

PMC-100

Cooled High Speed PMT Detector Head for Photon Counting

Applicable to Time-Correlated, Steady State and Gated Photon Counting

Non-descanned Detector for TCSPC Imaging

Excellent TCSPC Instrument Response: < 200 ps FWHM

Internal Cooler: Low Dark Count Rate

Internal GHz Preamplifier: High Output Amplitude

No High Voltage Power Supply Required

Excellent Noise Immunity

Overload Indicator and TTL / CMOS Overload Output

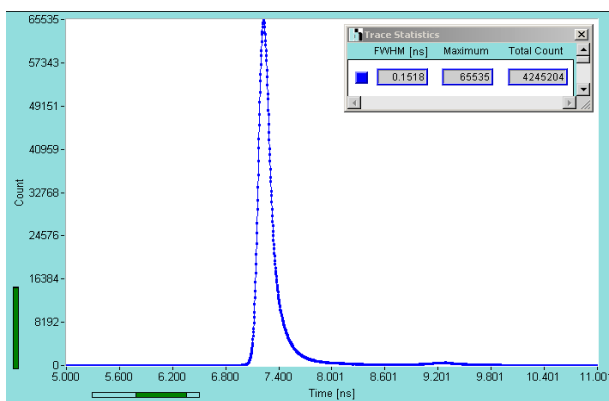
Cooling Control and Overload Shutdown via bh DCC-100 module

Direct Interfacing to all bh Photon Counting Devices

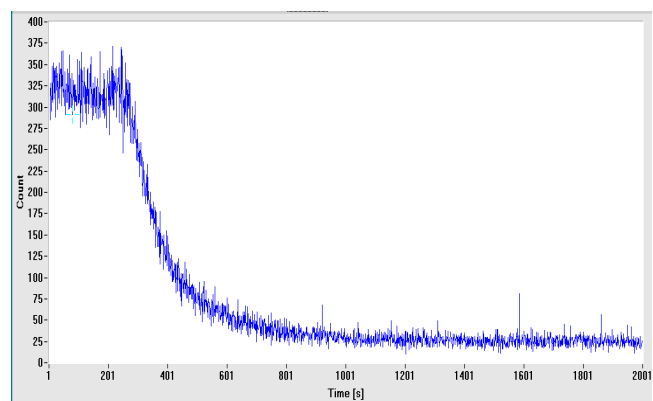
Standard C Mount Adapter



The PMC-100 is a cooled detector head for photon counting applications. It contains a fast miniature PMT along with a Peltier cooler, a high voltage generator, a GHz pulse amplifier and a current sensing circuit. Due to the high gain and bandwidth of the device a single photon yields an output pulse with an amplitude in the range of 50 to 200 mV and a pulse width of 1.5 ns. Due to the high gain and the efficient shielding noise pickup or crosstalk of start and stop signals in time-correlated single photon counting (TCSPC) experiments is minimised. Therefore the PMC-100 yields an excellent time resolution, a high counting efficiency and an exceptionally low differential nonlinearity. The instrument response function in TCSPC applications has a width of less than 200 ps. Overload conditions are detected by sensing the PMT output current and indicated by a LED, an acoustic signal, and a logical overload signal. The PMC-100 is operated by the bh DCC-100 detector controller card which delivers the current for the Peltier cooler, controls the detector gain, and shuts down the PMT on overload.



TCSPC instrument response function. Gain control voltage 0.9V, PMC-100-0, SPC-630 TCSPC module



Decrease of dark count rate after switch-on of cooler. PMC-100-1 with DCC-100 detector controller, cooling current 0.7 A



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Note:

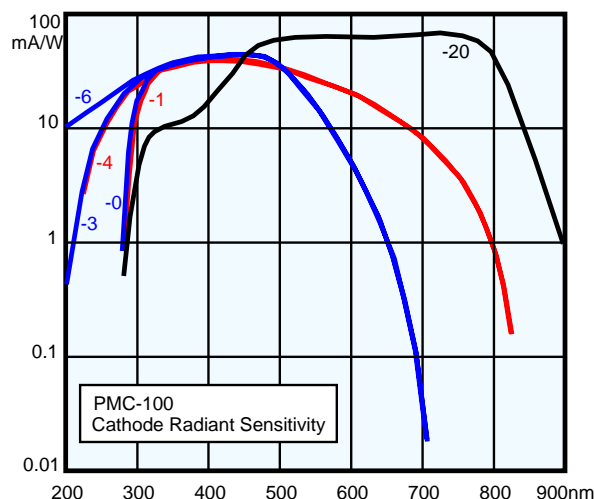
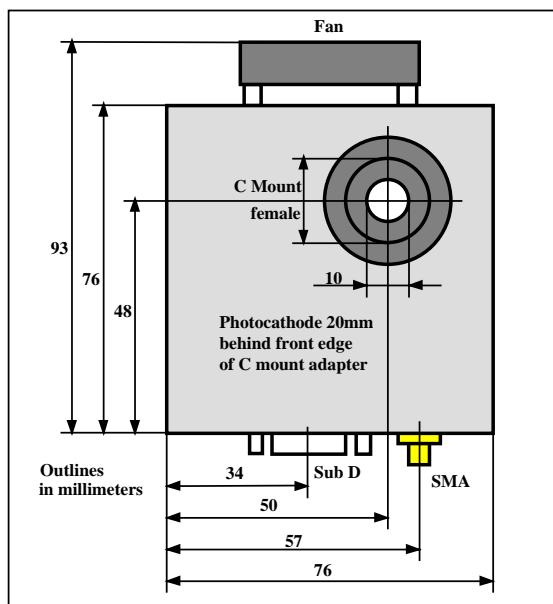
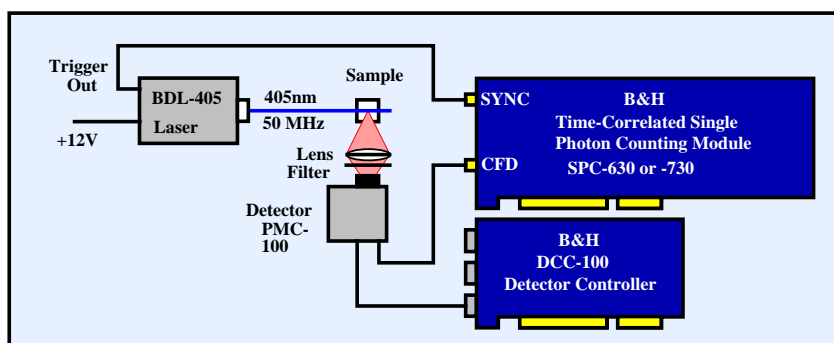
To avoid restriction of the wavelength range the PMC-100 has no hermetically sealed window. Please make sure that moisture is kept off the photomultiplier cathode by filters, lenses or other window elements inserted directly in front of the device.

PMC-100

	PMC-100-3	PMC-100-6	PMC-100-0	PMC-100-4	PMC-100-1	PMC-100-20
Wavelength Range (nm)	185 to 650	185 to 650	300 to 650	185 to 820	300 to 820	300 to 900
Dark Counts (Icool=0.7A, Tamb = 22°C, typ. value)	20	20	20	40	40	200 to 500
Cathode Diameter	8 mm					
Transit Time Spread / TCSPC IRF width	180 ps, FWHM, typ. value					
Single Electron Response Width	1.5 ns, FWHM, typ. value					
Single Electron Response Amplitude	50 to 200 mV, Vgain=0.9V					
Output Polarity	negative					
Count Rate (Continuous)	> 5 MHz					
Count Rate (Peak, < 100 ns)	> 100 MHz					
Overload Indicator	LED and acoustic signal					
Overload Signal	TTL / CMOS, active low					
Detector Signal Output Connector	SMA					
Output Impedance	50 Ω					
Power Supply (from DCC-100 Card)	+ 12 V, -12V (fan only), Peltier Current 0.5 to 1A					
Dimensions (width x height x depth)	76 mm x 111 mm x 56 mm					
Optical Adapter	C-Mount female					
Fibre Coupling	SMA 905, on request					

Simple fluorescence lifetime experiment:

The arrangement uses a BDL-405 blue picosecond diode laser, a PMC-100 detector module an SPC-630, -730 or -830 time correlated single photon counting module and a DCC-100 detector controller card. (Please see individual data sheets). The instrument response width is typically <180 ps FWHM. Fluorescence lifetimes down to 20 ps can be determined by deconvolution.



Pin Assignment of 15 pin sub-d-hd connector

1	not used	9	Peltier -
2	Peltier +	10	+12V
3	Peltier +	11	-12 (Fan)
4	Peltier +	12	not used
5	GND	13	Gain Control, 0 to +0.9V
6	not used	14	/OVL
7	Peltier -	15	GND
8	Peltier -		

A cable is delivered with the PMC-100



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