

## rfconfig command (TDMA version)



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### Description

The command is used to configure a radio interface. This document describes the command in WANFlex software version with TDMA technology support.



#### CAUTION

Not all radio interfaces have the same set of parameters and options because it depends on the radio module type and standard. A complete list of parameters available for the specific interface can be displayed by "*rf interface ?*" command. Radio module type and its features list can be displayed by "*rf interface cap*" command.

#### Syntax:

```
usage: rf interface parameters...
Interface rf5.0 parameters:
  band   XXX:  bandwidth (MHz)
  grid   B G:  frequency grid - <bw> freq1[-freq2[/step]],... | clear
  freq   XXX:  central frequency (MHz)
  bitr   XXX:  bitrate (Kbps)
  txpwr  XXX:  tx power (dBm)
  sid    XXX:  system identifier - up to 8 hex digits [10101010]
  cap [full]: RF capabilities
  txrt   XXX:  max transmit retries [10]
  txvrt  XXX:  max transmit retries in voice mode [5]
  [-]dpd      : dpd mode (digital pre-distortion)
  [-]burst    : burst mode (Super Packeting)
  [-]shortgi   : short guard interval mode
  [-]pwrctl    : automatic TPC mode
  [-]transient : transient mode
  mimo|miso
  [-]misoc1
  [-]greenfield
  stat[1] [qos] [mcs] [OPT]
```



#### NOTE

If frequency roaming is enabled, make changes to the roaming profile using "*mint profile*" command before making changes on the unit.

### Parameters

Parameter	Description
<b>cap</b>	Displays the radio module capabilities including the information on power levels, frequencies etc.

<b>band XXX</b>	<p>Allows choosing the bandwidth for transmission, can be specified as numeric or text values:</p> <ul style="list-style-type: none"> <li>• "double" – 40 MHz.</li> <li>• "full" – 20 MHz.</li> <li>• "half" – 10 MHz.</li> <li>• "quarter" – 5 MHz.</li> </ul> <p>The ability to switch between different bandwidth values is determined by the license. Within the same wireless network, devices must have the same values for this parameter.</p>
<b>grid B G</b>	<p>Allows to create a customized frequency grid within the license restrictions, i.e. to form the list of operating frequencies.</p> <ul style="list-style-type: none"> <li>• "B" – the bandwidth for which the frequency grid is formed.</li> <li>• "G" – list of sub ranges with the defined frequency step (start frequency–end frequency/step), or a list of comma delimited standalone frequencies.</li> </ul> <p>The resulting frequency grid can be viewed in radio interface properties and used in all cases when the frequency is determined automatically ("roaming", "dfs" and so on).</p> <ul style="list-style-type: none"> <li>• "clear" – restores the default frequency grid supplied in the unit's license.</li> </ul>
<b>freq XXX</b>	Sets central operating frequency in MHz. Must be equal at the both sides of the link.
<b>bitr XXX</b>	<p>The bit transfer rate in Kbit/s of the radio link. Allowed values are:</p> <ul style="list-style-type: none"> <li>• bandwidth 5 MHz: 3250, 6500, 9750, 13000, 19500, 26000, 29250, 32500 Kbit/s.</li> <li>• bandwidth 10 MHz: 6500, 13000, 19500, 26000, 39000, 52000, 58500, 65000 Kbit/s.</li> <li>• bandwidth 20 MHz: 13000, 26000, 39000, 52000, 78000, 104000, 117000, 130000 Kbit/s.</li> <li>• bandwidth 40 MHz: 30000, 60000, 90000, 120000, 180000, 240000, 270000, 300000 Kbit/s.</li> </ul>
<b>txpwr XXX</b>	Sets the transmitter emitting power in dBm. The acceptable transmit power values can vary depending on the radio module type.
<b>sid XXX</b>	Network identifier, a arbitrary hexadecimal number in the range of 1H to FFFFFFFH. All routers that are supposed to see each other on the same radio link must have the same identifier.
<b>txrt XXX</b>	Sets the maximum number of repeat requests to be done when sending unicast packets. By default is 10.
<b>txvrt XXX</b>	Sets the maximum number of repeat requests for data packets (excluding voice packets) in voice mode. By default is 5. The maximum allowed value is 64. Voice mode is turned on automatically when VoIP traffic appears.
<b>[-/]dpd</b>	Enables/disables digital pre-distortion mode. Allows to improve the signal quality by compensating of distortions that occur in the transmission path.
<b>[-/]burst</b>	<p>Enables/disables the BURST protocol support.</p> <p>The BURST protocol is grouping several short packets with the same destination address on a radio link into larger packets, thus significantly decreases the response time for applications when intensive streams of short packets appears. BURST has influence to a whole radio interface on selected device, but the BURST protocol can only work for destinations where it is also enabled at the other end, and only if MINT protocol is used at both sides. BURST does not affect the operation of other devices in the network.</p> <p>BURST protocol operation statistic can be viewed by using the "muffer stat" command. Enabled by default.</p>
<b>[-/]shortgi</b>	Enables/disables the short guard interval mode. Using of this mode allows the device to increase its throughput by reducing the time interval between symbols being transmitted. However, this may significantly increase the intersymbol interference and, thus, cause a higher errors rate. Enabled by default.
<b>extnoise X</b>	Raises / lowers the noise level, allows to reduce the interference influence (in case of level increasement) or to increase the received signal the modulation (in case of level decrease). Available values are from -16 to 32 dB. By default - 0.
<b>[-/]pwrctl</b>	Enables/disables Automatic Transmit Power Control (ATPC). When it is enabled the system automatically adjusts device's output power to the optimal value that is necessary and sufficient to maintain the maximum productivity of the link in the given conditions. Enabled by default.
<b>[-/]transient</b>	<p>Only for the InfiLINK Evolution / InfiMAN Evolution families devices. Enables/disables the InfiLINK 2x2 / InfiMAN 2x2 families compatibility mode.</p> <p>To ensure operation in compatibility mode, configuration changes must be made, which are detailly described in the article: <a href="#">Upgrade from R5000 to Evolution</a>.</p>
<b>mimo miso</b>	Allows to select a signal coding method: MIMO or MISO.

<b><i>[-]misoclt</i></b>	In this mode the device use MISO for transmission of service packets while working on a low modulation. It allows keep the link operation when a transmitter in one the polarizations fails or in case of signal levels imbalance in different streams. To disable this mode use the " <i>-misoclt</i> " parameter.
<b><i>[-]greenfield</i></b>	Enables/disables " <i>Greenfield</i> " mode. This mode reduces the transmitted frame size, removing the original (pre-802.11n) field from the header. Allows to increase the performance by 15%, as well as avoid the processing and decoding of noise preambles, which leads to an improvement of signal quality.
<b><i>stat[1] [qos] [mcs]</i></b>	Displays the radio module's statistic. For more information about table values see "Examples" subsection. <ul style="list-style-type: none"> <li>• "<i>1</i>" – shows statistic in current moment, if not specified, the statistic is displayed in real time.</li> <li>• "<i>qos</i>" – shows priorities statistic.</li> <li>• "<i>mcs</i>" – shows modulation statistic.</li> <li>• "<i>OPT</i>" – shows statistic of all parameters.</li> </ul>

## Examples

Displays the radio module's parameters.

```
rf cap
Radio capabilities:
Model name:                Infinet Wireless RMM54 Rev4
Adapter name:              Atheros AR9220 Wireless PCI Adapter. Infinet Wireless RMM54 5.5
GHz Radio rev 04 Beamsteering Antenna
Subvendor: 0xffff1, Subid 0x5404
Power levels (dBm):        min -10 max 30 step 0.5
Greenfield mode supported
Smart Antenna, 16 Beams, 1000ns, HW#0, SW#18, Enabled
MAC address:               000435136C7B
Bandwidth modes:           28, 3.5, 7, 14, 30, 15, 5, 10, 20, 40
Bitrate list:              30000, 60000, 90000, 120000,
                           180000, 240000, 270000, 300000
Frequency bounds (40 MHz): 4800-6060
Frequency grid (user defined): 4800-6060/100
Frequency list (12 channels):
    4900, 5000, 5100, 5200, 5300, 5400, 5500, 5600, 5700, 5800, 5900, 6000
```

Possible ways of how to set frequency grid are shown in the following example:

```
rf rf5.0 grid 40 4920-5940/5
rf rf5.0 grid 20 5310-5390/10,5450,5500-5580/20
rf rf5.0 grid 10 5480, 5500, 5520, 5540, 5560, 5580
```

Set the bandwidth value 20 on the node which use frequency roaming.

```
mint rf5.0 profile 1 -band 20
rf band 20
```

Display the current radio module's statistic.

```

rf stat
RF rf5.0 status UP (band 40, freq 5400) :ACTIVE
DFS status      OFF
TDMA status      Master (5 ms DL/UL:Auto) (DL2500/UL2500)

```

Receive statistics		Transmit statistics	
Broadcast Rate	300000	Voice Mode	OFF
Bytes Received	2564270416	Bytes Transmitted	3133097156
Frames Received OK	1174142362	Frames Transmitted OK	755978882
Multicast Frames	10147084	Multicast Frames	1852112
Load (kbps)	134484	Load (kbps)	141136
Load (pps)	11177	Load (pps)	7044
Frame size (bytes)	1504	Frame size (bytes)	2504
RX Medium Load	45.0%	TX Medium Load	46.6%
Total Medium Busy	92.1%	Frame Time Used	98.2%
Duplicate Received	186877	Too Short/Long Frame	0 / 4
Lost frames	74928	Aggr Subframe Retries	1207537
Rx Collision	1	Aggr Full Retries	8900
FIFO Overrun	13	FIFO Underrun	0
CRC Errors	11187590	Excessive Retries	1233
Noise Floor	-96	Max aggr frames	52
Rx Subslots/Nodes	4 / 48	Max aggr bytes	65430
Scrambled frames	11	Scrambled frames	0
Scramble errors	2	Tx queue overflow	1377218266
Rx Time Limit (us)	127	Tx Time Limit (us)	1942
Rx Cap (Mbps)	112	Tx Cap (Mbps)	139

- "RF rf5.0 status UP (band 20, freq 4900) :ACTIVE" – interface status, bandwidth, frequency, state.
- TDMA status Master (5 ms DL/UL:Auto) (DL2500/UL2500) (PTP mode) – TDMA status, frame size, DL/UL ratio, network topology.
- "DFS status OFF" – DFS status.
- "Broadcast Rate" – current bitrate value for Broadcast and Multicast packets on the BS (depends upon the speed of the slowest CPE).
- "Voice Mode" – presence/absence of voice traffic. If some appears, mode of it's prioritized processing is turned on.
- "Bytes Received" – number of received bytes including headers.
- "Bytes Transmitted" – number of transmitted bytes including headers.
- "Frames Received OK" – number of correctly received frames.
- "Frames Transmitted OK" – number of correctly transmitted frames.
- "Multicast Frames" – number of received multicast frames.
- "Load (kbps)" – wireless link load (Kbit/s).
- "Load (pps)" – wireless link load (packets/s).
- "Frame size (bytes)" – frame size (bytes).
- "Medium Load" – time spent to receive frames (%).
- "Frame Time Used" – average transmitted frame fill rate (%).
- "Medium Busy" – time during which the medium was occupied (reception or transmission) (%).
- "Duplicate Received" – number of duplicate packets received.
- "Aggr Subframe Retries" – number of packet drops in an aggregate due to protocol excesses (for transmission).
- "Lost frames" – number of frames lost.
- "Rx Collision" – number of cases when the frame transmission interrupted the receiving.
- "Aggr Full Retries" – number of duplicate aggregates transmitted.
- "FIFO Overrun" – number of FIFO queues overruns in the radio when receiving.
- "FIFO Underrun" – number of FIFO queues underruns in the radio while transmitting.
- "CRC Errors" – number of received packets with CRC errors.
- "Excessive Retries" – number of packets which were not transmitted with maximal number of retries.
- "Noise Floor" – input noise level. Measurement cycle –10 seconds.
- "Max aggr frames" – maximal detected number of packets in an aggregate.
- "Max aggr bytes" – maximal detected bytes in an aggregate.
- "Scrambled frames" – number of received/transmitted scrambled frames.
- "Scramble errors" – number of scramble errors.
- "Tx queue overflow" – data queue overflow for transmission.
- "Rx Subslots" – subslots number for UL frame part.
- "Rx Time Limit" – quota of useful data in microseconds for UL.
- "Tx Time Limit" – quota of useful data in microseconds for DL.
- "Rx Cap (Mbps)" – capacity limit for UL (Mbit/s).
- "Tx Cap (Mbps)" – capacity limit for DL (Mbit/s).