



Z41 Firmware Update

via the USB / Ethernet interfaces

Document version: [3.1]_a

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DOCUMENT UPDATES

Version	Modifications	Page(s)
3.1_a	Important note about bus/power failures within the first two minutes after a firmware update.	4, 8, 16
c	Self-reconnection to network/server with no need of a reboot.	9
	Possibility of enabling / disabling the firmware update function.	5, 9
	New network interface search indicator.	10
	Possibility of password-protecting the updates via Ethernet.	9, 12, 13
	New section: "Additional Remarks".	14
	New error events to be considered due to the new functionality.	7, 8, 15, 16
b	General revision of texts and styles.	-

Contents

Document Updates	2
1 Introduction	4
2 Update via USB.....	5
2.1 Step-by-Step Process.....	5
2.2 Troubleshooting	7
3 Update via Ethernet	9
3.1 Step-by-Step Process.....	9
3.1.1 Additional Remarks.....	14
3.2 Troubleshooting	15

1 INTRODUCTION

Z41 incorporates **two separate microcontrollers**. One of them is focused on interfacing with the KNX bus and on running the application program itself, while the second one is dedicated to running the firmware that implements the operating system and the management of the peripherals.

Therefore, an eventual update of Z41 may consist in two phases:

- Downloading the new application program (from ETS),
- Downloading the new firmware.

Two alternative methods are provided for the latter:

- Downloading the firmware to Z41 through a flash memory drive connected to its **mini-USB port** by means of a male mini-USB to female USB adapter (ref. ZN1AC-UPUSB).
- Downloading the firmware to Z41 through the local network from a PC running the Windows operating system, by means of the **Ethernet** adapter (see the Z41 user manual) bundled with the original packaging of the device.

The next sections explain how to perform the firmware update for each of the two alternate procedures, including the possible events that may take place during the process, together with the suggested solutions.

Important: *if successive restarts take place within the first two minutes of operation after a firmware update (via USB or via Ethernet), Z41 may consider that the new firmware is corrupt and therefore remain in the status screen to allow a new firmware update. Please avoid bus / power interruptions until the new firmware has been running for at least two minutes, as they may lead to the above situation (in such case, please disconnect and connect Z41 once more to load the firmware again, and ensure that there are no further interruptions for at least two minutes).*

2 UPDATE VIA USB

2.1 STEP-BY-STEP PROCESS

Updating the firmware via USB (universal serial bus) requires a male mini-USB to female USB adapter (reference **ZN1AC-UPUSB**; not bundled by default with Z41 – it is necessary to acquire it as a spare part) and a USB flash memory drive.

Important: *versions 3.0 and later of the Z41 application program let the integrator enable or disable, from ETS, the firmware updates through the USB port. Bear in mind that the procedure described next assumes that such function was marked as “enabled” (which is the default option) during the last parameterisation applied. Please refer to section 3.1.1 and to the user manual of Z41 for further detail.*

These are the steps:

1. Download from <http://www.zennio.com> the ***.ZIP** file with the firmware corresponding to the desired version of the application program. Compressed inside this *.ZIP file is the update package for Z41 (under the name **z41_update.pak**).
2. Save or copy this **z41_update.pak**, leaving the file name unchanged, in the **root folder** of a USB flash storage¹ drive with the **FAT32** file system.

Important: *if the file name (z41_update.pak) is altered or the file is not saved to the root directory, Z41 will not start the update process after the connection of the USB drive.*

3. **Safely** disconnect the USB drive from the PC, in order to prevent electrical risks that may corrupt the information stored.
4. Insert the USB drive into the female end of the mini-USB to USB adapter (see Figure 1) and connect the other end of the adapter to the mini-USB port of Z41 (see the element diagram in the Z41 user manual).

¹ Z41 only supports flash memory drives; USB hard disks are not compatible.



Figure 1 Male mini-USB to female USB adapter (ZN1AC-UPUSB)

After a few seconds, the update of Z41 will begin automatically, as long as the external power supply is plugged. This way, Z41 will automatically detect the USB drive, check the existence of the update package (z41_update.pak) and determine whether its version **differs** from that already installed (if any). If both versions are the same, no update process will take place.

Important: *any firmware version (newer or not) can be downloaded to Z41 as long as it differs from the currently installed version. Because of this, it is important to ensure that the version of the application program to be downloaded from ETS matches the version of the firmware being installed.*

5. Wait until the update process finishes, which may take several seconds/minutes and make Z41 reboot. The update process is totally transparent to the user, and will finish as soon as Z41 loads the user interface again. From that moment, the USB drive and the mini-USB adapter **can be disconnected** from Z41.

Important: *do not connect Z41 directly to the USB port of a PC, nor plug into Z41 a cable/adaptor other than the male mini-USB to female USB adapter provided by Zennio, as the device may become damaged.*

2.2 TROUBLESHOOTING

Event	Possible cause(s)	Solution
Z41 does not start the update process after connecting the USB memory	The file z41_update.pak has been renamed.	Change the file name back to z41_update.pak .
	The file z41_update.pak has not been saved into the root directory of the USB memory drive.	Move the file to the root folder of the USB memory drive, e.g., x: \.
	The USB drive is not supported (non-flash memory, external hard drive, etc.).	Use a flash memory drive or try with another.
	The file system in the USB memory is not FAT32 .	Format the USB memory to the FAT32 file system.
	More than one partition co-exist in the USB drive and the file z41_update.pak has not been found on the first partition detected by Z41.	Define only one partition in the USB memory and save the file z41_update.pak to the root directory of that partition.
	The file z41_update.pak and the already loaded firmware on Z41 have the same version.	Obtain a more recent / different version of the file z41_update.pak , if available.
	The firmware update feature through the USB port has been disabled in ETS.	Enable in ETS the update function via USB (<u>making use of the particular application program version that is currently loaded on the device</u> ; see section 3.1.1) and download the parameters again.

<p>After the update, the screen shows the Status page permanently, or remains blank, or shows a Software Error warning.</p>	<p>The file z41_update.pak was damaged, or the download to Z41 failed.</p>	<p>Restart the process (by disconnecting and then connecting back the USB drive) and/or obtain a fresh copy of the desired firmware.</p>
	<p>The firmware downloaded to Z41 is not compatible with the installed version of the application program.</p>	<p>Download from ETS the application program version that corresponds to the firmware version, or install a firmware that matches the current application program.</p>
	<p>The update process was interrupted (bus power failure, unexpected power loss from the external supply, disconnection of the USB drive, etc.).</p>	<p>Fix the incident and wait until the process automatically resumes. If this does not happen, restart it manually (disconnect and connect back the USB memory).</p>
	<p>Several resets (bus failures or external power failures) have taken place within the first two minutes after the firmware update, making Z41 consider the new firmware as corrupt.</p>	<p>Please, disconnect and connect the device again, avoiding power failures during the first two minutes of operation.</p>

3 UPDATE VIA ETHERNET

3.1 STEP-BY-STEP PROCESS

Updating the firmware through the local network from a PC running the Windows operating system requires an Ethernet cable connected to Z41 by means of the adapter supplied with the original packaging of the device.

Note:

- The PC that will be used for the firmware update needs as well to be connected to the local network (through an Ethernet cable).
- This procedure only works for wired networks. It is not supported under **wireless networks** (Wi-Fi).
- The local network must be running a **DHCP server** (implemented for example in the network router) that dynamically and automatically assigns IP addresses to any new devices joining the network.
- Versions 1.x and 2.x of the Z41 application program only try to connect to the IP network at the boot stage. In case this process fails (e.g., due to the disconnection of the Ethernet cable), it is necessary to **disconnect and connect back the power supply** of Z41 in order to make it retry the connection, once the problem has been solved. This requirement does not apply to versions 3.0 and later.

Important: *versions 3.0 and later of the Z41 application program let the integrator enable or disable, from ETS, the firmware updates through the USB port. Bear in mind that the procedure described next assumes that such function was marked as “enabled” (which is the default option) during the last parameterisation applied. Please refer to section 3.1.1 and to the user manual of Z41 for further detail.*

These are the steps:

1. Download from <http://www.zennio.com> the *.ZIP file containing the firmware corresponding to the version of the application program to be used.

Compressed inside this *.ZIP file is the update package for Z41 (under the name **z41_update.pak**).

2. Again from <http://www.zennio.com>, download the **Z41 Update** tool, which is also provided as a *.ZIP file.
3. After extracting the contents of the second *.ZIP file, launch the installer (**Z41Update_vX.exe**), where X may depend on the downloaded version.
4. The installer will copy the required files to the PC and will add to the Start menu a direct access to the **Z41 Update** tool.

Note: the PC must have the JAVA™ Runtime Environment (JRE) installed. If not installed, please download it from <http://www.java.com/download/>.

5. After launching the tool, it will analyse the **network interfaces** available on the system and will determine the one that the user would typically select (it is possible to switch to another interface afterwards, as explained later).



Figure 2 Interface Analysis

6. Next, the tool will search for devices in the local network corresponding to the selected interface will start.

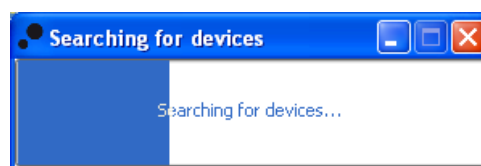


Figura 3 Device Search

7. The main window will look similar to Figure 4.

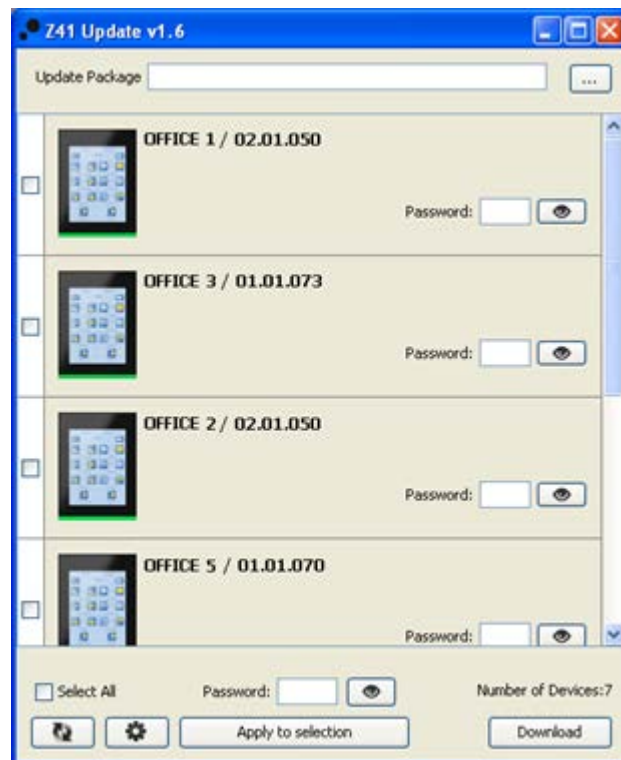



Figure 4 Main window in the Z41 Update tool

This window lists all the Z41 devices detected in the network. Each of them shows its identifying name, if parameterized in ETS (see the Z41 user manual), and the individual address it was assigned in the KNX topology.

On the other hand:

- In case of **multiple network interfaces** installed on the PC, button  will let the user access the Preferences window. This window (see Figure 5) shows the list of all the detected Ethernet interfaces, making it possible to select the one desired.

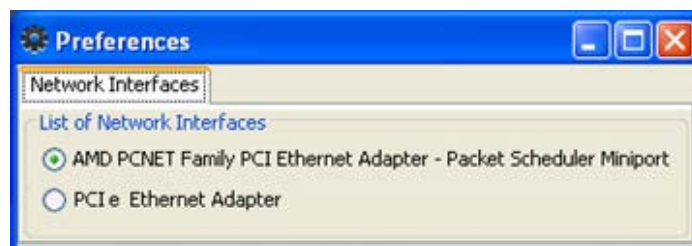






Figure 5 Preferences window

- Button  may be used to perform a **new device search and update the list** shown on the screen.

8. Select the update package to be installed by clicking on  and browsing to the desired *.PAK file.

Note: while the update via USB requires leaving the file name unchanged (**z41_update.pak**), such requirement is not required for updates via Ethernet.

9. After selecting the desired package, all the detected devices will show an overlaid icon depending on the firmware version currently installed on them.


	
The version of the selected package matches that of the currently installed firmware.	The version of the selected package does not match the currently installed firmware. The checkbox of the device becomes automatically marked.

Moreover, a colour bar (Figure 4) is shown under each device:


- **Green bar:** the device is currently in working mode.
- **Blue bar:** the device is in the Update mode (the Status page is shown on the screen instead of the user interface).

Important: any firmware version (newer or not) can be downloaded to Z41 as long as it differs from the currently installed version. Because of this, it is important to ensure that the version of the application program to be downloaded from ETS matches the version of the firmware being installed.

10. After marking the checkboxes of the devices to be updated, click on the “**Download**” button, in the right lower corner of the window. The update process will start from that moment.

Note: to select all the devices from the list, it is possible to mark the  **Select All** checkbox.

11. In case a **password protection** for the updates via Ethernet was configured in the ETS parameterisation of the application program currently installed on Z41 (see user manual), it will be necessary to type such password in the corresponding textbox. If no password was set, it can be left blank.

Note: passwords are masked with asterisks as they are typed in. These masks can be temporarily hidden by clicking on the  button.

Regarding the password protection, it is recommended to read section 3.1.1 of this document as well.

If multiple devices are going to be batch-programmed and all of them have the same password configured, it is possible to click on the “**Apply to selection**” button, so that the password typed into the adjacent textbox is copied into the password textboxes of the devices whose checkbox is active.



12. During the process, the device being updated will show a progress bar. At the end of the update, the bar will disappear and the device will boot normally, unless the application program corresponding to the new firmware has not been downloaded yet from ETS (in such case, the initial synchronisation will fail, and a “Software Error” message will be shown, being then necessary to download the proper application program).

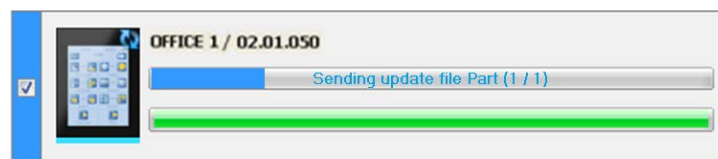


Figure 6 Update progress

Note: prior to the update process, please ensure that the device is provided with external power and has IP connectivity. Refer to the element diagram in the Z41 user manual to identify the device connections and the Ethernet adapter (bundled with the original packaging) required for firmware updates through the network.

3.1.1 ADDITIONAL REMARKS

Beginning with version 3.0, the Z41 application program lets the integrator enable or disable (in ETS) the firmware updates via USB or Ethernet, and even to set a password that will be required for the second case.

A few remarks must be taken into account:

- Z41 Update shows the “**Password**” **textboxes** in any case, although they should be filled out only when necessary.
- Up to **three password verification attempts** are allowed by Z41. After three firmware update denials due to incorrect password, the device will ignore any further update attempts (via Ethernet) during approximately the following 24 hours, which may be more if power failures take place under this state.
 - During the lock time count, the option to **update the firmware through the USB port** will still be available, unless it was specifically disabled by parameter in ETS. See section 2.
 - The device will leave this lock state if **a new password** is set by means of an additional parameter download from ETS (important: it is necessary to import into ETS the same version of the application program that may be running on the device at that moment, as explained in the next paragraph).
- The password configuration (and, in fact, the whole parameter configuration) that applies is always **the last one the device is aware of**. That is, the last configuration that led to a proper synchronisation at the device boot stage.
 - The synchronisation takes place if the version of the installed application program (from now on, “AP”) is compatible with that of the installed firmware. In such case, any successive parameterisation (passwords, enabling / disabling the update function...) will be taken into account.

However, if the version of the downloaded AP is not compatible with that of the already installed firmware, any further parameter download will be ignored (to make Z41 recognise the new parameters, it is first necessary to download a version of the AP which is compatible with the version of the installed firmware). That said, **updating the firmware prior to updating the AP is highly encouraged**.

3.2 TROUBLESHOOTING

Event	Possible cause(s)	Solution
The Z41 Update tool does not start	The version of the JAVA™ Runtime Environment installed on the PC is too old.	Update the JRE: http://www.java.com/download
The desired network interface is not listed under Preferences in the Z41 Update tool	The desired interface is a wireless network interface (Wi-Fi).	Use a wired Ethernet connection (Wi-Fi is not permitted).
	The local network interface is disabled or has not been installed on the PC.	Open the Windows Network Manager and enable or install the network interface.
The Z41 Update tool does not find the device after performing a device search.	Z41 or the PC are not connected to a wired Ethernet network.	Connect the PC and Z41 to the wired Ethernet network.
	Z41 is not being powered.	Connect the external power supply to Z41.
	The network is not running a DHCP server, thus Z41 has not been assigned an IP address.	Enable the DHCP protocol in the network router (or equivalent device).
	Multiple network interfaces are installed on the PC, and the right one is not being used.	Select the appropriate interface from the Preferences window of Z41 Update.
	There are security restrictions that prevent the detection of the device.	Temporarily deactivate the firewall restrictions or set an exception to permit routing traffic towards port 50000 (TCP and UDP).
	The network is unavailable.	Retry the update once the network failure is solved.

<p>Z41 does not get properly updated or remains blank or permanently shows the Status page after being updated through the Z41 Update tool.</p>	<p>The *.PAK file was corrupt, or was not transferred properly to Z41, or the update process failed (power failure, etc.).</p>	<p>Restart the process, making sure to obtain a fresh copy of the *.PAK file.</p>
	<p>The version of the selected *.PAK file is not compatible with the version of the current application program downloaded via ETS.</p>	<p>Download from ETS the application program version that corresponds to the firmware version, or install a firmware that matches the current application program.</p>
	<p>An old version of Z41 Update is being used.</p>	<p>Download the latest version available of Z41 Update, to ensure it supports all the security restrictions.</p>
	<p>The maximum number of password verification attempts has been exceeded.</p>	<p>Refer to section 3.1.1.</p>
	<p>Several resets (bus failures or external power failures) have taken place within the first two minutes after the firmware update, making Z41 consider the new firmware as corrupt.</p>	<p>Please, disconnect and connect the device again, avoiding power failures during the first two minutes of operation.</p>

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