

RUT300 USB Tools

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The information in this page is updated in accordance with firmware version [RUT30X_R_00.07.04.5](#).

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Summary

The **USB Tools** page is used to manage services related to the device's USB connector.

This chapter of the user manual provides an overview of the USB Tools page in RUT300 devices.

If you're having trouble finding this page or some of the parameters described here on your device's WebUI, you should **turn on "Advanced WebUI" mode**. You can do that by clicking the "Basic" button under "Mode", which is located at the top-right corner of the WebUI.

General

The **General** section is used to manage global USB settings. It consists of two subsections:

USB Mount Settings

The **USB Mount Settings** section is used to set the transfer type (synchronous or asynchronous) for the USB device.

^ USB MOUNT SETTINGS



Synchronous write off on

Synchronous ensures that all changes to the according filesystem are immediately flushed to disk. **Enabling this will drastically lower the life expectancy of your USB device.**

Mounted File Systems

The **Mounted File Systems** list displays USB mass storage devices (MSD) currently attached to this device.

^ MOUNTED FILE SYSTEMS

FILESYSTEM	MOUNT POINT	AVAILABLE	USED	IN USE	FORMAT	
/dev/sdb1	/mnt/sdb1	115.2G / 115.3G	0% (89.4M)	-	FORMAT	
/dev/sda1	/mnt/sda1	14.9G / 14.9G	0% (65.0M)	-	FORMAT	

[REFRESH](#)

[SAVE & APPLY](#)

Field	Value	Description
Device	filepath; default: /dev/sd*	The filesystem of the attached USB MSD.
Mount Point	filepath; default: /mnt/sd*	The root directory of the mounted filesystem.
Available	string; default: none	Displays available storage information for a mounted USB MSD.
Used	string; default: none	Displays used storage information for a mounted USB MSD.
In Use	string; default: none	Indicates whether a USB MSD is currently in use by some device service or not.

The **Format** button can be used to format the attached device, and the **Unmount** button next to each entry in the list is used to unmount an attached USB device. Please make sure to unmount a USB device before physically detaching it from the RUT300.

The **Refresh** is used to refresh the information in the Mounted File Systems list. If you attach a new USB device and cannot see it in the list, try clicking the 'Refresh' button.

Note: Usb with NTFS partition is supported in read-only mode.

USB MOUNT SETTINGS

Synchronous write

MOUNTED FILE SYSTEMS

Device	Mount Point	Available	Used	In use	Format
/dev/sda1	/mnt/sda1	0	100% (14.5G)	-	FORMAT

REFRESH

NTFS partitions are only supported in read-only mode, please use exFAT or Ext4

SAVE & APPLY

USB to Serial

The device's USB connector can also be used as a **serial port**.

USB TO SERIAL CONFIGURATION

Enabled

Baud rate 115200

Data bits 8

Parity None

Stop bits 1

Flow control None

Serial type Console

SAVE & APPLY

Field	Value	Description
Enabled	off on; default: off	Turns the USB to Serial service on or off.
Baud rate	300 1200 2400 4800 9600 19200 38400 57600 115200; default: 115200	Data rate for serial data transmission (in bits per second).
Data bits	5 6 7 8; default: 8	Number of data bits for each character

Parity	None Odd Even; default: None	<p>In serial transmission, parity is a method of detecting errors. An extra data bit is sent with each data character, arranged so that the number of 1 bits in each character, including the parity bit, is always odd or always even. If a byte is received with the wrong number of 1s, then it must have been corrupted. However, an even number of errors can pass the parity check.</p> <ul style="list-style-type: none"> • None (N) - no parity method is used • Odd (O) - the parity bit is set so that the number of "logical ones (1s)" has to be odd. • Even (E) - the parity bit is set so that the number of "logical ones (1s)" has to be even.
Stop bits	1 2; default: 1	<p>Stop bits sent at the end of every character allow the receiving signal hardware to detect the end of a character and to resynchronise with the character stream. Electronic devices usually use one stop bit. Two stop bits are required if slow electromechanical devices are used.</p>
Flow control	None RTS/CTS Xon/Xoff; default: None	<p>In many circumstances a transmitter might be able to send data faster than the receiver is able to process it. To cope with this, serial lines often incorporate a "handshaking" method, usually distinguished between hardware and software handshaking.</p> <ul style="list-style-type: none"> • RTS/CTS - hardware handshaking. RTS and CTS are turned OFF and ON from alternate ends to control data flow, for instance when a buffer is almost full. • Xon/Xoff - software handshaking. The Xon and Xoff characters are sent by the receiver to the sender to control when the sender will send data, i.e., these characters go in the opposite direction to the data being sent. The circuit starts in the "sending allowed" state. When the receiver's buffers approach capacity, the receiver sends the Xoff character to tell the sender to stop sending data. Later, after the receiver has emptied its buffers, it sends an Xon character to tell the sender to resume transmission.
Serial type	Console Over IP Modbus gateway NTRIP client ; default: Console	<p>Specifies the serial connection type. Look to the sections below for information on different USB to Serial type options.</p>

Console

Console mode requires no further configuration than the settings above and is used as a direct-access method to the device's shell interface. For this purpose you may want use such applications as PuTTY on Windows and microcom, minicom, picocom or similar applications on Linux.

Serial type

Over IP

The **Over IP** serial type is used to manage serial connections over a TCP/IP network.

Serial type

Protocol

Mode

No leading zeros off on

Port

Timeout (s)

Open port automatically off on

Echo off on

Field	Value	Description
Protocol	TCP UDP; default: TCP	Protocol used in the communication process.
Mode	Server Client Bidirect; default: Server	The role of this device in the serial connection: <ul style="list-style-type: none"> • Server - the device waits for incoming connections • Client - the device initiates the connection. • Bidirect - acts as client by default but waits for incoming connections at the same time.
No leading zeros	off on; default: off	When checked, indicates that the first hex zeros should be skipped.
Server settings: Port	integer [0..65535]; default: none	Internal port number used to listen for incoming connections.
Server settings: Timeout (s)	integer; default: none	Specifies an inactivity time limit (in second) after which an inactive clients is disconnected.
Server settings: Open port automatically	off on; default: on	Automatically adds a traffic rule in the firewall configuration to open the required port for NTRIP communication.
Client settings: Server Address	ip host; default: none	IP address or hostname of the server that this client will connect to.
Client settings: Port	integer [0..65535]; default: none	Server's listening port number.
Client settings: Reconnect interval (s)	integer; default: none	Time period (in seconds) between reconnection attempts in case a connection fails.
Echo	off on; default: off	Turn USB to serial echo on or off.

Modbus gateway

The **Modbus gateway** serial type allows redirecting TCP data coming to a specified port to an RTU

specified by the Slave ID. The Slave ID can be specified by the user or be obtained directly from the Modbus header.

Serial type

Listening IP

Port

Slave ID configuration type

Slave ID

Open port automatically off on

Echo off on

Field	Value	Description
Listening IP	ip; default: 0.0.0.0	IP address to listen for incoming connections. The default value (<i>0.0.0.0</i>) means that this device will listen for incoming connections on any interface or IP address.
Port	integer [0..65535]; default: 502	Port number to listen for incoming connections.
Slave ID configuration type	User defined Obtained from TCP ; default: User defined	Specifies whether slave IDs are user defined or automatically obtained from TCP.
Slave ID Permitted slave IDs	integer range of integers ; default: 1 or 1-247	Specifies the slave ID of range of permitted slave IDs. The way this field is named and its function depends on the value of the <i>Slave ID configuration</i> field. A range of IDs can be specified by placing a hyphen (-) between two integer numbers. For example, if you permit slave IDs in the range of 10 to 20, you would specify it as: <i>10-20</i> You can also specify multiple values that are not connected in a range using commas (.). For example, to specify 6, 50 and 100 as permitted slave IDs, you would have to use: <i>6,50,100</i>
Open port automatically	off on; default: on	Automatically adds a traffic rule in the firewall configuration to open the required port for serial communication. Caution: use with care if listening IP is left as the default value (<i>0.0.0.0</i>). Leaving it as such will leave the device open for remote connections on the specified port.
Echo	off on; default: off	Turn USB to serial echo on or off.

NTRIP client

Networked Transport of RTCM via Internet Protocol (NTRIP) is a protocol for streaming differential GPS (DGPS) data over the Internet in accordance with specification published by RTCM.

Serial type


IP address

Port

Mount point

Data format

User name

Password 

Default NMEA string

Use device GPS off on

Open port automatically off on

Echo off on

Field	Value	Description
IP address	ip; default: 0.0.0.0	IP address of an NTRIP server.
Port	integer [0..65535]; default: none	TCP/UDP port used for NTRIP communication.
Mount point	filepath string; default: none	NTRIP mount point.
Data format	NTRIP V2.0 TCP/IP NTRIP V2.0 RSTP/RTP NTRIP V1.0 Automatic detection NTRIP V2.0 UDP; default: NTRIP V1.0	Version of NTRIP protocol.
Username	string; default: none	Username for authentication to an NTRIP server.
Password	string; default: none	Password for authentication to an NTRIP server.
Default NMEA string	string; default: none	Optional NMEA string that will be used as the default value when initiating the connection to the NTRIP server (this value is only sent to the server if there is no NMEA from router's GPS device).

Use device GPS	off on; default: off	Allows to obtain default NMEA string from the router's GPS device. Only works if GPS service is enabled and location fix is obtained at the time of NTRIP service start.
Open port automatically	off on; default: on	Automatically adds a traffic rule in the firewall configuration to open the required port for serial communication.
Echo	off on; default: off	Turn USB to serial echo on or off.

IP Filter

The **IP Filter** section is used for configuring which network is allowed to communicate with the device. You may add a new instance by selecting the Interface and pressing Add.

IP FILTER

INTERFACE	ALLOW IP
This section contains no values yet	
<h4>ADD NEW INSTANCE</h4>	
INTERFACE <input type="text" value="LAN"/>	<input type="button" value="ADD"/> <input type="button" value="SAVE & APPLY"/>

Then enter the IP address and save.

IP FILTER

INTERFACE	ALLOW IP
lan	<input type="text" value="0.0.0/24"/> <input type="button" value="+"/>
<input type="button" value="X"/>	

Storage Memory Expansion

The **Storage Memory Expansion** function provides the possibility to expand the device's flash memory with a USB Mass Storage Device (MSD) and use the extra memory to install additional software packages. This section provides instruction on how to do just that. However, there are a few prerequisites and warnings to take note of before using memory expansion.


To be eligible for memory expansion, the USB MSD must meet the following restrictions.

- The MSD must be the last one (chronologically) inserted.
- If you are using a USB hub, the target MSD must be the last one attached to the hub.
- **No important data on the MSD as it will be wiped during expansion setup!**

When expansion is enabled, **do not detach the USB device as this will delete the data stored on it.** Changes made to the device configuration while expansion was enabled will disappear after it is disabled.

Enabling memory expansion

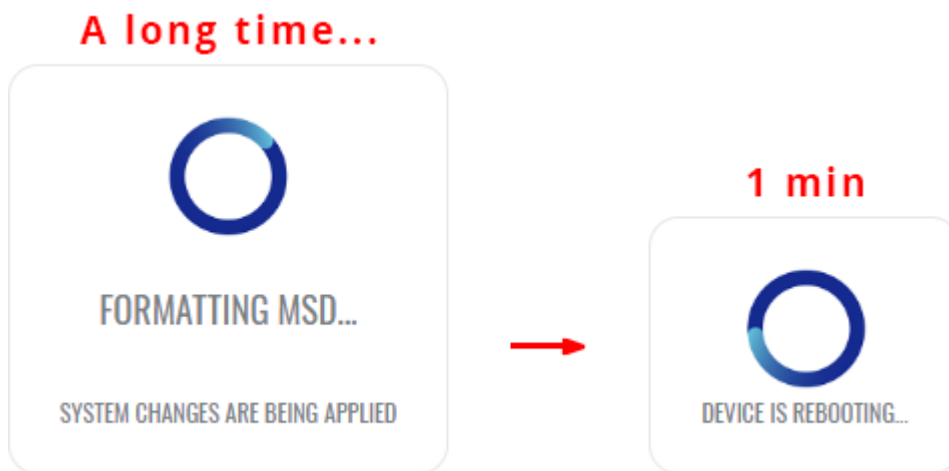
To successfully expand the flash memory of your device follow the steps described below.

1. Attach a USB Mass Storage Device (MSD) to the USB connector on the device and go to the Services → Storage Memory Expansion page.
2. Set the 'Enable storage expansion' slider to 'on' and click 'Save & Apply'.

3. You will see a pop-up asking for confirmation. Take note that if you continue from this point on:
 - your **USB device's memory will be wiped** and formatted to ext2 format;
 - your device's **current configuration will be backed up** and restored to this point if the USB drive is removed or memory expansion is disabled;
 - the entire procedure **may take a very long time** and includes a reboot at the end; exact time will vary depending on the size of the MSD (larger size will take longer; for example, using a 128 GB drive will take about 2 hours to fully set up, while a 16 GB will only take about 5 minutes).

Click 'Continue' to proceed.



4. If all is in order you should see a 'Formatting MSD...' message on the screen. This indicates that the MSD is being formatted and integrated with the system. This procedure can take a long time and ends with a reboot of the device.



5. Your device's flash memory will be expanded once the reboot has finished. In order to check, log in to the WebUI and look to the 'System' widget in the 'Overview' page. Hover your mouse cursor over the 'FLASH' memory indicator; you should see an increase to the device's flash memory.



Disabling memory expansion

To successfully disable memory expansion follow the steps described below.

1. Go to the Services → Storage Memory Expansion page.
2. Set the 'Enable storage expansion' slider to 'off' and click 'Save & Apply'.



3. You will see a pop-up asking for confirmation. Take note that if you continue from this point on:
- your **USB device's memory will be wiped** and formatted to NTFS format;
 - your **device's configuration will be restored** to the point it was before memory expansion;
 - the entire procedure **will take up to 2 minutes** including a reboot.

Click 'Continue' to proceed.



4. If all is in order you should see a 'Formatting MSD...' message on the screen. This indicates that the MSD is being formatted and detached from the system. This procedure can take up to a couple of minutes and ends with a reboot of the device.



5. Your device's flash memory will be restored to normal once the reboot has finished. In order to check, log in to the WebUI and look to the 'System' widget in the 'Overview' page. Hover your mouse cursor over the 'FLASH' memory indicator; you should see your device's flash memory return to its regular size.



Network Shares

The **Network Shares** section is used to manage Network-attached storage (NAS) such as USB drives and hard drives. The RUT300 device supports the following file system architectures:

- FAT
- FAT32
- exFAT
- NTFS
- ext2
- ext3
- ext4

Note: Network Shares is additional software that can be installed from the **Services** → [Package Manager](#) page.

General Settings

The **General** section is used to set up **Samba** - a software solution for using the Server Message Block (SMB) networking protocol, which provides shared file access between nodes on a computer network. Refer to the figures and table below for more information about Samba configuration.

▼ SAMBA

Samba status: Inactive

Active sessions: 0

Enable off on

Hostname:

Description:

Workgroup:

Share home-directories off on

Interfaces:

Insert custom configuration to config: +

[View config file](#)

Field	Value	Description
Enable	off on; default: off	Turns Samba on or off.
Hostname	string; default: Router_share	Name of the Samba server.
Description	string; default: Router share	Short description about the Same server.
Workgroup	string; default: WORKGROUP	Name of the server's workgroup.
Share home-directories	off on; default: on	Allows system users to reach their home directories via network shares.
Interfaces	lan; default: none	Bind samba server to specified interfaces
Insert custom configuration to config	string; default: none	Insert custom line to configuration file.

Shared Directories

The **Shared Directories** section is used to configure access to the device's files and directories, including USB storage drives. The list of Shared Directories is empty by default; click the 'Add' button in order to create a new configuration:

^ SHARED DIRECTORIES

NAME	PATH	ALLOWED USERS	READ-ONLY	BROWSEABLE	ALLOW GUESTS
------	------	---------------	-----------	------------	--------------

This section contains no values yet

ADD

SAVE & APPLY

The newly added Shared Directory configuration should look similar to this:

^ SHARED DIRECTORIES

NAME	PATH	ALLOWED USERS	READ-ONLY	BROWSEABLE	ALLOW GUESTS
<input type="text"/>	<input type="text"/>	-- please select --	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input type="button" value="ADD"/>					
<input type="button" value="SAVE & APPLY"/>					

Field	Value	Description
Name	string; default: none	Name of a shared directory.
Path	filepath; default: /mnt/	Path to a shared directory. To share an entire drive, choose an automatically generated path from this drop-down box (for example, /mnt/sda1). To share a specific directory on the drive, specify the full path to that directory (for example, /mnt/sda1/shared/video).
Allowed users	samba user(s); default: none	Samba user(s) that are permitted to access a Shared Directory. Users can be created from the Users menu tab.
Read-only	off on; default: off	Makes a Shared Directory read-only, which means the directory can only be accessed to view and read files (not write).
Browseable	off on; default: on	Makes a Shared Directory browsable; i.e., visible in shared directory network discovery.
Allow guests	off on; default: off	Turns guest access on or off. Guest access allows anonymous connections to a Shared Directory.
Delete	-(interactive button)	Deletes a Shared Directory configuration.

To connect to the router's SAMBA server from Windows, specify the address in this format:

```
\\smb_server_address\share_name
```

Replace *smb_server_address* with the IP address of this device or SAMBA share hostname; replace *share_name* with the name of the "share" (as specified in the 'Name' field). For example:

```
\\192.168.1.1\my_share  
\\Router_share\johns_files
```

Users

The **Users** section is used to create Samba users that can be granted access to Shared Directories. To add a new user, enter a custom username, password and click the 'Add' button.



The newly added User should appear in the Users list. To change the password of a Samba User, click the 'Edit' button located next to it:

^ USERS

USERNAME

demo



This will redirect you to the Settings page for that User which should look similar to this:

^ USER 'DEMO' SETTINGS

Password

Confirm Password

< BACK

SAVE & APPLY

DLNA

The **Digital Living Network Alliance (DLNA)** standard provides the possibility to stream media files from local storage to DLNA-capable devices such as computers, Smart TVs, tablets, etc.

This page is used to configure the DLNA service on the device. When the DLNA service is enabled, the device listens for incoming connections on the specified network interface and port number. Clients connecting to that port number on that interface will be granted access to the media files residing in the specified directories.

DLNA devices use Universal Plug and Play (UPnP) to discover and communicate with each other on a network. To access the DLNA server hosted on this device you will need a DLNA-capable application. If you're using your phone or other mobile device, simply search for DLNA in the device's application store. On Linux and Windows computers you can use applications capable of playing network media streams (such as VLC). Smart TVs and similar devices may have DLNA support built-in by default.

File format types supported by the DLNA service on this device:

- Audio - WMA, WAV, MP3, FLAC
- Image - JPEG
- Video - WMV, MTS, MP4, MKV, MOV

Note: DLNA is additional software that can be installed from the **Services** → [Package Manager](#) page.

General Settings

GENERAL SETTINGS

ADVANCED SETTINGS

MiniDLNA status *The miniDLNA service is not running.*

Enable off on

Port

Friendly name

Root container

Media directories +

Album art names +

SAVE & APPLY

Field	Value	Description
Enable	off on; default: off	Turns the DLNA service on or off.
Port	integer [0..65535]; default: 8200	DLNA service listening port.
Friendly name	string; default: Teltonika DLNA Server	The name of this server as it will be displayed to clients.
Root container	Standard container Browse directory Music Video Pictures; default: Standard container	Specifies which type of files will be made available in DLNA file sharing. <ul style="list-style-type: none"> • Standard container - allows browsing the shared media directory but also organizes files by type (music, video, pictures). • Browse directory - allows browsing the shared media directory . • Music, Video, Pictures - only shares the files of the specified type.
Media directories	filepath(s); default: /mnt	A list of directories that will be scanned by the DLNA service and made available to clients. You can also specify what types of files should be displayed from the directy. Use 'A' for audio, 'V' for video, 'P' for images followed by a comma and the path to the directory. For example: <ul style="list-style-type: none"> • <i>A,/mnt</i> - share only audio files from the <i>/mnt/sda1</i> directory. • <i>V,/mnt</i> - share only video files from the <i>/mnt/sda1</i> directory. • <i>P,/mnt</i> - share only image files from the <i>/mnt/sda1</i> directory. Click the plus symbol to add more directories.
Album art names	filename(s); default: Album.jpg	Name of the file(s) to check when searching for album art images. Click the plus symbol to specify more file names.

Advanced Settings

DLNA SETTINGS

GENERAL SETTINGS

ADVANCED SETTINGS

Interfaces	<input type="text" value="br-lan"/>
Database directory	<input type="text" value="/var/run/minidlna"/>
Enable inotify	<input checked="" type="checkbox"/>
Enable TIVO	<input type="checkbox"/>
Strict to DLNA standard	<input type="checkbox"/>
Notify interval	<input type="text" value="900"/>

SAVE & APPLY

Field	Value	Description
Interfaces	network interface; default: br-lan	Network interface(s) on which this DLNA server will be hosted.
Database directory	filepath; default: /var/run/minidlna	The directory where DLNA will store its database and album art cache.
Enable inotify	off on; default: on	Turns inotify on or off. Inotify is a Linux kernel subsystem that notices changes to the filesystem and reports on these changes to applications, in this case, the DLNA service.
Enable TIVO	off on; default: off	Turn support for streaming .jpg and .mp3 files to a TiVo supporting HMO on or off.
Strict to DLNA standard	off on; default: off	Set this to strictly adhere to DLNA standards. Turning this on will allow server-side downscaling of very large JPEG images, which may hurt JPEG serving performance on (at least) Sony DLNA products.
Notify interval	integer; default: 900	Notify interval in seconds.