Manuals+ — User Manuals Simplified.

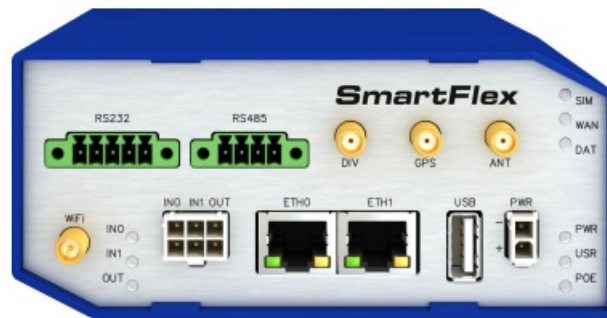# ADVANTECH ICR-OS Firmware 6.3.6 Cellular Router Instruction Manual

Contents

ADVANTECH ICR-OS Firmware 6.3.6 Cellular Router

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: 6.3.6
- Release date: June 16, 2022
    - ompatibility: Advantech routers; see the Firmware Distribution Overview

Please note that not all new Advantech routers are produced and shipped with the latest re-lease 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 icr.advantech.cz address. Advantech Czech s.r.o., Sokolska 71, 562 04 Usti nad Orlici, Czech Republic
This document was issued on June 17, 2022

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 firmware filename for your router was changed, as listed in Table 1, you will get an issue during the manual or automatic firmware update. The following warning message will appear: You are trying to upload file "xx.bin" but "yy.bin" is expected. Are you sure to continue?
To go ahead with the manual firmware update, check the table below for details about recent firmware filename changes and make sure you have the correct firmware file for your router. Now, you can confirm the displayed warning message.
To go ahead with the automatic firmware update, rename the new firmware file (*.bin and *.ver) to the filename valid before the filename change. This should allow the router to pass through the process of automatic firmware update. 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

Updating Firmware Version Earlier 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 the 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 con-figuration.
- 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 make the router inaccessible.
- Recommended Action:

  Enable access to both, the web and ssh services, before updating if you want to keep the current behavior

  (access to the WAN in-terface). 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 of 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 file). 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 an earlier firmware version, the password of the root user is reset to the default one, which is root.

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

IPsec Asymmetric PSK

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 | SmartFlex SR310 | SmartStart SL302 | SmartStart SL304 | SmartStart SL305
SmartStart SL306 | SmartMotion ST352 | SmartMotion ST355 | ICR-320x | ICR-321x | ICR-323x | ICR-324x
ICR-203x | ICR-243x | ICR-253x | ICR-383x | ICR-443x | ICR-445x

Asymmetric PSK for IPsec configuration is supported now. It allows establishing an IKEv2 VPN with an asymmetric Pre-Share key between two routers. It can be used when establishing the IPSec tunnel to a CISCO router. On an Advantech router, set the IPsec Authenticate Mode to the pre-shared key, IKE Protocol to IKEv2, and set up the Pre-shared Key together with the Remote Pre-shared key. For more information, see the IPsec Tunnel application note and Configuration Manual of your router.

New tables Extension

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 | SmartFlex SR310 | SmartStart SL302 | SmartStart SL304 | SmartStart SL305
SmartStart SL306 | SmartMotion ST352 | SmartMotion ST355 | ICR-320x | ICR-321x | ICR-323x | ICR-324x
ICR-203x | ICR-243x | ICR-253x | ICR-383x | ICR-443x | ICR-445x

The u32 match extension is now supported by the iptables. This module allows the matching of arbitrary bytes in a packet. Visit the u32 tutorial page for a detailed description of this match extension.

Improved DHCP Server Status

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 | SmartFlex SR310 | SmartStart SL302 | SmartStart SL304 | SmartStart SL305
SmartStart SL306 | SmartMotion ST352 | SmartMotion ST355 | ICR-320x | ICR-321x | ICR-323x | ICR-324x
ICR-203x | ICR-243x | ICR-253x | ICR-383x | ICR-443x | ICR-445x

The DHCP server status reported in the GUI was redesigned to make it more transparent. The basic information about DHCP leases is now displayed in a table with a few columns.

Fixed Cellular Connection

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 | SmartFlex SR310 | SmartStart SL302 | SmartStart SL304 | SmartStart SL305
SmartStart SL306 | SmartMotion ST352 | SmartMotion ST355 | ICR-320x | ICR-321x | ICR-323x | ICR-324x
ICR-203x | ICR-243x | ICR-253x | ICR-383x | **ICR-443x** | **ICR-445x**

We have fixed an issue when connecting to an IPv4-only cellular network.

Fixed ICMPv6 Ping over PPPoE

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** | **SmartFlex SR310** | **SmartStart SL302** | **SmartStart SL304** | **SmartStart SL305**
SmartStart SL306 | **SmartMotion ST352** | **SmartMotion ST355** | **ICR-320x** | **ICR-321x** | **ICR-323x** | **ICR-324x**
ICR-203x | **ICR-243x** | **ICR-253x** | **ICR-383x** | **ICR-443x** | **ICR-445x**

We have fixed sending of ICMPv6 ping over the PPPoE interface. This issue may cause an IPv6 route to be missing in the routing table.

Resolved WiFi Freezing

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 | SmartFlex SR310 | SmartStart SL302 | SmartStart SL304 | SmartStart SL305
SmartStart SL306 | SmartMotion ST352 | SmartMotion ST355 | **ICR-320x** | **ICR-321x** | **ICR-323x** | **ICR-324x**
ICR-203x | ICR-243x | ICR-253x | ICR-383x | ICR-443x | ICR-445x

We have fixed occasional WiFi module freezing during the AP network searching.

Fix for ip Program

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** | **SmartFlex SR310** | **SmartStart SL302** | **SmartStart SL304** | **SmartStart SL305**
SmartStart SL306 | **SmartMotion ST352** | **SmartMotion ST355** | **ICR-320x** | **ICR-321x** | **ICR-323x** | **ICR-324x**
ICR-203x | **ICR-243x** | **ICR-253x** | **ICR-383x** | **ICR-443x** | **ICR-445x**

We have fixed the VLAN/VRF ID listing by ip program. This issue caused an incorrectVLAN/VRF ID to be printed by the program.

Fixed WireGuard Report

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** | **SmartFlex SR310** | **SmartStart SL302** | **SmartStart SL304** | **SmartStart SL305**
SmartStart SL306 | **SmartMotion ST352** | **SmartMotion ST355** | **ICR-320x** | **ICR-321x** | **ICR-323x** | **ICR-324x**
ICR-203x | **ICR-243x** | **ICR-253x** | **ICR-383x** | **ICR-443x** | **ICR-445x**

We have fixed the issue with reporting the WireGuard service status in the report file.

Fixed Node-RED Login

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** | **SmartFlex SR310** | **SmartStart SL302** | **SmartStart SL304** | **SmartStart SL305**
SmartStart SL306 | **SmartMotion ST352** | **SmartMotion ST355** | **ICR-320x** | **ICR-321x** | **ICR-323x** | **ICR-324x**
ICR-203x | ICR-243x | ICR-253x | **ICR-383x** | **ICR-443x** | **ICR-445x**

We have fixed an issue with the Node-RED login observed in the firmware version 6.3.5.

Fixed XHCI Issue

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 | SmartFlex SR310 | SmartStart SL302 | SmartStart SL304 | SmartStart SL305
SmartStart SL306 | SmartMotion ST352 | SmartMotion ST355 | ICR-320x | ICR-321x | ICR-323x | ICR-324x
ICR-203x | ICR-243x | ICR-253x | ICR-383x | **ICR-443x** | **ICR-445x**

We have fixed an xHCI (eXtensible Host Controller Interface) issue that may have caused the router to reboot.

Fixed MAC Resolving

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** | **SmartFlex SR310** | **SmartStart SL302** | **SmartStart SL304** | **SmartStart SL305**
SmartStart SL306 | **SmartMotion ST352** | **SmartMotion ST355** | **ICR-320x** | **ICR-321x** | **ICR-323x** | **ICR-324x**
ICR-203x | **ICR-243x** | **ICR-253x** | **ICR-383x** | **ICR-443x** | **ICR-445x**

We had resolved a bug in the IPv6 MAC address resolving function that occurred when many addresses were logged.

Updated OpenSSL Library

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 | SmartFlex SR310 | SmartStart SL302 | SmartStart SL304 | SmartStart SL305
SmartStart SL306 | SmartMotion ST352 | SmartMotion ST355 | ICR-320x | ICR-321x | ICR-323x | ICR-324x
ICR-203x | ICR-243x | ICR-253x | ICR-383x | ICR-443x | ICR-445x

We have updated the OpenSSL library to version 1.1.1o. This update has fixed **CVE-2022-1292** (critical). For more details about changes, see the OpenSSL Changes webpage.

Updated strongSwan Software

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 | SmartFlex SR310 | SmartStart SL302 | SmartStart SL304 | SmartStart SL305
SmartStart SL306 | SmartMotion ST352 | SmartMotion ST355 | ICR-320x | ICR-321x | ICR-323x | ICR-324x
ICR-203x | ICR-243x | ICR-253x | ICR-383x | ICR-443x | ICR-445x

We have updated the strongSwan software to version 5.9.6. This update has improved the Denial of Service (DoS) protection. For more details about this release, see the strongSwan 5.9.6 Changelog.

Updated curl Program

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 | SmartFlex SR310 | SmartStart SL302 | SmartStart SL304 | SmartStart SL305
SmartStart SL306 | SmartMotion ST352 | SmartMotion ST355 | ICR-320x | ICR-321x | ICR-323x | ICR-324x
ICR-203x | ICR-243x | ICR-253x | ICR-383x | ICR-443x | ICR-445x

We have updated the curl program to version 7.83.1. This update has fixed **CVE-2022-27778** (high), **CVE-2022-27779** (medium), **CVE-2022-27780** (high), **CVE-2022-27781** (high), **CVE-2022-27782** (high), and **CVE-2022-30115** (medium). For more details about this release, see the Curl Changelog webpage.

Updated Net-SNMP Software

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 | SmartFlex SR310 | SmartStart SL302 | SmartStart SL304 | SmartStart SL305
SmartStart SL306 | SmartMotion ST352 | SmartMotion ST355 | ICR-320x | ICR-321x | ICR-323x | ICR-324x
ICR-203x | ICR-243x | ICR-253x | ICR-383x | ICR-443x | ICR-445x

We have updated the Net-SNMP software to version 5.9.1. This update has fixed various issues in version 5.8, including an occasional crash when reading values using the SNMP GETBULK command.

Firmware Update – Unexpected Filename

If the filename of firmware for your router was changed, you could have an issue during manual firmware update 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 earlier 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 coun-try 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:

Documents / Resources

ADVANTECH ICR-OS Firmware 6.3.6 RELEASE NOTES	**ADVANTECH ICR-OS Firmware 6.3.6 Cellular Router** [pdf] Instruction Manual ICR-OS, Firmware 6.3.6 Cellular Router, ICR-OS Firmware 6.3.6 Cellular Router

References

- **Advantech 4G, 5G Cellular Routers & Gateways for IoT applications - Engineering Portal**
- **IPTables U32 Match Tutorial**
- **curl - Changes**
- **Release strongSwan 5.9.6 · strongswan/strongswan · GitHub**
- **Advantech 4G, 5G Cellular Routers & Gateways for IoT applications - Engineering Portal**
- **Firmware - Cellular Routers Engineering Portal**
- **Router Models - Cellular Routers Engineering Portal**
- **openssl.org/news/cl111.txt**