

GENERAL

FlashX is a utility that allows programming of firmware into an F3200/NDU, RDU, ADU, FP1600 or OMEGA64 fire panel. Older versions of these products do not support field upgrading of the firmware using FlashX. The current version of software that is installed in the panel determines whether the panel supports firmware upgrading via FlashX as follows.

ADU	- all software versions
F3200/NDU	- V4.00 software or later
FP1600	- V4.00 software or later
Omega Master	- V4.00 software or later
Omega Slave	- V4.00 software or later
RDU	- V5.00 software or later

New versions of FlashX and the firmware data files will be made available on the Tyco Safety Products Australasia Extranet site called the "Fireplace", at www.tycosafetyproducts-anz.com.

Firmware data files

FlashX displays a list of available firmware data files. To add a file to the list, click the "Add" button on the toolbar and browse to the file. To remove a file from the list, select the file and click the "Remove" button. Each firmware data file contains the version number and checksum, and these are read and displayed by FlashX. The version number and checksum must be written onto the label that is affixed to the firmware IC in the panel itself after programming is successfully completed. Also, the panel should be powered up after programming new firmware, to verify the version and checksum. Refer to the panel specific details.

The version of firmware that is to be programmed must be selected by clicking the desired item from the list displayed. The selected firmware is shown in the lower part of the screen. Make sure the correct firmware is selected before clicking NEXT.

Firmware data files are given a name that identifies the product and software version, hence each file has a unique name and all files may be stored in the same directory or they can be in different directories. When a new version of software is released, the new firmware data file may be copied into the directory containing the previous version of software without deleting the previous file. It is not necessary to remove the older version from the list of files displayed by FlashX but this can be done if preferred.

FlashX Configuration File

FlashX uses a configuration file, FlashX.cfg, which is automatically created in the same directory as FlashX.exe if it does not already exist. The configuration file stores the serial port that was last selected, plus the filenames of the firmware data files.

When FlashX closes, if the configuration file FlashX.cfg has changed, it is written to the directory containing the FlashX.exe file. For this reason, FlashX.exe should be run from a directory that allows the writing of the configuration file. If the writing of the file does fail, FlashX will close without error. If the FlashX.cfg file is copied from a CD-ROM, it will probably be read-only so it may need to

be either deleted or have the read-only attribute turned off using the Windows file properties dialog box.

If multiple configuration files are needed for some reason, then FlashX.exe must be copied to a second directory which can then have its own FlashX.cfg file.

FlashX Diagnostics

There is a checkbox at the bottom of the FlashX screen named "Show retry counts". If this is checked, FlashX will display some diagnostic values while a firmware download is in progress, including a "retry count" which indicates the number of messages sent to a panel that did not get acknowledged. The retry count is normally zero but some PCs/ laptops can have faulty serial port hardware/software that give intermittent operation.

To program firmware into an F3200, NDU or RDU, a LM0076 cable is required to connect the panel to a serial port on the PC. The existing user database in the panel will not be affected by the firmware download process, however the database should be saved to the PC before downloading new firmware. Refer to the F3200/NDU programming manual LT0256 (LT0499 for the RDU) for detail on saving and loading the database.

Avoid Power Loss During The Firmware Download Operation

While the firmware download is in progress, there is a brief one second period at the end of the erase operation, during which it is important that the panel does not lose power. If power is lost during this brief period, the panel may be left with completely erased memory and not be able to be programmed using FlashX. If this happens, it is necessary to fit a new flash chip to U2 that contains pre-programmed F3200/NDU/RDU software. In a situation where this may be a real problem, the panel should be powered from a UPS or battery during the download, or a spare pre-programmed IC containing F3200/NDU/RDU firmware should be available. The memory erase operation occurs after approximately 10% of the data has been downloaded to the panel as described in the steps below.

The U2 IC in the F3200/NDU/RDU that contains the firmware, also contains the user database and there are separate write protect links for the firmware (LK20 Code Write Protect) and database (LK7 Database). If the U2 IC is replaced, then the database will need to be reloaded from the PC.

Procedure For Programming F3200/NDU/RDU Firmware

The firmware can be programmed by selecting the desired firmware in the displayed list, clicking the NEXT button and following the prompts displayed on the screen. Ensure that the firmware version information is updated on the board after programming and that the code protect link LK2 is left in the protect position. The full procedure is described below.

1. Connect a LM0076 serial cable from the PC to the panel DB9 connector. Set link LK20 (code write protect) to the "write" enable position. The database write protect link LK7 should be set to the protect position.
2. Power the panel OFF if not already.
3. Run FLASHX.EXE on the PC. Select the serial port (COM1,COM2 etc.) using the drop down list at the top of the screen.
4. FlashX will display a list of firmware files that have been used previously. If the desired file does not already appear then click the ADD button on the toolbar and browse to the location of the file and open it. FlashX will add the file to the displayed list. To remove a file from the displayed list, select it and click the REMOVE button.
5. Select the desired firmware from the list displayed by FlashX by clicking on it, then click the NEXT button. The firmware file will be read, and the selected serial port will be opened. Follow the prompts on the screen as follows.
6. Power the panel OFF if not already, then click the NEXT button.

7. Power the panel ON, then click the NEXT button. The screen should now show "ready for firmware download". Click the NEXT button to initiate the firmware download.
8. The screen will show the progress of the download. When the screen shows approximately 10% complete, a slight pause will occur while the panel erases its flash memory, after which the download will continue.
9. If the download completes successfully, the screen will show "download completed successfully". A checksum verification will be done automatically at the end of the download and a failure will be indicated with an error message. If the download is successful the panel will be restarted automatically.
10. Following the successful programming of firmware, the firmware version and checksum should be checked. From the "base display", press RECALL RECALL 4:CRC 4:FIRMWARE, and check the display shows the correct version and checksum.
11. Set the code write protect link LK20 to the protect position. Update the firmware version information label on the board showing the product name, version number and checksum of the new firmware.

PROGRAMMING ADU FIRMWARE

To program firmware into one of the various ADUs, e.g. Compact FF or Nurse Station Annunciator (NSA), a LM0076 cable is required to connect the ADU to a serial port on the PC. The existing user database in an ADU will not be affected by the firmware download process, however the database should be saved to the PC before downloading new firmware. The PanelX utility is required to perform a database save/load for an ADU and is available on the Tyco website. PanelX is also used to check the checksum of the ADU after firmware programming by recalling it to the 'LCD'/display using the sequence RECALL RECALL 4:CRC 4:FIRMWARE starting from the base display.

Avoid Power Loss During The Firmware Download Operation

While the firmware download is in progress, there is a brief one second period at the end of the erase operation, during which it is important that the ADU does not lose power. If power is lost during this brief period, the ADU may be left with completely erased memory and not be able to be programmed using FlashX. If this happens, it is necessary to fit a new flash chip to U2 that contains pre-programmed ADU software. In a situation where this may be a real problem, the ADU should be powered from a UPS or battery during the download, or a spare pre-programmed IC containing ADU firmware should be available. The memory erase operation occurs after approximately 10% of the data has been downloaded to the ADU as described in the steps below.

The IC in an ADU that contains the firmware, also contains the user database and there are separate write protect links for the firmware (LK2/CWP) and database (LK1/Database). If the IC is replaced, then the database will need to be reloaded from the PC.

Procedure For Programming ADU Firmware

The ADU firmware can be programmed by selecting the firmware in the displayed list, clicking the NEXT button and following the prompts displayed on the screen. Ensure that the firmware version information is updated on the board after programming and that the code protect link LK2 is left in the protect position. The full procedure is described below.

1. Connect a LM0076 serial cable from the PC to the ADU DB9 connector. Set link LK2/CWP (code write protect) to the "write" enable position (left two pins). The database write protect link LK1 should be set to the protect position.
2. Power the ADU on if not already.
3. Run FLASHX.EXE on the PC. Select the serial port (COM1,COM2 etc.) using the drop down list at the top of the screen.
4. FlashX will display a list of firmware files that have been used previously. If the desired file does not already appear then click the ADD button on the toolbar and browse to the location of the file and open it. FlashX will add the file to the displayed list. To remove a file from the displayed list, select it and click the REMOVE button.
5. Select the desired firmware from the list displayed by FlashX by clicking on it, then click the NEXT button. The firmware file will be read, and the selected serial port will be opened. Follow the prompts on the screen as follows.
6. Press the ADU RESET switch SW1 that is in the centre of the ADU PCB. NOTE - the ADU must be reset AFTER the firmware file has been read in the previous step above, or

the process will not work. If preferred, the ADU can be powered off in step 2 and powered on at this point, instead of pressing the RESET switch.

7. Click the NEXT button on screen. The screen should now show "ready for firmware download". Click the NEXT button to initiate the firmware download.
8. The screen will show the progress of the download. When the screen shows approximately 10% complete, a slight pause will occur while the ADU erases its flash memory, after which the download will continue.
9. If the download completes successfully, the screen will show "download completed successfully". A checksum verification will be done automatically at the end of the download and a failure will be indicated with an error message. If the download is successful the ADU will be restarted automatically.
10. Following the successful programming of firmware, the PanelX utility should be run to check the ADU firmware version and checksum. Run PanelX and connect to the ADU. From the ADU "base display", press `RECALL RECALL 4:CRC 4:FIRMWARE`, and check the display shows the correct version and checksum.
11. Set the code write protect link LK2 to the protect position. Update the firmware version information label on the board showing the product name, version number and checksum of the new firmware.

To program firmware into an FP1600 or OMEGA64 master or slave, a LM0076 DB9 Female-Female null modem cable is required to connect the panel to a serial COM port on the PC. The existing user database in the panel will not be affected by the firmware download process, however, if the firmware is being upgraded from version 4.XX to version 5.XX, the database created by version 4.XX firmware will be automatically converted by the version 5.XX firmware when it powers up (see below for more detail). The FPE (Flash Program Enable) link must be fitted to the board before downloading new firmware and removed after the firmware download is complete. The FPE link is located in the centre of the board to the left of the DPE (Data Program Enable) link. The DPE jumper link can be temporarily borrowed for the FPE link if necessary.

Procedure For Programming

The firmware can be programmed by selecting the desired firmware in the displayed list, clicking the NEXT button and following the prompts displayed on the screen. Ensure that the firmware version information label on the board is updated after programming new firmware. The full procedure is described below.

The procedure is the same for FP1600/OMEGA64 master and OMEGA64 slave(s), which must each be programmed in turn. Don't accidentally program master software into the slaves!

1. Connect a LM0076 serial cable from the PC to the panel DB9 connector. Install the FPE link on the board. The database program enable (DPE) link should be removed.
2. Power the panel OFF if not already.
3. Run FLASHX.EXE on the PC. Select the serial port (COM1,COM2 etc.) using the drop down list at the top of the screen.
4. FlashX will display a list of firmware files that have been used previously. If the desired file does not already appear then click the ADD button on the toolbar and browse to the location of the file and open it. FlashX will add the file to the displayed list. To remove a file from the displayed list, select it and click the REMOVE button.
5. Select the desired firmware from the list displayed by FlashX by clicking on it, then click the NEXT button. The firmware file will be read, and the selected serial port will be opened. Follow the prompts on the screen as follows.
6. Power the panel OFF if not already, then click the NEXT button.
7. Power the panel ON, then click the NEXT button. The seven segment display on the panel should show a rotating illuminated segment as the board powers up followed by the characters "ACO" (Application Checksum OK) or "Non" (None) if the currently installed application firmware is invalid. The screen should now show "ready for firmware download".
8. Click the NEXT button to initiate the firmware download.
9. The screen will show the progress of the firmware download. A flash memory erase will occur at the start, taking approximately 10 seconds, after which the download will continue, taking 15 to 20 seconds.

10. If the download completes successfully, the screen will show "download completed successfully". A checksum verification will be done automatically at the end of the download and a failure will be indicated with an error message. If the download is successful the panel will be restarted automatically.
11. Following the successful programming of firmware, the firmware version and checksum should be checked. Using the pushbuttons, press the Function key repeatedly (or hold it down) until the "Ur" option appears, then press the Select button. The firmware version and checksum will then be shown. Check that it matches the values shown by FlashX on the screen.
12. Remove the FPE link from the board (put back on one pin of DPE link if borrowed from there originally). Update the firmware version information label on the board.
13. Repeat for other boards in the system, if applicable. When the firmware in all boards has been upgraded, if any database conversion has been done at any master or slave board (see below), power the system off and on again and initiate a database save or manually enter program mode at the master and initiate a database save (to save the database, press the CHANGE button when "- -" is shown in program mode). If desired, use SmartConfig to extract the converted databases and save to disk.

Database conversion

When the firmware is upgraded from version 4.XX to version 5.XX, it is necessary for a database conversion to be done. When an FP1600 or OMEGA64 master board with version 5.XX firmware powers up and finds that a "version 4.XX database" is present, the database will be converted to "version 5.XX" and program mode will be entered automatically. The seven segment LED display will show the "- -" indication, at which point the CHANGE button can be pressed to save the converted database to non volatile memory. The DPE link must be installed first before initiating the save. When an OMEGA64 slave board with version 5.XX firmware powers up and finds that a "version 4.XX database" is present, the database will be converted to "version 5.XX" and a defect of "odb" (old database) will be indicated on the seven segment display. It is then necessary to enter program mode on the master board and execute a database save operation (at the master) to get the converted database saved into non volatile memory in the slave. The "odb" defect on the slave will then automatically clear.

SmartConfig (or SmartConfigLite) can be used to extract the databases from the panel before and after the firmware is upgraded so that the databases can be compared to check that the conversion has been done correctly.

If version 4.XX firmware is programmed into a panel that previously had version 5.XX firmware, then when the 4.XX firmware is powered up, it will report a database checksum error (Pc) and the database will not be usable.

NOTE - when extracting databases from an FP1600/OMEGA64 panel using Smart Config, it is necessary to extract the database from the master board first, before the slave boards, so that the correct number of boards is assigned before reading any slave databases.

FLASHX ERROR MESSAGES

Error messages which can appear while using FlashX are listed below. If a failure occurs during the use of FlashX that does not correspond to one of the following messages, or the fault cannot be cleared, it is worthwhile closing and restarting FlashX and trying again. Rebooting the computer may also help in some cases.

Comms port error occurred

A problem occurred trying to open or access the selected COM serial port. Check that the port is not in use by another program. Close other applications that don't need to be running, especially DOS applications. Use a terminal emulator such as Hyperterm to check that characters can be sent and received on the serial port.

Target not responding

Check that the correct serial cable is being used and the correct COM port is selected. Ensure that the sequence of operations shown on the screen is followed in the exact order specified, especially that the panel is powered on or reset at the correct point in the sequence. Check that the product contains a software version that supports FlashX.

Connect a terminal emulator to the panel instead of FlashX; power the panel on and check that a short message similar to "Powerup" appears. For the ADU or F3200/NDU, the terminal emulator baud rate will need to be set to 9600 to see the powerup message. For FP1600/Omega64 the baud rate needs to be 19200.

If the "Powerup" message does not appear when connecting with a terminal emulator, then it is possible that the flash memory in the target panel does not contain valid firmware. For F3200/NDU and ADU, check that the front panel LEDs flash when the panel is powered on. For FP1600/Omega64, check that the rotating illuminated segment on the seven segment display is shown on powerup.

Programming failed

This message indicates that an attempt to write to the flash memory failed. The firmware programming operation should be repeated from the beginning. If the error continues to occur then it is likely that either the flash IC is faulty or there is a hardware fault of some sort. The error can be produced artificially by setting the code protect link to the protect position after firmware programming has started. If the code protect link is in the protect position before firmware programming actually starts, then this error message won't normally occur and either "Erase operation failed" or "Target memory is write protected" messages will appear.

Erase operation failed (check write protect link)

This message can occur if the memory is write protected or if the flash IC is faulty or there is a hardware fault. Check that the memory is not write protected and try again.

Firmware verify failed

This error message indicates that the checksum verification of the target memory failed after programming completed. The firmware download operation should be repeated. If the error continues to occur, try powering the panel up into normal operation after completing the firmware download, to see if the panel itself reports a memory checksum error. This error is unlikely to occur because a failure during programming is normally reported as "Programming failed".

Target memory is write protected

This message occurs if the target panel reports that its memory is write protected. At the time of writing, this will not occur with F3200/NDU and ADU because they are not able to detect that their code memory space is write protected.

Verify operation timed out

This is an unlikely fault but can occur if communications is lost during the verify operation.

Internal resource error. Possibly corrupt .exe file

This error can occur if the FlashX.exe file is corrupted or FlashX fails to load correctly when it is started. Try rebooting the computer and restarting FlashX. If the fault re-occurs, download a new copy of FlashX from the Tyco website or report the problem to Tyco.

Error opening file

File open failed

The selected firmware file could not be opened. Check that the file exists. Try removing the file from the list using the REMOVE button, then add the file to the list again using the ADD button.

File content is not recognized

This message indicates that the first line in the file does not identify the file as a recognized firmware data file.

File contains invalid data

This indicates the firmware file may have been corrupted or is not a valid file.

No software selected

An item from the list of firmware files must be selected before the NEXT button is pressed, by clicking on the name and version number of the desired item.