

# Template:Networking rutos manual serial utilities

The information in this page is updated in accordance with firmware version .

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## Contents

- [1 Summary](#)
- [2 Console](#)
- [3 Over IP](#)
  - [3.1 Instance Example](#)
  - [3.2 Serial Device Configuration](#)
  - [3.3 Over IP Configuration Settings](#)
  - [3.4 IP Filter](#)

## Summary

The **Serial Utilities** page is used to make serial communication configurations of different types. This manual page provides an overview of the Serial Utilities page in {{{name}}} devices.

## 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.

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Field	Value	Description
Enable	off   on; default: <b>off</b>	Turns the instance on or off.
Name	string; default: <b>none</b>	Instance name, generated by the user when first creating the configuration.
Device	; default:	Specifies which serial port will be used for serial communication.

Baud rate	integer [300..3000000]; default: <b>9600</b>	Data rate for serial data transmission (in bits per second (bps)).
Data bits	8; default: <b>8</b>	Number of data bits for each character.
Stop bits	1   2; default: <b>1</b>	Stop bits sent at the end of every character allow the receiving signal hardware to detect the end of a character and to resynchronize with the character stream. Electronic devices usually use one stop bit. Two stop bits are required if slow electromechanical devices are used.
Parity	None   Odd   Even   Mark   Space; default: <b>None</b>	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. <ul style="list-style-type: none"> <li>• <b>None (N)</b> - no parity method is used.</li> <li>• <b>Odd (O)</b> - the parity bit is set so that the number of "logical ones (1s)" has to be odd.</li> <li>• <b>Even (E)</b> - the parity bit is set so that the number of "logical ones (1s)" has to be even.</li> </ul>
Flow control	None; default: <b>None</b>	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.

## Over IP

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

### Instance Example

Here's an example demonstrating Over IP in action, running in Client + Server Mode. 

### Serial Device Configuration

Configure serial port communication parameters in the **Serial Device Configuration** section.

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Field	Value	Description
Enable	off   on; default: <b>off</b>	Turns the instance on or off.
Name	string; default: <b>none</b>	Instance name, generated by the user when first creating the configuration.
Device	; default:	Specifies which serial port will be used for serial communication.

Baud rate	integer [300..3000000]; default: <b>9600</b>	Data rate for serial data transmission (in bits per second (bps)).
Data bits	8; default: <b>8</b>	Number of data bits for each character.
Stop bits	1   2; default: <b>1</b>	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.
Parity	None   Odd   Even   Mark   Space; default: <b>None</b>	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. <ul style="list-style-type: none"> <li>• <b>None (N)</b> - no parity method is used.</li> <li>• <b>Odd (O)</b> - the parity bit is set so that the number of "logical ones (1s)" has to be odd.</li> <li>• <b>Even (E)</b> - the parity bit is set so that the number of "logical ones (1s)" has to be even.</li> </ul>
Flow control	None; default: <b>None</b>	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.

## Over IP Configuration Settings

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You can configure network related parameters of the serial connection in the **Over IP Configuration** section.



	<b>Field</b>	<b>Value</b>	<b>Description</b>
Mode		Server   Client   Client + server   Bidirect; default: <b>Server</b>	This device's role in the connection: <ul style="list-style-type: none"> <li>• <b>Server</b> - the device waits for incoming connections.</li> <li>• <b>Client</b> - the device initiates the connection.</li> <li>• <b>Client + server</b> - launches service in server and client(s) mode simultaneously.</li> <li>• <b>Bidirect</b> - acts as client by default but waits for incoming connections at the same time.</li> </ul>
Protocol		TCP   UDP; default: <b>TCP</b>	Protocol used in the communication process.

<b>Client:</b> Destination address	IP   Port; default: <b>empty</b>	Specify server address and port for client to connect to. E.g first field for address second for port. 16 destination addresses are allowed.
<b>Server: UDP:</b> Predefined addresses	IP   Port; default: <b>empty</b>	Set predefined IP and port for UDP connection. E.g first field for address second for port.
Listening port	[1..65535]; default: <b>empty</b>	When enabled, all data will be transmitted transparently.



Field	Value	Description
Use TLS/SSL	off   on; default: <b>off</b>	Mark to use TLS/SSL for connection.
TLS version	Support all   tlsv1.0   tlsv1.1   tlsv1.2   tlsv1.3; default: <b>Support all</b>	Minimum TLS version allowed to be used.
TLS type	Certificate based   <a href="#">Pre-Shared-Key based</a> ; default: <b>Certificate based</b>	Select the type of TLS encryption.
Require certificate	off   on; default: <b>on</b>	Demand certificate and key from peer and verify them against certificate authority.
Verify host	off   on; default: <b>off</b>	Check if the server certificates Common Name (CN) matches hostname to which client is connecting.
Certificate files from device	off   on; default: <b>off</b>	Choose this option if you want to select certificate files from device. Certificate files can be generated <a href="/system/admin/certificates/generation">here</a> .
Certificate file	.crt file; default: <b>none</b>	Upload certificate file.
Key file	.key file; default: <b>none</b>	Upload key file.
CA file	.ca file; default: <b>none</b>	Upload CA file.
<a href="#">Pre-Shared-Key</a>	string; default: <b>none</b>	The pre-shared-key in hex format with no leading "0x".
<a href="#">Identify</a>	string; default: <b>none</b>	Specify the identity.



Field	Value	Description
Raw mode	off   on; default: <b>on</b>	When enabled, all data will be transmitted transparently.
Remove all zeros	off   on; default: <b>off</b>	When checked, indicates that the first hex zeros should be skipped.

Inactivity timeout	integer [0..36000]; default: <b>300</b>	Specifies period of time in seconds, where server connection must be inactive, to disconnect client. To disable timeout input 0.
Serial timeout	integer [0..1000]; default: <b>none</b>	Specifies the maximum milliseconds to wait for serial data.
Max clients	integer [1..32]; default: <b>4</b>	Specify how many clients are allowed to connect simultaneously.
TCP echo	on   off; default: <b>off</b>	Enable software TCP echo.
Close connections	on   off; default: <b>off</b>	Close TCP connections everytime data is sent or received (might result in serial data loss).
Keep alive	on   off; default: <b>off</b>	Enable keep alive.
Keep alive time	integer [0..32000]; default: <b>0</b>	Close TCP connections everytime data is sent or received (might result in serial data loss).
Keep alive interval	integer [0..32000]; default: <b>0</b>	The interval between subsequential keepalive probes.
Keep alive probes	integer [0..32000]; default: <b>0</b>	The number of unacknowledged probes.

## IP Filter

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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.



Then enter the IP address and save.



[[Category:{{{name}}} Services section]]