

# Dual SIM Functionality

Dual SIM support has been implemented in console server firmware version 3.9.0 for ACM devices. It allows multiple SIM cards/connections to be configured and have the device automatically switch between them based on user-configured criteria. This can provide redundant out-of-band access over a cellular connection.

## Dual SIM Setup

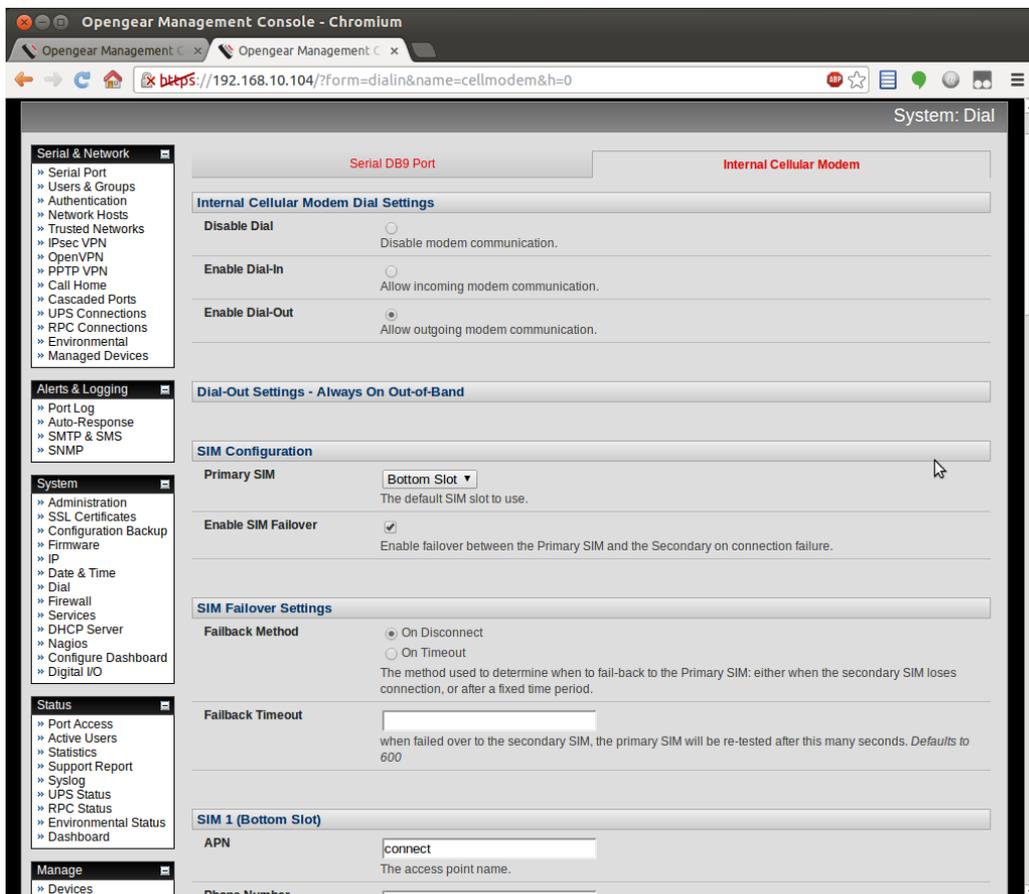
The screenshot below shows the configuration settings for dual SIM, and how failover/failback can be set up. The options are as follows:

**Primary SIM:** This allows the user to specify either the top or bottom SIM slot as the primary; the other will be referred to as the 'secondary' SIM.

**Enable SIM Failover:** If enabled, both SIMs will be configured and set up for failover functionality (as per the following options). If disabled, then only the primary SIM will be configured (as an always-on cellular connection), and the secondary will not be used.

**SIM Failback Method:** During normal dual-SIM operation, the primary SIM connection will be 'up'. If it fails, the device switches to the secondary SIM connection. There are two ways the device can determine if it should fail back to the primary. These are 'On Disconnect' and 'On Timeout', which are detailed below.

(There is scope to add extra failover selectors in future. For example, we could add the ability to change SIM based on the signal strength, or network status, or even GPS position, etc.)



The current failback methods available are:

*On Disconnect:* This is the simplest failback configuration. The device will not actively try to change from the secondary to the primary: it will only change when the secondary itself has failed.

*On Timeout:* The device will fail back to the primary either when the secondary fails, or the failback timeout has expired. The timeout is specified in the box below, and defaults to 600 seconds (ie. 10 minutes).

## Individual SIM Setup & Failure Detection

There are now one configuration section per SIM (example screenshot below), as each provider may have different details. These are exactly the same as in previous firmware revisions (eg. APN, credentials, and any provider details needed), so will not be detailed here. The only difference is the addition of one extra field at the bottom: the failover test IP.

The failover test IP is used to help determine if that connection has failed. When it is specified, the system will attempt to regularly ping the given IP, and will fail the connection if it isn't successful. The ping test tries every 10 seconds, and will fail the connection if it has 6 consecutive pings that do not work. (ie. The connection fails if it can not ping the given IP for more than a minute.)

These parameters are not currently customizable.

If the failover test IP is not specified, the connection will only detect failure if the managing process fails; that is, if the PPP process dies for some reason. This will usually only occur on severe failure; therefore, it is recommended that test IPs are specified in any dual-SIM setup.

The screenshot displays the Opengear Management Console interface for configuring SIM 1 (Bottom Slot). The browser address bar shows the URL: `https://192.168.10.104/?form=dialin&name=cellmodem&h=0`. The left sidebar contains navigation options: System (UPS Status, RPC Status, Environmental Status, Dashboard) and Manage (Devices, Port Logs, Host Logs, Power, Terminal). The main configuration area for SIM 1 includes the following fields:

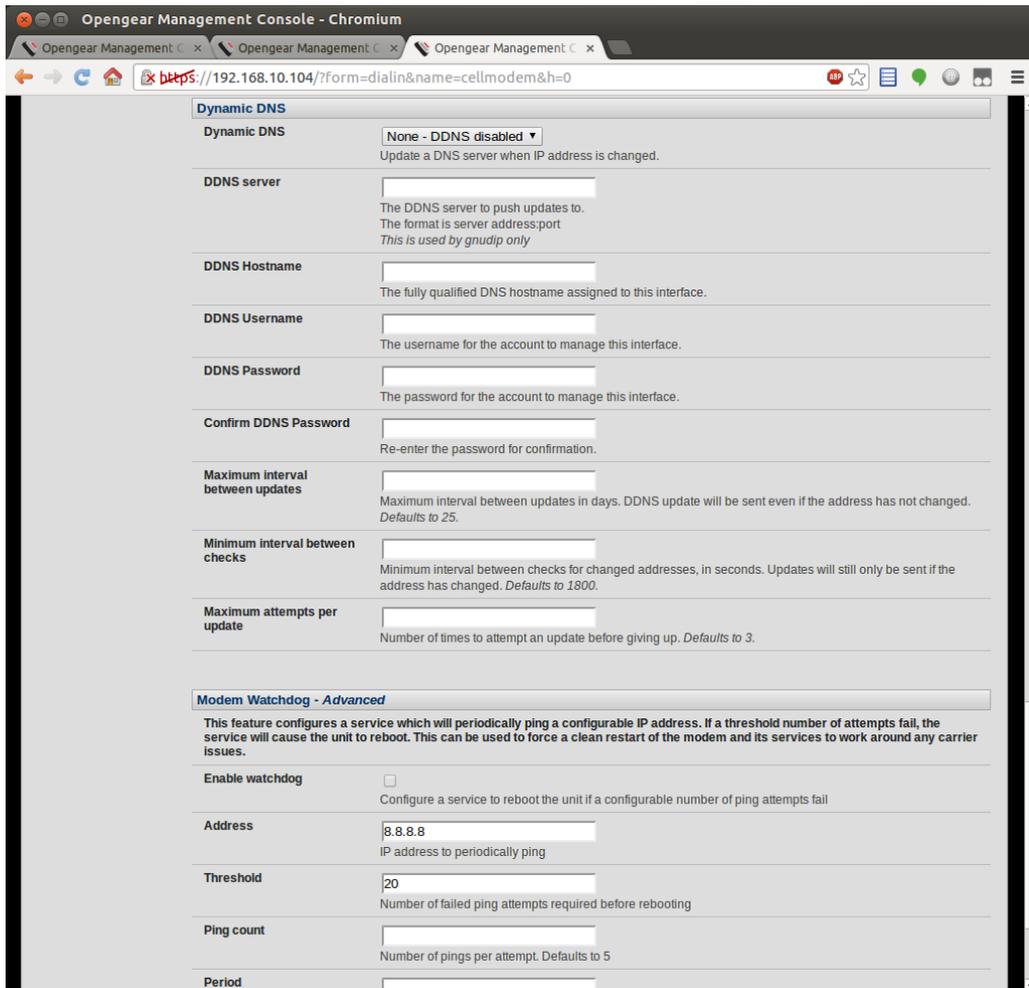
- APN:** `connect` (The access point name.)
- Phone Number:** (The sequence to dial to establish the connection, defaults to \*99\*\*1#)
- Username:** (Optional user name to authenticate the connection.)
- Password:** (Optional secret to use when authenticating the user.)
- Confirm:** (Re-enter the user's password for confirmation.)
- Custom Modem Initialization:** (Currently empty) (An optional AT command sequence to initialize the modem.)
- Radio Access Technology:** `Automatic` (Select the Radio Access Technology for this connection)
- Region:** `default (internal)` (Select a region to use specific search algorithms for)
- Unlock Password:** (The password to change modem region. Advanced use only.)
- Override returned DNS servers:**  (Use the following DNS servers instead of the PPP provided servers.)
- DNS Server 1:** (The primary DNS server.)
- DNS Server 2:** (The secondary DNS server.)
- Failback Test IP:** `8.8.8.8` (An IP address to ping to test if this connection is functioning (to enable failing between multiple SIMs).)

Below the SIM 1 configuration, the header for SIM 2 (Top Slot) is visible.

## Other Modem Configuration Options

The remaining config options on the page relate to Dynamic DNS and the Modem Watchdog. A screenshot is shown below.

These have not changed since the last release, and will still function in the same way. The only point to note is that they are not specific to one SIM or the other – they are applied to the 'modem', regardless of which SIM is being used. That is, if you enable the watchdog or DDNS, they will operate if the modem is active, regardless of which SIM is being used.



The screenshot shows the Opengear Management Console in a Chromium browser window. The URL is <https://192.168.10.104/?form=dialin&name=cellmodem&h=0>. The page is divided into two main sections: Dynamic DNS and Modem Watchdog - Advanced.

**Dynamic DNS**

Dynamic DNS	None - DDNS disabled	Update a DNS server when IP address is changed.
DDNS server		The DDNS server to push updates to. The format is server address:port <i>This is used by gnudip only</i>
DDNS Hostname		The fully qualified DNS hostname assigned to this interface.
DDNS Username		The username for the account to manage this interface.
DDNS Password		The password for the account to manage this interface.
Confirm DDNS Password		Re-enter the password for confirmation.
Maximum interval between updates		Maximum interval between updates in days. DDNS update will be sent even if the address has not changed. Defaults to 25.
Minimum interval between checks		Minimum interval between checks for changed addresses, in seconds. Updates will still only be sent if the address has changed. Defaults to 1800.
Maximum attempts per update		Number of times to attempt an update before giving up. Defaults to 3.

**Modem Watchdog - Advanced**

This feature configures a service which will periodically ping a configurable IP address. If a threshold number of attempts fail, the service will cause the unit to reboot. This can be used to force a clean restart of the modem and its services to work around any carrier issues.

Enable watchdog	<input type="checkbox"/>	Configure a service to reboot the unit if a configurable number of ping attempts fail
Address	8.8.8.8	IP address to periodically ping
Threshold	20	Number of failed ping attempts required before rebooting
Ping count		Number of pings per attempt. Defaults to 5
Period		

