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## FS2009 - Portable high-speed multi-project USB In-System (ISP) Programmer - OVERVIEW

The FS2009 is a portable programmer ideal for Development, Field-Service and Production. It supports high-speed In System Programming (ISP) of the on-chip FLASH / EEPROM memory of many FLASH microcontroller devices including 8051, Atmel AVR, NXP and Zensys microcontrollers. Support for the programming of many 24xxx Serial EEPROM Memories via I2C is also offered along with Atmel AT91SAM7 support. In Standalone Mode (without a PC) the operator can select from any 1 of 64 pre-loaded 'Programming Projects' using the keypad and Display and then simply presses the key to program the Target Device. This makes the FS2009 programmer ideal for use in Development, Field-Service or Production programming environments.

### Key features:

- Portable In-System (ISP) Programmer
- Ideal for Development, Production or Field use
- Supports ISP of Atmel 8051 FLASH microcontrollers (AT89Sxxx)
- Supports ISP of Atmel AVR FLASH Microcontrollers (ATmega, AT90USB, AT90CAN, AT90S, ATtiny)
- Supports ISP of NXP (Philips) P89C51Rx2 and P89C66x FLASH Microcontrollers
- Supports ISP of many 24Cxxx Serial EEPROM Memories via the I2C interface (chargeable upgrade)
- Supports ISP of AT91SAM7 devices (chargeable upgrade)
- Supports programming via SPI and UART protocols as standard
- Chargeable upgrade available for programming via JTAG and I2C
- Supports 'Standalone' operation i.e. no PC required after programmer has been configured
- Very fast programming speeds suitable for high-throughput production environments
- Up to 64 individual Programming Projects can be uploaded to the non-volatile On-board FLASH Store (4Mbytes).
- Robust I/O driver stage
- Individually configurable programmer I/O pins
- Programmable frequency generator output on SCK2 pin - supports external clocking of ATmega, and ATtiny AVR devices to speed up programming
- Programmer firmware is field upgradeable to cater for future algorithms
- CE / FCC / RoHS approved product

### Features

- ▶ [Supported Programmer Control Methods](#)
- ▶ [Target Interface Capabilities](#)
- ▶ [Standalone Programming Mode](#)
- ▶ [Development Mode](#)
- ▶ [Project Upload Mode](#)
- ▶ [ISP Header Support](#)
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- ▶ [Standalone Mode - Program -> Test -> Re-Program](#)
- ▶ [Device Support](#)

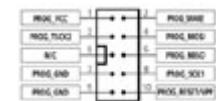
- ▶ [Supported Programmer Control Methods](#)



### Device Support

[Device Support List](#)
 

### Further Information


[ISP Header Overview >>](#)

### Downloads

 [View Downloads for this Product](#)

### Product Software

[View A](#)
[ConsoleEDS](#) [ConsoleEDS - Overview >>](#)

[EQTools Version 2 >>](#)

### Product News

[View A](#)
**11 February 2009:**
[Updated Device Support List available >>](#)

The programmer supports the following control methods:

- **Standalone Mode** - Keypad and LCD controlled (no PC)
- **Development Mode** - Controlled via PC Software - Equinox Development Suite (EDS)
- **Project Upload Mode** - PC Controlled
- **ISP-PRO** - Production Software (chargeable upgrade)
- **ASCII Text Communications Protocol** (RS232 Serial control - chargeable upgrade)

► Target Interface Capabilities

The FS2009 supports the following Target Interfaces / Algorithms:

- **Atmel AVR - SPI** - Serial Programming Mode
- **Atmel AT89S** - SPI - Serial Programming Mode
- **Atmel ATtiny11/12/15 High-Voltage** Serial Programming Mode
- **UART Boot Loader** - for Atmel T89C51Rx2 8051 microcontrollers
- **UART Boot Loader** - for Philips P89C51Rx2 and P89C66x 8051 microcontrollers
- **Atmel ATmega JTAG** In-System Programming (ISP) - chargeable upgrade
- **24Cxxx Serial EEPROMs** I2C (Two-Wire Interface) - chargeable upgrade
- **AT91SAM7 JTAG** In-System Programming (ISP) - chargeable upgrade

► Standalone Programming Mode



In 'Standalone Mode', the FS2009 is controlled via the push buttons on the front panel of the programmer - no PC connection is required. The programmer LCD and the LED Status Indicators are used to display the current status of the programmer. It is possible to select from 1 of 64 previously uploaded Programming Projects and then to repeatedly execute this project to program a batch of devices.

**In Standalone Mode...**

- Programmer is completely portable as no PC connection is required
- Programmer supports storage up to **64** independent Programming Projects in the non-volatile On-board **4Mbits** FLASH Memory Store .
- The operator simply selects the required project using LCD and keypad
- Each project name is version controlled showing the project name, date, firmware revision and build date. e.g. **myproject-240402-2.3.4.12**
- Single key auto-program mode
- Simple PASS / FAIL response with diagnostics on program failure
- Operator can not inadvertently change the programming data or settings

**To configure the programmer for Standalone Mode...**

- A Project Collection containing 1 - 64 Programming Projects must be uploaded on a one-off basis to the programmer using the EQTools PC software
- This is a single file which can be easily distributed to remote sites. It contains all projects, Hex File data, Fuse information etc.

► Development Mode



28 January 2009:

Serial EEPROM Memory ISP programming support extended >>



13 January 2009:

Cost-effective programmer 'Bundles' available - Epsilon5 & FS2009 >>



12 November 2008:

STOCK AVAILABILITY now displayed. >>



10 September 2008:

NEXT DAY delivery via FedEx to main USA and European destinations >>

05 May 2008:

New Equinox Programmer Firmware V3.07 >>



05 May 2008:

Atmel 24Cxxx Serial EEPROM Memory ISP programming support >>

**Product Upgrades**

[View A](#)



ASCII Text Communications (ATC) Serial Control Protocol for Equinox Programmers >>



Atmel AT91SAM7 - ARM7 JTAG Device Library Licence - Overview >>



EQTools Script Builder License Upgrades >>



ISP-PRO Production Software Suite - License Upgrade for Equinox programmers >>



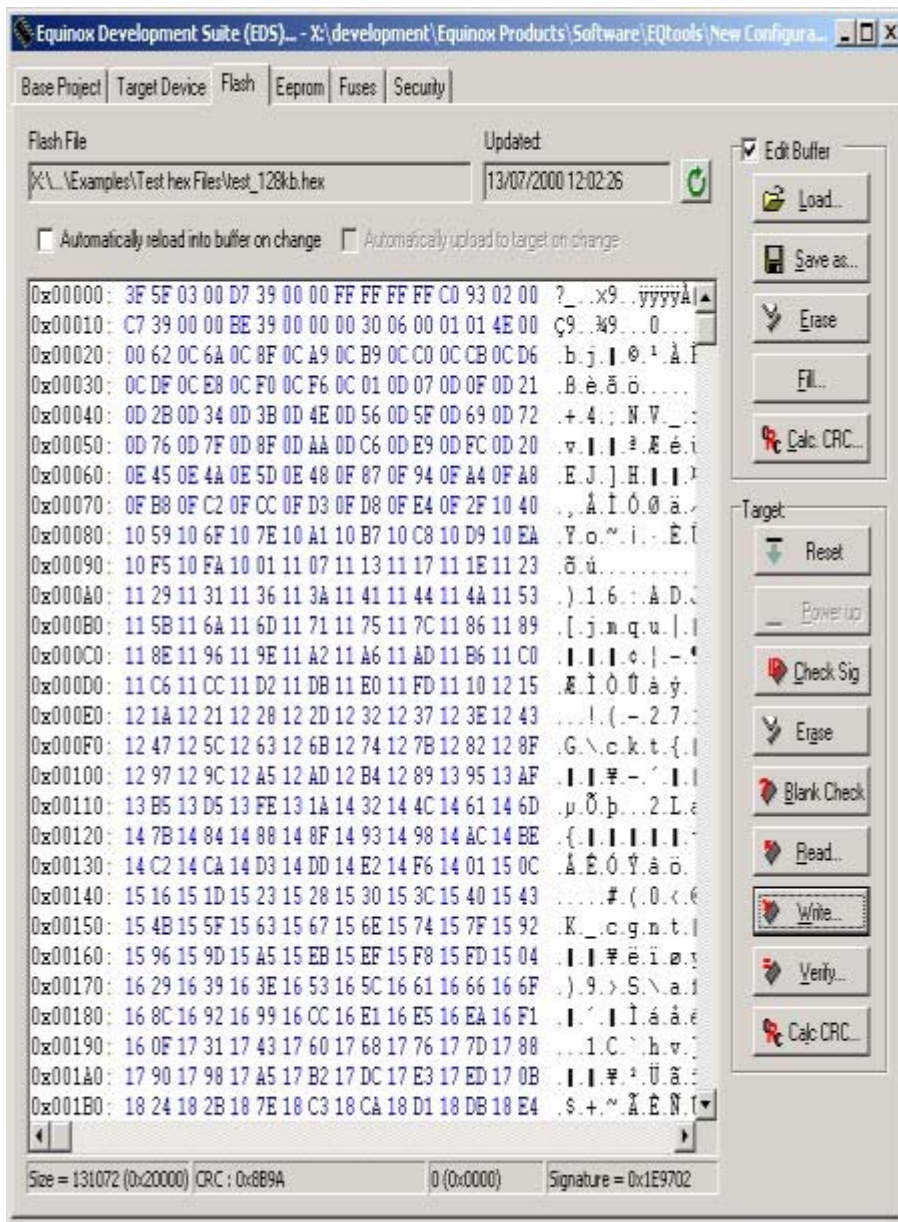
JTAG In-System Programming (ISP) Support for Atmel ATmega AVR Microcontrollers >>



LabView Control Licenses Upgrades >>



Remote Application Control of Equinox Programmers - Overview



- Programmer is controlled from the PC via EQTools - Equinox Development Suite (EDS) Software
- Ideal for use in a Development Environment
- Supports manual writing / reading of FLASH / EEPROM memory areas
- Supports manual writing / reading of Fuses and Security Fuses
- All projects can be developed and tested on a real device before uploading a Programming Project to the programmer
- Tested Programming Projects can then be uploaded to the Programmer for use in Standalone Mode

► Project Upload Mode

This mode allows a pre-compile Project Collection to be uploaded to the on-board 'FLASH Memory Store'. The programmer can store up to 32 Mbits of Project Information which is held indefinitely in non-volatile FLASH Memory. It is possible to upload up to 64 Programming Projects to the programmer, each of which can be for a different target device. A simple 'Upload Wizard' allows field personnel to upload single or multiple Programming Projects as part of Project Collections.

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**24xxx - Serial I2C EEPROM Memory - Device Library - Overview >>**

**Standalone Project Upload Utility Upgrade - Overview Product >>**

**Upload Wizard**

**Associated Products** [View A](#)

**Cables**

**USB to RS232 Serial Converter Cable >>**

**Evaluation Modules (Microcontroller)**

**Olimex - SAM7-H256 HEADER DEVELOPMENT BOARD FOR AT91SAM7S256 ARM7TDMI-S MC >>**

**Starter Systems (Microcontroller)**

**Olimex - SAM7-EX256 DEVELOPMENT BOARD FOR AT91SAM7S256 ARM7TDMI-S MC >>**

**Olimex - SAM7-H64 HEADER DEVELOPMENT BOARD FOR AT91SAM7S64 ARM7TDMI-S MC >>**

**Olimex - SAM7-LA2 DEVELOPMENT BOARD FOR AT91SAM7EA2 ARM7TDMI-S MC >>**

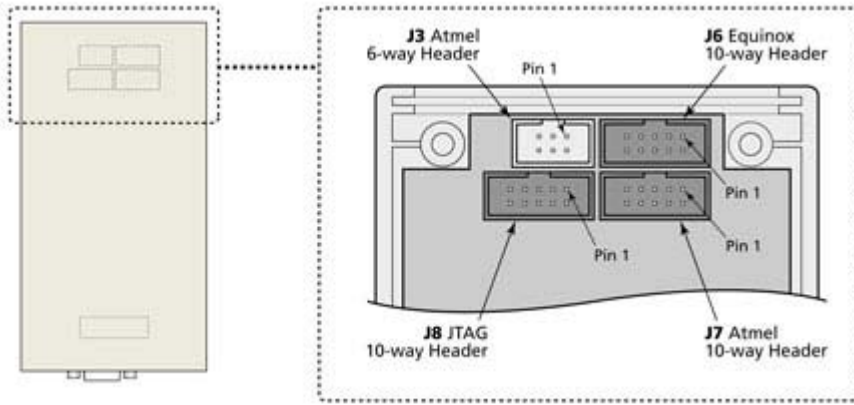
**Olimex - SAM7-MT-256 DEVELOPMENT BOARD FOR AT91SAM7S256 ARM7TDMI-S MC >>**

**Olimex - SAM7-P256 DEVELOPMENT BOARD FOR AT91SAM7S256 ARM7TDMI-S MC >>**

**Key Products**

**Olimex - SAM7-H256**

► ISP Header Support



The FS2009 programmer features all the popular In System Programming (ISP) Headers including:

- Atmel 10-way SPI Header (for Atmel AVR and AT89S microcontrollers)
- Equinox 10-way Header (for Atmel AVR and AT89S microcontrollers) and I2C Serial EEPROMs
- Atmel 6-way SPI Header (for Atmel AVR and AT89S microcontrollers)
- Atmel 10-way JTAG ISP Header (for JTAG ISP of Atmel ATmega AVR microcontrollers)
- Equinox 10-way UART Header (for Atmel AT89C51Rx2 and Philips P89C51RX2 and P89C66x microcontrollers)

This allows the programmer to interface directly to most target systems without requiring an external cable convertor.

Please refer to the [ISP Header Overview](#) page for full details of all available ISP Headers and ISP Cables.

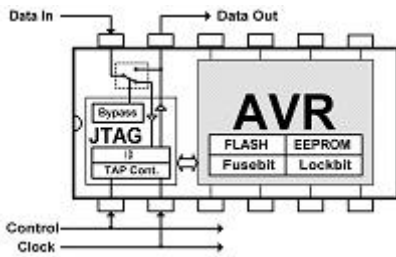
► Programmer / Target System - Power Supply Options

The Programmer supports the following powering options:

- Target System can supply power to the programmer: 3.0 - 5.0V @ 50mA
- Programmer can supply power to the Target System: 5.0V @ 300mA
- Programmer and Target System can be Independently Powered

The Programmer comes with a 9V DC Power Supply which is regulated down to +5.0V inside the programmer.

► JTAG ISP Support for Atmel ATmega AVR Microcontrollers



The FS2009 supports programming of the Atmel ATmega AVR Microcontroller Family using the JTAG algorithm. This chargeable upgrade allows the FS2009 to program the ATmega devices at high speed via the JTAG port of the Target Device.

The advantages of JTAG In-System Programming are:

- Much faster programming times (up to x4 times faster than SPI)
- JTAG port can also be used as a 'Debug Port' during product development

► Configurable Frequency Output Clock

The FS2009 is capable of outputting a continuous square wave at various frequencies on the



**HEADER DEVELOPMENT BOARD FOR AT91SAM7S256 ARM7TDMI-S MC >>**



**Olimex - SAM7-P256 DEVELOPMENT BOARD FOR AT91SAM7S256 ARM7TDMI-S MC >>**

Microcontroller Modules



**Olimex - SAM7-EX256 DEVELOPMENT BOARD FOR AT91SAM7S256 ARM7TDMI-S MC >>**



**Olimex - SAM7-H256 HEADER DEVELOPMENT BOARD FOR AT91SAM7S256 ARM7TDMI-S MC >>**



**Olimex - SAM7-H64 HEADER DEVELOPMENT BOARD FOR AT91SAM7S64 ARM7TDMI-S MC >>**



**Olimex - SAM7-LA2 DEVELOPMENT BOARD FOR AT91SAM7EA2 ARM7TDMI-S MC >>**



**Olimex - SAM7-MT-256 DEVELOPMENT BOARD FOR AT91SAM7S256 ARM7TDMI-S MC >>**



**Olimex - SAM7-P256 DEVELOPMENT BOARD FOR AT91SAM7S256 ARM7TDMI-S MC >>**



**Olimex - SAM7-P64 DEVELOPMENT BOARD FOR AT91SAM7S64 ARM7TDMI-S MC >>**

programmer SCK2 pin.

This clock frequency could be used for the following purposes:

- To toggle the STROBE pin on a Watchdog Timer IC to stop the IC from timing out during the In-System Programming operation.
- To provide a clock to an Atmel ATmega microcontroller to resurrect a device which has an incorrectly configured Internal Oscillator.

▶ Spare Programmer I/O pins

- In SPI mode, there are 2 x Spare I/O pins for custom use
- In UART mode, there is 1 x Spare I/O pins for custom use
- The spare I/O pin(s) can be used for controlling circuitry on the user Target System including Chip Selects, additional RESET control lines, Watchdog Timers etc.

▶ CE / FCC Approved Product

The FS2009 is a CE / FCC and RoHS approved product.

▶ Fast Programming Times



The FS2009 supports fast programming of Target Devices via the SPI, JTAG and UART algorithms.

▶ Standalone Mode - Program -> Test -> Re-Program

The programmer is capable of performing a multi-project Programming Sequence in Standalone Mode as follows:

- Program Test Firmware
- Execute Target Firmware
- Wait for Target Firmware to finish
- Program Production Firmware

This powerful functionality allows the programmer to be used as part of an In-Circuit Test procedure where the Target Firmware must be allowed to execute in order to eg. calculate some calibration values. The programmer initially programs some 'Test Firmware' into the Target Device and then allows the Target to run this firmware and waits for this firmware to finish executing. The real 'Production Firmware' is then programmed into the Target Device.

### Device Support (by manufacturer)

This product supports devices from the manufacturers listed below:

Atmel Corporation  
 Dallas Semiconductor (Maxim)  
 Exel Semiconductor (Rohm)  
 Holtek Semiconductor  
 IC Microsystems  
 ISSI  
 Microchip  
 NXP (Philips)  
 ON Semiconductors (Catalyst)  
 Ramtron  
 Rohm  
 Seiko Instruments  
 STMicroelectronics  
 Xicor  
 Zensys

*The following are available as chargeable upgrades: JTAG In-System Programming support for the Atmel ATmega AVR Family; 24Cxxx - Serial I2C EEPROM Memory Device Library and Atmel AT91SAM7 Upgrade Pack. See [Upgrades] tab.*

**Please note:**

Not all devices may be supported within a family.

Please see the [Detailed Device Support List](#) for a list of all devices which the product supports.

### Product Versions

For the standard programmer - the product code required is FS2009(UN). If you require a programmer for a specific device family other than the options offered, please e-mail [sales@equinox-tech.com](mailto:sales@equinox-tech.com).



#### FS2009 - Portable high-speed multi-project USB In-System (ISP) Programmer

FS2009 - Portable high-speed In-System (ISP) Programmer with Standalone capability using LCD / keypad (64 projects) and USB / RS232 connectivity.

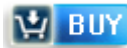
Manufacturer: [Equinox Technologies](#)

Order Code:

Equinox: **FS2009(UN)**  
**Digi-Key** 483-1020-ND

**Farnell** 1695684

| Quantity     | Price (GBP) [Excl. VAT] |
|--------------|-------------------------|
| 1 - 4        | 299.95                  |
| 5 - 9        | 284.95                  |
| 10 - 24      | 269.96                  |
| 25 and above | 254.96                  |



**Availability:**  
159 in stock



#### FS2009 - Portable multi-project ISP Programmer for Atmel AT91SAM7 Microcontrollers

FS2009 (SAM7) - Portable high-speed In-System (ISP) Programmer for JTAG programming of Atmel AT91SAM7 ARM7 microcontroller family with standalone capability using LCD / keypad (64 projects) and USB / RS232 connectivity.

Manufacturer: [Equinox Technologies](#)

Order Code:

Equinox: **FS2009(SAM7)**  
**Digi-Key** 483-1019-ND

**Farnell** 1695686

| Quantity     | Price (GBP) [Excl. VAT] |
|--------------|-------------------------|
| 1 - 4        | 299.95                  |
| 5 - 9        | 284.95                  |
| 10 - 24      | 269.96                  |
| 25 and above | 254.96                  |



**Availability:**  
0 in stock  
10 days delivery



#### FS2009 - Portable multi-project USB ISP Programmer for Atmel ATmega Microcontrollers

FS2009 (AVR-JTAG) - Portable high-speed In-System (ISP) Programmer for JTAG programming of Atmel AVR microcontroller family. Standalone capability using LCD / keypad (64 projects) and USB / RS232 connectivity.

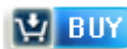
Manufacturer: [Equinox Technologies](#)

Order Code:

Equinox: **FS2009(AVR-JTAG)**  
**Digi-Key** 483-1018-ND

**Farnell** 1695685

| Quantity     | Price (GBP) [Excl. VAT] |
|--------------|-------------------------|
| 1 - 4        | 299.95                  |
| 5 - 9        | 284.95                  |
| 10 - 24      | 269.96                  |
| 25 and above | 254.96                  |



**Availability:**  
154 in stock

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