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PPM4 MK1 - High-speed Production ISP Programming Module

High-Speed Production In-System Programmer with Standalone Programming Capability

The Equinox PPM4-MK1 is a state-of-the-art Production ISP Programmer designed for high-speed In-System Programming (ISP) of FLASH Microcontrollers and Serial Memory devices. It supports programming of devices by most interfaces including SPI, JTAG, JTAG chain, SCI, I2C (2-wire) and UART Boot Loader. The fastest possible programming times are guaranteed due to a combination of highly optimised algorithms, local storage of Project Data and high slew rate Line Driver Circuitry.

The PPM4-MK1 is capable of operating in 'Standalone Mode' where any one of 64 independent 'Programming Projects' can be recalled and executed via the programmer keypad / display interface. This makes the programmer ideal for production environments as operator simply selects the correct project for the job and then presses a single button to repeatedly program the same project.

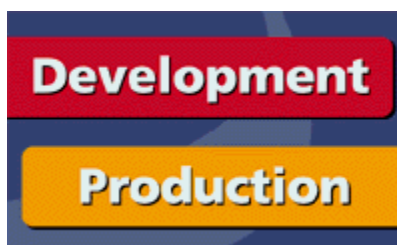
The PPM4-MK1 also features a 4-wire TTL Remote Control interface making it ideal for interfacing to any ATE or In-Circuit Tester (ICT). A special 'Start Signal' can be used to detect when a Test Fixture lid has been closed and thereby automatically start a programming operation.

Features

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▶ Main Features

- **Wide ranging Device Support capability**
Supports In-System Programming (ISP) of many popular FLASH Microcontrollers, Serial EEPROM and serial FLASH Memories
- **High-speed Programming**
Optimised algorithms, on-board project data storage and high-speed line-driver circuitry delivers the fastest possible programming times
- **Supports most ISP Protocols**
SPI, JTAG, I2C (2-wire), SCI, BDM, PDI
- **Excellent Host Control connectivity**
USB, RS232, RS485 (up to 32 programmers)



Device Support

[Device Support List](#)

Further Information


[ISP Header Overview >>](#)

Downloads

[View Downloads for this Product](#)

Product Software

[View All](#)
[Configit - Firmware Update Utility >>](#)

- **Gangable**
Up to 32 programmers can be controlled from a single PC using the RS485 Bus
- **Standalone Operation**
Programmers can operate without PC Control using LCD / keypad or 4-wire TTL control port
- **Supports up to 64 Independent 'Programming Projects'**
- Each project supports programming of a complete device inc. FLASH, EEPROM, Fuses etc.
- **Fully ESD and Over-voltage protected I/O**
All Target I/O pins feature both ESD and over-voltage protection
- **User-replaceable line-driver circuit board**
All programmer line driver circuitry can be replaced in minutes in case of damage.
- **Programmer Controlled Target Power Supply**
The programmer can switch 1.8 to 5.0V @ 300mA to the Target System
- **User-swappable I/O Connector Modules**
Many different I/O Connector Modules are available to suit any required connection system.
- **Firmware upgradeable**
New algorithms and features can be added via a simple firmware upgrade
- **Simple ATE / Test Fixture Integration**
Designed to interface to any ATE, ICT or Test Fixture

▶ PPM4-MK1 v PPM3-MK2

The main enhancements are:

- Larger LCD
- Double the on-board FLASH size for projects
- USB port (also still has the RS232 port)
- Faster JTAG algorithms (still to be tested)
- More space for new algorithms
- Upgradable to have dedicated I2C port for programming eg. Serial EEPROMs
- Very accurate Target Controlled Power Supply with the range of 1.2 to 5.0V
- In the future, the PPM4 should be able to support programming of devices down to 1.8V

▶ Device Support Overview

The programmer supports **In-System Programming (ISP)** of a wide variety of FLASH microcontrollers and Serial Memories.

Microcontrollers

Atmel

- **AT89(L)S** - 8051 (SPI)
- **AT89Cxxx** - 8051 (UART)
- **AT90S** - AVR (SPI)
- **AT90CAN** - AVR (SPI and JTAG / JTAG chain)
- **AT90PWM** - AVR (SPI and JTAG / JTAG chain)
- **AT90USB** - AVR (SPI and JTAG / JTAG chain)
- **ATmega** - AVR (SPI and JTAG / JTAG chain)
- **ATmega(PICO)** - AVR (SPI and JTAG / JTAG chain)
- **ATtiny** - AVR (LV SPI and High Voltage Serial Mode)
- **AT91SAM7A** - ARM7 (JTAG / JTAG chain)
- **AT91SAM7L** - ARM7 (JTAG / JTAG chain)
- **AT91SAM7S** - ARM7 (JTAG / JTAG chain)
- **AT91SAM7SE** - ARM7 (JTAG / JTAG chain)

NXP (Philips):

- P89C51Rx2 - 8051 FLASH Microcontroller Family
- P89C66x - 8051 FLASH Microcontroller Family

Zensys:

- Z-Wave Single Chips - 100 Series (SPI)
- Z-Wave Single Chips - 200 Series (SPI)
- Z-Wave Single Chips - 300 Series (SPI)

Serial Memories

- 24Cxxx Serial EEPROM memories (I2C)
- 45Dxxx Serial DataFLASH memories from Atmel (SPI)



[EQTools Version 2 >>](#)

Product News

[View All](#)

11 February 2009:

[Updated Device Support List available >>](#)



16 May 2008:

[NEW EQ-SFM-MAX-V1.3 - High-speed I/O Driver Module for PPM3-MK2 Programmer >>](#)

05 May 2008:

[New Equinox Programmer Firmware V3.07 >>](#)



05 May 2008:

[Atmel 24Cxxx Serial EEPROM Memory ISP programming support >>](#)



14 March 2008:

[Equinox announce ISP support for Atmel ATmegaxxxP 'PICO Power' AVR Family >>](#)



14 March 2008:

[Equinox announce ISP support for Atmel AT90USB AVR Family >>](#)



12 October 2007:

[EQUINOX ON-LINE ORDERING AVAILABLE >>](#)

Product Upgrades

[View All](#)



[Atmel AT91SAM7 - ARM7 JTAG Device Library Licence - Overview >>](#)

[Atmel AVR On-Chip Oscillator Calibration - Overview >>](#)



[ConsoleEDS - Overview >>](#)



[EQTools Script Builder License Upgrades >>](#)



[ISPPRO Production Software Suite - License Upgrade for Equinox programmers >>](#)



[JTAG In-System Programming \(ISP\) Support for Atmel](#)

Please note:

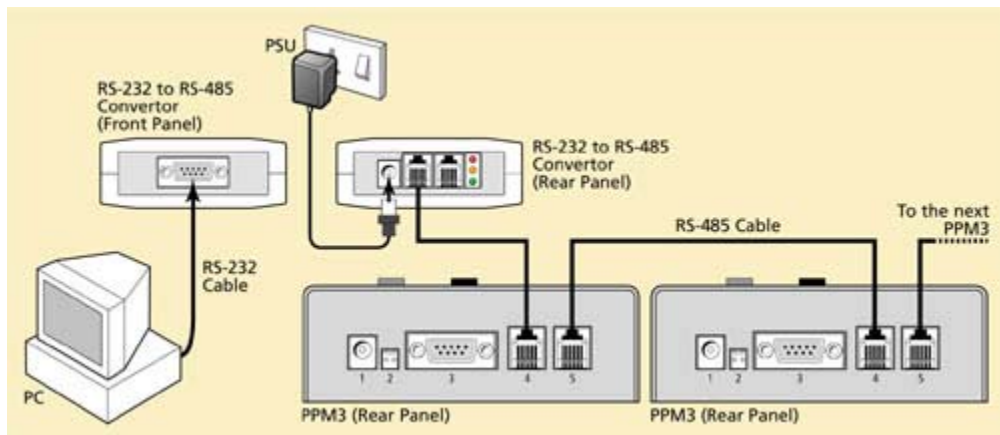
- Some devices can be programmed via multiple interfaces eg. SPI and JTAG.
- The programmer supports programming of devices connected in a JTAG chain.
- The devices supported depends on the version of the programmer purchased.
- Some 'Device Libraries' may have to be purchased as 'Optional license Upgrades'.

► Hardware Features

The PPM4 Programmer features state-of-the-art technology which delivers the fastest possible programming times together with the best I/O protection in a compact simple-to-use module.

- 20 x 4 character backlit display
- 4 key user keypad
- Single button autoprogram start key
- 9 to 24V DC power supply input
- Five digital Target I/O I/O lines
- User configurable RESET line with separate HIGH and LOW drive
- Dedicated 2-wire I2C Port with 400pF drive capability
- 1 x analog output line
- 1 x programmable output voltage (1.8 to 5.0V @300mA)
- Target System Voltage and Current Monitoring
- Short-circuit protected Target Power Supply
- 1 x fixed +12V Vpp voltage on RESET pin
- 1 x programmable clock output
- Full ESD and Over-voltage protection per I/O pin
- All I/O Driver Circuitry on a removeable module for easy replacement
- All I/O Connector Circuitry is on a separate I/O Connector Module
- 3 x Status (PASS, BUSY, FAIL) LEDs on the programmer
- 1 x Remote LED Port to allow mounting of Remote LEDs on a Test Fixture
- TTL Remote Control Port with START, BUSY, PASS and FAIL signals (to interface to ATE or ICT)
- Target System Connection / Disconnection sensing circuit
- ESD protected RS232 Communications Interface
- ESD protected RS485 Communications Interface (supports networking of up to 32 programmers)
- Support for Remote LCD / Keypad connection

► Gang Programming Capability



- Up to 32 Programming Modules can be daisy-chained from a single PC via the Equinox RS-485 Programmer Bus.
- Each channel can program a Target System independently of the other programmers (full asynchronous programming).
- Very high programming throughputs can be achieved in Production Environments by using multiple modules programming in parallel.
- This method also supports programming of 2 or more Target Devices on the same Target System.
- Multiple programmers on the RS485 network can be controlled either by the ISP-PRO or ConsoleEDS utilities.
- An RS-485 Converter is required to implement multi-channel programming.

► Programmer Control Methods (enabled as standard)

- Development Mode - using Equinox Development Suite (EDS) under PC control
- Standalone Keypad Mode - Project Selection via keypad / LCD. Press key to perform an autoprogram operation (no PC required).

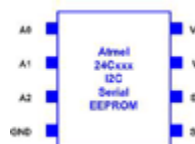
ATmega AVR
Microcontrollers >>



LabView Control License
Upgrades >>



Remote Application
Control of Equinox
Programmers - Overview
>>



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



Standalone Project
Upload Utility Upgrade -
Overview Product >>

Upload Wizard

Associated Products

[View All](#)

Evaluation Modules (Microcontroller)



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

Programmers



EQ-SFM-1 - Standard I/O
Driver Module (SFM) for
PPM3-MK2 Programmer
>>



EQ-SFM-MAX-V1.2 -
High-speed I/O Driver
Module for PPM3-MK2
Programmer >>



EQ-SFM-MAX-V1.3 -
High-speed I/O Driver
Module for PPM3-MK2 /
PPM4-MK1 Programmer
>>

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 >>

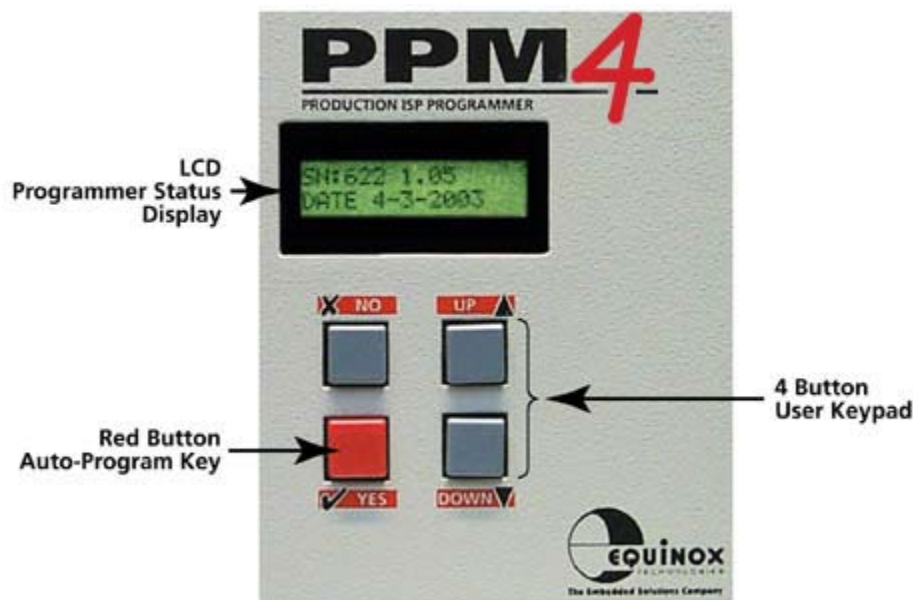
Olimex - SAM7-P256
DEVELOPMENT BOARD

- Standalone Target Sense Mode
- ASCII Text Communications - RS-232 serial control
- 4-Wire TTL Control - control via Remote system using 4 control signals

▶ Programmer Control Methods (chargeable License Upgrades)

- ConsoleEDS - Command Line control utility
- ISP-PRO - Production Monitoring Software
- Remote Application Control - control via a custom application written in eg. Visual Basic, C++, C Builder
- Labview Control - control via a custom Labview 6 application

▶ Standalone Programming Mode (no PC)



In '**Standalone Mode**', the programmer 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 by pressing the **[YES]** button 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 on display and via PASS / BUSY / FAIL LEDs
- Multiple Programming Projects can be chained together to create complex **Program Test Firmware -> Run Target -> Program Production Firmware** sequences
- Operator can not inadvertently change the programming data or settings

▶ PC Configuration / Driver Software - EQTools Software

- Equinox Development Suite (EDS)
- Project Builder - to create/edit Programming Projects
- Project Manager - to create and maintain Project Collections
- Project Upload / Download Utility - to upload projects to the programmer for use in Standalone Mode

▶ Supports all popular ISP Headers to connect to the Target System



FOR AT91SAM7S256
ARM7TDMI-S MC >>



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

Other Hardware Tools



I/O Connector Module 11
- ATE RELAY Interface
>>



I/O Connector Module 3
(JTAG) - Fast Connect
Version >>

I/O Connector Module 8 -
ATtiny261/461/861 -
SOIC-20 Socket Module
for PPM3 & PPM4 >>

Key Products



Olimex - SAM7-H256
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 >>

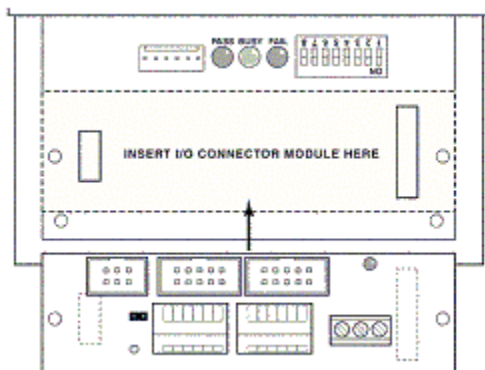


Olimex - SAM7-LA2
DEVELOPMENT BOARD
FOR AT91SAM7EA2
ARM7TDMI-S MC >>



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

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

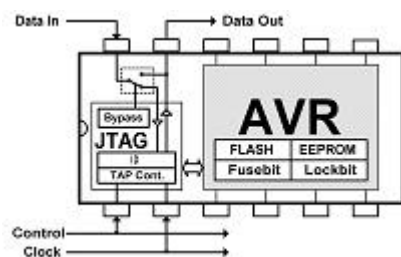


- Interchangeable 'I/O Connector Modules' support all popular ISP Header formats:
 - Atmel 10-way SPI Header (as per STK200 / STK500)
 - Atmel 6-way SPI Header
 - Equinox 10-way SPI header with support for Slave Select & SCK2
 - Atmel 10-way JTAG header (as per Atmel JTAG-ICE)
 - Equinox 10-way UART header for Atmel T89C51Rx2 (8051) and NXP (Philips) P89C51 ISP FLASH microcontrollers
 - Fast Connect - clip-in wire connectors
 - Wire-wrap connectors

▶ Programming Interfaces Supported

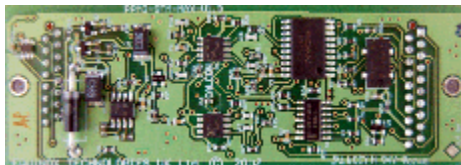
- Atmel 3-wire SPI Interface + RESET - Atmel AVR and AT89S microcontrollers
- Zensys - 3-wire SPI + RESET + PROG_ENABLE
- JTAG - for Atmel AVR (supports JTAG chain programming)
- JTAG - for AT91SAM7 (supports JTAG chain programming)
- Atmel UART Bootloader - Atmel 89C51Rx2 (TXD, RXD, PSEN & RESET)
- NXP (Philips) UART Bootloader - P89CRx2/66x (TXD, RXD, PSEN & RESET)
- I2C Interface (SDA + SCL)

▶ JTAG ISP Programming support



- Supports high-speed JTAG programming of a single Atmel AVR microcontroller or AT91SAM7 ARM microcontroller connected via the JTAG interface
- Supports high-speed JTAG programming of multiple Atmel AVR or AT91SAM7 microcontrollers which are connected as part of a 'JTAG Chain' (JTAG daisy-chain mode).
- Fast programming speeds via JTAG (3 - 4 times faster than SPI method)
- Simple 4-wire JTAG Interface to microcontroller
- Same JTAG Interface as Atmel JTAG ICE MK2 Debugger
- User-selectable JTAG frequency
- Supports JTAG Chain Validation
- Supports checking of the 'JTAG ID' of both AVR and any generic JTAG devices eg. CPLD's
- Supports automatic checking of 'Silicon Revision' of target JTAG device
- The JTAG algorithms can be purchased as a License Upgrade to the standard PPM3-MK2 programmer (Order code: PPM4MK1-UPG7)
- The JTAG I/O Connector Module IO-CON-3 is required to connect to an Atmel JTAG Target System.

▶ Interchangeable I/O Driver Circuitry (SFM Modules)



The 'Special Function Module contains the main 'I/O Driver Circuitry' which interfaces the programmer electronics to the Target System. This module is interchangeable allowing a



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

Test Equipment



I/O Connector Module 11
- ATE RELAY Interface
>>

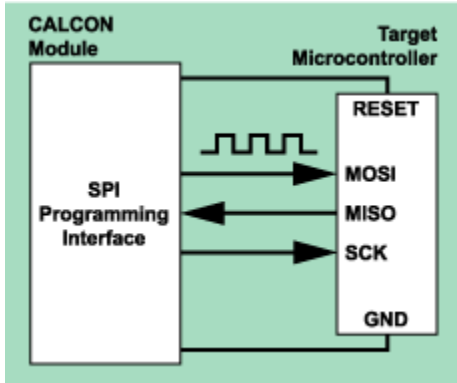
programmer to be repaired or upgrades in minutes by simply swapping the module.

The following 'Special Function Modules' are available for this programmer:

- **EQ-SFM-1** – Standard Special Function Module
- **EQ-SFM-MAX-V1.3** – High Speed / ESD Protected + 32 kHz

For further information, click the relevant link in the Associated Products section on the right-hand side of the page.

► AVR Internal RC Oscillator Calibration



The PPM4-MK1 programmer can be used to perform a very accurate Calibration (+/- 1%) of the Internal Oscillator of many Atmel AVR microcontrollers. This requires the use of the 'EQ-SFM-MAX-V1.3' module.

► Interfacing to ATEs and ICTs

The PPM4-MK1 programmer has been specially designed for straightforward integration with In-circuit Testers (ICT) or other Automatic Test Equipment (ATE).

- 4-wire TTL Remote Control Port - ideal for older ICT's
- Simple ASCII Control Protocol via RS232 Port - for ICT's which feature serial port
- Compatible with Agilent, Genrad, Teradyne and SPEA ATE Systems
- 4-wire TTL Remote Control Port
- Simple ASCII Control Protocol via RS232 Port

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



PPM4 MK1(UN) - Production ISP Programming Module for AVR, 8051 and Zensys devices

PPM4-MK1 - Production In System Programming (ISP) Module supporting AVR, 8051 and Zensys devices. Supplied with Universal Mains Power Supply Adaptor suitable for UK, US, Europe and Asia: Input: 110 - 240V AC @ 50Hz, Output: 9V DC reg. @ 1.5A

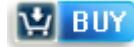
Manufacturer: [Equinox Technologies](#)

Order Code:

Equinox: PPM4-MK1(UN)

Digi-Key 483-1021-ND

Quantity	Price (GBP) [Excl. VAT]
1 - 3	587.40
4 - 9	528.66
10 - 24	499.29
25 and above	469.92



Availability:
18 in stock

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