

# RTX4027 REPEATER USER GUIDE

Technical Reference Document

Version 1.1

© May-2019 RTX A/S, Denmark



### **Trademarks**

RTX and the combinations of its logo thereof are trademarks of RTX A/S, Denmark.

Other product names used in this publication are for identification purposes and maybe the trademarks of their respective companies.

### **Regulatory information United States**

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

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

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. The antenna(s) used for this transmitter must be used to provide a separation distance of at least 20 cm from all persons. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

### **Regulatory information Canada**

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

- This device may not cause interference.
- This device must accept any interference, including interference that may cause undesired operation of the device.

This equipment complies with ISED radiation exposure limits set forth for an uncontrolled environment.

The antenna(s) used for this transmitter must be used to provide a separation distance of at least 20 cm from all persons.

Cet appareil contient des émetteurs / récepteurs exemptés de licence conformes aux RSS (RSS) d'Innovation, Sciences et Développement économique Canada. Le fonctionnement est soumis aux deux conditions suivantes:

- Cet appareil ne doit pas causer d'interférences.
- Cet appareil doit accepter toutes les interférences, y compris celles susceptibles de provoquer un fonctionnement indésirable de l'appareil.

Cet équipement est conforme aux limites d'exposition au rayonnement ISED établies pour un environnement non contrôlé. La ou les antennes utilisées pour cet émetteur doivent être utilisées de manière à assurer une distance de séparation d'au moins 20 cm de toutes les personnes.

### **Disclaimer**

The contents of this document are provided about RTX products. RTX makes no representations with respect to completeness or accuracy of the contents of this publication and reserves the right to make changes to product descriptions, usage, etc., at any time without notice. No license, whether express, implied, to any intellectual property rights are granted by this publication



**Confidentiality**

This document should be regarded as confidential, unauthorized copying is not allowed

© May-2019 RTX A/S, Denmark, All rights reserved

<http://www.rtx.dk>



## Contents

1. Introduction:	5
1.1. Document History	5
1.2. What is new	5
1.3. Main topics	5
2. Installation of Repeater	6
2.1. Package – Contents/Damage Inspection	6
2.2. Damage Inspection	6
2.3. RTX Base Station Mechanics	7
2.4. Mounting the repeater	8
3. Recommended external DC adapters	9
4. Repeater registration	10
4.1. Register repeater(s) “Local Automatic”	10
4.2. Register repeater(s) “Manually”	11
5. Firmware update:	14
6. LED and button:	16



## 1. Introduction:

The RTX4027 repeater user guide is designed to give a detailed overview on how to install, register and manage RTX repeaters

### 1.1. Document History

REVISION	AUTHOR	ISSUE DATE	COMMENTS
1.0	HDJ	26-06-2019	
1.1	JSK	20-09-2019	Add FCC and IC Regulatory information

### 1.2. What is new

What new features have been added.

VERSION	FEATURE
V460	

### 1.3. Main topics

- Installation
- Recommended external DC adapters
- Locate automatic registration
- Manual registration
- Firmware update
- LED indications

## 2. Installation of Repeater

After planning the network, next is to determine the proper places or location the repeater. The repeater should be mounted as high as possible (2 meters or higher).

### 2.1. Package – Contents/Damage Inspection

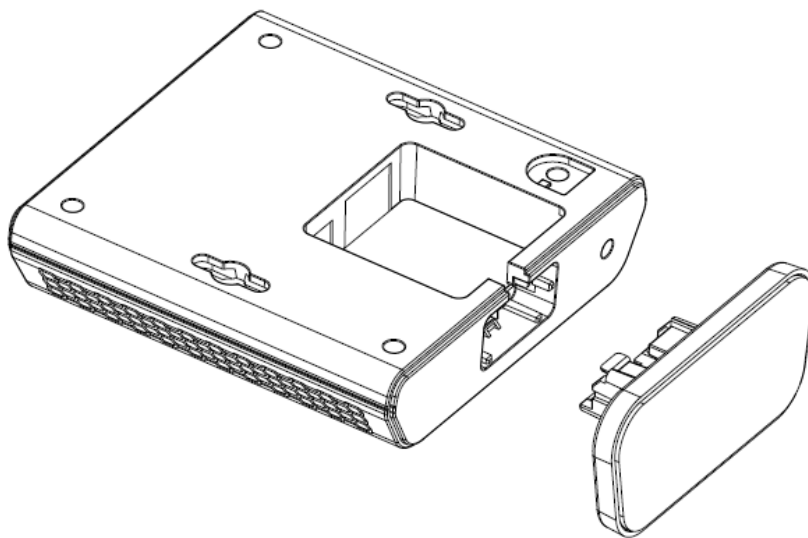
Before Package Is Opened:

Examine the shipping package for evidence of physical damage or mishandling prior to opening. If there is a proof of mishandling prior to opening, you must report it to the relevant support center of the regional representative or operator.

Contents of Package:

Make sure all relevant components are available in the package before proceeding to the next step. Every shipped repeater package/box contains the following items:

- 1 x Power supply
- 1 x Repeater
- 1 x Table stand
- 1 x Safetysheet



### 2.2. Damage Inspection

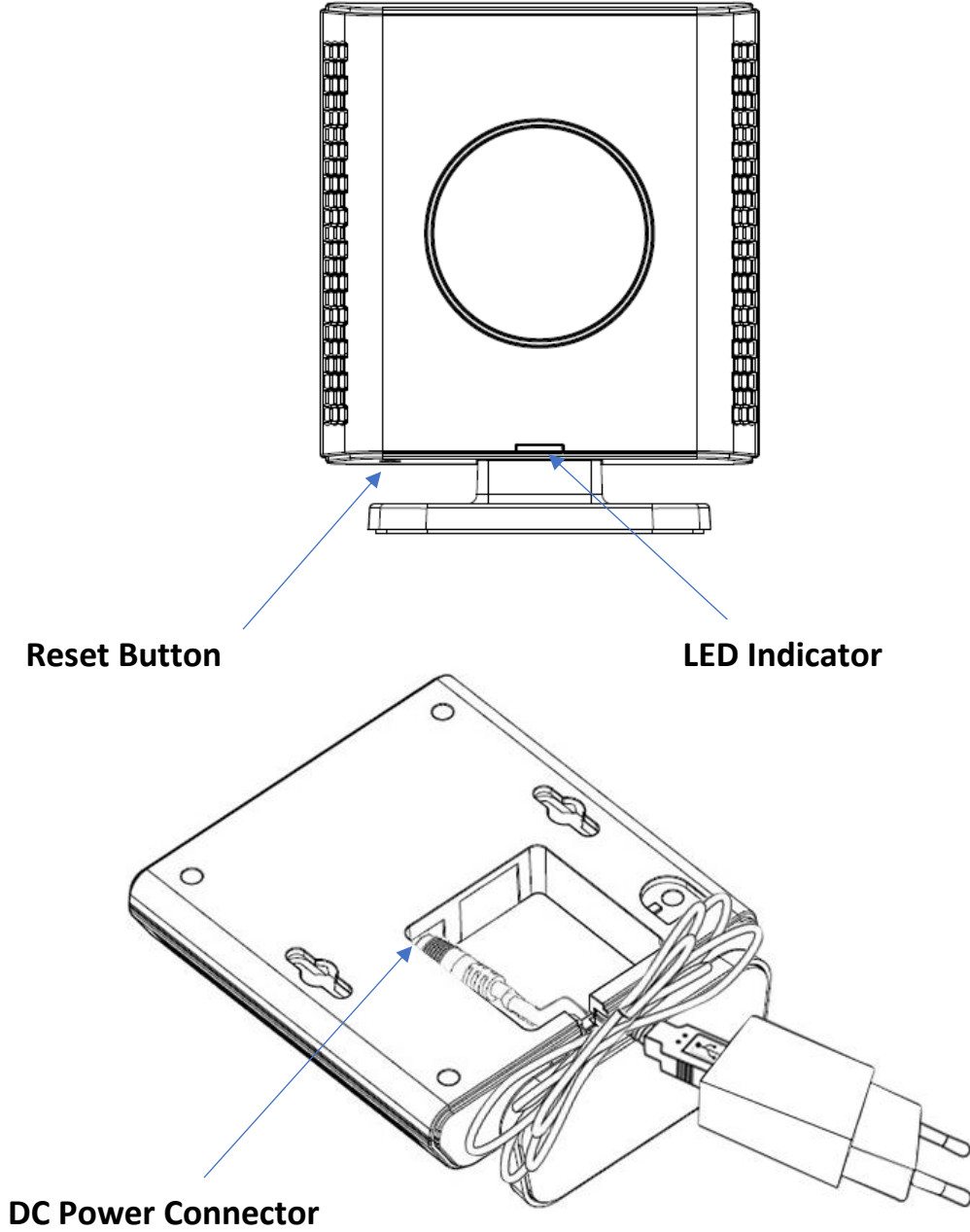
The following are the recommended procedure for you to use for inspection:

1. Examine all relevant components for damage.
2. Make a “defective on arrival – DOA” report or RMA to the operator. Do not move the shipping carton until the operator has examined it. If possible, send pictures of the damage. The operator/regional representative will initiate the necessary procedure to process this RMA. They will guide the network administrator on how to return the damaged package if necessary.
3. If no damage is found, then unwrap all the components and dispose of empty package/carton(s) in accordance with country specific environmental regulations.

## 2.3. RTX Base Station Mechanics

The repeaters front end shows an LED indicator that signals different functional states of the repeater.

The indicator is off when the repeater is not powered on.



## 2.4. Mounting the repeater

There are 2 way to mount the repeater.

1: Use the table stand that is in the box

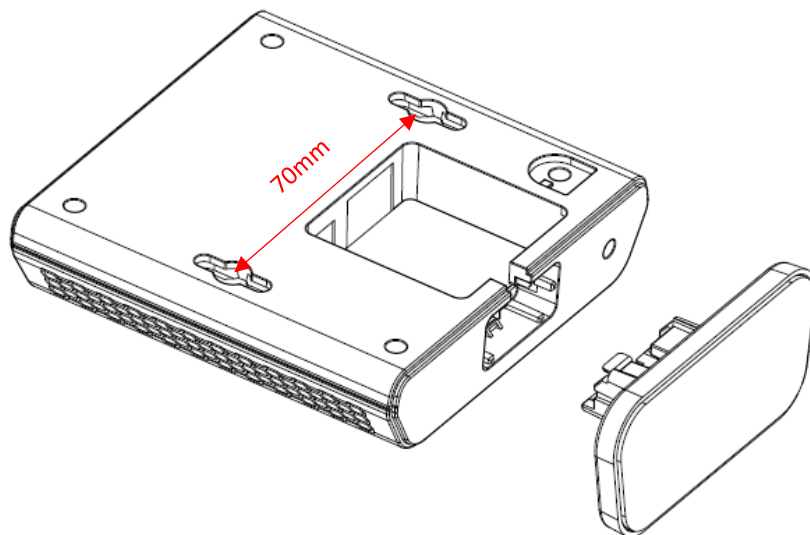
2: Wall mount the repeater using the screws and anchors

Screws and Anchors needed (Not supplied by RTX)

2x Screws = Screw wall mount M3.5x31

2x Anchors: Length 29,6mm, OD 6,0mm, ID 4,8mm

**NOTE:** The repeater should be mounted on a wall not higher than 2 meters







### 3. Recommended external DC adapters

Module number	Specification	Manufacturer	Type
S008ACM0550060	SMPS,100-240VAC,5.5V 600mA, VI	Ten Pao International LTD	Multi-Plug (body)

User can use different Adaptor Plug listed below:

Module number	Specification	Manufacturer	Type
8W, VDE	8W, VDE Adaptor Plug	Ten Pao International LTD	EU Plug
8W, UL	8W, UL Adaptor Plug		US Plug
8W, SAA	8W, SAA Adaptor Plug		AU Plug
8W, BS	8W, BS Adaptor Plug		UK Plug



## 4. Repeater registration

There are 2 different ways to register RTX repeater's "Local Automatic" and "Manually"

### Local Automatic:

In this mode the repeater registers to the base station with best signal strength, this option is only recommended for single cell systems and Multi cell systems where the repeater is only able to sync with one specific base station.

### Manually:

Manual registration is used in most cases when adding repeaters to a multi cell system. Manual registration allows to determine what base stations the repeater must connect to.

### 4.1. Register repeater(s) "Local Automatic"

**NOTE:** Do not power on the repeaters before they have been added on the base station

**NOTE:** When adding first repeater the base station(s) will reboot, this is because encryption is being enabled, the same goes if all repeaters is deleted, then the system will reboot to disable encryption.

**Step 1:** To register repeater(s), navigate to the Repeater page.

### Screen shot

Idx	RPN	Name/ IPEI	DECT sync source	DECT sync mode	State	FW Info	FWU Progress
-----	-----	---------------	------------------	----------------	-------	---------	--------------

**Step 2:** Click "Add Repeater" and select "Local Automatic" from the dropdown

### Screen shot

**Repeater**

Name:

DECT sync mode: Local Automatic ▼

Local Automatic

**Step 3:** Give the repeater a name and press "save"



**Step 4:** Power on the repeater(s) and registration will start.

When the LED is steady green the repeater is successfully registered.

**Screen shot**

**Repeaters**

[Add Repeater](#)

[Refresh](#)

Idx	RPN	Name/ IPEI	DECT sync source	DECT sync mode	State	FW Info	FWU Progress	
<input type="checkbox"/>	<u>1</u>	RPN09	Repeater 1/ 0298D02668	RPN08 (-26dBm)	Local Automatical	Present@RPN08	39	Off

[Check All](#) / [Uncheck All](#)  
With selected: [Delete Repeater\(s\)](#), [Register Repeater\(s\)](#) [Deregister Repeater\(s\)](#)

PARAMETERS	DESCRIPTION
IDX	System counter
RPN	SINGLE CELL SYSTEM:  The base has always RPN00, first repeater will then be RPN01, second repeater RPN02 and third RPN03 (3 repeaters maximum per base)  MULTI CELL SYSTEM:  Bases are increment by 2^2 in hex, means first base RPN00 second base RPN04 etc., in between RPN01, 02, 03 addressed for repeaters at Primary base and 05, 06, 07 addressed for Secondary base (3 repeaters maximum per base)
NAME/IPIE	Name and IPIE number of the repeater
DECT SYNC MODE	DECT Sync mode – Manually or Automatic
STATE	State of the repeater Enabled/Disabled
FW INFO	Firmware version
FWU PROGRESS	How many percentages of the firmware is loaded / Off if no firmware is being loaded

#### 4.2. Register repeater(s) “Manually”

**NOTE:** Do not power on the repeaters before they have been added on the base station

**NOTE:** When adding first repeater the base station(s) will reboot, this is because encryption is being enabled, the same goes if all repeaters is deleted, then the system will reboot to disable encryption.

**Step 1:** To register repeater(s), navigate to the Repeater page.

**Screen shot**

**Repeaters**

[Add Repeater](#)

[Refresh](#)

Idx	RPN	Name/ IPEI	DECT sync source	DECT sync mode	State	FW Info	FWU Progress
-----	-----	---------------	------------------	----------------	-------	---------	--------------

**Step 2:** Click "Add Repeater" and select "Manually" from the dropdown

**Screen shot**

**Repeater**

Name:

DECT sync mode:

RPN	DECT sync source
<input type="text" value="ERROR"/>	<input type="text" value="RPN00 (-∞dBm) SME VoIP"/>

**Step 3:** Give the repeater a name and press "save"



**Step 4:** select what base station the repeater needs to register to “DECT sync source” drop down

In this case there are three base stations in the multicell (RPN00, RPN04 and RPN08) and three repeaters can be connected to each base station.

Select the base station the repeater needs to register to.

E.g. RPN04

**Screen shot**

**Repeater**

Name:

DECT sync mode:

RPN	DECT sync source
ERROR	RPN00 (-∞dBm) SME VoIP
	RPN01 (-∞dBm) Repeater
	RPN02 (-∞dBm) Repeater
	RPN03 (-∞dBm) Repeater
	RPN04 (-∞dBm) SME VoIP
	RPN05 (-∞dBm) Repeater
	RPN06 (-∞dBm) Repeater
	RPN07 (-∞dBm) Repeater
	RPN08 (-∞dBm) SME VoIP
	RPN09 (-∞dBm) Repeater
	RPN0A (-∞dBm) Repeater
	RPN0B (-∞dBm) Repeater

**Step 5:** Select the RPN for the repeater.

ERROR: The repeater will choose the first available slot on the selected base station.

RPN x: The repeater connects to RPN x of the chosen base station.

E.g. Base station RPN04 + RPN1 repeater, then the repeater connects to “RPN5”

**Screen shot**

**Repeaters**

[Add Repeater](#)

[Refresh](#)

Idx	RPN	Name/IPEI	DECT sync source	DECT sync mode	State	FW Info	FWU Progress
<input type="checkbox"/>	<u>1</u>	Repeater 1/ 0298D02668	RPN00 (-26dBm)	Manually	Present@RPN00	39	Off

[Check All](#) / [Uncheck All](#)

With selected: [Delete Repeater\(s\)](#), [Register Repeater\(s\)](#) [Deregister Repeater\(s\)](#)

## 5. Firmware update:

The repeaters are updated over air.

**Step 1:** Navigate to Firmware Update page

**Step 2:** Enter "Firmware Update server address", "Firmware path" and DECT402x firmware version

**Screen shot**

Type	Required version	Required branch	Startup picture
Update Base Stations	0	0	
8200	0	0	
8633	0	0	
8632	0	0	
8630	0	0	
8631	0	0	
8930g	0	0	
DECT4024	0	0	

Save/Start Update

PARAMETER	DEFAULT VALUE(S)	DESCRIPTION
FIRMWARE UPDATE SERVER ADDRESS	Empty	IP address or DNS of firmware update files source  <b>Valid Inputs:</b> AAA.BBB.CCC.DDD or <URL> <b>Example:</b> firmware.rtx.net or 10.10.104.41
FIRMWARE PATH	Empty	Location of firmware on server (or firmware update server path where firmware update files are located).  Example: RTXFWU
TERMINAL FILE PATH	Empty	Location of image (folder where background and start up image are located).  Example: Images
REQUIRED VERSION	Empty	Version of firmware to be upgraded (or downgraded) on handset, repeater, or base station.  <b>Valid Input(s):</b> 8-bit string length. E.g. 400 <b>Note: Value version 0</b> will disable firmware upgrade <b>Note:</b> Two handset types will be serial firmware upgraded. First type 8630 then type 8430.
REQUIRED BRANCH	Empty	Branch of firmware to be upgraded (or downgraded) handset, repeater or base station.  <b>Valid Input(s):</b> 8-bit string length. E.g. 01

**NOTE:** Repeater firmware do not follow the normal version numbers.

## 6. LED and button:

### Power cycle

The repeater basically has two modes: Subscribed or not subscribed.

When powered up without a registration, the following applies.

Power	Press	Action
OFF	00s < x < XXs	Nothing
ON	00s < x < 05s	Nothing
ON	05s < x < 300s	Search for suitable base and start registration procedure if a suitable is found

When powered up with a registration, the following applies:

Power	Press	Action
OFF	00s < x < XXs	Nothing
ON	00s < x < 60s	Search for source base/repeater
ON	60s < x < XXs	Search for any base/repeater in the system

### Button

In the below table the action of the button press is presented.

Button	Press	Action
1	00s < x < 02s	Nothing
1	02s < x < 06s	Delete registration Old registration is deleted, and a new registration procedure is started.
1	18s < x < 60s	Enable or disable repeater monitor beep tone in handset during call.
1	60s < x < XXs	Nothing

### LED

LED	Indication	Action
GREEN	Off	Power Off
GREEN	Slow flash	Unlocked, Searching for base station
GREEN	Double flash	Registration/subscription mode and searching for open base station – registering procedure.
GREEN	Steady on	Locked to base station and ready for use - idle
RED	Off	No handset relayed by repeater





RED	<i>n</i> flash	<i>n</i> handset relayed by repeater
RED	Steady on	1. Registration procedure timed out after 5 min. 2: When key is held pressed the LED will light up in 2 sec. to indicate that releasing the key will delete registration, LED turns off after 4 more sec.
RED/GREEN	Flashing Red/Green	Recovery mode – repeater is locked to base station/repeater without repeater mode activated. 1: Sync. Source base station/Repeater not found (Manual mode). 2: Timeout during RPN allocation due to busy base station/Repeater.