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Equinox EQTools – Release Notes

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Abstract:

This document contains the Release Notes for the specified version of the EQTools – Programmer Interface Software.

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## 1.0 Overview of this release

### 1.1 Introduction

The document describes the new functionality, features and device support in this version of the EQTools software.

This version of EQTools has been specially developed to support programming of the following device families:

- Sigma - Z-Wave - 500 series devices and modules
- **ams (austriamicrosystems)** – AS5x63, AS5x62, AS54xx magnetic encoders
- **ST STM32 Cortex ARM** – STM32F103, STM32F103xxB, STM32F103xxC, STM32F103xxD, STM32F103xxE
- **'Atmel XMEGA AVR'** microcontroller family via the **'2-wire PDI'** programming interface
- **'Atmel ATtiny AVR'** microcontroller family via the **'2-wire TPI'** programming interface
- **NXP LPC2xxx ARM7'** microcontroller family via the **'4-wire JTAG'** programming interface
- **Atmel AT45DB – Serial DataFLASH** family via the **'SPI'** programming interface
- **Energy Micro - EFM Gecko ARM** microcontroller families via the SWD and JTAG interface

This version now includes support for all other devices supported by EQTools version 2. It can be used to support both legacy projects and to create new projects for any device.

### 1.2 Software versions in this release

This release of EQTools contains the following software utility versions:

Programmer	Software version	Description
EQTools	Build 3612	Main EQTools application
Upload Wizard	Build 3570	Utility used to upload 'Standalone Programming Projects' to a programmer.
ConsoleEDS	Build 3448	Utility used to control the operation of a programmer using simple Command Line instructions.
AOExplorer	Build 3176	Utility used to monitor / control the Interface Database.
ac_isppro Interface Database	<b>Version 14-7</b> <b>*** New version ***</b>	This is the Interface Database which is shared between EQTools and ISP-PRO. The database has been upgraded to version 14. A new 'Sigma' table has been introduced which is used to store parameters when programming Z-Wave 500 series devices.

## 1.3 Programmers supported

This version of the EQTools application supports the following Equinox programmers:

Programmer	Description	Production status
EPSILON5	Single channel portable ISP programmer.	In production
EPSILON5-MK3	Single channel portable ISP programmer.	In production
FS2000A	Single channel portable ISP programmer with LCD and keypad.	Now discontinued. Replaced by FS2003 or FS2000B.
FS2000B	The FS2000B is an FS2003 programmer running special firmware which emulates the functionality of the FS2000A programmer.	In production
FS2003	Single channel portable ISP programmer with LCD and keypad.	In production
FS2009	Single channel portable ISP programmer with LCD and keypad. (updated version of FS2003 supporting more algorithms)	In production
FS2009USB	Single channel portable ISP programmer with LCD and keypad. (updated version of FS2009 with USB port)	In production
PPM3 MK1	Discontinued	Discontinued. Replaced by PPM3-MK2.
PPM3 MK2	Production ISP Programming Module – expandable up to 16 programming channels.	In production – will be replaced by PPM4-MK1
PPM4 MK1	Production ISP Programming Module – expandable up to 16 programming channels.	In production
ISPnano Series 1	Production ISP Programming Module – expandable up to 32 programming channels.	Discontinued – replaced by Series 3
ISPnano Series 2	Production ISP Programming Module – expandable up to 32 programming channels.	Discontinued – replaced by Series 3
ISPnano Series 3	Production ISP Programming Module – expandable up to 32 programming channels.	In production
ISPnano-MUX	MUX2 / MUX4 / MUX8 – Sequential ISP programming systems	In production
ISPjuno	Single channel portable ISP programmer with LCD and keypad.	Pre-production testing

## 1.4 Installation instructions

**'EQTools Version 4'** is a completely new version of EQTools which replaces the existing **'EQTools Version 2'** software. It now supports all the legacy devices from Version 2 plus the new Atmel XMEGA and ATtiny TPI microcontroller families. We are currently in the process of adding all STM32 ARM microcontrollers plus Energy Micro EFM ARM microcontrollers.

This version of EQTools can be used to update / maintain any legacy projects created using Version 2 and also to create new projects for any device.

### Instructions to install the new version of EQTools.....

- If you already have an earlier version of EQTools installed, uninstall this older version by selecting Program Files → Equinox → Uninstall EQTools
- Launch the install for the new EQTools Version 4
- The new version of EQTools will be installed into the same folders as the older version 2.

### To run the new version of EQTools....

- Double-click the EQTools icon or select Start → Programs → Equinox → EQToolsV4

## 2.0 New functionality in this release

### 2.1 Sigma Z-Wave 500 Series support

This version of EQTools is the second beta release of programming support for the Sigma Z-Wave series of devices and modules.

A summary of the new features is as follows:

- New support for 'conditional calibration' of Z-Wave TXCAL and XTAL parameters
- Final NVR parameter values are now copied to a backup file and also backed up in the database
- Faster NVR parameter read stage as all parameters are now read from a cached NVR file instead of the target device NVR area
- Updated 'ISP-PRO Report file' now logs the NVR values before and after programming and also confirms the CCAL / TX calibration status before and after programming.
- New dedicated 'Sigma' table in the Interface Database - This is used to permanently store all 'NVR parameters' before and after programming.
- Enhanced 'NVR Area' data logging - all parameters are now logged to the database before and after programming.
- Enhanced NVR CRC16 validation - now checked at the start and the very end of the programming sequence.
- The Z-Wave 500 series programming sequence has been completely changed to reduce the possibility of leaving the "NVR Area" erased.
- Enhanced 'Diagnostic Report' for each target programmed now logs all Z-Wave NVR settings from before programming and after programming.
- Possibility to pass VID, PID, UUID parameters via fields in the database
- Full "Decoded NVR Report" now available to allow checking of programmed product.
- A "Restore NVR" script is now available which restores the data in the "NVR Area" to a pre-defined data set.
- The "Crystal Calibration" has been integrated into the programming script.

Please refer to application note AN145 for more detailed information about the Sigma Z-Wave support.

### 2.2 New dedicated 'Sigma' table in the Interface Database

A new dedicated 'Sigma' table has been added to the Interface Database.

This table is used exclusively by Sigma Z-Wave 500 programming scripts to store 'NVR parameters' and calibration information.

The Interface Database version is now version 14.

This new database version must be used with all Sigma Z-Wave 500 series scripts.

### 2.3 Support for 'conditional calibration' of Z-Wave 500 devices

This version of ISP-PRO introduces support for 'conditional calibration' of the Z-Wave TXCAL and XTAL parameters. The programming script now automatically detects whether the existing TXCAL and XTAL (CCAL) parameters are already calibrated and then only re-calibrates the relevant parameters if

required. This can save 5 - 6 seconds from the total calibration / programming cycle time if the Z-Wave device does not require re-calibrating.

Please note:

The XTAL (CCAL) calibration requires that the Equinox IOMOD10 'Calibration Module' is fitted to the programmer.

## **2.4 Support for final NVR area backup of Z-Wave 500 devices**

This version of ISP-PRO introduces support for backing up the final parameter values of the Z-Wave NVR area to both a file and to the ISP-PRO database. These final NVR values are now also re-validated and the CRC16 checksum is also revalidated. These final checks help to ensure that the Z-Wave device is correctly programmed at the end of the programming cycle.

## **2.5 New 'Database Analyser' tool available**

A new 'Database Analyser' tool has been integrated into EQTools. This tool can be used to check on batch statistics in the ISP-PRO Interface Database. It can be used to track failure rates, common failures and also to check calibration values across a batch of products.

## 3.0 New Device Support in this release

### 3.1 Atmel ATmegaxxxRFR2 family support

The following devices from the Atmel ATmegaxxxRFR2 family have been added:

- ATmega2564RFR2 rev A (JTAG)
- ATmega2564RFR2 (JTAG)
- ATmega1284RFR2 (JTAG)
- ATmega644RFR2 (JTAG)

### 3.2 Atmel ATmega6490P family support

The following devices have been added to the ATmega AVR library:

- ATmega6490P (JTAG)

Further devices from this family will be added soon.

### 3.3 Winbond W25Q - Serial SPI FLASH family support

The following devices have been added to the 'Serial FLASH memory' library:

- W25Q32BV (SPI)

Further devices from this family will be added soon.

### 3.4 Atmel AT25128B - Serial SPI EEPROM family support

The following devices have been added to the 'Serial EEPROM memory' library:

- AT25128B (SPI)

This device is found on many sigma Z-Wave 300 series modules.

Further devices from this family will be added soon.

### 3.5 Atmel ATtiny AVR family support

The following devices have been added to the ATtiny AVR library:

- ATtiny261 (SPI)

Further devices from this family will be added soon.



## 4.0 Upgrading the Programmer Firmware

### 4.1 Programmer firmware versions

This version of EQTools requires that the programmer firmware is upgraded to the latest version. The programmer firmware can be updated using either the Configit or Upload Wizard utilities. If the programmer is already running firmware version 3.00 or above then the Upload Wizard utility should be used to upgrade the programmer firmware.

The latest versions of programmer firmware are listed in the table below.

Programmer	Configit upgrades to firmware version:	Upload Wizard upgrades to firmware version:
<b>EPSILON5 MK1 / MK2</b>	3.07	5.36
<b>EPSILON5-MK3</b>	Not supported	5.40
<b>EPSILON5-MK4</b>	Not supported	Standard device support: 5.43 ARM device support: 9.04
<b>FS2000A</b>	2.54	Not supported
<b>FS2000B</b>	Not supported	3.07 (need to upgrade the firmware of an FS2003 to make an FS2000B programmer)
<b>FS2003</b>	3.07	5.36
<b>FS2009</b>	Not supported	5.36
<b>FS2009USB</b>	Not supported	Standard device support: 5.36 ARM device support: 9.08
<b>PPM3 MK1</b>	No longer supported	No longer supported
<b>PPM3 MK2</b>	3.07	5.38
<b>PPM4 MK1</b>	Not supported	5.39
<b>ISPnano Series I/II</b>	Not supported	5.35
<b>ISPnano Series III</b>	Not supported	Depends on algorithms being used
<b>ISPnano-MUX2 ISPnano-MUX4 ISPnano-MUX8</b>	Not supported	Depends on algorithms being used

**Please note:**

- Atmel XMEGA PDI AVR device support has been added in firmware 6.00 and above.
- Atmel ATtiny TPI AVR device support has been added in firmware 6.12 and above.
- Please email Equinox at [support@equinox-tech.com](mailto:support@equinox-tech.com) to request the latest version of this firmware.

## 5.0 Problems corrected in this version

### 5.1 Atmel AT91SAM7S family - programming reliability issue

#### Problem description

A few customers have reported a random programming reliability issue when programming the Atmel AT91SAM7S512 microcontroller device in standalone mode. The programming appears to randomly fail right at the very start of the programming sequence. If the operator simply re-runs the same standalone project a second or third time, then the device eventually programs OK.

Please note:

This problem only seems to manifest itself on the AT91SAM7S512 device.

#### Problem fix

This fix for this problem is very simple.

The AT91SAM7 device is given a RESET pulse before attempting to enter debug mode.

This RESET pulse on the nRST pin forces the AT91SAM7 into a known state so that the programmer can reliably enter programming mode every time.

#### Implementation

To implement this fix in an existing AT91SAM7 project:

- Open the existing project in Project Builder mode
- Go to the 'Statemachine' tab
- The existing statemachine did not drive the RESET (nRST) pin.
- Click the <Library> button on the statemachine tab and then select 'Statemachine - 24'
- The revised statemachine now drives the RESET (nRST) pin LOW for 20ms and then tristates the pin so it should go high again giving the device a RESET pulse.
- Recompile the project to save this new setting