Application Note

AS72xx

External Flash program and update

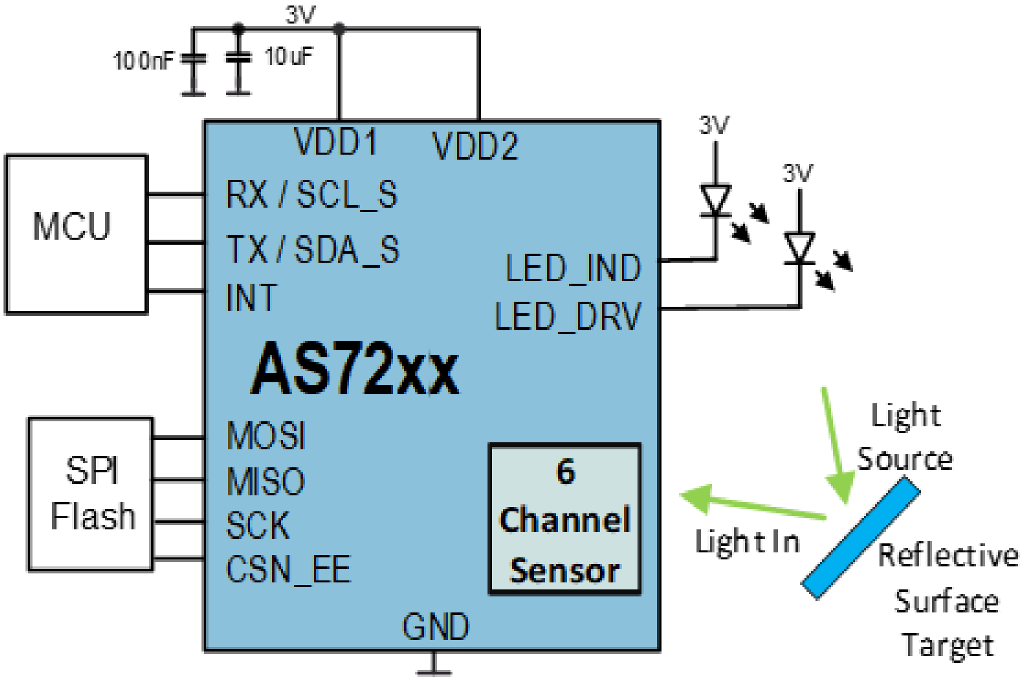
Content Guide

1. General Description

AS726x products use a serial Flash memory programmed with a valid firmware of ams (part of the product delivery) for the standard sensor operations like register configuration, measurement, calibration and matching, communication and networking.

This Application Note describes using the AS72xx UART interface for updating the external program Flash. This app note applies to UART capable AS72xx devices: AS7211, AS7221, AS7261, AS7262, AS7263 and AS7265x.

Figure 1: Block diagram AS72xxx



2. First Time Flash Programing

Get the latest “*.bin” file (512KB) from ams for the specific AS72xx device. Have the ams approved serial Flash manufacturer (see figure 3) or one of their distributors[1] use the “*.bin” file to program the Flash. This is a service they routinely provide. Or, use the SPI Programming setup as shown below to program the Flash (assumes programming tool access to the Flash is available).

[1] See for adesto_3rd.Party.Memory.Device.Programmer.Sources_11.22.16.pdf

Figure 1: Flash and manufacturer approved by ams

Serial Flash	Manufacturer	Comment
M95M02-XXXX	ST Micro (Serial EEPROM[2], not Flash)	Only for firmware version v3.x and 4.0.xx
AT25SF041-SSHD-B	Adesto Technologies	no firmware restrictions
MX25L4006ExxI-12G	Macronix	no firmware restrictions
SST25PF040C	Microchip Technology	Expect to support March/2018
W25X40CLSNIG	Winbond Electronics	Expect to support March/2018

(xx = alternative packages)

3. Flash Updating using the UART

AS72xx devices with the UART can use the ams AT commands for updating the Flash via standard programmer devices. Get the latest 56KB "*.bin" file from ams for the specific AS72xx device.

The technique is described per command in the AT Commands table below. In the table, text appearing between angle brackets ('<' and '>') are commands or response arguments. A carriage return character, a linefeed character, or both may terminate commands and responses. Note that any command that encounters an error will generate an "ERROR" response.

Figure 2: AT Commands for Flash Updating

Command	Response	Description/Parameters
Firmware Update		
ATFWU=<*value*>	OK	<*value*>= 16-bit checksum. Initializes the firmware update process. Number of bytes that follow are always 56 kBytes
ATFW=<*value*>	OK	Download new firmware Up to 7 bytes represented as hex chars with no leading or trailing 0x.

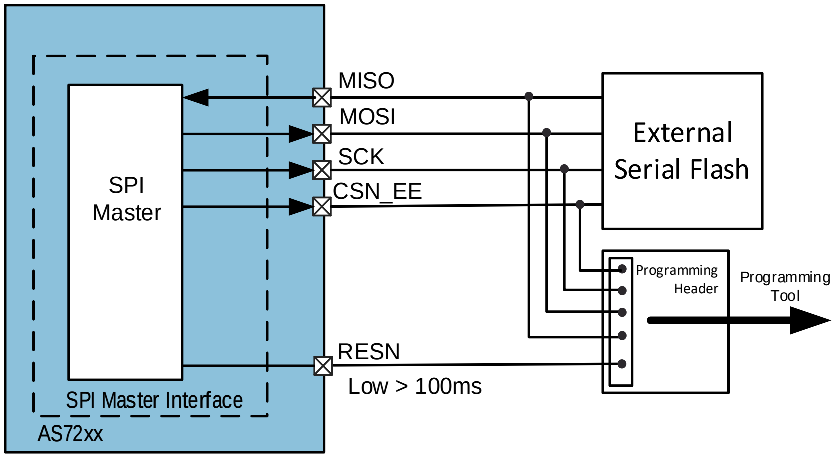
[2] EEPROMs are not supported longer for Scotty firmware version higher than v3.x and 4.0.xx – for more details see the application note "EEPROM Updating using I2C"

		Repeat command till all 56Kbytes of firmware are downloaded
ATFWA	OK	Causes target address for FW updates to advance. Should be called after every successful “OK” returned after “ATFW=<*value*>” command usage.
ATFWS	OK	Causes the active image to switch between the two possible current images and then resets the IC

Refer to the appropriate AS72xx datasheet for more AT Command information.

Make sure to the RESN signal is kept low during programming as shown.

Figure 3: Direct SPI Programming of Flash after System Assembly



4. Flash Updating using the FlashCatUSB programmer

The FlashCATUSB is a commercial programming tool that can be used to program the firmware to the Flash in conjunction with ams test boards AS72xx Demo kits.

The system and procedure is described in an additional application note “AN_AS726x How to Program AS72xx Firmware with FlashCatUSB”.

5. Contact Information

For further information and requests, e-mail us at:

ams_sales@ams.com

For sales offices, distributors and representatives, please visit:

www.ams.com/contact

Headquarters

ams AG
Tobelbader Strasse 30
8141 Premstaetten
Austria, Europe

Tel: +43 (0) 3136 500 0
Website: www.ams.com

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7. Revision Information

- Initial version V1-01 was for serial EEPROM
- V1-02 was first version for serial Flash
- V1-03 add the serial Flash part numbers that have been tested by ams
- V1-04 add a new Flash part number
- V1-05 updated different chapters with new details
- V1-06 updated different chapters with new details