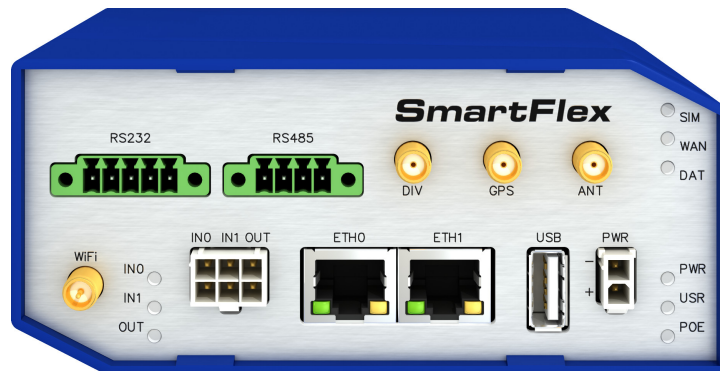


Firmware 6.1.6

RELEASE NOTES



B+B SMARTWORX

Powered by

ADVANTECH

Abstract

This document describes:

- Firmware upgrade instructions.
- Description of all new features, fixes and other changes implemented in firmware 6.1.6.
- Known issues.

For detailed information about firmware 6.1.6, see the Configuration Manual for your router.

Firmware Details

- **Version:** 6.1.6
- **Release date:** March 11, 2018
- **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

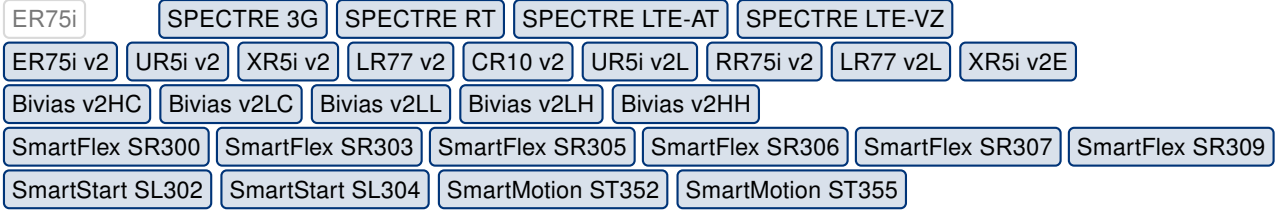
IPsec enhancements

ER75i SPECTRE 3G SPECTRE RT SPECTRE LTE-AT SPECTRE LTE-VZ
 ER75i 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 SmartFlex SR309
 SmartStart SL302 SmartStart SL304 SmartMotion ST352 SmartMotion ST355

We have made following enhancements to the *IPsec* implementation:

- support for Galois/Counter Mode (GCM),
- support for DH (Diffie Hellman) ECP Groups,
- support for XAUTH,
- support for PubKey,
- reauthentication for IKEv2 can now be disabled.

Added program *split*



Program *split* is supported by the firmware from now. This program splits a single file (INPUT) into multiple files. A custom PREFIX for the name of the output files can be specified.

Synopsis:

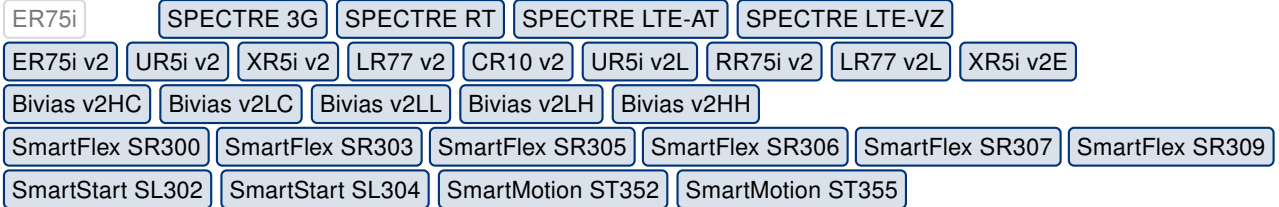
```
split [OPTIONS] [INPUT [PREFIX]]
```

Options:

| Option | Description |
|------------|--|
| -b N [k m] | Split input file by N (kilo mega)bytes. |
| -l N | Split input file by N lines (by default 1000 lines). |
| -a N | Use N letters as suffix for the name of the output files (by default 2 letters). |

Table 2: split options

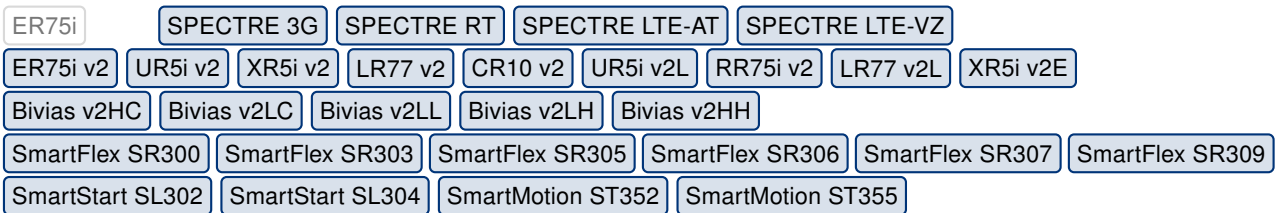
Enhanced report file



Added *Sockets* section to the router's report file. This section contains list of all opened TCP and UDP sockets.

Note: The report file can be generated on *Status/System Log* status page on router's web GUI by clicking on *Save Report* button.

User modules reports



Some user modules installed on the router can generate its own separate log files. From now, these log files can be included in the router's report file.

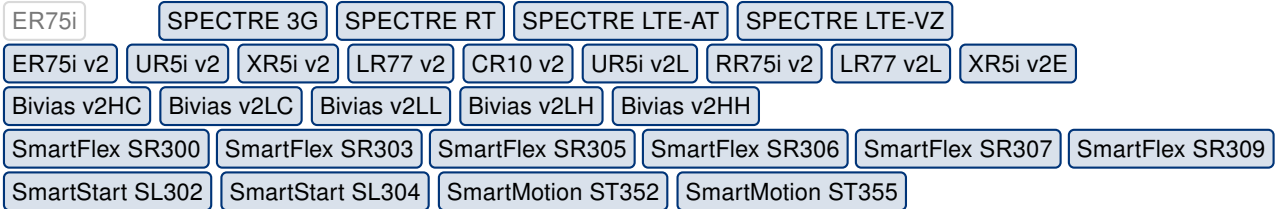
To achieve this, a dedicated script for the module has to be created. This script has to be stored at `/opt/<module_name>/etc` folder and named as *report*. The output of this script should match following format:

```
Module_name
=====

...some text...
...some text...
```

Note: The report file can be generated on router's web GUI on *Status/System Log* page by clicking on *Save Report* button.

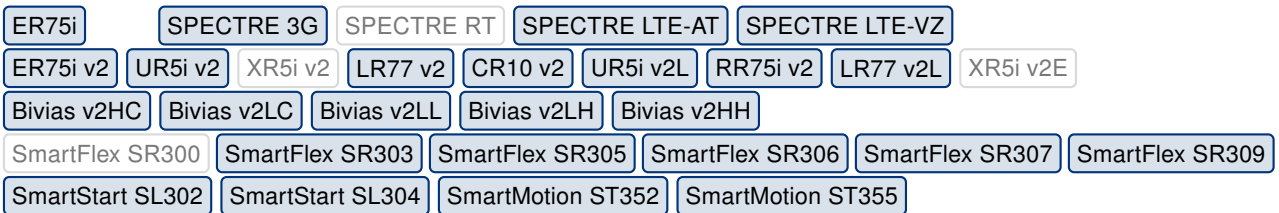
Special characters for user’s password



Extra characters can now be used when a new user is being created in router’s web GUI. These characters are as follows: “ \$ & ’ () ; < > \ ^ ‘ | "space".

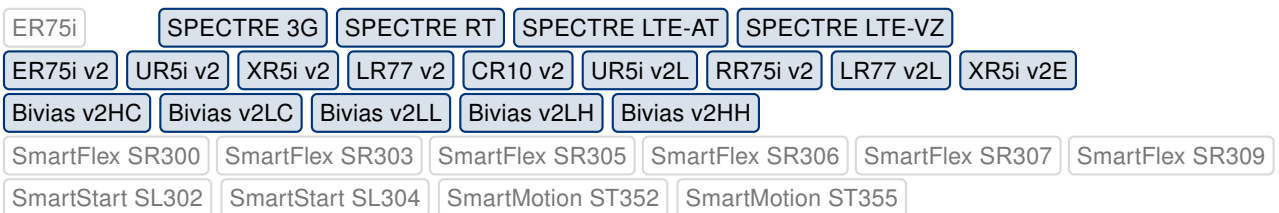
Note: Mentioned characters are forbidden to be used in any other forms on the router’s web GUI except the user’s password field. If so, they will be deleted during the data storing.

Fix of APN entry



Default APN entry for *PLMN 23201* was changed from *A1.net* to *a1.net*. The cellular module was not able to register to the cellular network using the *A1.net* entry.

Fixed watchdog settings



The timeout value for the hardware watchdog was extended. The reason for this fix was that the boot time, after the firmware upgrade, may take longer for some routers resulting into an unexpected reboot of the router invoked by the watchdog.

Improved Emergency reboot

| | | | | | | | | |
|------------------|------------------|-------------------|-------------------|-----------------|-----------------|----------|----------|----------|
| ER75i | SPECTRE 3G | SPECTRE RT | SPECTRE LTE-AT | SPECTRE LTE-VZ | | | | |
| ER75i 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 | SmartFlex SR309 | | | |
| SmartStart SL302 | SmartStart SL304 | SmartMotion ST352 | SmartMotion ST355 | | | | | |

The process of *Emergency reboot* detection was redesigned and improved. The new process reduces the usage of system resources and is able to capture more issues reported in the Kernel Log. Please note, that the *Emergency Log* in router's report is determined especially for *Advantech Support Department* to improve the customer support.

Throughput of the second Ethernet

| | | | | | | | | |
|------------------|------------------|-------------------|-------------------|-----------------|-----------------|----------|----------|----------|
| ER75i | SPECTRE 3G | SPECTRE RT | SPECTRE LTE-AT | SPECTRE LTE-VZ | | | | |
| ER75i 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 | SmartFlex SR309 | | | |
| SmartStart SL302 | SmartStart SL304 | SmartMotion ST352 | SmartMotion ST355 | | | | | |

Improved throughput of the second Ethernet (ETH1) interface by applying a patch to the Linux Kernel.

Second Ethernet issues

| | | | | | | | | |
|------------------|------------------|-------------------|-------------------|-----------------|-----------------|----------|----------|----------|
| ER75i | SPECTRE 3G | SPECTRE RT | SPECTRE LTE-AT | SPECTRE LTE-VZ | | | | |
| ER75i 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 | SmartFlex SR309 | | | |
| SmartStart SL302 | SmartStart SL304 | SmartMotion ST352 | SmartMotion ST355 | | | | | |

Fixed several issues related to the second Ethernet (ETH1) interface. These issues could cause that the communication through the second Ethernet interface got stuck after some time.

Third Ethernet issues

- ER75i SPECTRE 3G SPECTRE RT SPECTRE LTE-AT SPECTRE LTE-VZ
- ER75i 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 SmartFlex SR309
- SmartStart SL302 SmartStart SL304 SmartMotion ST352 SmartMotion ST355

Fixed several issues related to the third Ethernet (ETH2) interface. These issues could cause that the communication through the third Ethernet interface got stuck after some time.

WiFi driver issues

- ER75i SPECTRE 3G SPECTRE RT SPECTRE LTE-AT SPECTRE LTE-VZ
- ER75i 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 SmartFlex SR309
- SmartStart SL302 SmartStart SL304 SmartMotion ST352 SmartMotion ST355

Recent issues in WiFi driver were fixed. These issues could cause that the communication through the WiFi got stuck after some time.

FLASH driver issues

- ER75i SPECTRE 3G SPECTRE RT SPECTRE LTE-AT SPECTRE LTE-VZ
- ER75i 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 SmartFlex SR309
- SmartStart SL302 SmartStart SL304 SmartMotion ST352 SmartMotion ST355

In case of high router’s CPU load, especially when booting, some issues with reading or writing the FLASH may appear. These issues can result into router’s reboot. The FLASH driver was updated to avoid this behavior in the future.

Disconnecting of cellular module

| | | | | | | | | |
|------------------|------------------|-------------------|-------------------|-----------------|-----------------|----------|----------|----------|
| ER75i | SPECTRE 3G | SPECTRE RT | SPECTRE LTE-AT | SPECTRE LTE-VZ | | | | |
| ER75i 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 | SmartFlex SR309 | | | |
| SmartStart SL302 | SmartStart SL304 | SmartMotion ST352 | SmartMotion ST355 | | | | | |

There is a new bug found in the latest firmware for *Telit* cellular modules. This bug caused that the cellular module occasionally did not reply to the router's connection check query. This state will cause that the mobile connection is terminated and established again. A workaround was implemented to the router's firmware to handle this bug and to avoid the interruption of the mobile connection.

Preferred cellular technology

| | | | | | | | | |
|------------------|------------------|-------------------|-------------------|-----------------|-----------------|----------|----------|----------|
| ER75i | SPECTRE 3G | SPECTRE RT | SPECTRE LTE-AT | SPECTRE LTE-VZ | | | | |
| ER75i 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 | SmartFlex SR309 | | | |
| SmartStart SL302 | SmartStart SL304 | SmartMotion ST352 | SmartMotion ST355 | | | | | |

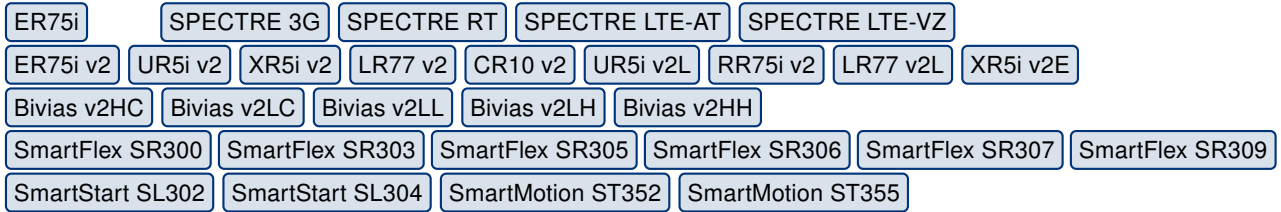
Fixed settings of preferred cellular technology for *Quectel EC25* cellular modules.

Fixed LTE connection

| | | | | | | | | |
|------------------|------------------|-------------------|-------------------|-----------------|-----------------|----------|----------|----------|
| ER75i | SPECTRE 3G | SPECTRE RT | SPECTRE LTE-AT | SPECTRE LTE-VZ | | | | |
| ER75i 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 | SmartFlex SR309 | | | |
| SmartStart SL302 | SmartStart SL304 | SmartMotion ST352 | SmartMotion ST355 | | | | | |

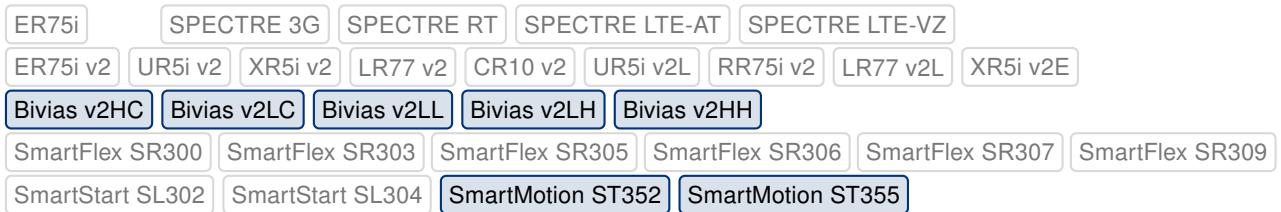
Fixed issues with connecting to the LTE cellular networks, which may not be established under certain conditions. These issues were introduced in firmware version 6.1.5 as a side effect of workaround for bug in the latest firmware for *Telit* modules that caused issue with switching between two SIM cards. An alternative workaround for this bug in *Telit* modules has been applied.

Incorrect MAC address for VRRP



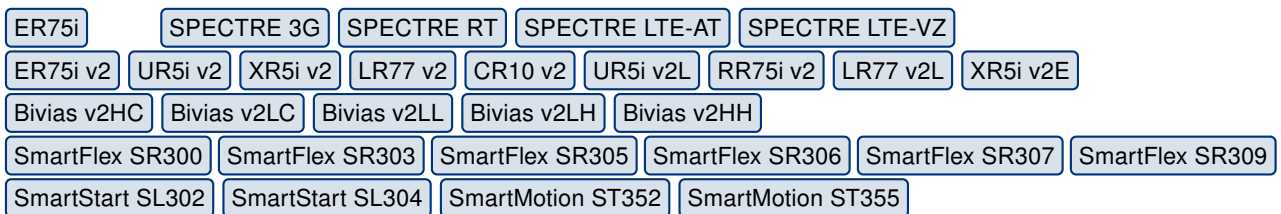
Fixed an issue when incorrect MAC address was reported by SNMP in case the VRRP is enabled on the router.

Default gateway switching



Fixed switching of the default gateway address in case both cellular modules are enabled and *Backup Routes* mode is configured to *Multiple WAN*.

Fixed static routes



Fixed an issue when no static route was created for PPPoE interface or for bridged Ethernet interfaces. Static routes can be configured on the *Configuration/Static Routes* page on router's web GUI.

Fixed logout from web interface

| | | | | | | | | |
|------------------|------------------|-------------------|-------------------|-----------------|-----------------|----------|----------|----------|
| ER75i | SPECTRE 3G | SPECTRE RT | SPECTRE LTE-AT | SPECTRE LTE-VZ | | | | |
| ER75i 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 | SmartFlex SR309 | | | |
| SmartStart SL302 | SmartStart SL304 | SmartMotion ST352 | SmartMotion ST355 | | | | | |

Fixed an issue when the HTTP session of the web interface was not closed after the session timeout has expired.

Note: HTTP session timeout can be configured in *Session Timeout* field on *Configuration -> Services -> HTTP* configuration page on router's web GUI.

Fixed CVE-2017-18017 in Linux Kernel

| | | | | | | | | |
|------------------|------------------|-------------------|-------------------|-----------------|-----------------|----------|----------|----------|
| ER75i | SPECTRE 3G | SPECTRE RT | SPECTRE LTE-AT | SPECTRE LTE-VZ | | | | |
| ER75i 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 | SmartFlex SR309 | | | |
| SmartStart SL302 | SmartStart SL304 | SmartMotion ST352 | SmartMotion ST355 | | | | | |

Fixed [CVE-2017-18017](#) in Linux Kernel. This vulnerability allows remote attackers to cause a denial of service (use-after-free and memory corruption) or possibly have unspecified other impact by leveraging the presence of `xt_TCPMSS` in an iptables action.

Upgrade of program *curl*

| | | | | | | | | |
|------------------|------------------|-------------------|-------------------|-----------------|-----------------|----------|----------|----------|
| ER75i | SPECTRE 3G | SPECTRE RT | SPECTRE LTE-AT | SPECTRE LTE-VZ | | | | |
| ER75i 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 | SmartFlex SR309 | | | |
| SmartStart SL302 | SmartStart SL304 | SmartMotion ST352 | SmartMotion ST355 | | | | | |

Upgraded program *curl* to version 7.58.0. This update has fixed [CVE-2018-100005](#) and [CVE-2018-100007](#).

Upgrade of program *dhcp-isc*

| | | | | | | | | |
|------------------|------------------|-------------------|-------------------|-----------------|-----------------|----------|----------|----------|
| ER75i | SPECTRE 3G | SPECTRE RT | SPECTRE LTE-AT | SPECTRE LTE-VZ | | | | |
| ER75i 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 | SmartFlex SR309 | | | |
| SmartStart SL302 | SmartStart SL304 | SmartMotion ST352 | SmartMotion ST355 | | | | | |

Upgraded program *dhcp-isc* to version 4.1-ESV-R15-P1. This update has fixed [CVE-2018-5732](#) and [CVE-2018-5733](#).

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 – cellular network registration

It is necessary to use router's firmware of version 6.1.5 or higher if the *Telit* cellular module installed in your SmartStart router has following version the firmware:

- *Telit LE910-EU V2* cellular module with firmware version 20.00.403 or newer,
- *Telit LE910-NA1* cellular module with firmware version 20.00.014 or newer.

Note: The model name and firmware version of the cellular module can be found on router's web GUI at *Mobile WAN Status* page in *Mobile Network Information* section.

SmartStart SL302 – -cellular network authentication

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.