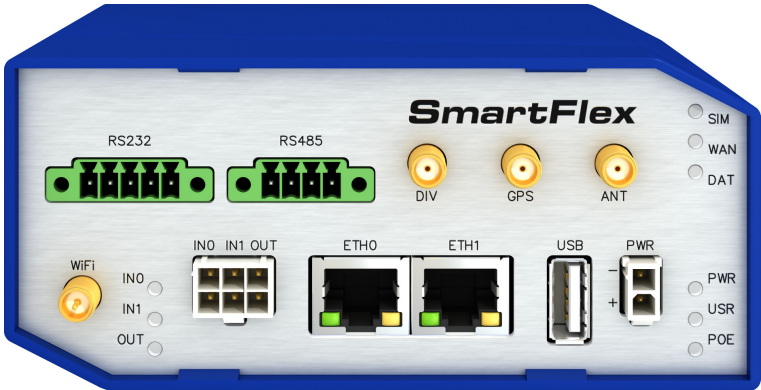
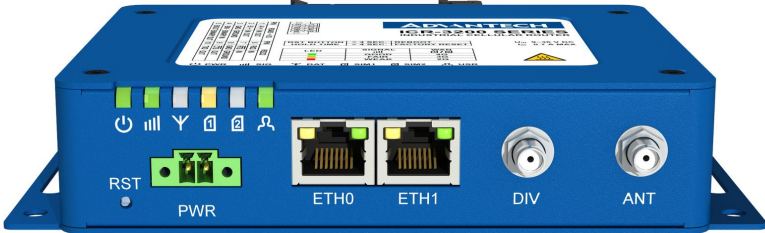




# Firmware 6.2.2

## RELEASE NOTES



# Abstract

This document describes:

- Firmware update 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:** 6.2.2
- **Release date:** December 16, 2019
- **Hardware compatibility:** This firmware is applicable to the 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 current and detailed information about the router configuration see the latest version of the *Configuration Manual* for your router.

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

## **Part I**

# **Firmware Update Instructions**

## General Update Instructions and Notices

**HTTPS certificates:** The HTTPS certificate format in the router was updated in FW 5.3.5 to improve the security. Existing HTTPS certificates on previously manufactured routers will not automatically be updated with the firmware update! It is possible to update the 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 Update Instructions

**New filename:** If the filename of firmware for your router was changed, you will meet with an issue during manual firmware updating or with automatic firmware update feature. This 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 for details about recent firmware filename changes and make sure you have the correct firmware file for your router. Go ahead with manual firmware updating and confirm the 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 with no need to rename the file.

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

## Updating Firmware of Version Less than 5.3.0



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

**Due to a bug in the firewall (now fixed) when a WAN device is part of a bridged interface, caution should be taken when updating 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 updating 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.

### Change the root's password:

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

Please note that when downgrading from 5.3.0+ to previous firmware versions, the password for the *root* user is reset to the default one, which is *root*.

**Part II**  
**Changelog**



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

Affected product    Not affected product

## Added SNMP Programs

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

Added *snmpget* and *snmpset* programs, coming from the *Net-SNMP* package. Program *snmpget* is an SNMP application that uses the SNMP GET request to query for information on a network entity. Program *snmpset* is an SNMP application that uses the SNMP SET request to set information on a network entity. For more information about these commands, see help in the console or at <http://www.net-snmp.org/>.

## TACACS+ Authentication Support

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

Added support for TACACS+ authentication protocol. For more information see <https://tools.ietf.org/id/draft-ietf-opsawg-tacacs-13.html>.

### Improved RADIUS/TACACS+ Authentication

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			

Added taking over a server user during the RADIUS/TACACS+ authentication. A new user account is created when the RADIUS/TACACS authentication has passed and no corresponding local user account exists. A user account created this way cannot be used for authentication to the router without the RADIUS/TACACS server.

### APN for AT&T

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			

The default APN for the AT&T SIM cards was changed to the "broadband" string.

### APN for FirstNet

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			

The default APN for the FirstNet SIM cards was changed to the "firstnet-broadband" string.



## Updated Status Command

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			

The dealing with units for the amount of transferred data reported by the *status* command was changed. By now, the units were rendered dynamically (in KB, MB, etc.) only. From now, the verbose (-v) option displays the units just in bytes, which allows getting the exact value.

## Increased Pending TCP Connections

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			

The maximal number of pending TCP connections in the HTTP server was increased. This update has fixed the bogus SYN flooding detection that was recognized in the new kernel version.

## Disabled LCP Echo Requests

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			

Disabled sending of LCP echo requests to the CDMA modules. It reduced the workload for the cellular module.

### Support for Vertex Wireless 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 support for *Vertex Wireless VWM10* modules running in the new kernel version.

### Support for Cellient 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			

We have made a few fixes for the *Cellient MPN100* and *MPN200* cellular modules to speed up establishing a connection after reboot or after a connection failure.

### Support for Texas Instrument 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 support for *Texas Instrument WL1807* modules running in the multi-role mode which was introduced in the firmware version 6.2.0.

### Fixed Ethernet Status Detection

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 detection of link status in Ethernet driver which may cause the interface to fall down. This issue was recognized in the firmware version 6.2.0.

### Fixed Memory Access

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			

We have fixed issues noticed in very rare events when executing various programs. This issue was recognized in the firmware version 6.2.0.

### Fixed IPsec Routing

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 routing of packets over the IPsec tunnel. It did not work properly in case the remote subnet overlaps the local subnet and when the local subnet was not on the *eth0* interface. This issue was recognized in the firmware version 6.1.0 when the *Openswan* implementation was replaced by the *strongSwan*.

### Fixed L2TP Establishing

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			

We have fixed an issue establishing an L2TP connection. This issue could appear when a client establishes a connection with a significantly slower server side.

### Fixed hostapd Program

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-2019-16275](#) in the *hostapd* program. More information about *hostapd* can be found at <http://w1.fi/hostapd/>.

### Updated curl Program

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			

The *curl* program was updated to version 7.67.0. This update has fixed [CVE-2019-5481](#) and [CVE-2019-5482](#). For more details about this *curl* release, see [https://curl.haxx.se/changes.html#7\\_67\\_0](https://curl.haxx.se/changes.html#7_67_0).

**Part III**  
**Known Issues**

## Firmware Update – Unexpected Filename

If the filename of firmware for your router was changed, you could have an issue during manual firmware updating or with Automatic Update feature. This 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 Update Instructions](#).

## Automatic Update – Update to Version 6.1.10

The feature of automatic firmware update will not recognize the firmware version 6.1.10 as a new version in case the installed version of firmware is from 6.1.0 to 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.

## WiFi Configuration – Lost After Firmware Downgrade

If the firmware is downgraded to the version less than 6.2.0, the WiFi configuration will be lost completely.

## ICR-3200 – Country Code for WiFi

The first version of the firmware for the WiFi module does not support the settings of the country code. Due to this issue, the settings of the country code made on the configuration page has no effect at all. The country code is set up during the manufacturing process according to the product destination region.

## SmartStart – Cellular Network Registration

It is necessary to use router's firmware version 6.1.5 or higher if the *Telit* cellular module installed in your SmartStart router has following version of 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 version higher than 20.00.012 is required.