



AC1200MS



Auto-Provisioning Manual

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Auto-Provisioning of AC1200MS

Introduction

This document is targeted to developers and system integrators who intend to include support for the AC1200MS in their VoIP provisioning systems. It provides details for auto-provisioning ReadyNet's AC1200MS, a Wi-Fi router with two ATA ports and five Ethernet ports. Auto-provisioning is supported via TFTP, HTTP, HTTPS, and DHCP Option 66, allowing for true zero-touch remote provisioning.

Configure Provisioning Parameters

This section first describes how to enable provisioning via the web interface and then describes the various parameters that can be set to control provisioning.

Enable Provisioning

To enable provisioning, log into the AC1200MS [user=admin, password=pz938q12ms] and navigate to Administration > Provision. The image below shows the default values.

The screenshot shows the AC1200MS web interface under the Administration tab. The Provision sub-tab is selected. The Configuration Profile section contains the following parameters:

Parameter	Value
Provision Enable	Enable
Resync On Reset	Enable
Resync Random Delay(sec)	40
Resync Periodic(sec)	3600
Resync Error Retry Delay(sec)	3600
Forced Resync Delay(sec)	14400
Resync After Upgrade	Enable
Resync From SIP	Disable
Option 66	Enable
Option 67	Disable
Config File Name	AC1200MS.cfg
User Agent	ReadyNet_AC1200MS
Profile Rule	(Blank)

The Firmware Upgrade section contains the following parameters:

Parameter	Value
Upgrade Enable	Enable
Upgrade Error Retry Delay(sec)	3600
Upgrade Rule	(Blank)

A help panel on the right provides a detailed description of the Provision setting:

Provision:
Provision allows a device automatically resync to a specific configuration file on a TFTP server or a web server which use HTTP or HTTPS

In the default settings, provisioning is enabled but the parameter 'Profile Rule', which is the provisioning URL, is blank. Similarly, firmware upgrade is enabled but 'Upgrade Rule' has no value. The table below describes the various provisioning parameters and provides their default values.

Parameter Name	Description	Default Value
Provision Enable	Enable or disable the Provision functions.	Yes
Resync on Reset	Triggers a resync after every reboot except for reboot caused by parameter updates and firmware upgrades.	Yes
Resync Random Delay	The maximum value for a random time interval that the device waits before making its initial contact with the provisioning server. This delay is effective only on the initial configuration attempt following device power-on or reset. The delay is a pseudo-random number between zero and this value. This parameter is in units of 1 second; the default value of 40 represents 40 seconds. This feature is disabled when this parameter is set to zero. It can be used to prevent an overload of the provisioning server when a large number of devices power on simultaneously.	40 seconds
Resync Periodic	The number of seconds between periodic resyncs with the provisioning server. Set this parameter to zero to disable periodic resyncing.	3600 seconds
Resync Error Retry Delay	If the last resync failed, the device will retry resync after the "Resync Error Retry Delay" seconds.	3600 seconds
Forced Resync Delay	Maximum delay in seconds the device waits before performing a resync. The device will not resync while any of its phone lines are active. Because a resync can take several seconds, wait until the device has been idle for an extended period before resyncing. This allows a user to make calls in succession without interruption. The device has a timer that begins counting down when all of its lines become idle. This parameter is the initial value of the counter. Resync events are delayed until this counter decrements to zero.	14400 seconds
Resync After Upgrade	Triggers a resync after every firmware upgrade attempt.	Yes
Option 66	If enabled, the device will also request DHCP Option 66 with its DHCP request. When enabled, the parameter 'Profile Rule' is ignored.	Yes
Config File Name	This parameter is appended to the DHCP Option 66 value returned by the DHCP server to create the TFTP provisioning URL. e.g. if the DHCP Option 66 return value is 123.45.67.89 and the 'Config File Name' parameter is a.conf , then the device will request a provisioning file from the TFTP server located at123.45.67.89 for a file named, a.conf. This parameter is ignored when the parameter 'Option 66' is set to 'No'.	Changes for different models. For the AC1200MS, it will be AC1200MS.conf. For engineering samples, .cnf
Profile Rule	This parameter is a URL that evaluates to the provisioning resync command. The protocol can be TFTP and HTTP. The file name component of this parameter can make use of macros allowing the device to make requests for unique provisioning files. This parameter is ignored if the parameter 'Option 66' is enabled.	Empty

The table below describes the various firmware upgrade parameters and provides their default values.

Parameter	Description	Default Value
Enable Upgrading	Enables firmware upgrade operations independently of resync actions	Enable
Upgrade Error Retry Delay	The upgrade retry interval (in seconds) applied in case of upgrade failure. The device has a firmware upgrade error timer that activates after a failed firmware upgrade attempt. The timer is initialized with the value in this parameter. The next firmware upgrade attempt occurs when this timer counts down to zero.	3600 seconds
Upgrade Rule	This parameter sets the URL for the new firmware file. It follows the same syntax as the 'Profile Rule' parameter. e.g. http://192.168.100.1/AC1200MS_v3.1.bin	Empty

Syntax of Profile Rule and Upgrade Rule

The two parameters 'Profile Rule' and 'Upgrade Rule' must follow the following syntax.

[scheme://][server IP or domain[:port]]/file_path

The scheme can be one of the following:

http
https
tftp

The 'file_path' component follows macro expansion rules as described in the section 'Macro Expansion' below.

Examples:

tftp://prov.mydomain.com/cpe/\$MAU.conf
http://dev.easyvoip.com:8080/prov/\$PN/\$MA.conf

Note: If you use https as the scheme there is a section in Provisioning titled "Obtaining a Server Provisioning Certificate" that will explain how to obtain a certificate from ReadyNet.

Macro Expansion

Macro expansion can be used with the parameters ‘Profile Rule’ and ‘Upgrade Rule’. The table below lists the macros variables and to what they expand.

Macro Name	Expansion
\$	The form \$\$ expands to a single \$ character. The form \$\$MAU expands to \$00019F1EB1B2. The form \$MAU expands to 00019F1EB1B2.
MA	MAC address with lower case hex digits, e.g. 00019F1Eb1b2.
MAU	MAC address with upper case hex digits, e.g. 00019F1EB1B2.
MAC	MAC address with lower case hex digits, and colons to separate hex digit pairs, e.g. 00:01:9F:1E:B1:B2.
PN	Product Name, e.g. AC1200MS or VRT210
SN	Serial Number, e.g. 12MS123456
IP	WAN IP address , e.g. 123.45.67.89
SWVER	Software version, e.g. v3.0.1
HWVER	Hardware version, e.g. v1.0.1

Macro variables are invoked by prefixing the macro name with the ‘\$’ character (e.g. \$MAC). Macro substitution works even within a quoted string, without requiring additional escapes. If the macro is immediately followed by an alphanumeric character, enclose the variable name in parentheses (e.g. '\$(MAC)config.conf').

Please note the following additional points with regards to macro expansion;

- 1) During macro expansion, expressions of the form \$NAME and \$(NAME) are replaced by the contents of the named variables. For example, a AC1200MS with a MAC address of 00:01:9F:1E:B1:B2, the macro \$(MAU)config.cfg expands to 00019F1EB1B2config.cfg.
- 2) If the macro name is not recognized, it will remain unexpanded. For example, if you try to use STRANGE as a macro name it will remain unexpanded. Thus the expression \$STRANGE\$MAC.cfg expands to \$STRANGE00:01:9F:1E:B1:B2.cfg.
- 3) Macro expansion is not applied recursively. This means that the macro expression \$\$MAU expands to \$MAU and not 00019F1EB1B2.
- 4) Macro expressions can have optional qualifiers that allow you to specify a substring of the macro variable. The syntax for macro substring expansion is \$(NAME:p) and \$(NAME:p:q) where p and q are non-negative integers. The resulting expansion results in the macro variable substring starting at the character offset p, and of length q (or till end-of-string if q is not specified). For our example device with a MAC address of 00019F1EB1B2, the expression \$(MAU:4) expands to the string 9F1EB1B2, and the expression \$(MAU:8:2) expands to the string B1.

Provisioning

Provision with HTTP or HTTPS

Begin by resetting a AC1200MS to factory defaults.

- 1) Install a web server on the WAN side of the AC1200MS.
- 2) In the DocumentRoot of the web server, create a directory named ‘prov’ for provisioning files.
So if the path to the DocumentRoot is /var/www/html, the path to the directory for the provisioning files will be /var/www/html/prov.
- 3) In the prov directory, create a file named a.cfg with the following contents and save it.

```
DBID_SUPER_WEB_PASSWORD=newpass1
```
- 4) From a PC connected to device LAN port, you should be able to view the file contents of a.cfg by browsing to; <http://HTTP SERVER/prov/a.cfg> or <http://HTTPS SERVER/prov/a.cfg>.
- 5) Log into the AC1200MS [user=admin, password=pz938q12ms], navigate to Administration -> Provision and set the ‘Option 66’ field to Disable and in the Profile Rule field enter: <http://HTTP SERVER/prov/a.cfg> or <http://HTTPS SERVER/prov/a.cfg>.

The screenshot shows the AC1200MS Administration interface with the 'Administration' tab selected. Under the 'Administration' tab, the 'Provision' sub-tab is active. The configuration profile section contains the following settings:

Provision Enable	Enable
Resync On Reset	Enable
Resync Random Delay(sec)	40
Resync Periodic(sec)	3600
Resync Error Retry Delay(sec)	3600
Forced Resync Delay(sec)	14400
Resync After Upgrade	Enable
Resync From SIP	Disable
Option 66	Enable
Option 67	Disable
Config File Name	AC1200M.cfg
User Agent	ReadyNet_AC1200M
Profile Rule	<input type="text" value="http://172.16.8.25/prov/a.cfg"/>

The 'Firmware Upgrade' section contains the following settings:

Upgrade Enable	Enable
Upgrade Error Retry Delay(sec)	3600
Upgrade Rule	<input type="text"/>

At the bottom of the screen are three buttons: 'Save', 'Cancel', and 'Reboot'.

- 6) Click save and then do a reboot.

- 7) When the device boots and its WAN interface is up, it will retrieve the file located at Profile Rule and compare the checksum of the file to the checksum of the previously retrieved file. For a default device, the checksum is calculated from the default configuration file. As the new provisioning file and subsequently new checksum are different, the device will reboot to apply the new configuration.
- 8) When you now log in to the web interface with the user 'admin', you will need to enter the password 'newpass1'.

HTTPS Certificate Management

For secure provisioning, ReadyNet devices ship with unique SSL Client Certificates and a ReadyNet CA root certificate. The client certificate allows the provisioning sever to identify the individual devices while the CA root certificate allows the device to recognize authentic provisioning servers. Client certificates and the CA root certificate for a device may be viewed under Administration > Certification.

Certificate Management		
TR069	Issued To	Issued By
CA Certificate	CN=ReadyNet Solutions Provisioning Root Authority 1, OU=ReadyNet Solutions Certificate Authority, L=Midvale, ST=Utah	ReadyNet Solutions Provisioning Root Authority 1
Client Certificate	CN=ReadyNet, OU=VWRT510, L=RNV5100037, ST=00019f130089	ReadyNet Solutions CPE Root Authority 1
Private Key		Uploaded

Figure 1

The client certificates and ReadyNet CA root certificate are used both for provisioning via TR-069 and configuration profile synchronization. The client certificate and the ReadyNet CA root certificate are not overwritten by firmware upgrades.

For secure end-to-end HTTPS provisioning, the service provider will need to install a server certificate on each provisioning server by which ReadyNet devices will be configured. This server certificate must be signed by ReadyNet.

Obtaining a Provisioning Server Certificate

For each provisioning server, the service provider will need to submit to ReadyNet a Certificate Signing Request (CSR). There is no charge for obtaining or renewing provisioning server certificates. The steps show below use the openssl command.

- 1) First create a server key with; `openssl genrsa -out ServerKey.pem 1024`
- 2) Then create a CSR with; `openssl req -new -key ServerKey.pem -out CSR.pem`
Ensure that the 'Common Name' field contains the FQDN (Fully Qualified Domain Name) of the provisioning server and that the other fields are appropriate.
- 3) Email the CSR.pem file to SSLCA@readynetsolutions.com

We will return two files. The server certificate (server.crt) and the ReadyNet CPE Certificate Authority file (CPE_CA.pem). Below is an example Apache web server configuration snippet showing the deployment of the various files.

```
SSLCertificateKeyFile /etc/pki/ServerKey.key # private key from step 1
SSLCertificateFile /etc/pki/server.crt # returned server certificate
SSLCACertificateFile /etc/pki/CPE_CA.pem # returned CPE_CA.pem file
SSLVerifyClient require
```

The provisioning server will verify the client certificate presented by the device using the CPE_CA.pem file. The device will use the ReadyNet CA root certificate to verify the authenticity of the server. On successful mutual SSL authentication, the contents of the client certificate will be available as CGI environment variables in the provisioning server.

SSL environment variables table:

Variable Name	Description
SSL_CLIENT_S_DN_CN	Company Name
SSL_CLIENT_S_DN_OU	Device Model
SSL_CLIENT_S_DN_L	Device Serial Number
SSL_CLIENT_S_DN_ST	Device WAN MAC Address

For the device in Figure 1, the SSL environment variables would have the following values:

Variable Name	Value
SSL_CLIENT_S_DN_CN	ReadyNet
SSL_CLIENT_S_DN_OU	VWRT510
SSL_CLIENT_S_DN_L	RNV5100037
SSL_CLIENT_S_DN_ST	00019F1E0089

Provisioning server certificates from ReadyNet are valid for 2 years and need to be renewed when they expire. There is no charge for renewal of provisioning server certificates. Perform steps 2 and 3 to renew a provisioning server certificate.

Provision with DHCP and TFTP

In the example above, we had to manually configure the Profile Rule of the AC1200MS by logging into the web interface of the device as the admin user and entering a valid location for the provisioning URL. Using DHCP Option 66 together with a TFTP server, the Profile Rule parameter can be automatically set. The AC1200MS with its default, out-of-the-box configuration is set for 1) DHCP on the WAN interface and 2) Option 66 enabled. A correctly configured DHCP server will provide the IP address of a TFTP server when the AC1200MS includes a request for Option 66 together with its DHCP request. e.g. if the DHCP server sends back '172.16.8.25' as the Option 66 response and **DBID_PRV_CONFIGFILE** is '.cfg', the device will make a TFTP request to the server at IP address 172.16.8.25, for a file named '.cfg'.

- 1) Configure DHCP server to include Option 66 response.
- 2) Configure TFTP server. Create the initial provisioning file named '.cfg' with the following contents.

```
DBID_RESYNC_PERIODIC=60
DBID_PRV_OPTION66_ENABLED=0
DBID_PROFILE_RULE=http://172.16.8.25/prov/\$MAU.conf
```

Note: We change DBID_RESYNC_PERIODIC to 60 seconds only during testing and development.

- 3) In the prov directory of the HTTP server create a file named 00019F1EXXXX.conf, replacing XX:XX in the file name to match the WAN MAC address of the AC1200MS.
- ```
DBID_SUPER_WEB_PASSWORD=newpass2
```
- So if the WAN MAC address is 00:01:9F:1E:00:01, the file would be named, '00019F1E0001.conf'.
- 4) Reset a AC1200MS device to factory defaults. On bootup, we should expect the following events to occur;
- AC1200MS includes Option 66 in its DHCP request on the WAN port.
  - The DHCP server includes the Option 66 response with the other DHCP parameters.
  - The AC1200MS makes a TFTP connection to the IP address that it received as the Option 66 value and requests a file named .cfg.
  - On receiving the file named '.cfg', the device will set the Option 66 parameter to 'Disable' and set the Profile Rule to [http://172.16.8.25/prov/\\$MAU.conf](http://172.16.8.25/prov/$MAU.conf) and do a reboot.
  - This time when the devices boots up, it will not include Option 66 with its DHCP request. Once the WAN interface is up, the AC1200MS will expand the macro \$MAU to its WAN MAC address in uppercase. So if the WAN MAC address of the AC1200MS is 00:01:9F:1E:00:01, then the device will request a provisioning file from the URL; <http://172.16.8.25/prov/00019F1E0001.conf>.
  - The request URL uniquely identifies the device allowing the provisioning server to customize the provisioning file returned. In this example we set the password for the user admin to 'newpass2'.
  - The device will reboot again.
- 5) When you now log in to the web interface with the user 'admin', you will need to enter the password 'newpass2'.

## Provisioning Examples

This section provides example provisioning files for the AC1200MS. Refer to the Appendix for a listing of the provisioning parameters and their descriptions.

Note 1: The provisioning file only contains the parameters that need changing.

Note 2: The device generates a checksum of the provisioning file it receives from the provisioning server and compares it to the checksum from the previous retrieval. If the checksums of the two files are different, the device will reboot to apply the latest configuration.

Note 3: On successful application of a provisioning file, the device will save the checksum of the file to compare against newer configuration files.

## Provisioning SIP Parameters

This example provisioning file configures the SIP port of the AC1200MS. You will need to change the actual parameters in the file to match your SIP server.

```
DBID_DNSSRV_DOMAIN=12.34.56.78
DBID_SIP_SERVER_HOST_NAME=12.34.56.79
DBID_SIP_DIS_NAME=Customer Name
DBID_SIP_PHONE_NUM=1234
DBID_SIP_ACCOUNT=1234
DBID_SIP_PASSWORD=SIPpass
```

## Provisioning WAN Parameters

In this example provisioning file, the WAN connection mode is changed from DHCP to STATIC. Further we change, wan\_DnsMode from Auto to ‘Manual’ and define a primary and secondary DNS server that the AC1200MS itself will use. In addition, this provisioning file changes the wireless SSID to ‘MySSID’, sets the wifi authentication mode to WPA/WPA2 with a pre-shared key, sets the encryption algorithm to TKIP/AES and the pre-shared key to ‘abc123xyz’.

```
wanConnectionMode=STATIC
wan_ipaddr=172.16.8.60
wan_netmask=255.255.255.0
wan_gateway=172.16.8.1
wan_DnsMode=Manual
wan_primary_dns=8.8.8.8
SSID1=MySSID
AuthMode=WPAPSKWPA2PSK
EncrypType=TKIPAES
WPAPSK1=abc123xyz
```

## Provisioning LAN Parameters

This remote provisioning example file changes the network parameters on the LAN side of the AC1200MS. In addition, this file changes the username and passwords of the two administrative access levels of the web interface of the AC1200MS.

```
lan_ipaddr=192.168.88.1
lan_netmask=255.255.255.0
dhcpGateway=192.168.88.1
dhcpStart=192.168.88.200
dhcpEnd=192.168.88.220
dhcpLease=3600
NormalUser=Alice
DBID_NORMAL_WEB_PASSWORD=Alice123Pass
AdminUser=Jack
DBID_SUPER_WEB_PASSWORD=Jack123pass
```

# Appendix

## WAN Network Parameters

| Parameter         | Valid Values                     | Description                                                                                                                                                                                                                                                                                |
|-------------------|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| wanConnectionMode | DHCP<br>STATIC<br>PPPoE          | This parameter defines the WAN connection method. It can be one of the following; Static, DHCP or PPPoE.                                                                                                                                                                                   |
| mdns              | 1<br>0                           | When set to 1 (Auto), the WAN interface of the router will use the DNS servers that it got from the upstream DHCP server. Setting this parameter to 0 (Manual) allows you to define custom DNS servers on the WAN side by setting the parameters, mwan_primary_dns and mwan_secondary_dns. |
| wan_primary_dns   | IP Address                       | When <b>dhcpDnsMode</b> is set to Manual or <b>wanConnectionMode</b> is set to Static, this parameter can be defined to set the primary DNS server used by the AC1200MS.                                                                                                                   |
| wan_secondary_dns | IP Address                       | When <b>dhcpDnsMode</b> is set to Manual or <b>wanConnectionMode</b> is set to Static, this parameter can be defined to set the secondary DNS server used by the AC1200MS.                                                                                                                 |
| wan_ipaddr        | IP Address                       | This parameter sets the WAN IP address and must be set when <b>wanConnectionMode</b> is set to Static.                                                                                                                                                                                     |
| wan_netmask       | Netmask                          | This parameter sets the WAN Netmask and must be set when <b>wanConnectionMode</b> is set to Static.                                                                                                                                                                                        |
| wan_gateway       | IP Address                       | This parameter sets the WAN Netmask and must be set when <b>wanConnectionMode</b> is set to Static.                                                                                                                                                                                        |
| wan_pppoe_user    | Empty                            | This parameter is the PPPoE username and must be defined when <b>wanConnectionMode</b> is set to PPPoE.                                                                                                                                                                                    |
| wan_pppoe_pass    | Empty                            | This parameter is the PPPoE password and must be defined when <b>wanConnectionMode</b> is set to PPPoE.                                                                                                                                                                                    |
| wan_pppoe_opmode  | KeepAlive<br>On Demand<br>Manual | This parameter is the PPPoE Operation mode and defaults to KeepAlive.                                                                                                                                                                                                                      |
| wan_pppoeoptime   | 60                               | This parameter defines the PPPoE Keep Alive Redial period in seconds when PPPoE is the <b>wanConnectionMode</b> . Range is between 0 - 3600.                                                                                                                                               |
| wan_vid           | 2                                | This parameter defines the VLAN ID of the WAN port. VLAN IDs are defined under Network -> VLAN in the web interface.                                                                                                                                                                       |

## LAN Network Parameters

| Parameter   | Valid Values      | Description                                                                                                                                                                                                                   |
|-------------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| natEnabled  | NAT<br>Bridge     | When natEnabled is set to NAT, the AC1200MS operates as a router and when set to Bridge, all network interfaces are bridged.                                                                                                  |
| lan_ipaddr  | IP Address        | This parameter sets the IP address of the LAN interface when <b>natEnabled</b> is set to NAT. This IP address is also the gateway address for the devices connected to the LAN side of the AC1200MS.                          |
| lan_netmask | Subnet Mask       | This parameter sets the subnet mask of the LAN subnet when <b>natEnabled</b> is set to NAT.                                                                                                                                   |
| dhcpEnabled | Enable<br>Disable | Use this parameter to enable or disable running a DHCP server on the AC1200MS.                                                                                                                                                |
| dhcpStart   | IP Address        | If <b>dhcpEnabled</b> is set to Enable, this parameter sets the starting IP address of the DHCP pool.                                                                                                                         |
| dhcpGateway | IP Address        | <b>dhcpGateway</b> defines the gateway address for DHCP requests from the LAN network.                                                                                                                                        |
| dhcpEnd     | IP Address        | If <b>dhcpEnabled</b> is set to Enable, this parameter sets the ending IP address of the DHCP pool.                                                                                                                           |
| dhcpDnsMode | Auto<br>Manual    | When set to Auto, DHCP clients on the LAN side are given default LAN DNS servers. Setting this parameter to Manual allows you to set custom DNS servers for LAN clients by setting the parameters, dhcpPriDns and dhcpSecDns. |
| dhcpPriDns  |                   | When <b>dhcpDnsMode</b> is set to Manual, this parameter defines the IP address of DNS server that will be provided as the primary DNS server with DHCP requests.                                                             |
| dhcpSecDns  |                   | When <b>dhcpDnsMode</b> is set to Manual, this parameter defines the IP address of DNS server that will be provided as the secondary DNS server with DHCP requests.                                                           |
| dhcpLease   | 86400             | This parameter defines the DHCP lease time.                                                                                                                                                                                   |
| lan_vid     | 1                 | This parameter defines the VLAN ID of the LAN port. VLAN IDs are defined under Network -> VLAN in the web interface.                                                                                                          |

## Wireless Parameters

| Parameter     | Valid Values                                                      | Description                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------|-------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| RadioOff      | 0<br>1                                                            | The default value for this parameter is 0, which sets the radio to 'On'. To turn the radio off, set this value to '1'.                                                                                                                                                                                                                                                                                                                |
| SSID1         | <i>AlphaNumeric string</i>                                        | This parameter sets the Service Set Identifier for the access point. For the AC1200MS, the default SSID is the string 'Wireless_AP-' appended with 4 random characters.                                                                                                                                                                                                                                                               |
| Channel       | 0<br>1<br>2<br>3<br>4<br>5<br>6<br>7<br>8<br>9<br>10<br>11        | This parameter sets the Wi-Fi channel for the radio as per the mapping below.<br>0 --> Auto Select<br>1 --> 2412MHz (Channel 1)<br>2 --> 2417MHz (Channel 2)<br>3 --> 2422MHz (Channel 3)<br>4 --> 2427MHz (Channel 4)<br>5 --> 2432MHz (Channel 5)<br>6 --> 2437MHz (Channel 6)<br>7 --> 2442MHz (Channel 7)<br>8 --> 2447MHz (Channel 8)<br>9 --> 2452MHz (Channel 9)<br>10 --> 2457MHz (Channel 10)<br>11 --> 2462MHz (Channel 11) |
| AuthMode      | Disable<br>OPENWEP<br><b>WPA-PSK</b><br>WPA2-PSK<br>WPAPSKWPA2PSK | This parameter defines the authentication mechanism for the access point. The default value is WPA-PSK.                                                                                                                                                                                                                                                                                                                               |
| EncrypType    | TKIP<br><b>AES</b><br>TKIPAES                                     | When the parameter 'AuthMode' is set to WPA-PSK, WPA2-PSK, or WPAPSKWPA2PSK, this parameter defines the type of encryption to be used. The default is AES.                                                                                                                                                                                                                                                                            |
| WPAPSK1       | <i>AlphaNumeric string</i>                                        | When the parameter 'AuthMode' is set to WPA-PSK, WPA2-PSK, or WPAPSKWPA2PSK, this parameter defines the Pre-Shared Key. This parameter is also referred to as the 'Pass Phrase'. For the AC1200MS, the default Shared Key is 8 random characters.                                                                                                                                                                                     |
| RekeyInterval | <b>3600</b>                                                       | This parameter sets the Key Renewal Interval for WPA and WPA2 wireless encryption.                                                                                                                                                                                                                                                                                                                                                    |

## SIP Parameters

These parameters configure the SIP settings and correspond to the settings seen on the ‘SIP Account’ menu of the web interface.

| Parameter                      | Description                                                                                                                                                |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DBID_DNSSRV_DOMAIN             | This parameter defines the ‘Proxy Server’ for the SIP account.                                                                                             |
| DBID_SIP_OUTBOUND_PORT         | This parameter defines the ‘Proxy Port’. The default port is 5060.                                                                                         |
| DBID_SIP_SERVER_HOST_NAME      | This parameter defines the ‘Outbound Server’ for the SIP account.                                                                                          |
| DBID_SIP_SERVER_PORT           | This parameter defines the ‘Outbound Port’. Default value is 5060.                                                                                         |
| DBID.Alter_SIP_Server_Hostname | This parameter defines the ‘Backup Outbound Server’ for the SIP account.                                                                                   |
| DBID.Alter_SIP_Server_Port     | This parameter defines the ‘Backup Outbound Port’. The default port is 5060.                                                                               |
| DBID_SIP_DIS_NAME              | This parameter defines the ‘Display name’ for the SIP account.                                                                                             |
| DBID_SIP_PHONE_NUM             | This parameter defines the ‘Phone Number’ for the SIP account.                                                                                             |
| DBID_SIP_ACCOUNT               | This parameter defines the ‘Account’ attribute associated with the SIP account.                                                                            |
| DBID_SIP_PASSWORD              | This parameter defines the ‘Password’ assigned to the particular SIP account.                                                                              |
| DBID_SIP_TOS                   | This parameter sets the DHCP mark for Layer 3 QoS for SIP packets. Range is 0 through 63.                                                                  |
| DBID_RTP_TOS                   | This parameter sets the DHCP mark for Layer 3 QoS for RTP packets. Range is 0 through 63.                                                                  |
| DBID_DATA_TOS                  | This parameter sets the DHCP mark for Layer 3 QoS for Data packets. Range is 0 through 63.                                                                 |
| sip_vid                        | This parameter defines the VLAN ID over which SIP packets will be sent. VLAN IDs are defined under Network -> VLAN in the web interface. The default is 2. |
| rtp_vid                        | This parameter defines the VLAN ID over which RTP packets will be sent. VLAN IDs are defined under Network -> VLAN in the web interface. The default is 2. |

## Administration Parameters

| Parameter                |                  | Description                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------------|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| BasicUser                | <b>useradmin</b> | This parameter defines a web login username of type 'Basic'.                                                                                                                                                                                                                                                                                                                             |
| BasicPass                | <b>admin</b>     | This parameter defines the password for <b>BasicUser</b> .                                                                                                                                                                                                                                                                                                                               |
| NormalUser               | <b>user</b>      | This parameter defines a web login username of type 'Normal'.                                                                                                                                                                                                                                                                                                                            |
| DBID_NORMAL_WEB_PASSWORD | <b>user</b>      | This parameter defines the password for NormalUser.                                                                                                                                                                                                                                                                                                                                      |
| AdminUser                | <b>admin</b>     | This parameter defines a web login username of type 'Admin'.                                                                                                                                                                                                                                                                                                                             |
| DBID_SUPER_WEB_PASSWORD  | <b>admin</b>     | This parameter defines the password for AdminUser.                                                                                                                                                                                                                                                                                                                                       |
| DBID_LAN_LOGIN_ONLY      | <b>0</b>         | The default for this parameter is 0 which allows access to the web interface of the device from the WAN interface. To only allow access to the web interface set this parameter to 1.                                                                                                                                                                                                    |
| DBID_WEB_PORT            | <b>80</b>        | This parameter sets the port that web server on the device listens to for requests on both the LAN side and WAN (if DBI_LAN_LOGIN_ONLY =0) side.                                                                                                                                                                                                                                         |
| DBID_WEB_IDLE_TIMEOUT    | <b>5</b>         | While logged into the web interface of the device this parameter sets the value in minutes of inactivity before being logged out.                                                                                                                                                                                                                                                        |
| DBID_PROVISION_ENABLED   | <b>1<br/>0</b>   | The default value for this parameter is 1, which enables provisioning for the device.                                                                                                                                                                                                                                                                                                    |
| DBID_RESYNC_ON_RESET     | <b>1<br/>0</b>   | The default value for this parameter is 1, which triggers a resync after every reboot except for a reboot caused by parameter update or firmware upgrade.                                                                                                                                                                                                                                |
| DBID_RANDOM_DELAY        | <b>40</b>        | This parameter defines the maximum number of seconds the device waits before making its initial contact with the provisioning server. This delay is effective only on the initial configuration attempt following device power-on or reset. The delay is a pseudo-random number between zero and this value. The default value is 40. Setting this parameter to 0 disables this feature. |

## Provisioning Parameters

| Parameter                 | Default        | Description                                                                                                                                                                                |
|---------------------------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DBID_RESYNC_PERIODIC      | <b>3600</b>    | This parameter is used to define the number of seconds between periodic resyncs with the provisioning server. Set this parameter to zero to disable periodic resyncing.                    |
| DBID_RESYNC_RETRY_DELAY   | <b>3600</b>    | This parameter defines the number of seconds the device will wait to retry a resync after the last attempt to resync failed.                                                               |
| DBID_RESYNC_DELAY         | <b>14400</b>   | This is the starting value of a counter in seconds that is decremented when all its lines become idle. Resync events are delayed until this counter decrements to zero.                    |
| DBID_RESYNC_AFTER_UPGRADE | <b>1<br/>0</b> | When set to 1, the device will trigger a resync after every firmware upgrade attempt. Set this parameter to 0 to disable.                                                                  |
| DBID_PRV_OPTION66_ENABLED | <b>1<br/>0</b> | When this parameter is set to 1 (default), the device will include DHCP Option 66 with its DHCP request. When enabled, the parameter DBID_PROFILE_RULE is ignored.                         |
| DBID_PRV_CONFIGFILE       | <b>.cfg</b>    | This is the name of the provisioning file retrieved from the TFTP server when DHCP Option 66 is enabled.                                                                                   |
| DBID_PROFILE_RULE         |                | This parameter sets the URL from which the device will retrieve its provisioning file. This parameter is ignored when DBID_PRV_OPTION66_ENABLED is set to 0.                               |
| DBID_UPGRADE_ENABLED      | <b>1<br/>0</b> | The default value for this parameter is 1, which enables firmware upgrades. Set to 0 to disable this function.                                                                             |
| DBID_UPGRADE_RETRY_DELAY  | <b>3600</b>    | On a firmware upgrade failure, this parameter is set to the value defined in seconds and a countdown begins. Once the timer reaches zero, the next attempt at firmware upgrade will occur. |
| DBID_UPGRADE_RULE         |                | This parameter sets the URL from which the new firmware file is requested.                                                                                                                 |

## Default Provisioning Template File

To generate the default provisioning file, first reset the device to factory defaults by navigating to Administration > Management and clicking ‘Factory Default’. After the reboot, the default provisioning file can be downloaded from the device by navigating to Administration > Management > Config File Upload & Download, then clicking ‘Download’. The file can be opened in a simple text editor and the contents are in this format - attribute = value.