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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.

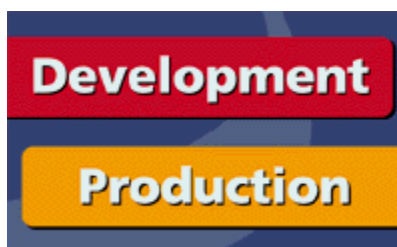
The PPM4-MK1 also features a 4-wire TTL Remote Control interface making it ideal for interfacing to any ATE or In-Circuit Tester (ICT). A special 'Start Signal' can be used to detect when a Test Fixture lid has been closed and thereby automatically start a programming operation.

#### Features

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- ▶ [AVR Internal RC Oscillator Calibration](#)
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#### ▶ Main Features

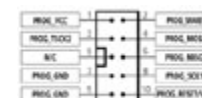
- **Wide ranging Device Support capability**  
Supports In-System Programming (ISP) of many popular FLASH Microcontrollers, Serial EEPROM and serial FLASH Memories
- **High-speed Programming**  
Optimised algorithms, on-board project data storage and high-speed line-driver circuitry delivers the fastest 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:

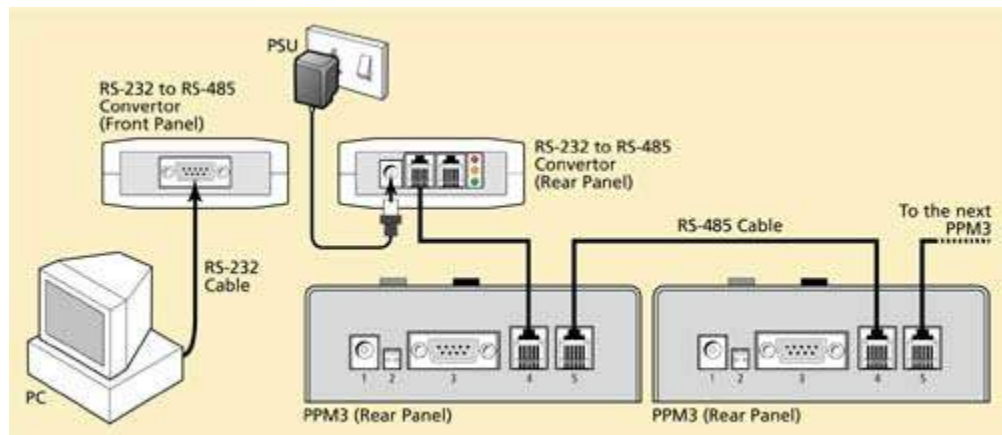
- Some devices can be programmed via multiple interfaces eg. SPI and JTAG.
- The programmer supports programming of devices connected in a JTAG chain.
- The devices supported depends on the version of the programmer purchased.
- Some 'Device Libraries' may have to be purchased as 'Optional license Upgrades'.

#### ► 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).

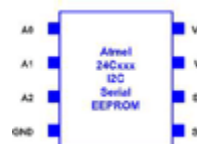
ATmega AVR  
Microcontrollers >>



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

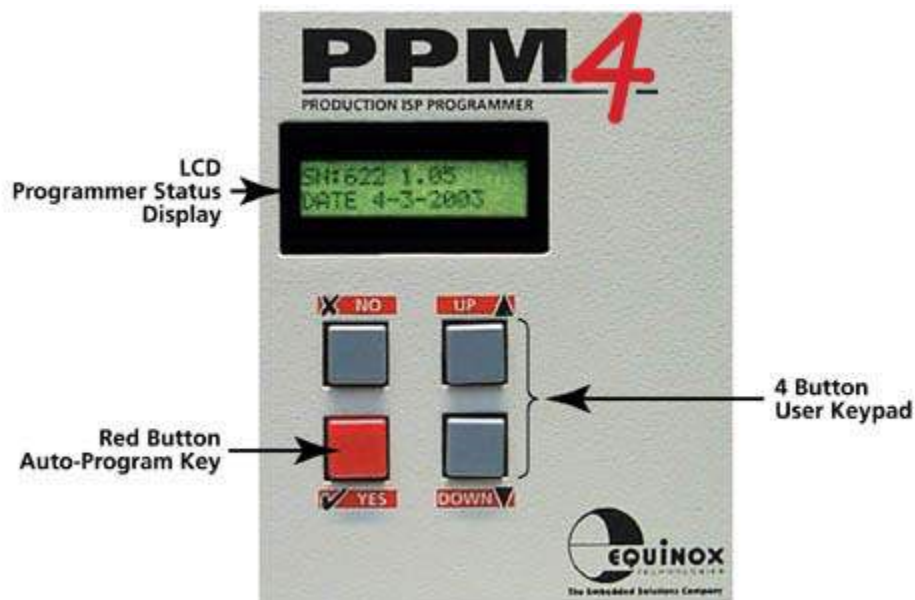


- Standalone Target Sense Mode
- ASCII Text Communications - RS-232 serial control
- 4-Wire TTL Control - control via Remote system using 4 control signals

► 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 >>

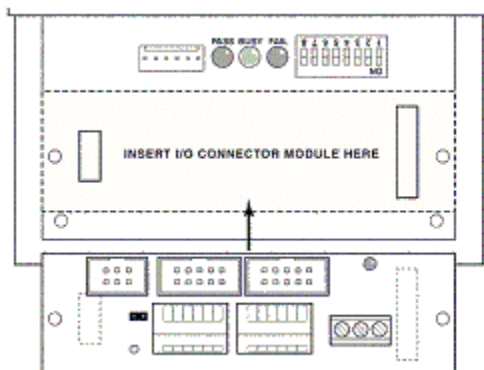


Olimex - SAM7-LA2  
DEVELOPMENT BOARD  
FOR AT91SAM7EA2  
ARM7TDMI-S MC >>



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

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

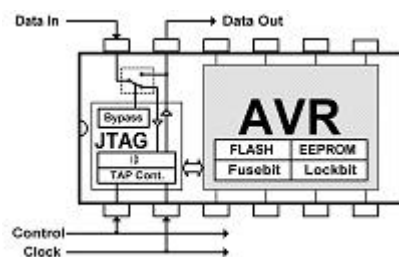


- Interchangeable 'I/O Connector Modules' support all popular ISP Header formats:
  - Atmel 10-way SPI Header (as per STK200 / STK500)
  - Atmel 6-way SPI Header
  - Equinox 10-way SPI header with support for Slave Select & SCK2
  - Atmel 10-way JTAG header (as per Atmel JTAG-ICE)
  - Equinox 10-way 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

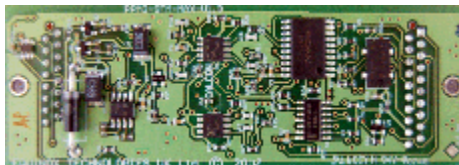
- Atmel 3-wire SPI Interface + RESET - Atmel AVR and AT89S microcontrollers
- Zensys - 3-wire SPI + RESET + PROG\_ENABLE
- JTAG - for Atmel AVR (supports JTAG chain programming)
- JTAG - for AT91SAM7 (supports JTAG chain programming)
- Atmel UART Bootloader - Atmel 89C51Rx2 (TXD, RXD, PSEN & RESET)
- 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  
>>

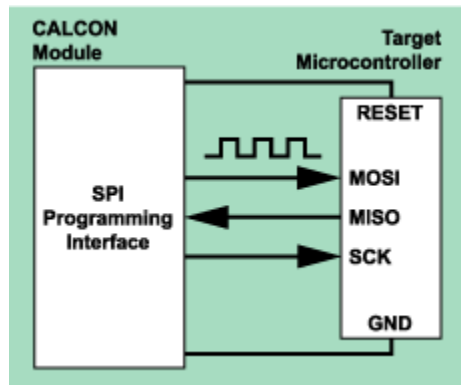
programmer to be repaired or upgrades in minutes by simply swapping the module.

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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