

Series 2000
3G Modem / Router
Firmware Release Notes

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CYBERTEC

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1 Introduction

This document provides a summary of the firmware changes and details the firmware upgrade procedure for the Cybertec Series 1000 and Series 2000 of 3G Modem / Routers.

2 Version

The latest version of the Series 1000/2000 firmware is v1.48.

The firmware files for the current release are:

- **Series 1000** : S1000-v148.upg
- **Series 2000** : S2000-v148.upg

3 Applicability

The firmware described in this document is applicable for the following models:

- Series 1000
 - Model 1100
 - Model 1100u
 - Model 1220
- Series 2000
 - Model 2100W & 2100E
 - Model 2220W & 2220E

The firmware upgrade will fail for any model not listed above.

4 Version 1.48 (16/08/2011)

4.1 General

- This is a bug fix release.

4.2 New Features

- Telnet client
 - The command telnet has been added to command line interface.

4.3 Enhancements

- SMS
 - Support for full GSM character set.
 - AT Commands - Modified
 - +CMGL
 - the return SMS text will be coded using the character set specified by +CSCS
 - +CMGR
 - the return SMS text will be coded using the character set specified by +CSCS
 - +CPMS
 - the first parameter (location to read SMS from) now affects only the serial port that issued the command. The second and third parameters (location to send SMS, and location to receive SMS) affect the whole device.
 - AT Command - Added
 - +CSCS
 - sets the SMS character set (either IRA or UTF-8). The default is UTF-8.
 - Commands - Modified
 - sms send
 - the SMS message accepts UTF-8 characters.
 - sms location - the command has been deleted.
 - sms memory
 - set the device's location to send SMS and the location to receive SMS.
 - sms list
 - the location to read the SMS from must be specified. The SMS text is displayed using UTF-8.
 - sms read
 - the location to read the SMS from must be specified. The SMS text is displayed using UTF-8.
 - sms delete
 - the location to delete the SMS from must be specified
- Command Line Interface
 - Interface can now handle quotes and the slash character.
 - The following substitutions occur when the backslash ('\') character is used.
 - \n New Line
 - \r Carriage Return
 - \\ The backslash character
 - \\$ the dollar character
 - \\" the double quote character
 - \' the single quote character
 - \SPACE the space character

- The dollar ('\$') character has been reserved for future use.
- Text within a double quote allows backslash and dollar substitution.
- Text within a single quote does not allow backslash or dollar substitutions.

- AT Commands
 - Allow white space between the tokens of an AT command.

- VRRP
 - Introduced the concept of a Keep-alive Condition. This allows VRRP to respond quickly to the loss of the remote host.

4.4 Bug Fixes

- Route Command
 - The route function in craft does not always output the full result. Fixed

- Serial Server
 - The serial server does not recover when telnet is closed before the device is connected to the associated serial port. Fixed.

- IPsec
 - IPsec modified so that large changes in the time/date can be handled correctly.

4.5 Known Issues

- No known issues.

5 Version 1.47 (11/07/2011)

5.1 General

- This is a bug fix release.

5.2 New Features

- No new features.

5.3 Enhancements

- No enhancements.

5.4 Bug Fixes

- Module firmware upgrade fails. Fixed.

5.5 Known Issues

- No known issues.

6 Version 1.46 (11/05/2011)

6.1 General

- This is a bug fix release.

6.2 New Features

- No new features.

6.3 Enhancements

- No enhancements.

6.4 Bug Fixes

- L2TP/IPsec
 - An L2TP/IPsec tunnel was not correctly established. Fixed.
 - L2TP connection was requesting mppe encryption incorrectly. Fixed

6.5 Known Issues

- No known issues.

7 Version 1.45 (14/04/2011)

7.1 General

- This is an enhancement release.

7.2 New Features

- Parse Astaro Generated OpenVPN configurations.
 - Added the ability to read Astaro OpenVPN configuration files & automatically configure an OpenVPN tunnel. Certificates included in the Astaro configuration will also be read and uploaded into the Certificate management system.

7.3 Enhancements

- SMS
 - Unhandled SMS Control
 - Option added to Wireless▷ SMS web page to direct unhandled SMS to serial port.
 - If selected any SMS that is not bound for the modem, is directed to all serial ports which are in modem emulation mode.
 - If not selected, then all SMS that are not bound for the modem are discarded.
 - SMS Command
 - The command "sms location" has been added. It tells "sms list" and "sms read" to act on either the SIM or Modem.
 - Syntax:
sms location [<read> [<write> [<receive>]]

<read> the location to read SMS from.
<write> the location to write SMS to.
<receive> the location that received SMS are written to.

Use SM for SIM, and ME for modem.
 - AT Commands - Modified
 - +CNMI - New message indications
 - Command now only acts on a single serial port, instead of all ports on the modem.
 - AT&W - write configuration
 - Modified to save the following extra fields: +CNMI, +IPR
 - AT&F - restore configuration
 - Modified to restore the following extra fields: +CNMI, +IPR
 - AT+CMGS - send a SMS
 - After a SMS is accepted, the following is replied
+CMGS: <mr>
Where <mr> is the message reference, a cyclic 8 bit number (0..255)
 - UTF-8 characters are accepted but not all may be included in the SMS.
 - The following characters may be included in an SMS:
abcdefghijklmnopqrstuvwxyz
ABCDEFGHIJKLMNOPQRSTUVWXYZ
@ \$! " # % & ' () * + , - . / : ; < = > ? _
0123456789
and ' ' , '\r' , '\n'

- Unrecognised characters are mapped to the '?' character.
- AT Commands - Added
 - +IPR
 - Set the serial port speed
 - AT+IPR=?
AT+IPR: (0),(300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200, 230400)
 - AT+CSCA
 - Set the SMS service centre
 - +CSCA=<address>[,<address_type>]

<address>=specifies the service centre address, usually a phone number

<address_type>: 129 means use a typical ISDN/telephony numbering plan, but not an international number (ie does not start with a '+'). 145 means use a typical ISDN/telephony numbering plan starting with a '+'.
 - AT+CPMS
 - Preferred message storage
 - +CPMS <mem1>,<mem2>,<mem3>
<mem1> = location to list, read, & deleting messages
<mem2> = location to send messages
<mem3> = location to receive messages

Locations - "SM" SIM - "ME" Modem
 - +GMM
 - Return the product information
 - +GMI
 - request manufacturer identification
 - +GMR
 - request revision identification
 - +GCAP
 - overall capabilities
 - +GSN
 - serial number
 - +CGMM
 - model identification
 - +FCLASS?
 - modem mode (Only data mode accepted)
 - #CLS?
 - modem mode (Only data mode accepted)
 - +GCI
 - country code (Command accepted, but ignored) The set command accepts any 2 digit hex value, but ignores it
 - Ix
 - Identification information.
Where x is a digit in the range 0..9.
 - All commands return the string "Serial Modem"
- Serial Port Configuration
 - Circuit Switch Data (CSD) serial port reset.
 - When the operating mode of a serial port is "Direct to single port", a "reset Port" button is presented on the web page.

- Pressing the button restores the port to its default configured parameters.
- Modem Emulation serial port parameter reset.
 - When the operating mode of a serial port is "Modem Emulation", then a "reset port <x>" (<x> is {1,2,3}) button is presented on the web page.
 - Pressing the button restores the port to its default configured parameters.
- Upgraded to HSO driver
 - Improved IPv4 frame synchronisation and faster recovery when synchronisation is lost.

7.4 Bug Fixes

- GRE
 - Keep-alive to be sent at start-up. Fixed.

7.5 Known Issues

- No known issues.

8 Version 1.43 (23/11/2010)

8.1 General

- This is a bug fix release.

8.2 New Features

- No new features.

8.3 Enhancements

- No enhancements.

8.4 Bug Fixes

- DHCP Server
 - The DHCP server now includes the DNS search domain (DSN Suffix) in its DHCP information.
- VRRP
 - Configuration changes not correctly applied. Fixed.
- GRE
 - tunnels do not bring up static routes correctly. Fixed.
 - tunnels may change interface id when the device is rebooted. Fixed

8.5 Known Issues

- No known issues.

9 Version 1.42 (25/10/2010)

9.1 General

- This release includes several enhancements and bug fixes.

9.2 New Features

- No new features.

9.3 Enhancements

- GRE Tunnels
 - Support for keep-alives added.
- VRRP and GRE integration
 - GRE tunnel status integrated with VRRP to allow for tunnel switch-over.
- Serial server
 - Enable TCP No Delay option has been added to the Serial Server.

9.4 Bug Fixes

- Time change reboot.
 - A change in the system time of more than 100 seconds causes the unit to reboot. Fixed.
- Packet dial-on-demand (Series 1000 Only)
 - Issue with packet mode dial on demand not connecting fixed.
- Wireless mode.
 - On the web page config/ifaces-wls.asp, when disabling CSD mode and then pressing Cancel, the web page incorrectly sets the option to Packet Mode. Fixed.
- Negative temperatures displayed incorrectly.
 - Negative temperature incorrectly displayed, eg -1.4C was displayed as -1.-40. Fixed.
- Web server
 - The IPsec configuration page is slow to update. Fixed.
 - Web pages do not display correctly on webkit browsers. Fixed.
- PPP over CSD
 - Kernel crash when disabling PPPD Dialout over 3G when call active. Fixed
- Configuration reset
 - Early 2000 Series hardware does not respond to the config reset switch. Fixed

9.5 Known Issues

- No known issues.

10 Version 1.41 (25/06/2010)

10.1 General

- This release is a bug fix release.

10.2 New Features

- No new features.

10.3 Enhancements

- IPsec
 - Allow IPSec to be configured with XAUTH and rekeying at the same time.

10.4 Bug Fixes

- Management
 - SMS rate limit cannot be configured. Fixed.
- Serial Server
 - The pulldown options for Serial Server's (config/serial-server.asp) Immediate send character matching field were incorrect. The options presented:
 - Override
 - Follow carrierchanged to:
 - Off
 - Match any character
 - Match all characters

10.5 Known Issues

- No known issues.

11 Version 1.40 (23/04/2010)

11.1 General

- This release includes new features, several enhancements and bug fixes.

11.2 New Features

- Circuit Switched Data (CSD) PPP Dial-In / Dial-Out capability.
 - This functionality allows a PPP connection to be established between two devices over a CSD connection.
- Capability to establish a PPP connection using an external modem added to Serial Server.
 - This feature allows a unit to establish a PPP connection using an external modem connected to a serial port.
- Ethernet MAC Address filter.
 - Filter allows MAC addresses to be accepted or rejected.
 - Default policy can be set to allow or deny.
- Alias IP address can be enabled using configuration reset switch.
 - Pressing the configuration reset switch for approximately 2 seconds will enable an aliased IP at the default IP address setting.
 - This feature enables access to the unit when the IP is not known.
 - The Ethernet ports must be enabled for this feature to work.
- Unit can be powered down using configuration reset switch.
 - Pressing and holding the configuration reset switch will cause the unit to disconnect from the network and power down.
 - This feature is provided to shutdown the network connection prior to removing power.
 - If the power is not removed from the unit it will power on again after 60 seconds. This provides a recovery mechanism should the power down be accidentally activated.
- Generic Routing Encapsulation (GRE) support added.
 - Up to 5 GRE tunnels can be configured.

11.3 Enhancements

- Power on/off sequence improved
 - The power on/off sequence has been enhanced.
 - Power on sequence changes improves boot time.
 - Improved power off sequence allows for faster network connection on next boot.
- Power controller power off maximum offset added.
 - An off time offset has been added to the power controller. This value only has meaning if the unit has been powered off by the power controller and then during the off time the power to the unit is removed and then re-applied. When the power is re-applied the unit will re-boot and then check if the current time indicates the unit should be off. The previous behaviour was to shutdown if the current time was prior to the “on” time. The option adds an offset time which by default is 5 minutes. If the “on” time will be within the offset time then the modem will not turn off but will remain on.

- Web Pages
 - Status alarms for non active services are now shown in the background colour. The previous colour was to display the background in green which could indicate the service was active thus causing confusion.
- System log automatically scrolls to last entry.
 - The system log web page now automatically scrolls to the last entry. It is common for a user to be interested in the last file entries. This saves the user from scrolling to the end of the log each time it is selected.
- Serial Server
 - PPP Dial-out client added.
 - Modem emulator - Added support for unsolicited SMS
- System Information
 - Model name suffix displayed correctly.
 - Wireless firmware version now reported in a more concise manner.
- IPsec Virtual Private Network (VPN) improvements.
 - The IPsec “tab” on the web page is now the first tab so it is the default VPN page.
 - The name of the IPsec tab has been changed from “IPsec VPN” to “IPsec”.
 - The default for IPsec was changed from Enabled to Disabled.
 - Check-box added to overwrite MTU on General Configuration page.
 - General IPsec Configuration defaults set to the following:
 - NAT traversal enabled
 - Overwrite MTU disabled.
 - “General Configuration” page added.
 - Tunnel can now be configured to be either an Initiator or Responder.
 - Phase 1 Encryption - IKE proposal defaults set to AES(128) SHA1 DH Group 2.
 - Phase 2 Configuration - Phase 2 Encryption defaults set to the following:
 - ESP proposal: AES(128)-SHA1
 - Perfect forward secrecy & group : Enabled with DH Group 2.
 - Key lifetime: 480 mins.
 - Dead Peer Detection (DPD) moved to “Tunnel options” configuration page.
 - Dead Peer Detection (DPD) action on failure supports the following:
 - None
 - Hold
 - Clear (Default for Responder)
 - Restart (Default for Initiator)
 - Restart by peer
 - Default to not use shared certificates. Previously the default was to use shared certificates.
 - Tunnel Network configuration moved from Phase 2 page to a separate page.
 - Tunnel Networks - Network option “None (Host only)” removed and replaced by 2 more explicit options:
 - Host only (WAN IP)
 - Host only (LAN IP)
 - Support for Xauth.
 - XAUTH provides an additional level of authentication by allowing the IPsec responder to request extended authentication from remote users. Before being allowed access to the VPN remote users are required to respond with their credentials.

- VPN log automatically scrolls to last entry.
 - The VPN log web page now automatically scrolls to the last entry. It is common for a user to be interested in the last file entries. This saves the user from scrolling to the end of the log each time it is selected. This feature works in the same way as the System log scroll and was added for consistency.
- Firewall
 - Custom NAT - Added check box to “Drop traffic to original target”.

11.4 Bug Fixes

- IPsec
 - Traffic destined to be sent over the tunnel could block if a transmission attempt was made prior to the tunnel initialisation. This has been fixed for both Initiator and Responder modes.
 - Timeout problems when using Greenbow client have been resolved.
- Web Server
 - Web Server fails to respond. The Web Server was found to block under certain conditions, this has been fixed.

11.5 Known Issues

- No known issues.

12 Version 1.32 (24/08/2009)

12.1 General

- This release is a bug fix release.

12.2 New Features

- No new features.

12.3 Enhancements

- No enhancements.

12.4 Bug Fixes

- Serial server
 - Serial port 1 not transmitting. Fixed.
- WLS
 - Added 10 sec delay before generating packet session connect event.
- IPsec
 - Added reject routes to resolve "continuous ping" issue.

12.5 Known Issues

- No known issues.

13 Version 1.30 (29/07/2009)

13.1 General

- This release provides several enhancements and bug fixes.

13.2 New Features

- No new features added

13.3 Enhancements

- IPsec
 - Tidy up of web pages, add more steps to make configuration clearer.
- OpenVPN
 - Add support for CA-only certificates, username and passwords for MDEX compatibility.
 - Made MTU, fragmentation and renegotiation settable.
- Serial server
 - Basic framer & Modbus
 - timeouts can now be set in milliseconds.
- GPIO
 - Use kernel timer to more strictly control GPIO polling loop.
- Boot
 - Restructure start up sequence to speed up by a few seconds.
- Web pages
 - All lists now have clickable checkboxes to enable/disable entries.

13.4 Bug Fixes

- WLS
 - Serial server inaccessible from WLS port after CSD/PKT mode change fixed.
- Router
 - QOS rates not correctly initialised fixed.

13.5 Known Issues

- No known issues.

14 Version 1.23 (16/03/2010)

14.1 General

- This release is a bug fix release.
- This firmware version is for release only with the Beta version of the Cybertec Series 2000 firmware upgrader.

14.2 New Features

- No new features

14.3 Enhancements

- No enhancements.

14.4 Bug Fixes

- Wireless module
 - Firmware upgrade reset bug resolved.

14.5 Known Issues

- No known issues.

15 Version 1.22 (15/05/2009)

15.1 General

- This release is for an IPsec enhancement.

15.2 New Features

- No new features

15.3 Enhancements

- IPsec
 - Dead Peer Detection (PDP) options made more aggressive.
 - Restart changed to restart-by-peer;
 - hold changed to clear

15.4 Bug Fixes

- No bug fixes.

15.5 Known Issues

- No known issues.

16 Version 1.21 (03/04/2009)

16.1 General

- This release is to provide support for revised hardware.

16.2 New Features

- No new features

16.3 Enhancements

- Support for revised hardware power control.

16.4 Bug Fixes

- No bug fixes.

16.5 Known Issues

- No known issues.

17 Version 1.20 (24/03/2009)

17.1 General

- Internal configuration file format
 - The internal configuration file format has been changed in this version.
 - Existing configuration file will be automatically converted to the new format.
 - The new format is not backward compatible with earlier versions of firmware.
 - After upgrade if the firmware is reverted back to an earlier version all configuration settings will be lost.
 - It is recommended that the current configuration file is backed-up prior to upgrading the firmware. Refer to Section 18 Upgrade Procedure for instructions on saving the configuration of the modem.

17.2 New Features

- PPP Server added to Serial Server (Series 2000 only).
 - Allows serial devices running PPP to establish an IP connection directly to the modem.
 - The device can then route data across the Wireless interface
 - Can also be used with Modem Emulator
 - When the dial command ATD*99# is issued, the emulator connects to a local PPP session rather than a network connection.

17.3 Enhancements

- Top level menu tab added called Management.
 - The management tab brings together several management related configuration items under the one menu section. The Management tab contains the following sub-menus:
 - Events
 - SNMP
 - DNP3
 - SMS (Outgoing)
 - Email
 - Events
 - The events sub-menu provides a table to enable event reporting via SNMP, DNP3, SMS and email.
 - SNMP
 - Rate limit now a global setting found under Management->Events.
 - Configurations with limits under Sys->GPIO or Wireless->Events must now update the configuration under Management->SNMP.
 - SMS
 - New Distribution list for sending events to multiple numbers.
 - GPIO SMSes now sent to distribution list.
 - Configurations with a destination number under System->GPIO must now add this to the Wireless->SMS distribution list.
 - Rate limit now a global setting found under Management->Events.
 - VPN tunnels can be stopped, started and restarted via an SMS trigger.
 - SMS VPN command is of the form “VPN <start/stop/restart> <ALL/<tunnel name>>”
 - SMS VPN command examples:

- VPN start ALL
 - VPN stop SSL
 - VPN restart IPsec-1
- Email
 - Added for event reporting. The modem can now send system or GPIO events to multiple email addresses via an SMTP server.
- System temperature
 - Added as an event source.
- Serial Server
 - New option in Port Settings called Network congestion back-off signal.
 - This provides flow control by de-asserting the specified serial port signal when the network queue reaches 75% full. The signal is reasserted when the network queue drains to 50%.
 - Modbus performance improved (Series 2000 Only).
 - Serial server parses incoming RTU frames to find boundaries and forward to network more quickly (rather than waiting for framing timeout to expire). Will reduce packet errors and timeout errors.
- GPIO
 - Events selection moved to Management section.
 - SMS triggers moved to Wireless->SMS.
- LAN
 - MTU can now be configured under Network->LAN.
- Wireless
 - New option in Connection Maintenance to reset link if registration lost for specified period.
 - Field update of RF module now supported (Series 2000 only).

17.4 Bug Fixes

- Isec tunnels 2 & 3 not allowed in firewall filter rules fixed.
- Internal DNP3 outstation not restarting after configuration change fixed.
- RADIUS default group not persistent bug fixed.
- Port forward not validating end of port range fixed.
- UMTS 900Mhz not registering resolved (Model 2000E only).

17.5 Known Issues

- No known issues.

18 Firmware Upgrade Procedure

The firmware upgrade procedure for the /ctpfullname / is described. The same procedure can be used for all models in the product range.

18.1 Connect to the Web interface

- Connect to the Web interface of the modem either via the Ethernet interface or the wireless interface if web access is enabled.
- If connecting via the Ethernet interface:
 - Connect an Ethernet cable between the modem and the PC which will be used for the upgrade.
 - Open a web browser on the PC and enter the IP address of the LAN address of the modem. Note: The IP address of the modem may be configured differently for each installation. The default IP address is 10.10.10.10
- If connecting via the wireless interface:
 - Open a web browser on the PC and enter the IP address of the wireless interface.
- When prompted supply the username and password.
- The main status page should now be displayed.
- If the main page is not shown check:
 - If using the Ethernet interface:
 - The Ethernet cable is connected correctly to the modem and the PC.
 - The IP address of the modem is correct.
 - The Ethernet ports are enabled.
 - If using the wireless interface:
 - The wireless IP address is correct and is publicly accessible.
 - The firewall rules have been set to allow wireless web access.

18.2 System Backup and Upgrade

- Select System ▸ Backup & Upgrade. The System Backup & Upgrade page will be displayed as shown in Figure 1.



Figure 1: The System Backup & Upgrade page.

18.2.1 Backup Configuration

- It is recommended to save the current configuration file.
- The configuration of the modem is forward compatible. This means the configuration of the modem will still be correct after a firmware upgrade to a later version even though the format used to store the configuration may be changed.
- The configuration of the modem is not always backward compatible. This means that if the modem firmware is replaced with an earlier version the configuration file may not be readable by the earlier version of firmware and so the configuration will revert to the default settings. If the configuration file from the earlier version was saved prior to the upgrade then this configuration can be loaded into the modem to restore the previous settings after reverting to the earlier revision of firmware.
- To save the configuration click the link in the section titled “Backup current configuration” as shown in Figure 2 and save the file to the local machine.



Figure 2: System configuration backup.

- To restore a configuration click the Browse button in the section title “Restore a saved configuration” as shown in Figure 3 then click the Upload button.

Restore a saved configuration	
Select configuration file	<input type="text"/> Browse...
Upload	

Figure 3: System configuration restore.

18.2.2 Firmware Upgrade

- In the section titled “Upgrade Series 1000 firmware” or “Upgrade Series 2000 firmware” click the Browse button and navigate to and select the upgrade file appropriate for the series of modem being upgraded as shown in Figure 4. The firmware files for the current release are:
 - **Series 1000** : S1000-v148.upg
 - **Series 2000** : S2000-v148.upg
- If the incorrect file is selected the upload will fail and report an error.

Upgrade Series 2000 firmware	
Current firmware version	1.21
Select upload file	<input type="text" value="00-images/S2000-v140.upg"/> Browse...
Upload	

Figure 4: Select the upgrade file.

- Click the Upload button. The file will now be transferred to the modem.
- When the upload is complete the Upgrade section of the page will change to be similar to that shown in Figure 5.

Upgrade Series 2000 firmware	
Status of uploaded file	Passed
Filename	series-2000-v140.img
Release	1.40
Build date	24/04/2010
Upgrade	Cancel Upgrade

Figure 5: File has been uploaded to the modem.

- Check that the information shown is correct.

- If the data is correct click the “Upgrade” button.



Once the Upgrade has started power must be maintained to the modem to prevent corruption of the Flash memory.

- The Upgrade section of the page will now show a message as shown in Figure 6.

Upgrade Series 2000 firmware
The Series 2000 is now starting the upgrade.
The upgrade will take several minutes to complete and the modem will be offline during this time.
The modem will reboot once the upgrade is complete.

Figure 6: The Upgrade page.

- During the upgrade:
 - the top two front panel LEDs will flash alternatively Red then Green.
 - the modem will disconnect from the wireless network.
 - the modem will not respond to any network traffic.
 - the modem will re-boot when the upgrade has completed
- When the Upgrade has completed and the modem has re-booted the new firmware version can be checked in the System Information page. Figure 7 is an example of the System Information page after the upgrade has completed. Note only the Application Version is shown.

Series 2000 Information	
Model	
Serial Number	
Application Version	1.40
Bootloader Version	
Hardware Addresses	
LAN MAC	
Wireless IMEI	
Wireless IMSI	
Wireless Software Version	

Figure 7: The System Information page after the upgrade.

CYBERTEC

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