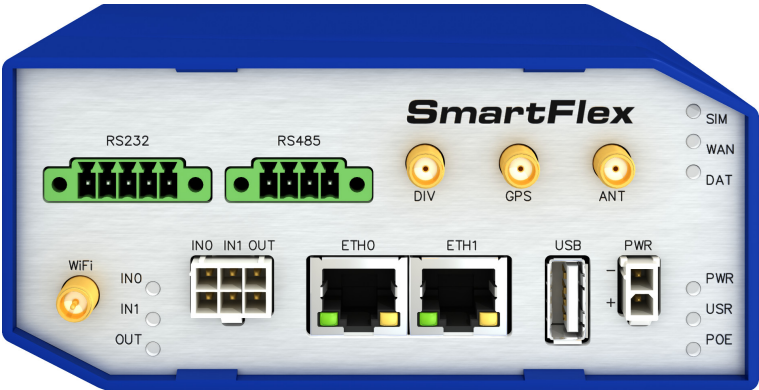
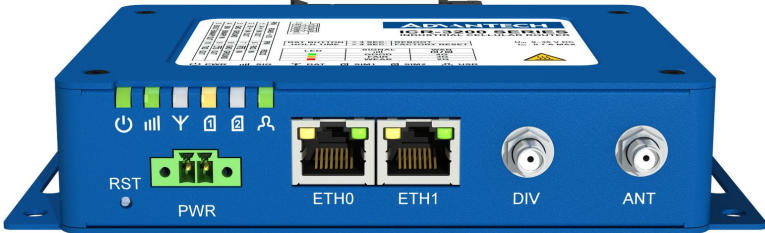




Firmware 6.2.1

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:** 6.2.1
- **Release date:** October 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 of 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 Support of Inotify

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 kernel *inotify* to enable monitoring of the filesystem events. This feature can be used by a user module or by another application eventually.

Enhanced Traffic Counters

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 the enhanced traffic counters in the new Linux kernel. The size of counters was increased to 64 bits. These counters are used for the storage of transferred resp. received bytes or packets.

Fixed MWAN Data Counting

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			

Counting of data transferred over the mobile connection was fixed. The new Linux kernel has increased the size of data counters to 64 bits. This fact caused the data counting stopped working when the 4 GB limit was reached. It could cause issues with the MWAN statistics and MWAN data limit evaluation in case the data limit has been set up to 4 GB or more.

Fixed PPTP Crash

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			

An issue, when PPTP client was terminated unexpectedly, was fixed. This issue was observed in the firmware of version 6.2.0.

Fixed FTP/PPTP 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 an issue with access to the FTP or PPTP server running behind NAT. This issue was observed in the firmware of version 6.2.0 in case the firewall filtering was enabled.

Fixed RS485 Direction Control

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 with the direction control for RS485. This issue caused the interrupted transmission for data less than 8 bytes. This issue was observed on affected routers with the firmware of version 6.2.0.

Fixed RS485 Direction Control

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 RS485 direction control was fixed. This issue may cause the received data on the RS485 interface were lost or corrupted. This issue was observed on affected routers with the firmware of version 6.2.0.

Fixed Setting of Ethernet PHY

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 the setting of the Ethernet Physical Layer (PHY). Due to the incorrect settings, the Gigabit Ethernet was allowed for the auto-negotiation feature. This issue was observed in the firmware of version 6.2.0.

Fixed WiFi Crash

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			

Crash of the Linux kernel, which could happen during the WiFi restart, was fixed.

Fixed List of Supported WiFi Channels

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			

Unsupported channels of 5 GHz WiFi band were removed from the list in the GUI. Channels 38, 42 and 46 were removed.

Fixed AT Command Parsing

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 parsing of response to an AT command coming from the cellular module. The issue was related to the response containing the binary zero character.

Fixed Bootloader Processing

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			

U-Boot environment, which is stored in NOR FLASH, keeps information about SN, MAC and the pointer from which image the router should boot up. *U-Boot* environment may get into an inconsistent state if the process of it's updating was interrupted. In this state, the *fwupdate* program will crash when processing the data from the *U-Boot* environment. We have fixed this issue and implemented process for recovery of *U-Boot* environment from a backup.

Fixed Execution of 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			

An execution issue for programs was fixed. For very rare events, the execution of various programs has failed with the "Command xxx failed" message. This issue was observed in the firmware of version 6.2.0.

WiFi Firmware Upgrade

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 firmware of the WiFi module was updated to the version 8.9.0.0.79. There is a small fix addressing some valid packets that were mistakenly detected as KRA (key replay attack) and dropped by the firmware.

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-2019-17133](#) and [CVE-2019-16746](#) in Linux kernel.

Updated *OpenSSL* Library

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			

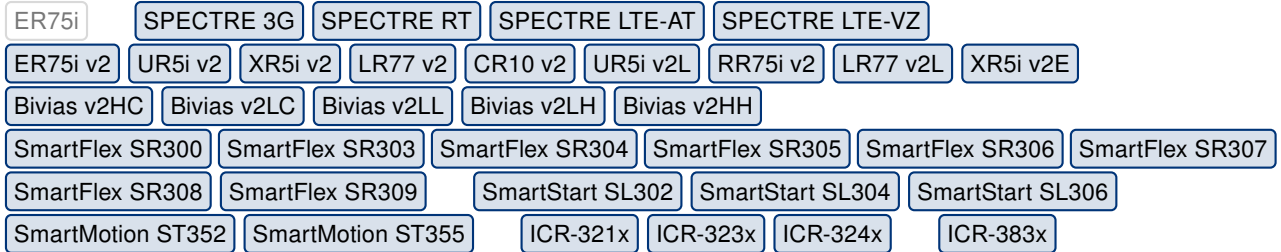
OpenSSL library was updated to version 1.0.2t. This update has fixed [CVE-2019-1547](#) and [CVE-2019-1563](#).

Updated *libpcap* Library

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			

libpcap library was updated to version 1.9.1. This update has fixed [CVE-2018-16301](#), [CVE-2019-15161](#), [CVE-2019-15162](#), [CVE-2019-15163](#), [CVE-2019-15164](#) and [CVE-2019-15165](#).

Updated *tcdump* Program



tcdump program was updated to version 4.9.3. This update has fixed [CVE-2017-16808](#), [CVE-2018-10103](#), [CVE-2018-10105](#), [CVE-2018-14461](#), [CVE-2018-14462](#), [CVE-2018-14463](#), [CVE-2018-14464](#), [CVE-2018-14465](#), [CVE-2018-14466](#), [CVE-2018-14467](#), [CVE-2018-14468](#), [CVE-2018-14469](#), [CVE-2018-14470](#), [CVE-2018-14879](#), [CVE-2018-14880](#), [CVE-2018-14881](#), [CVE-2018-14882](#), [CVE-2018-16227](#), [CVE-2018-16228](#), [CVE-2018-16229](#), [CVE-2018-16230](#), [CVE-2018-16300](#), [CVE-2018-16301](#), [CVE-2018-16451](#), [CVE-2018-16452](#), [CVE-2019-15166](#) and [CVE-2019-15167](#).

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 of 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 of 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 of version higher than 20.00.012 is required.