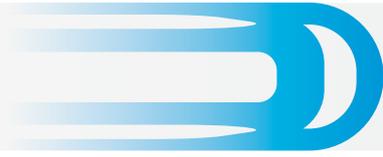


Manual for switching the ZKL3000 RC using the **MTinfo 3000 app**



ti DualInventive
Ubiquitous Rail

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1. INTRODUCTION

This manual describes the process of remotely operating the ZKL 3000 Remote Control (RC) Line Blockage System via the MTinfo 3000 Smartphone app.

The MTinfo 3000 app provides remote access to the ZKL 3000 RC system, which safeguards a section of track by producing and monitoring a short circuit which in turn, simulates a train in the track section. This causes the track circuit to be 'OCCUPIED', holding the protecting signals at danger. The section will be immediately closed for rail traffic, aiding rail workers in performing their work on the track both safely and efficiently.

This manual is part of a set that details the entire ZKL 3000 RC system: The web interface (MTinfo 3000 Version 5), the Line Blockage System (ZKL 3000 RC) and the MTinfo 3000 app.

2. APPLICATION

The MTinfo 3000 app allows the user to remotely operate one, or a group of, ZKL 3000 RC's in a safe, effective, and efficient manner. These both use Dual Inventive's secured network to connect to the ZKL 3000 RC. You can remotely switch one or a group ZKL 3000 RC's.

a. Scope

Using the MTinfo 3000 app you are able to:

- view the projects for which you are authorised;
- switch ZKL 3000 RC(s) on or off;
- view the real time status of equipment;

b. Technical specifications

- The MTinfo 3000 app runs on iOS, Android and Windows 10 smartphones/tablets.
- The MTinfo 3000 app needs a minimum storage capacity of 8 MB.
- An internet connection is required to use the MTinfo 3000 app
- Dual Inventive recommends using a tablet to view documents using the MTinfo 3000 app.
- In order to view documents using the MTinfo 3000 app an app to view PDF documents (such as the Adobe Reader app) is required.

3. CONDITIONS & SAFETY INSTRUCTIONS



WARNING!

Please read all safety instructions carefully before using the ZKL 3000 RC. Please ensure you fully understand the system and its functions. When the correct safety measures are not followed, there is a risk of electric shock, fire or even death.

a. Conditions for use

Users must only use the MTinfo 3000 app when the following criteria are satisfied:

- The user holds an in date ZKL 3000 RC competency
- The user has been assigned the appropriate user rights in MTinfo 3000
- The user has been authorised to use the MTinfo 3000 app

As a competent user you are responsible for:

- Any relevant paperwork, user names and passwords (and any authorisation codes via text message or PIN that you have been assigned)
- Managing your password and your PIN. You must never share this information with others

b. Instructions

MTinfo 3000 app

- You will need a user name, company code and password for the MTinfo 3000 app. Additionally, you should ensure your mobile phone number is correctly entered in MTinfo 3000, using the correct country code (e.g. +44 for UK), as this is used for authorisation during first-time logon
- Ensure user has access to the MTinfo 3000 app, and RS module before use
- Only start using the MTinfo 3000 app when your smartphone or tablet has been fully charged

ZKL 3000 RC

- Check whether the ZKL 3000 RC has the correct certificates. Please consult our website for the list of required certificates: www.dualinventive.com
- Always take care of your own safety within the railway environment using the most up-to-date, applicable legislation
- Issues may be encountered which mean ZKL 3000 RC's cannot be switched. For more information about these alerts, please see [chapter 6 "Alerts"](#)

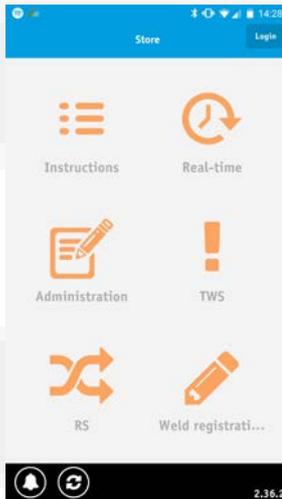
4. USING THE MTINFO 3000 APP

a. Download and Installation

To download the MTinfo 3000 app, do the following:

- Go to the app store on your smartphone or tablet and search for “MTinfo 3000”
- Download the free MTinfo 3000 app (the app requires a minimum storage capacity of 8 MB)

Once you have installed and started the MTinfo 3000 app, the following screen will appear:



b. MTinfo 3000 app symbols

The MTinfo 3000 app uses several symbols. The explanation of these symbols can be found below:



Notifications Shows all notifications which have been sent to your device by MTinfo 3000.

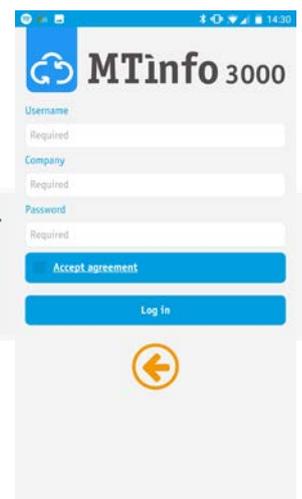


Refresh Refreshes the screen.

c. Login

- Open the app and select the login button in the top right corner
- Enter your login information (user name, company code and password), accept the general terms & conditions and press the 'Login' button

Attention: logging in is only possible when you possess the correct app user rights. Please contact your internal contact person for this.



4. USING THE MTINFO 3000 APP CONTINUED

d. Authorisation

- You will receive an authorisation code via SMS on the phone number that is linked to your MTInfo 3000 account. Enter the authorisation code and click “log in” again.

The authorisation code will expire after one month. If you do not log onto the app within a month, you will receive a new authorisation code when you next login.

If you do not receive an authorisation code, please consult your internal contact person for more information. It may be that your phone number has been entered into MTInfo 3000 incorrectly.

- Once logged in, the app will show you a list of all of the modules you have access to. The RS module is the one which will be covered in this document. Please open it, by selecting the ‘RS’ icon

A light orange tile indicates that you do not have the correct rights to access to this tile. If you are not able to access certain tiles, please consult your internal contact person.

e. Logout

- Click the account button in the top right corner
- Select “Logout”
- You will be taken back to the home screen
- When finished using the app, it can be closed using your phone’s application manager”

f. GPS-location

Upon opening the realtime status tile the MTInfo 3000 app will ask you to allow the use of your phone’s location, if this has not been allowed already. In case you do not give the app permission to use the location of your phone, your location will not be linked to the MTInfo 3000 app. You can always change these permissions through the settings menu on your phone.

g. (Push) Notifications

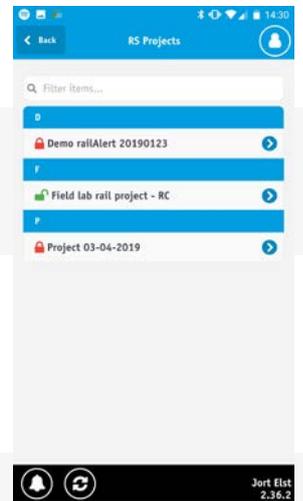
The MTInfo 3000 app will, upon first login, ask permission to send push notifications to your phone. You can allow or deny this request. This will only be asked once. In case you do not grant the app permission to send push notifications, certain notifications will be sent as text messages to the phone number linked to your account, instead. You can always change these permissions through the settings menu on your phone.

5. OPERATING THE MTINFO 3000 APP

To operate a ZKL 3000 RC using the MTinfo 3000 app, you first need to press the RS tile.

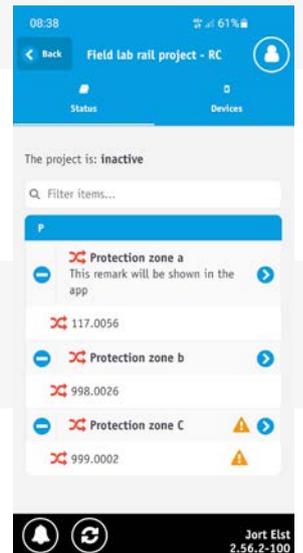
a. Select Project

- The RS module will display the projects the logged in user is assigned to
- Select the required project from the list
- Non-released projects are indicated by a red padlock. Selecting one of these projects will display the name and phone number of the project leader. You will not be able to switch any devices on a project until it has been released



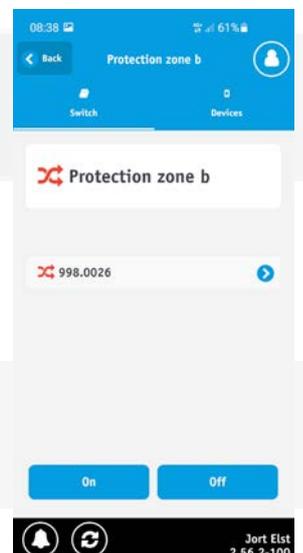
b. Select Protection zone

- After selecting a project, the screen will then display the protection zones contained within it
- Select the required protection zone



c. Equipment Status

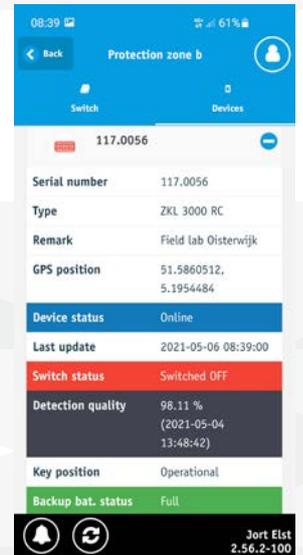
Once a protection zone has been selected, the following screen will be displayed. From this screen, the ZKL 3000 RC's in the protection zone can be switched and their status seen in real time. The positions can also be seen on a map by pressing the 'Devices' tab followed by the 'Map' button.



5. OPERATING THE MTINFO 3000 APP CONTINUED

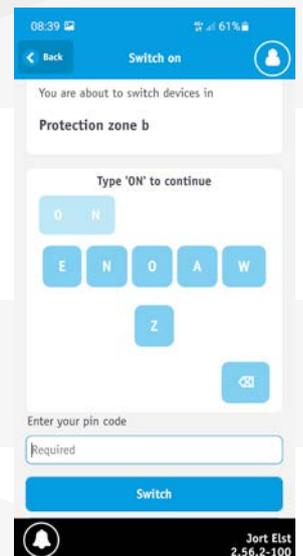
c. Equipment Status continued

- Press the 'Devices' button to check the status of the selected ZKL 3000 RC(s) during the selected protection zone
- The status of the selected ZKL 3000 RC [ID] is indicated on the screen by a colour. Red indicates that the ZKL 3000 RC is switched off and/or not detecting a short circuit. Green means that the ZKL 3000 RC is switched on and successfully creating a short circuit. Black indicates that the ZKL 3000 RC is offline
- When the '+' icon next to a ZKL 3000 RC is pressed, the status box will expand to give more details on the ZKL 3000 RC (as shown to the right)



d. Switching using the MTInfo 3000 app

- To switch the ZKL 3000 RC(s) in the protection zone, select one of the 'ON' or 'OFF' buttons on the 'Switch' tab. A verification screen will then appear.
 - Confirm your choice by typing either "ON" or "OFF" using the on screen keyboard
- Attention: the letters are not always in the same place**
- Once an action has been entered, you will be asked to enter your PIN code for security reasons



5. OPERATING THE MTINFO 3000 APP CONTINUED

d. Switching using the MTinfo 3000 app continued

- If the correct PIN is entered when switching 'ON', the green LED on the ZKL 3000 RC will start to blink and then the unit will report that it has been switched on
- If the correct PIN is entered when switching 'OFF', the green LED on the ZKL 3000 RC will switch off and then the unit will report that it has been switched off

Note: If any problems are encountered during the switching process, the app will provide details explaining why the ZKL 3000 RC could not be switched. If a switch action proves to be unsuccessful Dual Inventive advises to repeat the switch action once more.

If a ZKL 3000 RC cannot be switched, or is showing a different error, this will be indicated with 

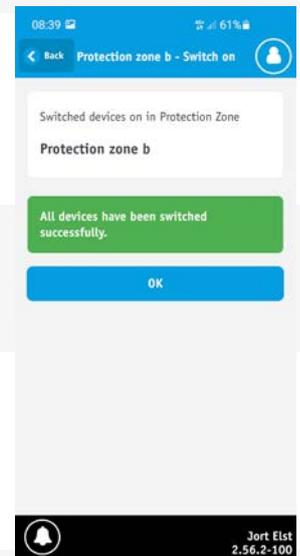
Upon opening the protection zone in question an explanation will be given which explains why the ZKL 3000 RC is showing the error.

Please note, for more information, please see [chapter 6, "Alerts"](#).

Alternatively, protection zone can also be switched using the web interface MTinfo 3000 (where product approval allows). Please read the manual MTinfo 3000 version 5 for this, chapter "Switching".

You may encounter situations that prevent you from switching the ZKL 3000 system. For more information about these notifications, please see the ZKL 3000 RC Installation manual, chapter 9 "Troubleshooting".

Alternatively, protection zones can also be switched using the web interface MTinfo 3000 (where product approval allows). Please read the manual MTinfo 3000 for this, chapter "Switching".



6. ALERTS

a. Status Screen Alerts

When you click the 'plus' symbol next to a ZKL 3000 RC on the realtime screen, you will see an expanded status view for the ZKL 3000 RC.

Status	Explanation
Device status: Online	The ZKL 3000 RC is connected to MTinfo 3000.
Device status: Offline	The ZKL 3000 RC is not connected to MTinfo 3000.
Last update	The last date and time when the ZKL 3000 RC signaled to MTinfo 3000 and the app
Switch status: Switched ON	The ZKL 3000 RC is switched ON.
Switch status: Switched OFF	The ZKL 3000 RC is switched OFF.
Detection: OK	A short circuit has been detected.
Detection: NOK	A short circuit has not been detected.
Key position: Operational	The override key switch is in the operational position.
Key position: On	The override key is in the overruled position – ON.
Key position: Off	The override key is in the overruled position – OFF.
Battery 	The battery is connected to the ZKL 3000 RC and has sufficient power.
Battery 	The battery is connected to the ZKL 3000 RC and has adequate power.
Battery 	The battery is connected to the ZKL 3000 RC but is low in power.
Battery 	The battery is connected to the ZKL 3000 RC but is almost empty.
Battery 	The battery is connected to the ZKL 3000 RC but is empty.
Battery 	The battery has been removed or is completely empty.
Battery voltage	Shows the voltage of the ZKL 3000 RC's batteries.

6. ALERTS CONTINUED

b. SMS/push Alerts

Users with switching rights on a released project will automatically receive alerts via SMS or push notifications. Those not on a project can also receive these, however this will need to be arranged with the company contact person as they will need to register the mobile phone number as an additional alarm number using MTinfo 3000. Monitoring starts as soon as the ZKL 3000 RC has been powered on. It is the responsibility of the recipient to act upon these alerts (more information is available in the ZKL 3000 RC Installation Manual).

The text message alerts that require action are:

SMS Alert	Explanation
Project: 'Manual ZKL 3000 RC', Protection zone 'A' has been released	Project "Manual ZKL 3000 RC" containing Protection zone "A" has been released
Project: 'Manual ZKL 3000 RC', Protection zone: 'A' has been returned	Project "Manual ZKL 3000 RC" containing Protection zone "A" has been returned
ZKL 3000 X * Device no longer creating short circuit.	The ZKL 3000 RC X is no longer detecting a short
ZKL 3000 X * The backup battery is almost empty, the external battery has sufficient power.	The backup battery of ZKL 3000 RC X is (almost) empty. The external battery is OK
ZKL 3000 X * The backup battery has sufficient power, the external battery is almost empty.	The external battery of ZKL 3000 RC X is (almost) empty. The backup battery is OK

c. Errors and Alerts

Error	Explanation and solution	Further reading
ZKL 3000 RC offline in real-time status	Try again, check the batteries and if needed use the override key switch.	Check batteries: ZKL 3000 RC Installation manual, chapter "Preparation" Use key switch: ZKL 3000 RC Installation manual, chapter "Key switch"
Override key is not in setting OPERATIONAL	ZKL 3000 RC has been overruled with the override key. It is not possible to remotely operate this ZKL 3000 RC. Rotate override key to 'OPERATIONAL' to allow remote switching	Use key switch: ZKL 3000 RC Installation manual, chapter "Key switch"
Short circuit already present	When switching, a short circuit was already detected in the vicinity (section is not empty). The ZKL 3000 RC cannot guarantee it is creating the short circuit. Check the section and try again before proceeding. Always be certain of a proper short circuit (in an empty space)	Execute functional test: ZKL 3000 RC Installation manual, chapter "Functional test in the track"

6. ALERTS CONTINUED

d. Errors and Alerts continued

Error	Explanation and solution	Further reading
Short circuit still present after ZKL 3000 RC has been switched off	ZKL 3000 RC has been switched off, but a short circuit is still being measured in this section. Try removing the ZKL 3000 RC from the track	Execute functional test: ZKL 3000 RC Installation manual, chapter "Functional test in the track"
ZKL 3000 RC has been switched on, but there is no (proper) short (DET NOK)	Connection with the ZKL 3000 RC has been lost (partly or decreased quality). Try switching again. If this doesn't work, attempt to use the override key. If still encountering problems, please contact Dual Inventive	Placing ZKL 3000 RC: ZKL 3000 RC Installation manual, chapter "Placing the ZKL 3000 RC"
After switching ZKL 3000 RC on, there is no immediate (proper) short circuit (DET NOK)	ZKL 3000 RC short has not been detected (DET NOK). Please attempt to reseal the ZKL 3000 RC in the track and check again	Placing ZKL 3000 RC: ZKL 3000 RC Installation manual, chapter "Placing the ZKL 3000 RC"
After switching ZKL 3000 RC, SWITCH remains ON	ZKL 3000 RC has not been successfully switched OFF. Try again or use the override key switch	Use key switch: Installation manual ZKL 3000 RC, chapter "Key switch"
After switching ZKL 3000 RC ON, SWITCH remains OFF	ZKL 3000 RC has not been successfully switched ON. Try again or use the override key switch	Check batteries: Installation manual ZKL 3000 RC chapter "Preparation" Use key switch: Installation manual ZKL 3000 RC, chapter "Key switch"
ZKL 3000 RC SWITCH status unknown whilst being switched ON	The ZKL 3000 RC is experiencing issues communicating with the switch. Please repeat command, and if the problem persists, take it out of service	Execute functional test: Installation manual ZKL 3000 RC, chapter "Functional test in the track"
ZKL 3000 RC SWITCH status unknown whilst being switched OFF	There is no guarantee about the status of the ZKL 3000 RC. Be certain of a switched off short circuit (in an empty section) by contacting the signaller	Execute functional test: Installation manual ZKL 3000 RC, chapter "Functional test in the track"
ZKL 3000 RC battery 2 is almost empty	External battery of ZKL 3000 RC is almost empty. Replace battery as soon as possible	Check batteries: Installation manual ZKL 3000 RC, chapter "Preparation"
ZKL 3000 RC battery 2 is empty	External battery of ZKL 3000 RC is empty. Replace battery.	Check batteries: Installation manual ZKL 3000 RC, chapter "Preparation"
No ZKL 3000 RC in protection zone	Consult the project lead	Consult the project lead

6. ALERTS CONTINUED

d. Errors and Alerts continued

Error	Explanation and solution	Further reading
No Internet Connection	The app is not able to connect to the internet.	Create a network connection via Wi-Fi or the 3G/4G network, restart the app and try again.
Poor connection, try again	The app has a poor network connection.	Move to a new location, restart the app and try again.
Enable GPS and restart the app	The app cannot determine your GPS location. This may be because this function is not enabled on your smartphone, or because you did not provide the app with permission to use your GPS location.	Enable the GPS function or grant permission to the MTinfo 3000 app, restart the app and try again.

IN CONCLUSION

If you encounter any problems whilst using our products, or are unsure of anything in this manual, please report this to us via info@dualinventive.com or by phone. Ultimately, customer satisfaction and users safety are our top priorities and therefore we take all feedback very seriously. We use this to improve the safety and design of our products. On behalf of the Dual Inventive team, we wish you all the best.

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