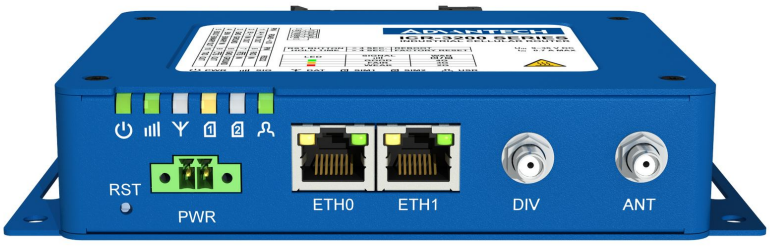
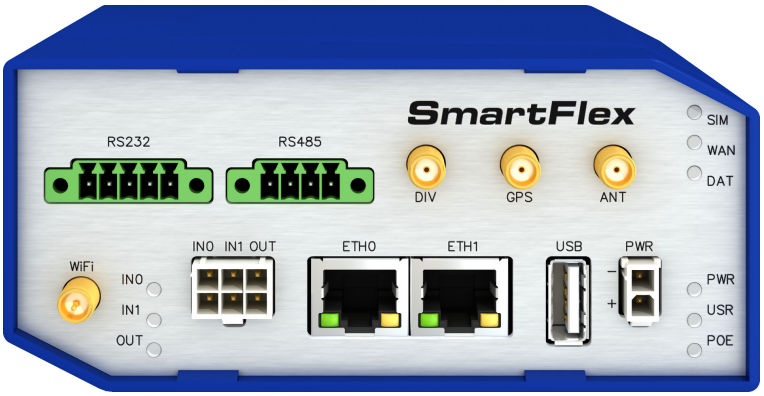
Firmware 6.1.10

RELEASE NOTES





Abstract

This document describes:

- Firmware upgrade instructions.
- Description of all new features, fixes and other changes implemented in the firmware.
- Known issues related to a firmware version.

Firmware Details

- **Firmware version**: 6.1.10
- **Release date**: July 2, 2019
- **Hardware compatibility**: This firmware is applicable to routers made by Advantech company.

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

For actual and detailed information about the router configuration see the latest version of the *Configuration Manual* document.

Product related documents and applications including the firmware can be obtained on *Engineering Portal* at `https://ep.advantech-bb.cz/` address.

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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.

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

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 products are marked as shown below for every changelog item:

Affected product | Not affected product

Protection against Brute Force Attacks

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 SR304 SmartFlex SR305 SmartFlex SR306 SmartFlex SR307
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Implemented a protection mechanism that will block any HTTP(S) access from an IP address for one minute after three unsuccessful login attempts.

Filtering out of Sensitive Data

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 SR304 SmartFlex SR305 SmartFlex SR306 SmartFlex SR307
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Sensitive data from the report are now filtered out for security reasons.

Note #1: The report can be generated in the GUI on *Status -> System Log* page by *Save Report* button.

Note #2: The report can be generated by the `report` command from the command line as well.

Dynamic Execution Time for Automatic Update

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
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To reduce HTTP/FTP server peak load during the automatic update the configuration of this feature was enhanced. The updated feature also allows updating the firmware and the configuration file on the same day which was not possible before (in case the explicit time was set). There are two fields to configure this feature, *Update Window Start* and *Update Window Length*, see the table below for the description.

Item	Description
Update Window Start	Choose an hour (range from 1 to 24) when the automatic update will be performed on a daily basis. If the time is not specified (set to *dynamic*), the automatic update is performed five minutes after router boots up and then regularly every 24 hours.
Update Window Length	This value defines the period within the update will be done. This period starts at the time set in the *Update Window Start* field. The exact time, when the update will be done, is generated randomly.

Table 2: Automatic Update Configuration

Note: The automatic update feature is also executed five minutes after the firmware upgrade, regardless of the scheduled time.

Support for Encrypted Configuration Handling

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
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Added support for encrypted backup and restoration of the router's configuration. There are new *Encryption Password* and *Decryption Password* entry fields in the GUI for the encryption and decryption password. In case the password is not provided, the configuration will be stored into an unencrypted file.

Note: The feature of automatic configuration update now supports the decryption of an encrypted configuration file as well.

Dropping of SYN Packets with Suspicious MSS Value

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
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Added dropping of SYN packets with suspicious MSS value. This fix was made due to the CVE-2019-11477, CVE-2019-11478 and CVE-2019-11479 vulnerabilities and protects the router itself and all Linux based devices behind the router.

Note: For more details see the *Multiple TCP-based remote denial of service vulnerabilities* advisory.

Compatibility Check for Uploaded User Modules

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
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Prior to the planned launch of the v4 platform routers, the feature of user module compatibility check was enhanced. At the time of a user module uploading, the compatibility validation is performed. The module installation will be refused if the module is not compatible with the router's platform. The user module compatibility matrix for routers of product line v2, v3 and v4 is shown in the table below.

UM File Name	v2	v3	v4
module_name.**v2**.tgz	✓	✓	✗
module_name.**v3**.tgz	✗	✓	✗
module_name.**v4**.tgz	✗	✗	✓

Table 3: UM compatibility check matrix

Enabled OpenVPN Management 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
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Support for the *OpenVPN Management Interface* was added to the firmware. This feature allows OpenVPN to be administratively controlled from an external program via a TCP or Unix domain socket. To enable this feature, enter `--management` parameter into the *Extra Options* field when configuring the OpenVPN tunnel in the GUI.

Note: For more information about the *OpenVPN Management Interface* see this link.

Fixed Getting Mobile Network Registration Status

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 SR304** SmartFlex SR305 **SmartFlex SR306** **SmartFlex SR307**
SmartFlex SR308 **SmartFlex SR309** SmartStart SL302 SmartStart SL304 SmartStart SL306
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An occasional issue with getting the GPRS network registration status was fixed. This issue was observed during cellular technology switching.

Fixed Setting Preferred 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 SR304** **SmartFlex SR305** **SmartFlex SR306** **SmartFlex SR307**
SmartFlex SR308 **SmartFlex SR309** **SmartStart SL302** **SmartStart SL304** **SmartStart SL306**
SmartMotion ST352 **SmartMotion ST355** **ICR-321x** **ICR-323x** **ICR-324x** **ICR-383x**

Settings of preferred technology and PDP context were slightly modified to improve connectivity to LTE cellular networks.

Reading out Technology from PLS8 Modules

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 SR304** SmartFlex SR305 **SmartFlex SR306** **SmartFlex SR307**
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Fixed issue with reading out of cellular technology from the first revision of PLS8 cellular modules. Under certain conditions, the cellular technology reported by the module was incorrect.

Fixed Sending and Receiving SMS from EC25-AF Modules

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
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SmartFlex SR308 SmartFlex SR309 SmartStart SL302 SmartStart SL304 SmartStart SL306
SmartMotion ST352 SmartMotion ST355 ICR-321x ICR-323x ICR-324x ICR-383x

Fixed bug in firmware 6.1.9 which may cause that SMS is encoded or decoded incorrectly.

Fixed Activation of ODIS/DHIR in EC25-AF Modules

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 SR304 SmartFlex SR305 SmartFlex SR306 SmartFlex SR307
SmartFlex SR308 SmartFlex SR309 SmartStart SL302 SmartStart SL304 SmartStart SL306
SmartMotion ST352 SmartMotion ST355 ICR-321x ICR-323x ICR-324x ICR-383x

Fixed issue with the activation of ODIS/DHIR on EC25-AF cellular modules.

Fixed Route Selection in Multi-WAN Mode

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 SR304 SmartFlex SR305 SmartFlex SR306 SmartFlex SR307
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Wrong default route could be chosen by IPSec daemon if the *Multiple WANs* mode in *Backup Routes* has been selected. This issue was fixed by adding a metric to all auxiliary routes.

Fixed CVEs 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 SR304 SmartFlex SR305 SmartFlex SR306 SmartFlex SR307
SmartFlex SR308 SmartFlex SR309 SmartStart SL302 SmartStart SL304 SmartStart SL306
SmartMotion ST352 SmartMotion ST355 ICR-321x ICR-323x ICR-324x ICR-383x

This update has fixed CVE-2019-11477 and CVE-2019-11478 in Linux kernel.

Note: For more details see the *Multiple TCP-based remote denial of service vulnerabilities* advisory.

Part III

Known Issues

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.

Automatic Update – Update to Version 6.1.10

The feature of automatic firmware update will not recognize the firmware of version 6.1.10 as a new version if the installed version of firmware is from 6.1.0 till 6.1.8. To fix this issue, either update the firmware by the automatic update to version 6.1.9 first or update it manually directly to the version 6.1.10.

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.