

# APPLICATION NOTE

APNUS028 How to upgrade ACKSYS router's  
firmware  
June 2023

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## 1. Introduction

We need to upgrade Acksys Router for many reasons:

- Better security to prevent WaveOS vulnerability to hackers and cyber criminals as updates keep you safe from exploitable holes into your organization
- Increased efficiency in order to offer new and improved features and speed enhancements to make the end-user experience better
- To guarantee to existing systems and software to be compatible

The firmware upgrade is performed in 2 steps to separate the transfer of the firmware and the upgrade itself. Therefore, it is possible to download the firmware and perform a system upgrade later to avoid disrupting customer in service network.

## 2. Requirements

Before we begin, let's overview the asynchronous upgrade on Acksys device in general that we are attempting to achieve and the prerequisites that make it possible.

- Any ACKSYS routers
- A valid Firmware downloaded from our extranet
- Do not turn off the product's power supply or push the reset button before the upgrade completed.
- An end device "Laptop" to configure the router

## 3. Typical firmware upgrade use case

An industrial company deployed hundreds of Acksys devices on their operating machines. These machines are working 24 hours per day, 6 days per week. Upgrading the routers during production hours is impossible, and there is operational team on Sunday to validate the upgrade process.

The asynchronous firmware upgrade option allows to:

- Upload the FW file on all routers during working hours without impact on the current production,
- Schedule the upgrade itself when machines are not used and the routers reboot has no impact on production.

## 4. Firmware upgrade process

Firmware upgrade process is performed in 2 steps:

- 1) Firmware file transfer from server toward router, which is independent of the system upgrade function. Regardless of the method used for transmission, the upgrade function checks whether the file is a valid firmware.  
Depending on the router model, the downloaded firmware can be stored in the non-volatile memory (Ex: For Railbox V2) and so survive to reboot/power off (please check the router specifications).
- 2) Firmware flashing process which overwrite the older firmware.

## 5. UPGRADE METHODS

The only official web site to download firmware for Acksys router is at:

<https://www.acksys.fr/en/support/download-center/softwares-and-drivers-downloads/>

### Web Interface Upgrade

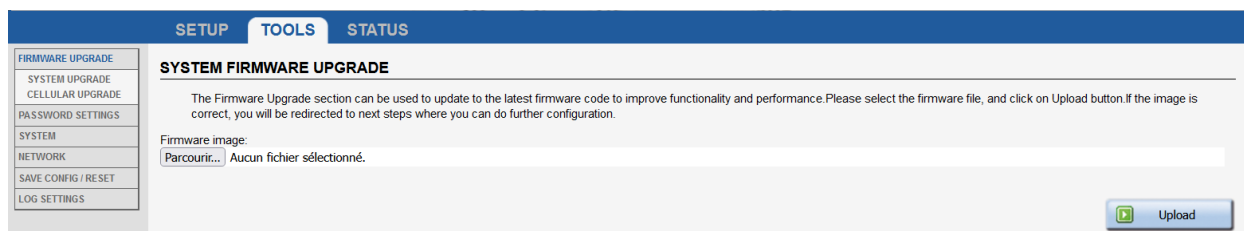
If you have familiarized yourself with the upgrade process and have all of the device in order, we can start upgrading the router using instructions provided in this section.

NOTE: Since the firmware can only be saved to RAM, once a restart is performed, the scheduled or pending update will be lost.

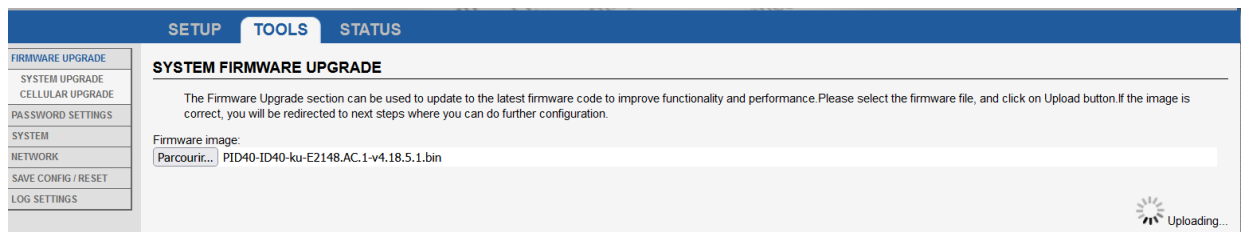
With Railbox V2, when a system update is scheduled, the firmware is immediately saved in the eMMC, which allows data to be preserved when the product is not powered.

Login to the router's WebUI and go to Tools → Firmware Upgrade → System Upgrade:

- Select and locate the firmware image.

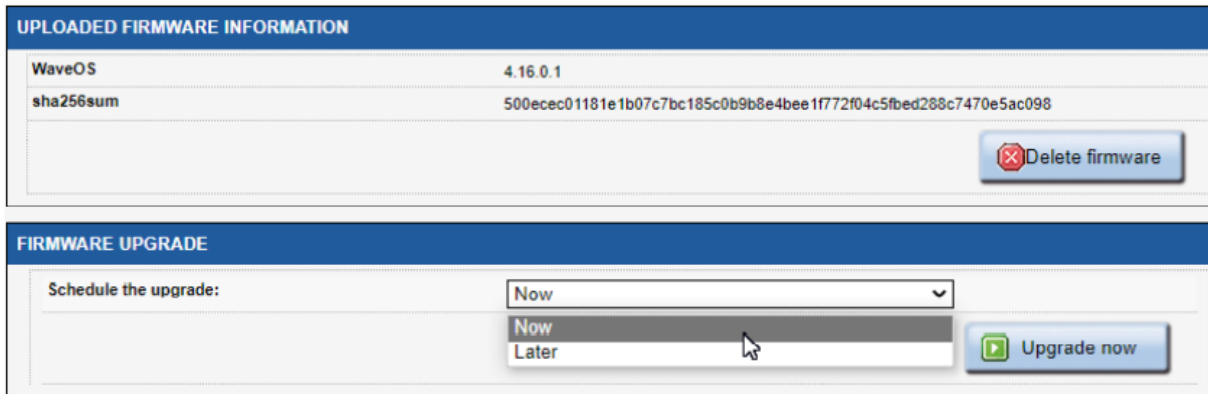


- Click Upload



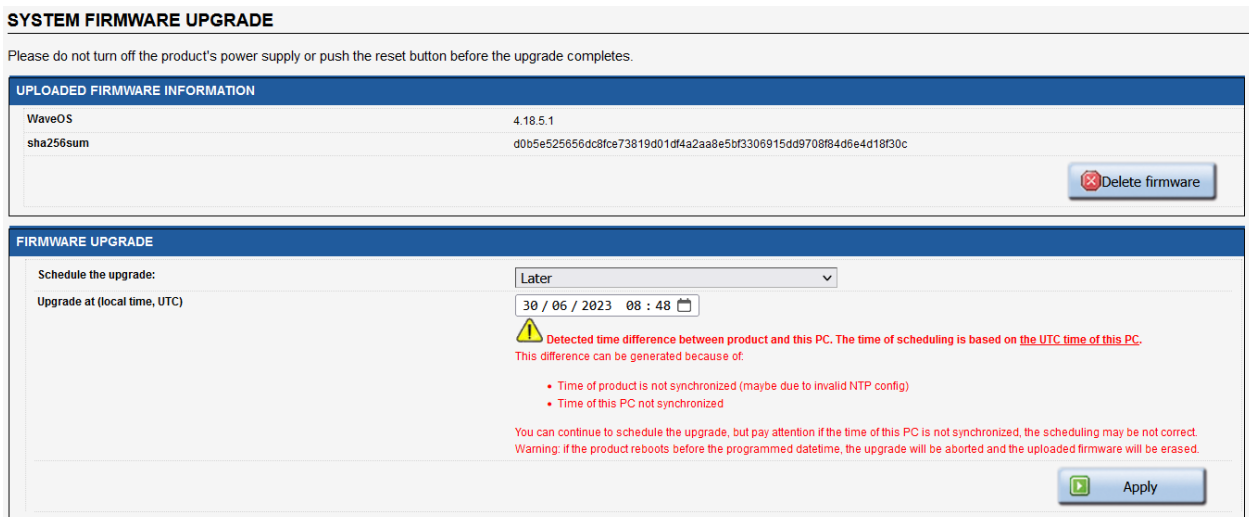
### Immediate Upgrade

The system upgrade is started as soon as your press the Apply button:



### Scheduled Upgrade

You can also schedule a date and time to start the upgrade. By default, the router date and time is displayed in the agenda. If you define a date or time in the past a message error will warn that date and time must be equal or later to current date.



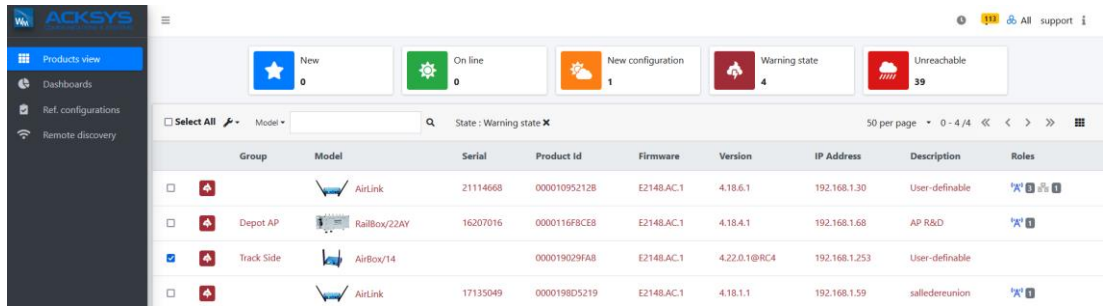
### Upgrade via WaveManager

NOTE: WaveManager and router should be on time before performing scheduled upgrading and please do not power off the router during upgrade.

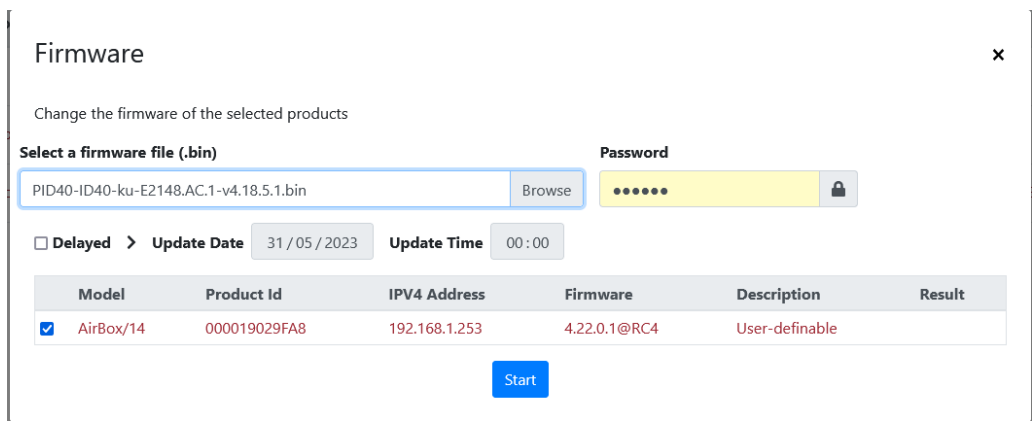
Wavemanager is ACKSYS NMS to manage remotely the routers on local network, which is used to upgrade a parc of ACKSYS routers and for maintenance purpose.

#### Processing steps:

- 1) Login in WaveManager
- 2) Select Product View submenu
- 3) Select the list of routers to be upgraded.



- 4) Select and locate the firmware image (Browse to find the firmware binary file on your disk, enter the Password if required. The password is defined in the product WEB interface (SETUP/SERVICES/DISCOVER AGENT). Of course, if a password is defined, it must be common to all the selected products.



- 5) Updates the firmware for the selected products.
- Chose if you apply the upgrade or you delayed it on a specific date
  - Click Start to launch the upgrade.

When the update starts, a warning message is displayed and the status of each line changes to In progress... in the Result column. All selected units will be updated simultaneously.

Model	Product ID	Description	IPV4 Address	Firmware	Result
☑ AirLink	000019B78CA6	User-definable	10.1.1.42	4.12.1.1	In progress...
☑ AirLink	0000198D5F88	User-definable	10.1.1.30	4.16.9.1	In progress...
☑ AirLink	000019B71D12	User-definable	10.1.1.38	3.14.3.1	In progress...
☑ AirLink	0000198D6A7B	User-definable	10.1.1.34	3.18.1.1	In progress...

## Upgrade via CLI

In case you want to upgrade a fleet of router without using the WaveManager or the Web interface, it is possible to upgrade the router via CLI if ssh server is enabled on the router.

The upgrade must be performed in 2 steps:

- 1) You have to copy first of all the firmware already downloaded from our extranet, with WinSCP for windows computer or SCP for Linux computer in the **/tmp** directory on the router with the following command:

```
scp PID40-ID40-ku-E2148.AC.1-v4.18.5.1.bin root@192.168.1.253:/tmp/
```

Where:

PID40-ID40-ku-E2148.AC.1-v4.18.5.1.bin	is the firmware file's name. Replace it with your firmware's name.
192.168.1.253	is the router's IP address. Replace with your own router's IP
/tmp/	is the directory where the file will be copied to

NOTE: files are removed from the /tmp/ directory after a reboot. If you rebooted the router, you'll need to upload the firmware file again.

Replace the firmware file's name that you are using. If you uploaded the firmware via WebUI, the name will automatically be changed to firmware.img.

- 2) To upgrade the firmware, login to the router and execute the following command:

```
sysupgrade /tmp/ PID40-ID40-ku-E2148.AC.1-v4.18.5.1.bin
```

Then you should wait that the router reboots and flashes the new firmware.

## Deprecated SNMP upgrade method

We strongly discouraged to use SNMP as firmware upgrade method as the file transfer take very long time and could generate timeouts in the upgrade process. (ex: SNMP transfer takes 16 minutes for a file of 41Mbytes (data rate around 43kbps))

## 6. System Upgrade Status

To monitor the upgrade status, we offer the possibility to the user to:

- Check if there is a pending system upgrade,
- Modify the date and/or time to upgrade the system,
- Cancel the pending system upgrade,
- Delete the pending firmware file.

WaveManager shows the upgrade status and in this case, the upgrade is done successfully in 4.18.5.1 release as shown in the below screenshot.

The screenshot shows the 'Firmware change' interface in WaveManager. It includes a 'Select a firmware file (.bin)' field with 'PID40-ID40-ku-E2148.AC.1-v4.18.5.1.bin' and a 'Browse' button. There is also a 'Password' field. Below these are 'Update Date' (13/06/2023) and 'Update Time' (00:00) fields. A table lists the upgrade progress for 'AirWan/17' with a 'Success' result. A 'Start' button is at the bottom.

Next to it is a detailed window for 'AirWan/17' (S/N 2114201d) showing various system parameters. The 'Version' is highlighted as 4.18.5.1.

Model	Product Id	IPv4 Address	Firmware	Description	Result
<input checked="" type="checkbox"/> AirWan/17	00001D33B03B	192.168.1.254	4.18.6.1	User-definable	Success

Discovery date	08/06/2023 05:59
Last connection	12/06/2023 13:14
IP Address	192.168.1.254
Mask	255.255.255.0
Gateway	0.0.0.0
Group	
Product Id	00001D33B03B
Firmware	E2148.AC.1
Version	4.18.5.1
Latitude	0
Longitude	0
Description	User-definable

To check if the firmware is correctly apply, let login in Router GUI and Click on Status as seen in the screenshot below:

### DEVICE INFORMATION

The screenshot shows the 'DEVICE INFORMATION' page in the Router GUI. It is divided into two sections: 'FIRMWARE INFORMATION' and 'DEVICE INFORMATION'. In the 'FIRMWARE INFORMATION' section, the 'WaveOs version' is 4.18.5.1, which is highlighted with a red box. Other details include 'Boot loader version: 3.6.2.1', 'Firmware ID: E2148.AC.1', and 'SSH access: enabled (by configuration)'. The 'DEVICE INFORMATION' section lists: 'Host name: Acksys', 'Model: AirWan/17', 'Product version: V1', 'Motherboard ID: 00001d33b03b', 'Product serial number: 2114201d', and 'GNSS info: GNSS is disabled'.

FIRMWARE INFORMATION	
WaveOs version:	4.18.5.1
Boot loader version:	3.6.2.1
Firmware ID:	E2148.AC.1
SSH access:	enabled (by configuration)

DEVICE INFORMATION	
Host name:	Acksys
Model:	AirWan/17
Product version:	V1
Motherboard ID:	00001d33b03b
Product serial number :	2114201d
GNSS info:	GNSS is disabled



It is possible to check the upgrade Status via SNMP command with the below OID.

OID	Type	Get: returned value	Set
statusAsyncFirmwareExists	Bool	If FW file is stored or not	-
statusAsyncFirmwareInfo	String	Version and checksum of stored FW	-
configAsyncTimerEnable	Bool	Last value	Enable timer mode
configAsyncTimerMode		Last value (1, 2, 3 or 99) <sup>1</sup>	(1, 2, 3) <sup>1</sup>
configAsyncTimerMinute	Unsigned int	Time before upgrade	Time before upgrade
sysDescr/.1.3.6.1.2.1.1.1.0	OctetString	FirmWare version	-

NOTE : sysDescr which is a generic OID from the Standard.  
 This value should include the full name and version identification of the system's hardware type, software operating-system, and networking software. It is mandatory that this only contain printable ASCII characters. The firmware version is obtained by the extract of the third colon separated by \_ character.  
 Name/OID: sysDescr.0; Value (OctetString): AirLink\_E2148.AC.1\_4.16.9.1\_UT3L  
 Example :Firmware version=4.16.9.1

## 7. ANNEX

### SSH configuration in web interface

"SSH-RSA key list"

If you use the web page to manage SSH-RSA keys, the system will verify that:

- The list of downloaded keys is correct,
- The permission to access the file is correct,
- The deletion of key(s) has been carried out correctly.

**SSH SERVER CONFIGURATION**

**Enable SSH server**

**Disable password login**  At least one public key should be uploaded in order to login via ssh if password login is disabled

Index	Type	Comment	Fingerprint
1	ssh-rsa	factory.waveos@acksys.fr	psKdtBNak+U9B/8P2Sa11ldD9aDd0VRRi/llng1Boj8
2	ssh-rsa	rsa-key-20211011	b0siRsnRXWw0MKwDuiCA+xiL9vTSbx0oQz3MymeIAw

**Add public key**    Only supports SSH-RSA

Support : <https://support.acksys.fr>