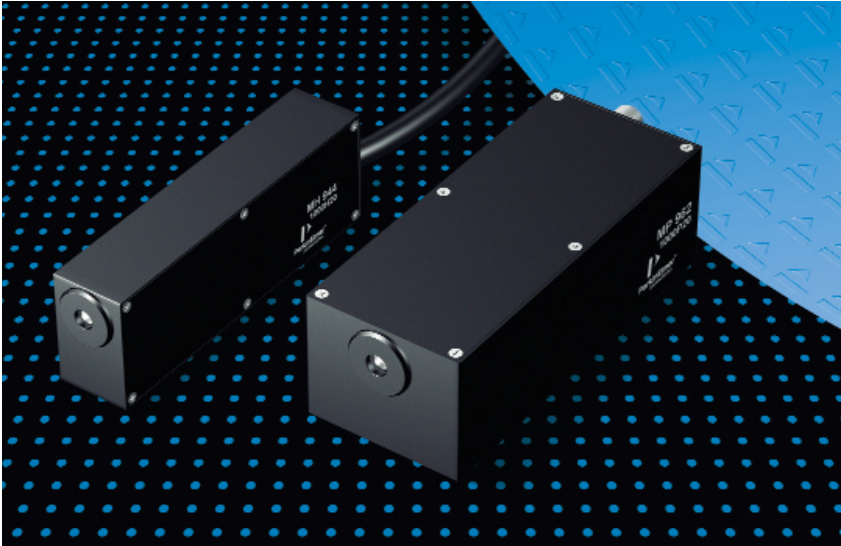


# MP Series Photon Counting Modules

## Ultra High Sensitivity Gateable Photon Counting Module



### Description

The Photon Counting Head MP 900 series is designed for applications in all fields of single photon detection, e.g. chemoluminescence, bioluminescence, fluorescence, in-vitro assay, environmental measurements or pure research.

It is an easy to use module, containing the Channel Photomultiplier, a high voltage power supply, a discrimination amplifier and a pulse shaper for fast output pulses. An installed active quenching system avoids over-illumination to the detector.

It is also possible to apply an external gate function for time correlated photon counting. Strong variations in light levels are possible due to the high dynamic range of the installed CPM. The exceptional low noise and high sensitivity facilitates detection of extremely low light levels.

### Features

- High dynamic range
- No cooling required
- Very high stability in noise level
- Active quenching circuit for high light protection
- Gateable CPM input
- Optical fiber read-out possible
- 5 volts operating voltage
- Monitor voltage output

## MP 900 Series 1/3" Photoncounting Module

\*) Additional models on request

### Technical Specifications

Model *) (also order no.)	Detector type	Installed CPM type	Photocathode diameter	Photocathode material	Window material	Spectral response / nm	Quantum efficiency	Dark counts per second (cps)
MP 942	CPM-Channel Photomultiplier	C942	min. 5 mm	Bialkali	Quartz	165-650	20% typical (ext. red MA: 10% typ.)	10
MP 943		C943		Bialkali	UV glass	185-650		10
MP 952		C952		Low noise Multialk.	Quartz	165-750		40
MP 953		C953		Low noise Multialk.	UV glass	185-750		40
MP 962		C962		Multialk.	Quartz	165-850		100
MP 963		C963		Multialk.	UV glass	185-850		100
MP 972		C972		Extended red Multialk.	Quartz	165-900		500
MP 973		C973		Extended red Multialk.	UV glass	185-900		500
MP 982		C982		Low noise Bialkali	Quartz	165-650		3
MP 983		C983		Low noise Bialkali	UV glass	185-650		3

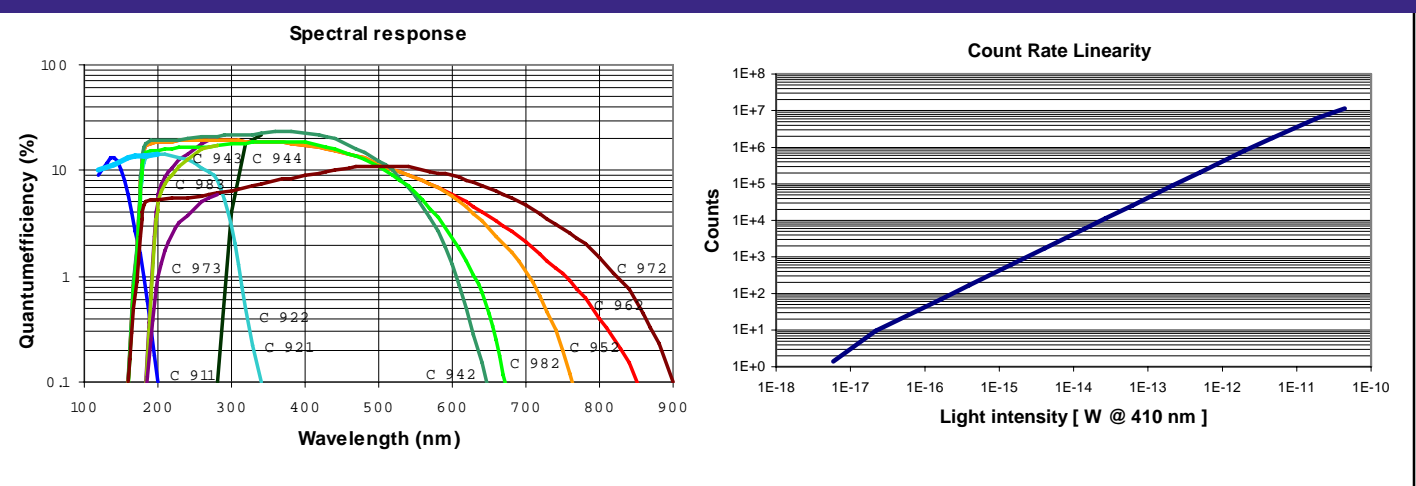
### Operating Conditions

Supply voltage	5 V dc
Supply voltage	5 V dc
Input current at max. count rate	< 280 mA
Settling time	< 1s (time to stabilize HV after supply voltage applied)
Over-illumination protection:	active quenching control (internal)
Linear count rate:	5 MHz
Output pulse:	TTL, positive
Active Quenching Control	TTL-Pulse, active high, RESET: internal via timer, typ. 2,5 s, external via 5 V-pulse
Output pulse width	15 ns, (opt. 130 ns)
GATE voltage $V_{gate}$	5 V: h to l set time $V_{ca}$ to $V_{ch-ent}$ +100 V : ~ 150 $\mu$ s 5 V: l to h set time $V_{ca}$ to $V_{ch-ent}$ - 100 V : ~ 150 $\mu$ s

### Maximum ratings

Input voltage	+5.5 V
Operating temperature	5 to 40 °C
Storage temperature	-20 to 50 °C
Weight	~ 350 g

### Performance Characteristics



## MD 1300 Series 1/2" Photon Counting Module

\*) Additional models on request

### Technical Specifications

Model #) (also order no.)	Detector type	Installed CPM type	Photocathode diameter	Photocathode material	Window material	Spectral response / nm	Quantum efficiency	Dark counts per second (cps)
MP1342	CPM-Channel Photomultiplier	C1342	min. 9 mm	Bialkali	Quartz	165-650	20% typical (ext. red MA: 10% typ.)	40
MP1343		C1343		Bialkali	UV glass	185-650		40
MP1352		C1352		Low noise Multialk.	Quartz	165-750		160
MP1353		C1353		Low noise Multialk.	UV glass	185-750		160
MP1362		C1362		Multialk.	Quartz	165-850		400
MP1363		C1363		Multialk.	UV glass	185-850		400
MP1372		C1372		Extended red Multialk.	Quartz	165-900		2000
MP1373		C1373		Extended red Multialk.	UV glass	185-900		2000
MP1382		C1382		Low noise Bialkali	Quartz	165-650		10
MP1383		C1383		Low noise Bialkali	UV glass	185-650		10

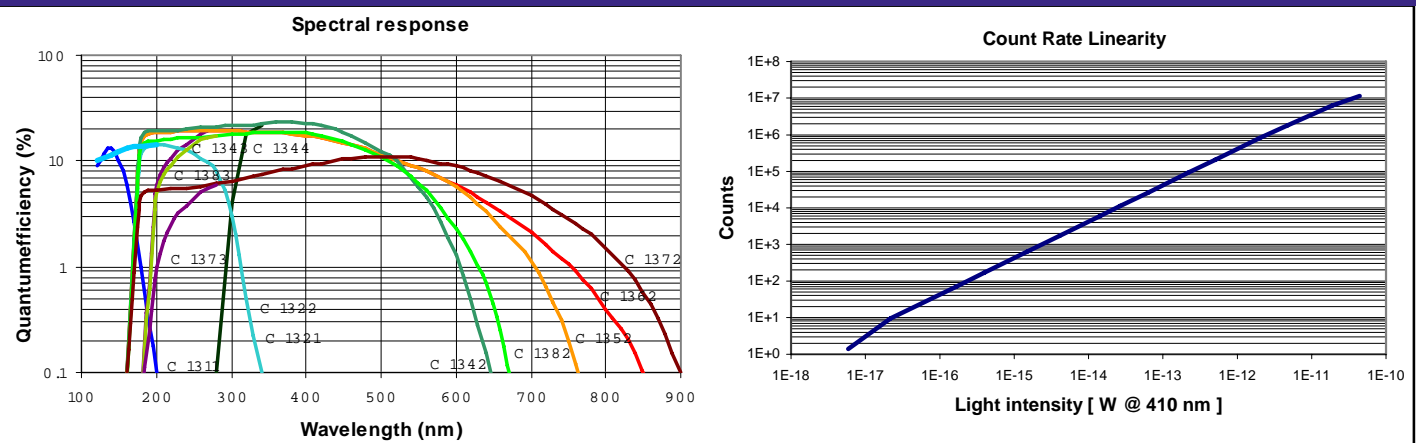
### Operating Conditions

Supply voltage	5 V dc
Input current at max. count rate	< 280 mA
Settling time	< 1s (time to stabilize HV after supply voltage applied)
Over-illumination protection:	active quenching control (internal)
Linear count rate:	5 MHz
Output pulse:	TTL, positive
Active Quenching Control	TTL-Pulse, active high, RESET: internal via timer, typ. 2,5 s, external via 5 V-pulse
Output pulse width	15 ns, (opt. 130 ns)
GATE voltage $V_{gate}$	5 V: h to l set time $V_{ca}$ to $V_{ch-ent}$ +100 V : ~ 150 $\mu$ s 5 V: l to h set time $V_{ca}$ to $V_{ch-ent}$ - 100 V : ~ 150 $\mu$ s

### Maximum ratings

Input voltage	+5.5 V
Operating temperature	5 to 40 °C
Storage temperature	-20 to 50 °C
Weight	~ 420 g

### Performance Characteristics



## Mp 1900 Series 3/4" Photon Counting Module

\*) Additional models on request

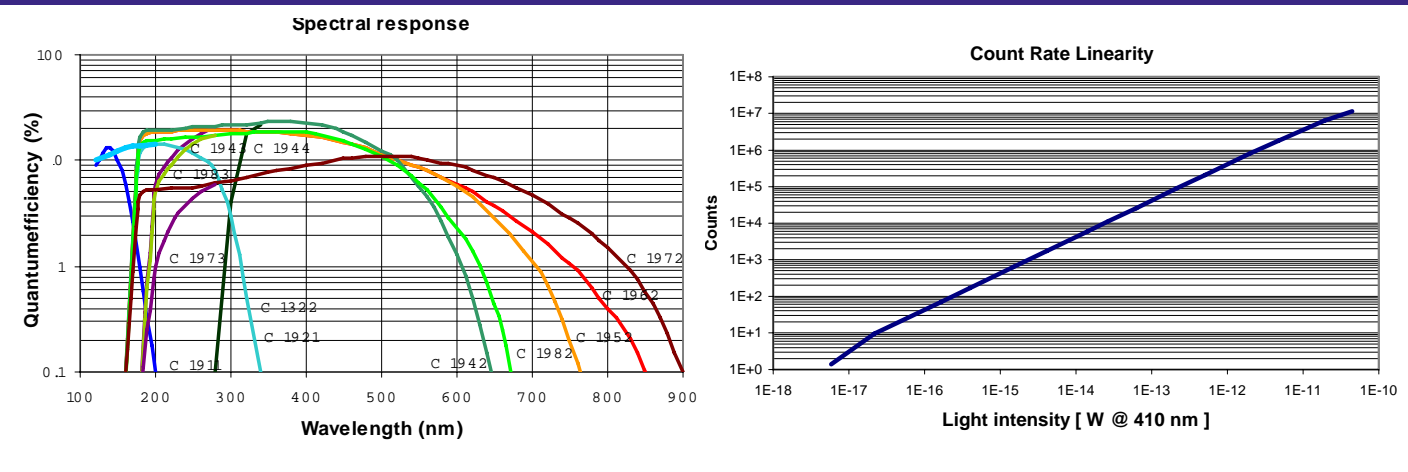
### Technical Specifications

Model *) (also order no.)	Detector type	Installed CPM type	Photocathode diameter	Photocathode material	Window material	Spectral response / nm	Quantum efficiency	Dark counts per second (cps)
MP1942	CPM-Channel Photomultiplier	C1942	min. 13 mm	Bialkali	Quartz	165-650	20% typical (ext. red MA: 10% typ.)	100
MP1943		C1943		Bialkali	UV glass	185-650		100
MP1952		C1952		Low noise Multialk.	Quartz	165-750		400
MP1953		C1953		Low noise Multialk.	UV glass	185-750		400
MP1962		C1962		Multialk.	Quartz	165-850		1000
MP1963		C1963		Multialk.	UV glass	185-850		1000
MP1972		C1972		Extended red Multialk.	Quartz	165-900		5000
MP1973		C1973		Extended red Multialk.	UV glass	185-900		5000
MP1982		C1982		Low noise Bialkali	Quartz	165-650		25
MP1983		C1983		Low noise Bialkali	UV glass	185-650		25

### Operating Conditions

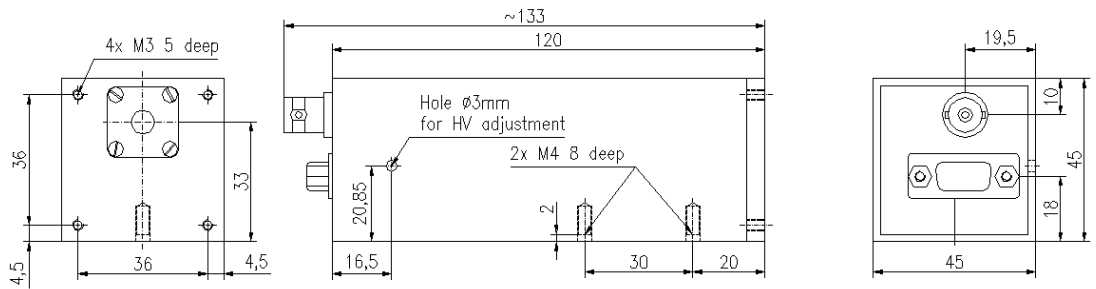
Supply voltage	5 V dc
Input current at max. count rate	< 280 mA
Settling time	< 1s (time to stabilize HV after supply voltage applied)
Over-illumination protection:	active quenching control (internal)
Linear count rate:	5 MHz
Output pulse:	TTL, positive
Active Quenching Control	TTL-Pulse, active high, RESET: internal via timer, typ. 2,5 s, external via 5 V-pulse
Output pulse width	15 ns, (opt. 130 ns)
GATE voltage $V_{gate}$	5 V: h to l set time $V_{ca}$ to $V_{ch-ent}$ +100 V : ~ 150 $\mu$ s 5 V: l to h set time $V_{ca}$ to $V_{ch-ent}$ - 100 V : ~ 150 $\mu$ s
Maximum ratings	
Input voltage	+5.5 V
Operating temperature	5 to 40 °C
Storage temperature	-20 to 50 °C
Weight	~ 450 g

### Performance Characteristics

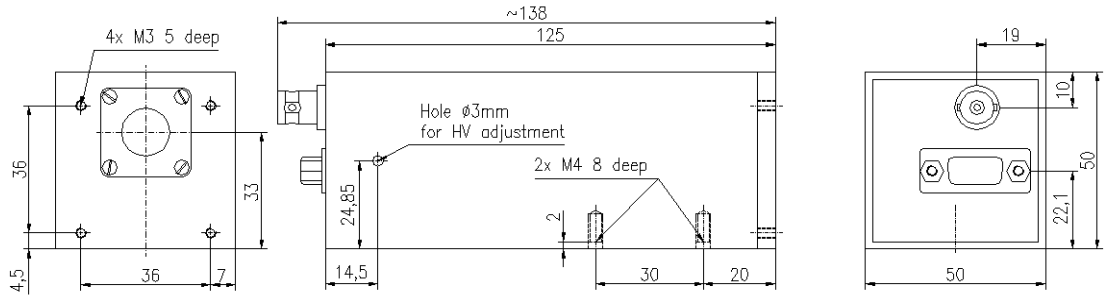


## Dimensions (mm)

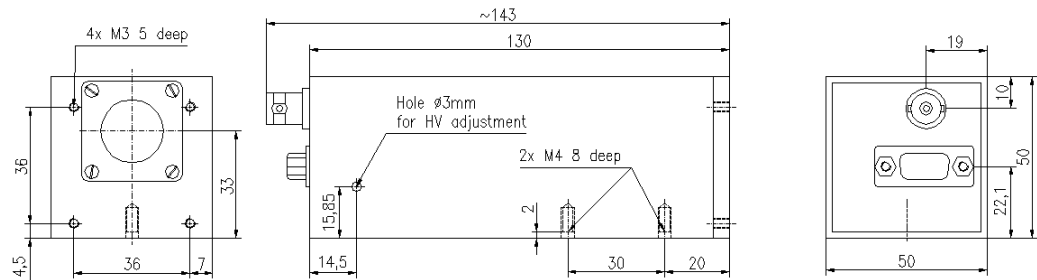
### MP 900 Series



### MP 1300 Series



### MP 1900 Series



## Connections

Red: Vcc, input (+5 V to +5.5 V DC)  
 Black: GND  
 Coax: External Gate in (TTL, active high)  
 Yellow: Monitor voltage output ( $I_{V_{ch-ent}}/1000$ )  
 Green: Control voltage input via ext.  
 OpAmp (ref. to manual)

### BNC Connector:

- TTL Signal Output
- GND



### CAUTION: HIGH VOLTAGE WARNING

This product operates at high voltage. Extreme care must be taken to ensure operator safety and to avoid damage to other instruments. Avoid direct contact with the entrance window of the built in CPM when high voltage is applied. Avoid placing conductive material close to the cathode.

Ensure that no light levels are applied, generating higher anode currents than specified.

All given values are nominal/typical @ 20 °C ambient temperature; specification subject to change without notice

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