signal interlocking building*. It is used with authorisation, to switch signals and other railway signalling assets when a protection zone needs to be secured.

The RSS 3000 can be activated for both short-term and long-term periods.

5 SAFETY

Safety instructions are included in the logistics, installation, switching operations, troubleshooting, and lifecycle management of the RSS 3000. These are described in the relevant sections.

5.1 General safety instructions

Please follow these general safety instructions:

1. **Approved design:** Install the RSS 3000 according to a design that follows the signal interlocking design, installation, testing, and commissioning processes set by the railway infrastructure maintainer.
2. **Product certification verification:** Verify that the RSS 3000 has the correct certification. See the [Dual Inventive website](#) for product certifications.
3. **Qualified installation and testing:** Only individuals authorized by the infrastructure maintainer, with the required knowledge and expertise, should install and test the RSS 3000.
4. **Installation Regulation:** The installer's safety must be ensured during installation. Follow the process described in national regulations ([SRAC I11](#)).
5. **Secure operator key management:**
 - a. Only authorized personnel should distribute RSS 3000 operator keys.
 - b. Manage operator keys according to the railway infrastructure maintainer's instructions.
 - c. If the connection to MTinfo 3000 is lost, ensure the operator key to switch the RSS 3000 is available at the work site ([SRAC A12](#)).

5.2 User certification

Only certified personnel may use the RSS 3000 ([SRAC I5](#)).

5.3 Worksite

When entering the railway worksite, prioritize your safety by following all local regulations and your organization's safety procedures. Always comply with your country's safety regulations for track work.

5.4 Personal protective equipment

The RSS 3000 does not require any specific PPE during installation. Please follow local regulations regarding PPE requirements.

5.5 Residual risks

Dual Inventive has assessed the risks of the RSS 3000 for its intended use and normal operating conditions. The following residual risks are acceptable:

HAZARD	RESIDUAL RISK
Magnetic field	The RSS 3000 can generate a small magnetic field during use.

Table 4 Residual risk

5.6 Regulatory compliance

The RSS 3000 complies with the following regulations:

1. **UK REACH:** Ensures the safe use of chemicals by regulating substances that may pose risks to human health or the environment. Substances used in this product, including lead (CAS 7439-92-1), are registered and assessed according to UK REACH standards.
2. **UK RoHS:** This product meets UK RoHS rules. It limits the use of hazardous substances, including lead, in electrical and electronic equipment. This makes the product safe to use and eco-friendly.

 No actions are required from users concerning UK REACH and UK RoHS.

6 LOGISTICS

6.1 Transport

Follow these instructions for safe transport and storage:

1. Always use the original packaging to transport the RSS 3000.
2. Transport the RSS 3000 in protective packaging ([SRAC T1](#)).
3. Transport the antenna cable in protective packaging ([SRAC T2](#)).
4. If damage is detected, contact [Dual Inventive Support](#) ([SRAC S1](#)).

 The RSS 3000 can be installed 1 to 3 meters from the track.

6.2 Storage

Follow these instructions for proper storage of the RSS 3000 before installation:

1. Confirm the shipping box contains the [RSS 3000 and accessories](#).
2. Store the shipping box in a cool, dry area with temperatures between 20°C and 25°C and relative humidity between 40% and 60%.

6.3 Unpacking

1. The RSS 3000 and accessories are delivered in a shipping box.
2. Cross-check the contents of the shipping box with the RSS 3000 receipt list to ensure all equipment is delivered.

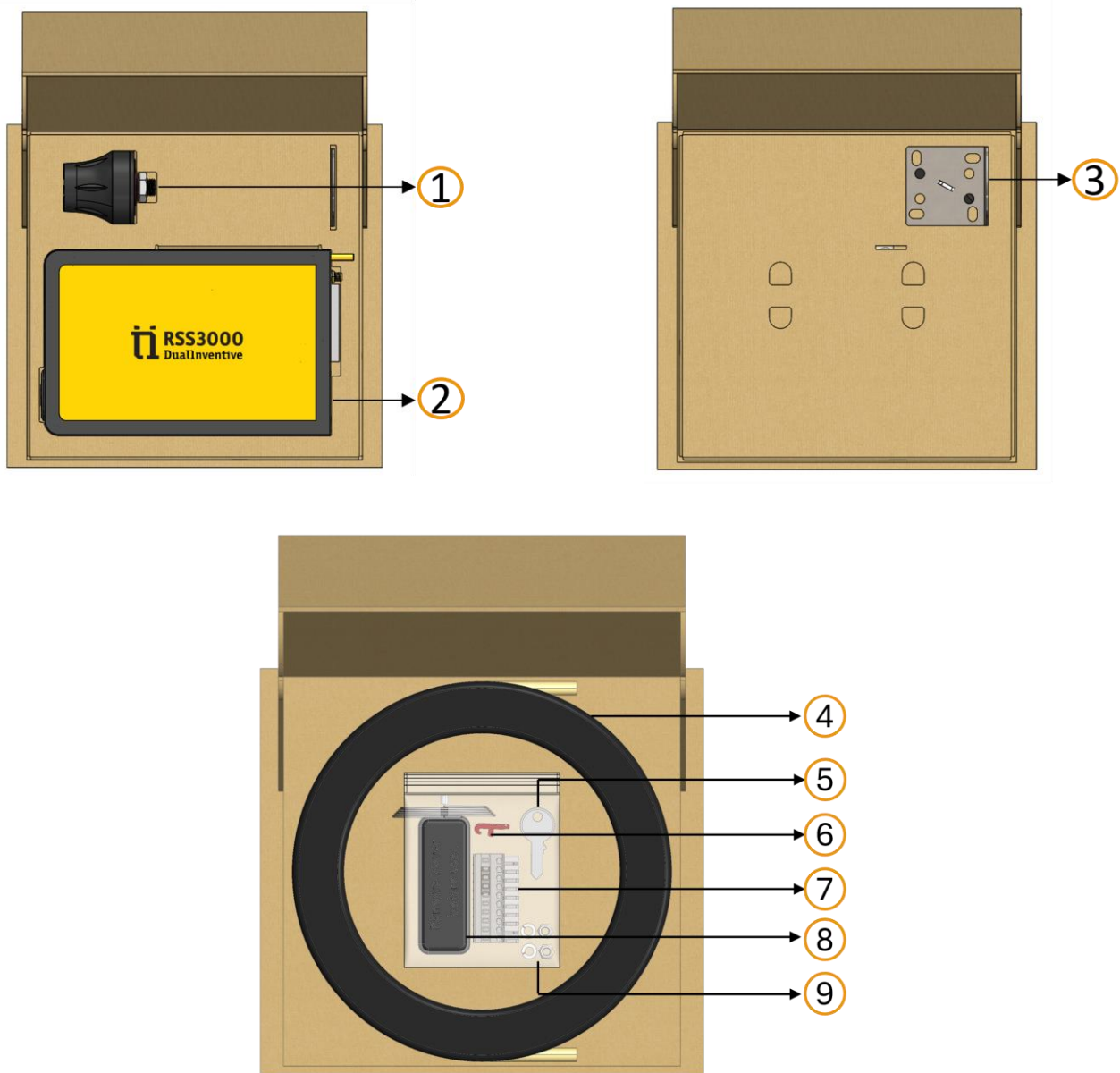


Figure 3 RSS 3000 and accessories

KEY	DESCRIPTION
①	Antenna
②	RSS 3000

KEY	DESCRIPTION
③	Mounting Bracket
④	Antenna extension cable; available in 2m or 5m (length specified in the purchase order based on installation needs).
⑤	Operator keys
⑥	Wire insertion tool
⑦	Connector Plug
⑧	Emergency Plug
⑨	2 X M5 nuts, 2X spring washers

7 INSTALLATION

7.1 Before installation

CAUTION



1. The user is responsible for the safe installation of the RSS 3000.
2. Ensure compliance with Safety standards before installation.
3. Always install the RSS 3000 with the antenna to ensure connectivity with MTinfo 3000.
4. The RSS 3000 shall be placed either in a relay room or location cabinet to prevent vandalism (SRAC I13).
5. Do not attempt to open the device or break the RSS 3000 seal under any circumstances.

Follow these instructions before installing the RSS 3000:

1. Visually inspect the RSS 3000 for damage or flaws. If any are present, do not use the system (SRAC I6).
2. During on-site checks, the RSS 3000 should not show major damage (a slight scratch is acceptable). If it does, replace the device to ensure availability (SRAC M3).
3. Ensure all electrical power is completely isolated.

7.2 Mounting

7.2.1 Materials used for mounting

1. 2 X M5 nuts
2. 2X spring washers
3. Mounting Bracket
4. Antenna
5. Extension cable

7.2.2 Mounting steps

Follow these steps to mount the RSS 3000 in the relay room or location cabinet:

Step 1: Find the materials used for mounting and the RSS 3000 in the shipping box.

Step 2: Attach the RSS 3000 to the frame using the pins on the back face. Secure it with the nuts and spring washers.

Step 3: Find the antenna in the shipping box.

Step 4: Position the antenna outside the relay room or location cabinet.

Step 5: Connect the antenna cable to the antenna connector on the back of the RSS 3000 with the mounting bracket. Use the antenna extension cable if necessary.



CAUTION

Tighten the antenna cable to a maximum of **0.4 Nm** to prevent damage.

i The installation situation may vary from what is described in the User Manual.

7.3 Inserting the relay cable

7.3.1 Materials for inserting the relay cable

1. Connector plug
2. Wire insertion tool

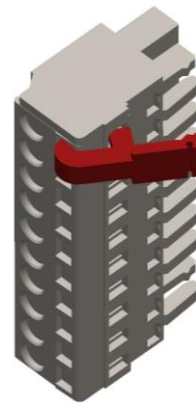
7.3.2 Steps to insert the relay cable

Wiring must be done in accordance with the railway infrastructure maintainer-approved wiring design scheme.

Follow these instructions for the correct installation of the relay cables in the RSS 3000:

Step 1: Find the wire insertion tool included in the shipping box.

Step 2: Insert the wire insertion tool close into the square socket of the connector plug.

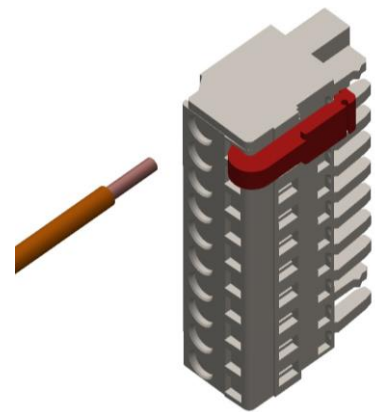


Step 3: Gently pull the tool to snap back into the connector plug as shown in the figure.

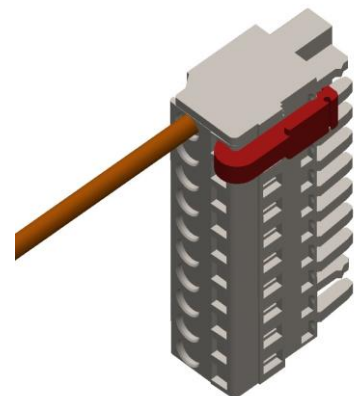
This action will open the corresponding circular socket.



Step 4: Insert the relay wire into the now-open circular socket as shown in the figure.



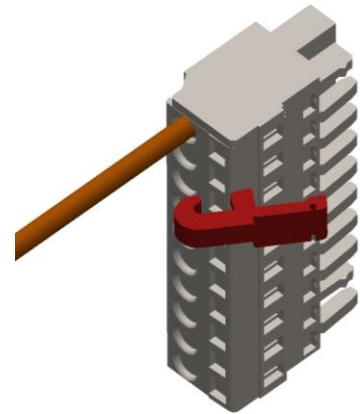
Step 5: Firmly secure the wire in place.



Step 6: Carefully remove the wire insertion tool.

As you do, the circular socket will close and lock the cable in place.

Gently pull on the wire to ensure it is securely in place to prevent loose connections.



Step 7: Repeat Steps 2 to 6 for each of the remaining relay wires. Work with *one wire at a time* for accurate and secure connections.

Step 8: Gently pull each relay wire to ensure it is securely connected.

Step 9: Install the connector plug at the back face of the RSS 3000 after all the wires are securely connected.

PIN NO.	FUNCTION
1.	Power input L (85-265VAC 50/60Hz)
2.	Power input N (85-265VAC 50/60Hz)
3.	-
4.	-
5.	Relay NC output contact A
6.	Relay NC output contact B
7.	Monitor NO 1 contact A
8.	Monitor NO 1 contact B
9.	Monitor NO 2 contact A
10.	Monitor NO 2 contact B

Table 5 Pinout diagram

Solid conductor	0.08 ... 2.5 mm ² / 28 ... 12 AWG
Fine-stranded conductor	0.08 ... 2.5 mm ² / 28 ... 12 AWG
Fine-stranded conductor; with insulated ferrule	0.25 ... 1.5 mm ²
Fine-stranded conductor; with uninsulated ferrule	0.25 ... 2.5 mm ²
Strip length	8 ... 9 mm / 0.31 ... 0.35 inches

Figure 4 Relay cable gauge

Step 10: Perform testing and commissioning of all power and signalling wires according to the infrastructure maintainer's requirements or standards.

Step 11: Power on the RSS 3000. The cloud light indicator should turn *solid blue within 5 seconds*, indicating a successful connection to MTinfo 3000.

If the cloud light fades in and out, it indicates no connection to MTinfo 3000. To stabilise the connection, ensure the antenna cable is properly connected. If the problem persists, try relocating the antenna to different positions until a stable connection is achieved. If stability is still not achieved, kindly contact [DI Technical Support](#) for assistance.



WARNING

Incorrect installation of the wires will fail or potentially cause damage to the RSS 3000.

8 SETUP IN MTINFO 3000

The RSS 3000 is registered in the MTinfo 3000 - Asset Management by Dual Inventive during the device calibration process. The registration uses the serial number, which is found on the front and back face of the RSS 3000.

Authorised users can create a project by adding one or more registered RSS 3000 devices under the 'Project Design' step. After setup, the device is ready for [Installation](#) and [Functional test](#).

You can combine multiple RSS 3000s, ZKL 3000 RCs, and RDI 3000s in the same protection zones. This allows you to activate or deactivate them at the same time. This allows the practical use of the RSS 3000 for different scenarios. Some examples of different project setups include:

1. Projects with only RSS 3000s, with one or more protection zones.
2. Combined projects with RSS 3000s, ZKL 3000 RCs, and RDI 3000s.

The RSS 3000, ZKL 3000 RC, and RDI 3000 can be switched by the same project. Depending on the design and arrangement of the protection zones, you can switch the devices *together or separately*.

The RSS 3000 can work with other Dual Inventive [products](#).



Ensure that the products you plan to use are approved for use by the relevant railway infrastructure maintainer.



REFERENCE

For detailed instructions on setting of the RSS 3000 in MTinfo 3000 and the conditions for using MTinfo 3000, refer to the [MTinfo 3000 web app User Manual](#).

9 SWITCHING

Switching of the RSS 3000 is controlled by the rules of the infrastructure maintainer.

The RSS 3000 can be switched manually using the operator key or remotely through the MTinfo 3000.

Without the operator key, web/mobile app, or computer connection, the RSS 3000 cannot be operated ([SRAC A13](#)).



WARNING

Before switching, confirm the permission from the signalling controller, signaller, or dispatcher.

9.1 Device indication lights

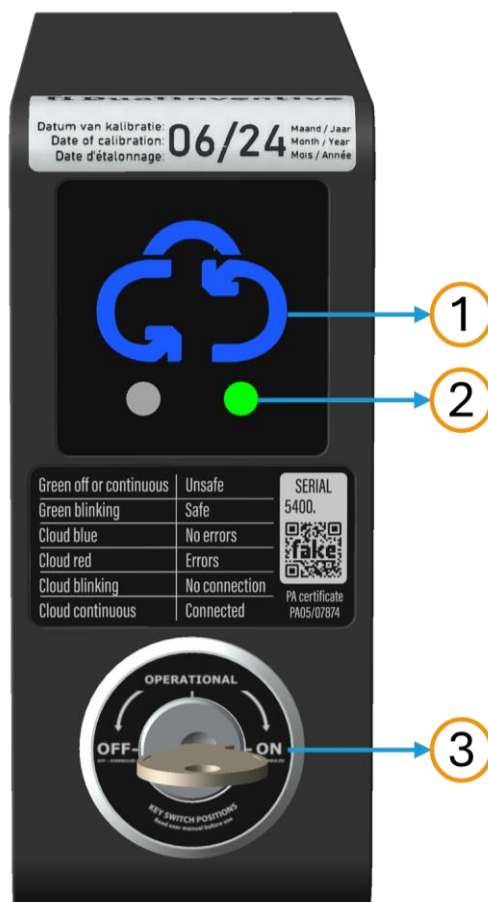


Figure 5 Switching & indication lights RSS 3000

KEY	DESCRIPTION
①	Cloud light

KEY	DESCRIPTION
②	Green LED
③	Key switch

9.1.1 Cloud light

The cloud light has the following indications:

CLOUD LIGHT	INDICATION
Blue	Normal working state
Red	Error state
Solid lit	Online (Connected to MTinfo 3000)
Fade in and out	Offline (Not connected to MTinfo 3000)

Table 6 Cloud light indications

When the RSS 3000 is offline (with no errors), do not use the RSS 3000 if it remains in this state and contact [DI Technical Support \(SRAC 112\)](#).



DANGER

The red cloud light shows that the RSS 3000 is in an *error state*. Do not use the device if it remains in this state ([SRAC 110](#)).

9.1.2 Green LED

The Green LED lights up when the device is activated and turns off when it is deactivated.

9.1.3 Key switch positions

The key switch is used to manually and remotely switch the device between three positions: **ON**, **OFF**, and **OPERATIONAL**. Further details are explained below.

9.2 Manual switching



KEY	DESCRIPTION
①	OPERATIONAL
②	ON
③	OFF

Figure 6 Operator key positions

9.2.1 Manually switched ON

To *activate* the RSS 3000, insert the operator key into the key switch and turn it to the 'ON' position.

9.2.1.1 Device switch status indicator

1. Cloud light is blue (solid);
2. Green LED is ON.



Figure 7 Manually switched 'ON'

9.2.1.2 RTS in MTinfo 3000

1. Device status: Online (blue);
2. Switch status: Switched ON (green);
3. Operator key position: ON (overruled).

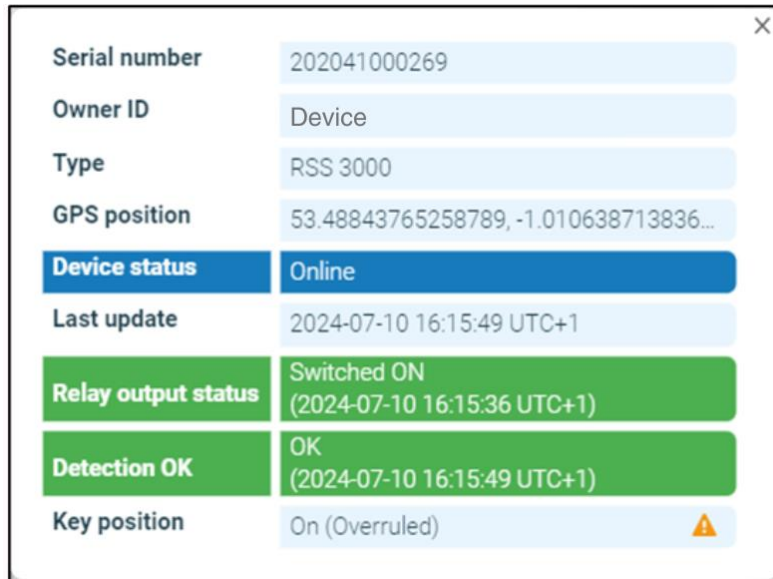


Figure 8 The device is 'Switched ON' in RTS

9.2.2 Manually switched OFF

To *deactivate* the RSS 3000, insert the operator key into the key switch and turn it to the 'OFF' position.

9.2.2.1 Device switch status indicator

1. Cloud light is blue (solid);
2. Green LED is OFF.



Figure 9 Manually switched 'OFF'

9.2.2.2 RTS in MTinfo 3000

1. Device status: Online (blue);
2. Relay output status: Switched OFF (red);
3. Relay output status: OFF;
4. Operator key position: OFF (overruled).


Serial number	202041000269
Owner ID	Device
Type	RSS 3000
GPS position	53.488136291503906, -1.01053535938...
Device status	Online
Last update	2024-07-10 16:11:09 UTC+1
Relay output status	Switched OFF (2024-07-10 16:11:09 UTC+1)
Key position	Off (Overruled) 

Figure 10 The device is 'Switched OFF' in RTS

9.3 Remote switching

For remote switching, switch the operator key to the 'OPERATIONAL' position.

REFERENCE



1. For further details on remote switching using the MTinfo 3000 web app, refer to the [MTinfo 3000 web app User Manual](#).
2. For further details on remote switching using the MTinfo 3000 mobile app, refer to the [MTinfo 3000 mobile app User Manual](#).

10 FUNCTIONAL TEST

Perform a functional test of the RSS 3000 to verify that the device is working as intended ([SRAC 19](#)).

At initial placement, always follow the installation procedure as described in the RSS 3000 User Manual ([SRAC 18](#)).

Follow these steps to ensure the correct functioning of the RSS 3000:

SWITCHING	STEPS	RESULT
Manual switching	Step 1: Turn the operator key to the 'ON' position.	a. <u>RSS 3000 is activated (green LED is ON).</u> b. <u>The device is 'Switched ON' in RTS of the device is updated as 'Switched ON'.</u> c. The switch is correctly registered as activated in MTinfo 3000 and the Train Signaller/Dispatcher's signalling control panel.
	Step 2: Turn the operator key to the 'OFF' position.	a. <u>RSS 3000 is deactivated (green LED is OFF).</u> b. <u>The device is 'Switched OFF' in RTS of the device is updated as 'Switched OFF'.</u> c. The switch is correctly registered as deactivated in MTinfo 3000 and the Train Signaller/Dispatcher's signalling control panel.
Remote switching	Step 1: Turn the operator key to the 'OPERATIONAL' position.	Remote switching is enabled.
	Step 2: Refer to MTinfo 3000 User Manuals for instructions on project release, and switching.	a. <u>RSS 3000 is activated (green LED is ON).</u> b. <u>The device is 'Switched ON' in RTS of the device is updated as 'Switched ON'.</u> c. The switch is correctly registered as activated in MTinfo 3000 and the Train Signaller/Dispatcher's signalling control panel.
	Step 3: Refer to MTinfo 3000 User Manuals for instructions on project release, and switching.	a. <u>RSS 3000 is deactivated (green LED is OFF).</u> b. <u>The device is 'Switched OFF' in RTS of the device is updated as 'Switched OFF'.</u> c. The switch is correctly registered as deactivated in MTinfo 3000 and the Train Signaller/Dispatcher's signalling control panel.



WARNING

This test is not intended to verify the correct switching and status of the associated railway signal interlocking. To ensure the correct switching and status of the railway signal interlocking, it must comply with the installation, testing, and commissioning processes carried out by the railway infrastructure maintainer.

11 TROUBLESHOOT

11.1 General issues

S/N	GENERAL ISSUES	CAUSE	SOLUTION
1.	The device(s) in a project are offline.	a. No telecommunications signal available due to provider maintenance, faulty service , or a malfunctioning cell tower.	Contact Dual Inventive Support .
		b. The device(s) may be defective.	Check the device and perform a functional test .
		c. Issue with power supply connection.	Check the cables of the RSS 3000 and the power supply.
		d. Issue with antenna connection.	Ensure the antenna is connected properly. If still offline, replace it with a new antenna.
2.	Unable to release the project when starting.	a. The 'project design' or 'project planning' steps are incomplete.	Check the project steps and device state according to the error message feedback from the MTinfo 3000 web app.
		b. One of the devices is not in the correct state.	
3.	The MTinfo 3000 mobile app indicates that the project is not released.		Contact the person authorised to release the project as indicated in the MTinfo 3000 mobile app.
4.	The authorised person to release the project is ill or unavailable.		Contact the MTinfo 3000 planner and check if the RSS 3000 can be manually switched using the operator key.

Table 7 General issues and solutions

11.2 Notifications


Notifications from MTinfo 3000 inform users of *important updates or actions required*. Users with switching rights for a released project will automatically receive notifications.

Depending on safety criticality these can be sent as *SMS, email, or push notification*.

The notification service for the RSS 3000 activates when the *device is assigned to a project* and that *project is released*.

The RSS 3000 reports if any action do not comply with safety regulations. The system manages this, and all notifications are communicated in the user's native language. These notifications can be read via the user's mobile or the MTinfo 3000 mobile app ([SRAC A10](#)).

In areas with poor telecommunication, the RSS 3000 may lose its connection with the MTinfo 3000. This means that the RSS 3000 cannot be switched remotely. If telecommunications connectivity is lost the RSS 3000 will maintain its switched state, ensuring track worker protection is maintained.

 If you frequently receive notifications, contact [Dual Inventive Support](#).

To ensure these notifications are received, the *your contact number* must be entered as the *alarm contact number* in your user profile. It is the recipient's responsibility to act on these notifications. The notifications that require action are:

11.2.1 General notifications


S/N	NOTIFICATIONS	EXPLANATION	ACTION
1.	RSS 3000 "Serial Number" Detection NOT ok. Please check the User Manual for more information.	RSS 3000 <i>switch status is unknown</i> or cannot be verified. Detection has failed.	Inspect the device connector and cable to the relay room or location cabinet; replace them if damaged. If the problem persists, contact Dual Inventive Support .
2.	RSS 3000 "Serial Number" is offline. Please check the User Manual for more information.	RSS 3000 with ID "Serial Number" is offline. The RSS 3000 cannot connect to MTinfo 3000.	Verify the RSS 3000's power source. Additionally, check the Dual Inventive status page for any network or telecommunications outages. If the problem persists, contact Dual Inventive Support .

Table 8 General notifications

11.2.2 Warning codes

WARNING CODE	WARNING MESSAGE	ACTION
2001040	Detection is not OK, and a proper short-circuit could not be established.	<ul style="list-style-type: none"> • Check the wiring to the external relay • Check the external relay itself. • If the problem persists, contact Dual Inventive Support.
2001058	The device has reported a switch issue.	Urgent. Do not use the device. Contact Dual Inventive Support .


Table 9 Warning codes and actions

 If the problem persists or for all other warning codes, contact [Dual Inventive Support](#).

11.2.3 Error codes

ERROR CODE	ERROR MESSAGE	ACTION
1027	EEPROM error.	Reset the device remotely. If the problem persists, contact Dual Inventive Support .
1062	The operator key is not in the operational position. Remote switching is not possible.	Turn the operator key to the 'OPERATIONAL' position to enable remote switching.
1063	The device has errors.	Retry. If the problem persists, contact Dual Inventive Support .
1073	The device has not been switched on correctly.	Retry. If the problem persists, contact Dual Inventive Support .
1074	The device has not been switched off correctly.	Retry. If the problem persists, contact Dual Inventive Support .

Table 10 Errors codes and actions

 If the problem persists or for all other error codes, contact [Dual Inventive Support](#).

11.2.4 Reminders

The reminder service is for *offline and critical events*. Reminders help you remember that there is an unresolved issue with a specific RSS 3000.

1. Reminders are only sent when the device is active.
2. Reminders are sent *every 15 minutes*.
3. A maximum of *3 reminders* are sent when an issue occurs with the RSS 3000.



CAUTION

If you continue to receive error messages that require examination of the RSS 3000, or if you need to manually switch the relevant RSS 3000, escalate the issue to the *railway infrastructure maintainer's fault control centre*. This ensures that the relevant technicians, with the authority to access the RSS 3000 location, can investigate.

The reminder text messages are:

S/N	REMINDER	EXPLANATION	ACTION
1.	Reminder: RSS 3000 "Serial Number" Detection NOT ok. Please check the manual for more information.	Reminder message when the monitoring is not ok, and the device is in an activated protection zone.	Check the device connector and cable to the relay . If they are damaged, replace the connector or cable following the procedures set by the Rail Infrastructure Controller. If this does not fix the issue, replace the device and send the original device for servicing.
2.	Reminder: RSS 3000 "Serial Number" is offline. Please check the User Manual for more information.	Reminder message when the device is offline, and the device is in an activated protection zone.	Check the power source of the RSS 3000. Check the status page for network outages. If this does not solve the issue, contact Dual Inventive Support .

Table 11 Reminders

11.3 Emergency plug

The Emergency Connector should be used when:

1. The RSS 3000 has a fault or a loss of 110v power.
2. There are signalling disconnections because the REM DIS R is de-energised.
3. A replacement RSS 3000 or restored power is not available.

11.3.1 Installing the emergency plug

Step 1: Locate the Emergency plug (as shown in Figure 11) fixed at the back face of the RSS 3000.

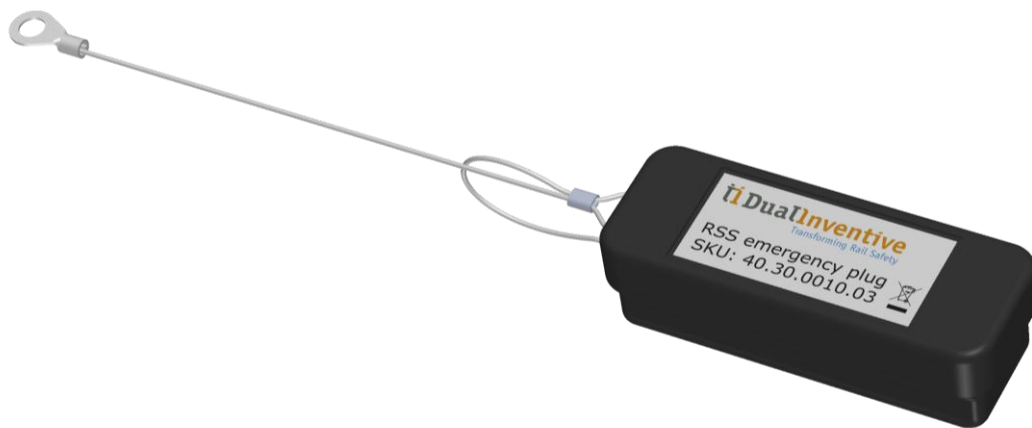


Figure 11 Emergency plug

- Step 2:** Ensure the Emergency plug is undamaged. Verify that the dust cap is in place and the pins are straight and clean.
- Step 3:** Remove the plug coupler from the back face of the RSS 3000.
- Step 4:** Communicate with the Signalling Designer. Explain that signalling will be restored and get their permission before moving to Step 5.
- Step 5:** Insert the Emergency Connector into the plug coupler.
- Step 6:** Check that the REM DIS R is now energised. Verify with the Signaller to ensure the issue is resolved.
- Step 7:** If Yes, remove the faulty RSS 3000 and arrange for replacement. If No, the problem may be with the REM DIS R, and needs further fault analysis.

12 LIFECYCLE MANAGEMENT

12.1 Maintenance

The RSS 3000 is made to work in a **relay room or location cabinet**. This protects it from weather, shocks, vibrations, and electromagnetic signals. The RSS 3000 is not for use outside this protected environment.

The predictive maintenance period for the RSS 3000 is **10 years**. After this time, you will receive a notification. Send the RSS 3000 back to Dual Inventive for service ([SRAC M2](#)).

This ensures sustained performance without the need for routine maintenance checks outside of the designated service period due to its robust design.

12.2 Security update

Security updates will be provided by the terms and conditions specified in the *contractual agreements*.

12.3 Replacement

To replace the RSS 3000 device, follow these steps:

Step 1: Remove the original device from MTinfo 3000 – Asset Management.

Step 2: Disconnect the antenna and the connector attached to the relay.

Step 3: Quarantine the original device.

Step 4: Replace the RSS 3000 device with the new device following the Setup and Installation steps.

Step 5: Perform the Functional test on the newly installed RSS 3000 device.

12.4 Quarantine

If the RSS 3000 shows signs of major damage, immediately stop using it. Place the damaged device away from other equipment in a designated quarantine area. Take photographs and notes of the damage for records, and contact [Dual Inventive support](#) for further assistance.

12.5 Disposal

12.5.1 Shipping box disposal

The shipping box must be disposed in accordance with your waste management process.

12.5.2 RSS 3000 disposal

1. Dual Inventive offers a service to collect and recycle the RSS 3000. Please contact [Dual Inventive Support](#) to arrange this service.

2. If there is no take-back agreement, the *owner* of the RSS 3000 is responsible for the correct disposal. Consult [UK WEEE regulations](#) or contact specialised disposal companies for advice on environmentally safe disposal.
3. This product follows ISO 14001 standards for environmental management.



CAUTION

Please do not dispose of the RSS 3000 in the environment as it *contains toxic* substances.

13 SUPPORT AND LEGAL INFORMATION

13.1 DI Technical Support

You can contact Dual Inventive Technical support through the email address support@dualinventive.co.uk or contact 03300 169033.

Alternatively, for customer support contact details specific to your project, please refer to the 'Contact Us' section within the MTinfo 3000.

Your feedback is crucial for improving safety and optimising the distribution of rail capacity.

13.2 Legal notice

No rights can be derived from the information in this User Manual. Reproducing or distributing manual concepts in printed, written, audiovisual, or any other form without Dual Inventive's prior authorisation is prohibited

14 WARRANTY

The RSS 3000 is carefully manufactured from high-quality materials and comes with a *10-year service contract*. The service contract explains the general delivery and warranty conditions. These conditions depend on the contractual agreement and the subscription license applied at the time of purchase.

The warranty is no longer valid if:

1. You use the RSS 3000 for purposes other than its Intended use.
2. You break the RSS 3000 seal on the top corner of its side face (see image below)



Figure 12 RSS 3000 seal

15 ABBREVIATIONS

1.	DNCM	Dual Inventive Network Communication Module
2.	ID	Identification
3.	LED	Light Emitting Diode
4.	MTinfo 3000	Dual Inventive Cloud control system
5.	NC	Normally Closed
6.	PPE	Personal Protective Equipment
7.	REM DIS R	Remote Disconnection Relay
8.	RSS 3000	Remote Safety Switch 3000
9.	RTS	Real-Time Status
10.	SD card	Secure Digital card
11.	SIL4	Safety Integrity Level 4
12.	SMS	Short Message Service

16 GLOSSARY

1. **Latching Relays** are types of electrical switches that maintain their state without continuous power.
2. **RDI 3000s** is a safety device designed to activate and deactivate a combination of an LED light, flag, and detonator, enhancing the safety of the worksite.
3. **Safety Integrity Level** quantifies the level of risk reduction provided by safety systems to prevent hazardous events. It is expressed as a discrete number (SIL 1, SIL 2, SIL 3, SIL 4) where higher SIL numbers indicate a higher level of safety integrity.
4. **Quarantine** of devices refers to the practice of isolating or separating certain devices from the rest of a network or environment due to suspected or confirmed issues that could pose a threat.
5. **ZKL 3000 RC** is a blocking safety device that protects a section of track efficiently and effectively by producing and monitoring a short circuit in the track, simulating a train in the section.
6. **Zone B** is a land area 1-3 meters away from the railway tracks.