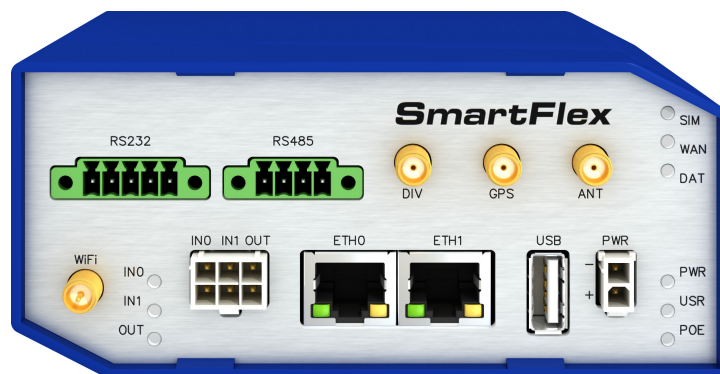


Firmware 6.1.4

RELEASE NOTES



B+B SMARTWORX

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Abstract

This document describes:

- Firmware upgrade instructions.
- Description of all new features, fixes and other changes implemented in firmware 6.1.4.
- Known issues.

For detailed information about firmware 6.1.4, see the Configuration Manual for your router.

Firmware Details

- **Version:** 6.1.4
- **Release date:** September 27, 2017
- **Hardware compatibility:** This firmware is applicable to any router made by Advantech B+B SmartWorx s.r.o.



Please note that not all new Advantech routers are produced and shipped with the latest release of the firmware. The reason usually is an existing certification made for a specific carrier or a region. For more information see document **Firmware Distribution Overview**.

Part I

Firmware Upgrade Instructions

General Upgrade Instructions and Notices

HTTPS certificates: The HTTPS certificate creation in the router was updated in FW 5.3.5 in order to improve security. Existing HTTPS certificates on previously manufactured routers will not automatically be upgraded with the firmware upgrade! It is possible to upgrade HTTPS certificates by deleting the files within /etc/certs/https* in the router (e.g. via SSH). The certificates will be re-created automatically during the router's next start.



Python user module is not uploaded by default to the produced routers with firmware of version 6.0.2 and later. To get the Python user module, please contact your local Sales Representative.



The **SPECTRE v3 LTE** and **SPECTRE v3 ERT** routers were renamed to **SmartFlex**. You will find them under this name in the Changelog below.

Specific Upgrade Instructions – new filename

If the filename of a firmware for your router was changed recently, then you can have an issue during manual firmware updating or with automatic firmware update feature. Following warning message will appear during the firmware updating process: *"You are trying to upload file "xx.bin" but "yy.bin" is expected. Are you sure to continue?"*

To proceed with the firmware updating please follow these steps: Check the table below with details of recent firmware filename changes for routers and make sure you have the correct firmware file for your router. Go ahead with manual firmware updating and confirm displayed warning message.

To proceed with automatic firmware updating, rename new firmware files (*.bin and *.ver) to filenames valid before the filename change. This should allow the router to pass through the process of automatic firmware updating. Next time, the automatic firmware update feature will work as expected and no other file renaming will be required.

Router model	FW ver.	New filename	Original filename
SmartMotion ST352 SmartMotion ST355	6.0.2	SPECTRE-v3T-LTE.bin	BIVIAS-v3LL.bin
SmartStart SL302	6.0.3	SPECTRE-v3L-LTE-US.bin	SPECTRE-v3L-LTE-AT.bin

Table 1: Recent firmware filename changes

Specific Instructions for Upgrading from Firmware Older than 5.3.0



It is necessary to follow specific upgrade instructions below only if you are upgrading from firmware older than 5.3.0.

Due to a (now fixed) bug in the firewall when a WAN device is part of a bridged interface, caution should be taken when upgrading in following case:

Condition: When a WAN device is part of a bridged interface, access to that WAN device (HTTPS, SSH) is always granted regardless of configuration.

Problem: If this is your configuration, it is highly likely that you are not aware of this, so the undesired effect of the bridge firewall fix may render the router inaccessible.

Recommended Action: Enable access to both the web and ssh services before upgrading if you want to retain the current behavior (access to the WAN interface). This can be done on the *NAT* page in the *Configuration* section of the router's Web interface.

Changing the password

It is necessary to change the password for user "root" (or enter it again) when upgrading to firmware version 5.3.0. or newer. The reason for this is an upgrade of the authentication system (encryption algorithm *crypt* was changed to *MD5*; passwords are now stored in the */etc/shadow* file instead of */etc/passwd*). Changing of the password is required before it is possible to set up remote access on the *NAT Configuration* page.

Please note that when downgrade from 5.3.0+ to previous firmware versions, the password for user *root* is reset to default ("root").

Part II

Changelog



Legend: Affected routers are marked as shown below for every changelog item:

Affected router version Router version not affected

Verizon SMS support

ER75i	UR5	UR5i	XR5i	SPECTRE 3G	SPECTRE RT	SPECTRE LTE-AT	SPECTRE LTE-VZ		
ER75i v2	UR5 v2	UR5i v2	XR5i v2	LR77 v2	CR10 v2	UR5i v2L	RR75i v2	LR77 v2L	XR5i v2E
Bivias v2HC	Bivias v2LC	Bivias v2LL	Bivias v2LH	Bivias v2HH					
SmartFlex SR300	SmartFlex SR303	SmartFlex SR305	SmartFlex SR306	SmartFlex SR307					
SmartStart SL302	SmartStart SL304	SmartMotion ST352	SmartMotion ST355						

Added support for SMS in *Verizon* cellular network. Please note that to support SMS receiving, cellular module with Verizon firmware of version higher than 20.00.012 is required.

Added 5GHz WiFi channels

ER75i	UR5	UR5i	XR5i	SPECTRE 3G	SPECTRE RT	SPECTRE LTE-AT	SPECTRE LTE-VZ		
ER75i v2	UR5 v2	UR5i v2	XR5i v2	LR77 v2	CR10 v2	UR5i v2L	RR75i v2	LR77 v2L	XR5i v2E
Bivias v2HC	Bivias v2LC	Bivias v2LL	Bivias v2LH	Bivias v2HH					
SmartFlex SR300	SmartFlex SR303	SmartFlex SR305	SmartFlex SR306	SmartFlex SR307					
SmartStart SL302	SmartStart SL304	SmartMotion ST352	SmartMotion ST355						

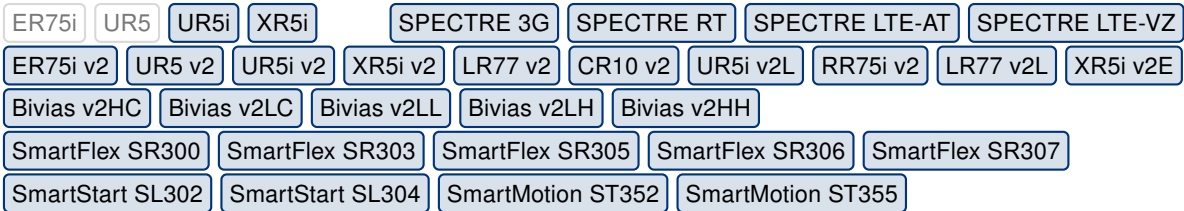
Added support for following 5GHz WiFi channels: 38, 42, 46, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136 and 140.

Window size of vi editor

ER75i	UR5	UR5i	XR5i	SPECTRE 3G	SPECTRE RT	SPECTRE LTE-AT	SPECTRE LTE-VZ		
ER75i v2	UR5 v2	UR5i v2	XR5i v2	LR77 v2	CR10 v2	UR5i v2L	RR75i v2	LR77 v2L	XR5i v2E
Bivias v2HC	Bivias v2LC	Bivias v2LL	Bivias v2LH	Bivias v2HH					
SmartFlex SR300	SmartFlex SR303	SmartFlex SR305	SmartFlex SR306	SmartFlex SR307					
SmartStart SL302	SmartStart SL304	SmartMotion ST352	SmartMotion ST355						

If the window size of the console session was changed by hand, the *vi* editor will adapt to the new window size automatically.

Added *top* program



Added *top* program to the Linux kernel. This program provides a dynamic real-time view of a running system. It can display system summary information, as well as a list of processes or threads currently being managed by the kernel.

Synopsis:

`top [-b] [-nCOUNT] [-dSECONDS]`

Options:

Option	Description
-b	Batch mode - could be useful for sending output from <i>top</i> to other programs or to a file. In this mode, <i>top</i> will not accept input and runs until the iterations limit you've set with the '-n' command-line option, or until killed.
-nCOUNT	Exit after N iterations.
-dSECONDS	Delay between updates in <i>secs</i> format.

Table 2: touch options

Keys:

Key	Description
n/m/p/t	Sort by pid/mem/cpu/time
r	Reverse sort
q, ^C	Exit

Table 3: touch keys

Examples:

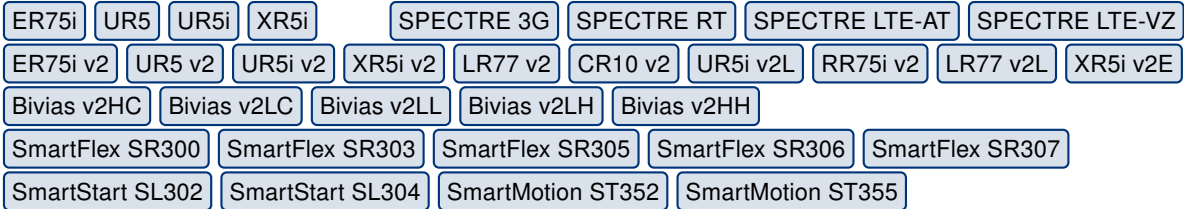
Run *top* program in batch mode and exit after 5 iterations.

```
top -b -n5
```

Run *top* program and update the output every 10 seconds. Exit by *q* key.

```
top -d10
```


Timestamp in Kernel log

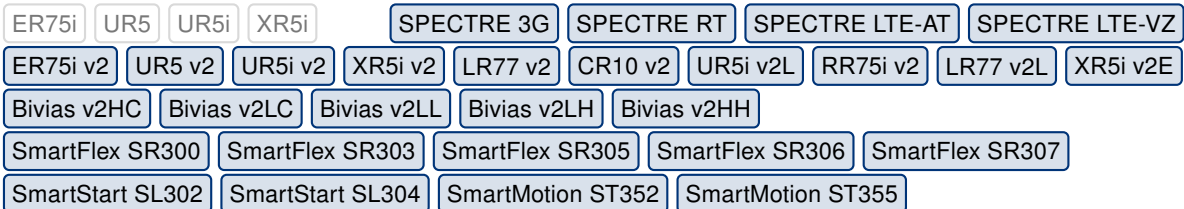


Added timestamp to Linux Kernel log messages. This log can be displayed on router’s web GUI (url is http://<router_address>/klog.cgi) or in console using *dmesg* command. *Dmesg* command has new options for the timestamp processing. In the table 4 is the list of all available options for *dmesg* command.

Option	Description
-R	Display relative time since the router booted in <i>sec.nanosec</i> format.
-T	Display human-readable timestamp in <i>YYYY-MM-DD hh:mm:ss</i> format.
-c	Read and clear all messages.

Table 4: Dmesg command options

List of User Modules in report



Added *User Modules* section to the router’s report file. This section contains list of all User Modules installed on the router including the version. Report file can be generated on *Status/System Log* status page on router’s web GUI by clicking on *Save Report* button.

Fixed DNS query filtering

ER75i	UR5	UR5i	XR5i	SPECTRE 3G	SPECTRE RT	SPECTRE LTE-AT	SPECTRE LTE-VZ		
ER75i v2	UR5 v2	UR5i v2	XR5i v2	LR77 v2	CR10 v2	UR5i v2L	RR75i v2	LR77 v2L	XR5i v2E
Bivias v2HC	Bivias v2LC	Bivias v2LL	Bivias v2LH	Bivias v2HH					
SmartFlex SR300	SmartFlex SR303	SmartFlex SR305	SmartFlex SR306	SmartFlex SR307					
SmartStart SL302	SmartStart SL304	SmartMotion ST352	SmartMotion ST355						

Fixed filtering of DNS requests that was causing issues to primitive implementations of DNS resolver.

Fixed IPsec tunnel termination

ER75i	UR5	UR5i	XR5i	SPECTRE 3G	SPECTRE RT	SPECTRE LTE-AT	SPECTRE LTE-VZ		
ER75i v2	UR5 v2	UR5i v2	XR5i v2	LR77 v2	CR10 v2	UR5i v2L	RR75i v2	LR77 v2L	XR5i v2E
Bivias v2HC	Bivias v2LC	Bivias v2LL	Bivias v2LH	Bivias v2HH					
SmartFlex SR300	SmartFlex SR303	SmartFlex SR305	SmartFlex SR306	SmartFlex SR307					
SmartStart SL302	SmartStart SL304	SmartMotion ST352	SmartMotion ST355						

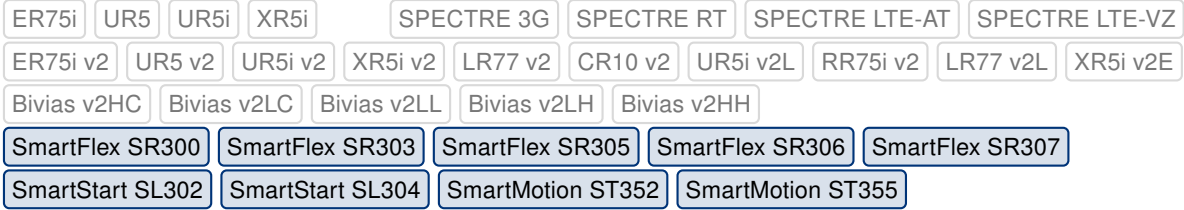
Fixed IPsec tunnel termination. This issue could cause an interruption of communication through the IPsec tunnel.

Fixed IPsec tunnel control mechanism

ER75i	UR5	UR5i	XR5i	SPECTRE 3G	SPECTRE RT	SPECTRE LTE-AT	SPECTRE LTE-VZ		
ER75i v2	UR5 v2	UR5i v2	XR5i v2	LR77 v2	CR10 v2	UR5i v2L	RR75i v2	LR77 v2L	XR5i v2E
Bivias v2HC	Bivias v2LC	Bivias v2LL	Bivias v2LH	Bivias v2HH					
SmartFlex SR300	SmartFlex SR303	SmartFlex SR305	SmartFlex SR306	SmartFlex SR307					
SmartStart SL302	SmartStart SL304	SmartMotion ST352	SmartMotion ST355						

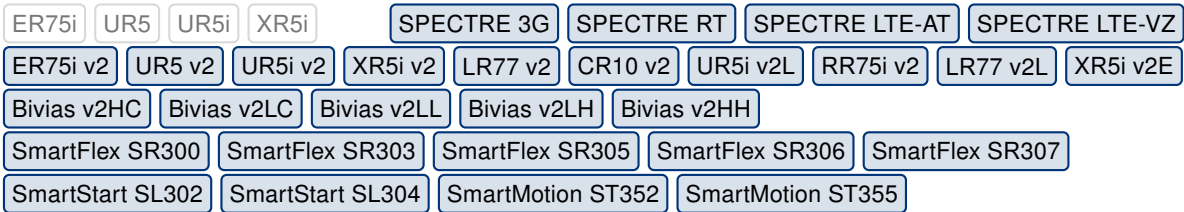
Control mechanism for IPsec connection has stopped working after a few days since the tunnel establishment. In this state the connection may be not successfully restored in case of a communication interruption.

Fixed IPsec tunnel routing



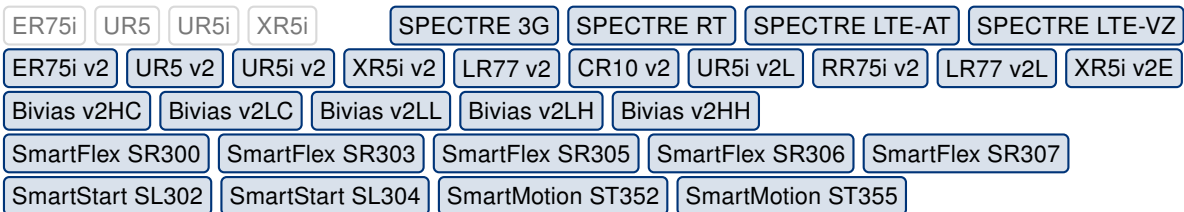
Fixed routing of mixed IPv4 and IPv6 IPsec tunnel. IPsec tunnel did not work properly if host IP mode was set to IPv4, tunnel IP mode was set to IPv6 and there was no IPv6 address configured on the WAN interface. The same issue happens for reverse configuration of IPv4 and IPv6 for host IP mode respective tunnel IP mode.

Fixed iptables records after IPsec tunnel termination



In some cases, iptable records were not cleared after IPsec tunnel was terminated (restarted). This state caused issues with SNMP communication through the IPsec tunnel.

Fixed IPsec second subnet routing



Fixed routing of second subnet through IPsec tunnel using IKEv2 protocol.

Fixed default OpenVPN configuration

ER75i	UR5	UR5i	XR5i	SPECTRE 3G	SPECTRE RT	SPECTRE LTE-AT	SPECTRE LTE-VZ		
ER75i v2	UR5 v2	UR5i v2	XR5i v2	LR77 v2	CR10 v2	UR5i v2L	RR75i v2	LR77 v2L	XR5i v2E
Bivias v2HC	Bivias v2LC	Bivias v2LL	Bivias v2LH	Bivias v2HH					
SmartFlex SR300	SmartFlex SR303	SmartFlex SR305	SmartFlex SR306	SmartFlex SR307					
SmartStart SL302	SmartStart SL304	SmartMotion ST352	SmartMotion ST355						

Fixed default OpenVPN configuration. Added *Remote IPv6 Subnet Prefix Length* parameter to the default configuration, so the parameter value will persist once the firmware is upgraded.

Fixed restart of SSH server

ER75i	UR5	UR5i	XR5i	SPECTRE 3G	SPECTRE RT	SPECTRE LTE-AT	SPECTRE LTE-VZ		
ER75i v2	UR5 v2	UR5i v2	XR5i v2	LR77 v2	CR10 v2	UR5i v2L	RR75i v2	LR77 v2L	XR5i v2E
Bivias v2HC	Bivias v2LC	Bivias v2LL	Bivias v2LH	Bivias v2HH					
SmartFlex SR300	SmartFlex SR303	SmartFlex SR305	SmartFlex SR306	SmartFlex SR307					
SmartStart SL302	SmartStart SL304	SmartMotion ST352	SmartMotion ST355						

Fixed issue when the daemon of SSH server could not be restarted from active SSH session.

Fixed a few USB driver issues

ER75i	UR5	UR5i	XR5i	SPECTRE 3G	SPECTRE RT	SPECTRE LTE-AT	SPECTRE LTE-VZ		
ER75i v2	UR5 v2	UR5i v2	XR5i v2	LR77 v2	CR10 v2	UR5i v2L	RR75i v2	LR77 v2L	XR5i v2E
Bivias v2HC	Bivias v2LC	Bivias v2LL	Bivias v2LH	Bivias v2HH					
SmartFlex SR300	SmartFlex SR303	SmartFlex SR305	SmartFlex SR306	SmartFlex SR307					
SmartStart SL302	SmartStart SL304	SmartMotion ST352	SmartMotion ST355						

Fixed a few USB driver issues by backporting fixes from Kernel 4.12.9.

Fixed EHCI driver issue

ER75i	UR5	UR5i	XR5i	SPECTRE 3G	SPECTRE RT	SPECTRE LTE-AT	SPECTRE LTE-VZ		
ER75i v2	UR5 v2	UR5i v2	XR5i v2	LR77 v2	CR10 v2	UR5i v2L	RR75i v2	LR77 v2L	XR5i v2E
Bivias v2HC	Bivias v2LC	Bivias v2LL	Bivias v2LH	Bivias v2HH					
SmartFlex SR300	SmartFlex SR303	SmartFlex SR305	SmartFlex SR306	SmartFlex SR307					
SmartStart SL302	SmartStart SL304	SmartMotion ST352	SmartMotion ST355						

Fixed EHCI driver issue that caused an unexpected reboot of the router.

Fixed mobile uptime

ER75i	UR5	UR5i	XR5i	SPECTRE 3G	SPECTRE RT	SPECTRE LTE-AT	SPECTRE LTE-VZ		
ER75i v2	UR5 v2	UR5i v2	XR5i v2	LR77 v2	CR10 v2	UR5i v2L	RR75i v2	LR77 v2L	XR5i v2E
Bivias v2HC	Bivias v2LC	Bivias v2LL	Bivias v2LH	Bivias v2HH					
SmartFlex SR300	SmartFlex SR303	SmartFlex SR305	SmartFlex SR306	SmartFlex SR307					
SmartStart SL302	SmartStart SL304	SmartMotion ST352	SmartMotion ST355						

Fixed reported uptime value of mobile connection which may be not correctly evaluated in case of low battery together with the NTP service enabled.

Fixed registration to mobile network

ER75i	UR5	UR5i	XR5i	SPECTRE 3G	SPECTRE RT	SPECTRE LTE-AT	SPECTRE LTE-VZ		
ER75i v2	UR5 v2	UR5i v2	XR5i v2	LR77 v2	CR10 v2	UR5i v2L	RR75i v2	LR77 v2L	XR5i v2E
Bivias v2HC	Bivias v2LC	Bivias v2LL	Bivias v2LH	Bivias v2HH					
SmartFlex SR300	SmartFlex SR303	SmartFlex SR305	SmartFlex SR306	SmartFlex SR307					
SmartStart SL302	SmartStart SL304	SmartMotion ST352	SmartMotion ST355						

Fixed issue with registration to mobile network in case the operator name reported by cellular module is empty for some reason.

Switching off the cellular modules

ER75i	UR5	UR5i	XR5i	SPECTRE 3G	SPECTRE RT	SPECTRE LTE-AT	SPECTRE LTE-VZ		
ER75i v2	UR5 v2	UR5i v2	XR5i v2	LR77 v2	CR10 v2	UR5i v2L	RR75i v2	LR77 v2L	XR5i v2E
Bivias v2HC	Bivias v2LC	Bivias v2LL	Bivias v2LH	Bivias v2HH					
SmartFlex SR300	SmartFlex SR303	SmartFlex SR305	SmartFlex SR306	SmartFlex SR307					
SmartStart SL302	SmartStart SL304	SmartMotion ST352	SmartMotion ST355						

Automatic switching off the *MPL200* and *ME909s* cellular modules, prior to the router’s shut-down, is now safer, extending module’s lifetime.

Fixed dial-in and dial-out switching

ER75i	UR5	UR5i	XR5i	SPECTRE 3G	SPECTRE RT	SPECTRE LTE-AT	SPECTRE LTE-VZ		
ER75i v2	UR5 v2	UR5i v2	XR5i v2	LR77 v2	CR10 v2	UR5i v2L	RR75i v2	LR77 v2L	XR5i v2E
Bivias v2HC	Bivias v2LC	Bivias v2LL	Bivias v2LH	Bivias v2HH					
SmartFlex SR300	SmartFlex SR303	SmartFlex SR305	SmartFlex SR306	SmartFlex SR307					
SmartStart SL302	SmartStart SL304	SmartMotion ST352	SmartMotion ST355						

Fixed issue when automated process of switching between dial-in and dial-out mode on mobile WAN interface got stuck. The dial-in access can be enabled and configured on mobile WAN configuration page.

OpenVPN program upgrade

ER75i	UR5	UR5i	XR5i	SPECTRE 3G	SPECTRE RT	SPECTRE LTE-AT	SPECTRE LTE-VZ		
ER75i v2	UR5 v2	UR5i v2	XR5i v2	LR77 v2	CR10 v2	UR5i v2L	RR75i v2	LR77 v2L	XR5i v2E
Bivias v2HC	Bivias v2LC	Bivias v2LL	Bivias v2LH	Bivias v2HH					
SmartFlex SR300	SmartFlex SR303	SmartFlex SR305	SmartFlex SR306	SmartFlex SR307					
SmartStart SL302	SmartStart SL304	SmartMotion ST352	SmartMotion ST355						

Upgraded *OpenVPN* program to version 2.3.18. This update has fixed [CVE-2017-12166](#).

Tcpdump program upgrade

ER75i	UR5	UR5i	XR5i	SPECTRE 3G	SPECTRE RT	SPECTRE LTE-AT	SPECTRE LTE-VZ		
ER75i v2	UR5 v2	UR5i v2	XR5i v2	LR77 v2	CR10 v2	UR5i v2L	RR75i v2	LR77 v2L	XR5i v2E
Bivias v2HC	Bivias v2LC	Bivias v2LL	Bivias v2LH	Bivias v2HH					
SmartFlex SR300	SmartFlex SR303	SmartFlex SR305	SmartFlex SR306	SmartFlex SR307					
SmartStart SL302	SmartStart SL304	SmartMotion ST352	SmartMotion ST355						

Upgraded *tcpdump* program to version 4.9.2. This update has fixed lot of CVEs, see <http://www.tcpdump.org/tcpdump-changes.txt> page for more details.

Part III

Known Issues

5 GHz band for WiFi

The first one hundred v3 routers produced (with serial number from 6200000 to 6200099) contain a WiFi chip which does not support the 5 GHz band. There is no way of detecting this, the 5 GHz ranges on these devices will simply not work and the router will not be able to detect this.

Python user module

Python user module versions earlier than 2014-11-25 have lacked SSL functionality since firmware version 5.3.4. **The Python user module needs to be upgraded** to version from 2016-05-03 or later. This user module upgrade can be done safely either before or after upgrading the firmware. The Python interpreter version 2.7.12 is included in the latest version of the user module (2016-09-30).

Warning during WiFi configuration update

During a WiFi configuration update a warning may appear in syslog. This has no other known effects other than the appearance of the warning message.

Firmware Update – unexpected filename

If the filename of a firmware for your router was changed recently, you can have an issue during manual firmware updating or with Automatic Update feature. Following warning message will appear: *"You are trying to upload file "xx.bin" but "yy.bin" is expected. Are you sure to continue?"* To fix this issue follow instructions in Part I (Firmware Upgrade Instructions) in this document.

SmartStart SL302 cellular network authentication with username and password

It is not possible to use username and password when connecting to Mobile WAN network (on *Mobile WAN Configuration* page) if your SmartStart SL302 router has the 20.00.522 firmware version inside the Telit LE910-NA1 cellular module. The version of cellular module firmware can be found at *Mobile WAN Status* page in *Mobile Network Information* section.

SmartStart SL302 – SMS in Verizon network

SmartStart SL302 router (equipped with the *Telit* modules *LE910-SV1* or *LE910-NA1*) supports sending and receiving of SMS in *Verizon* cellular network since the firmware version 6.1.4. Please note that to support SMS receiving, cellular module with Verizon firmware of version higher than 20.00.012 is required.