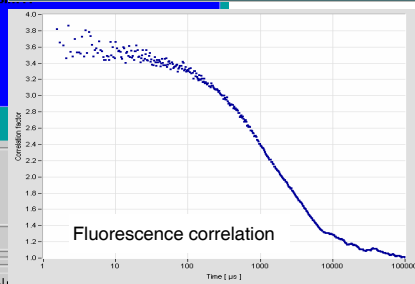
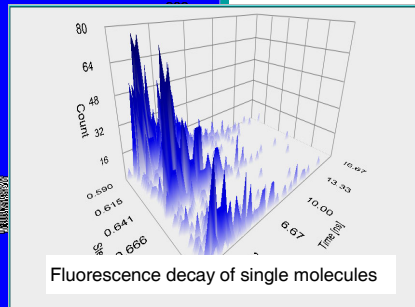
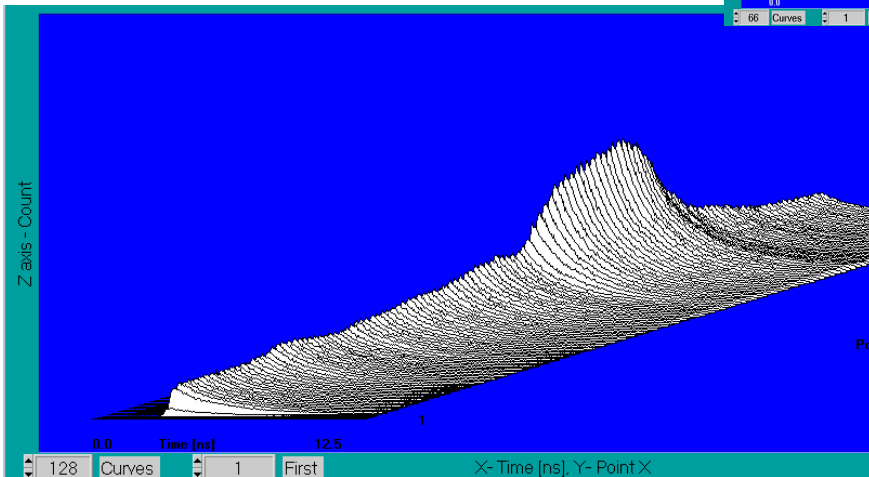
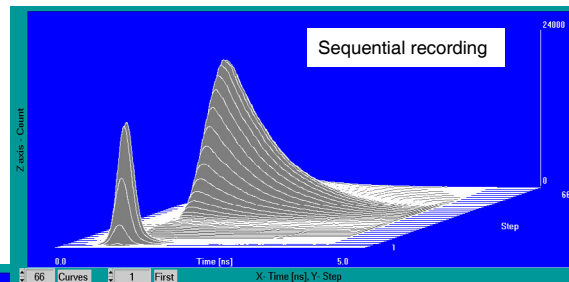
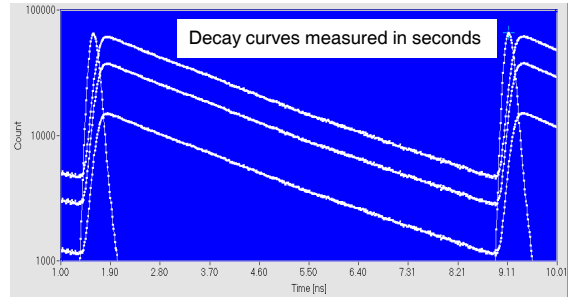


The TCSPC Power Package

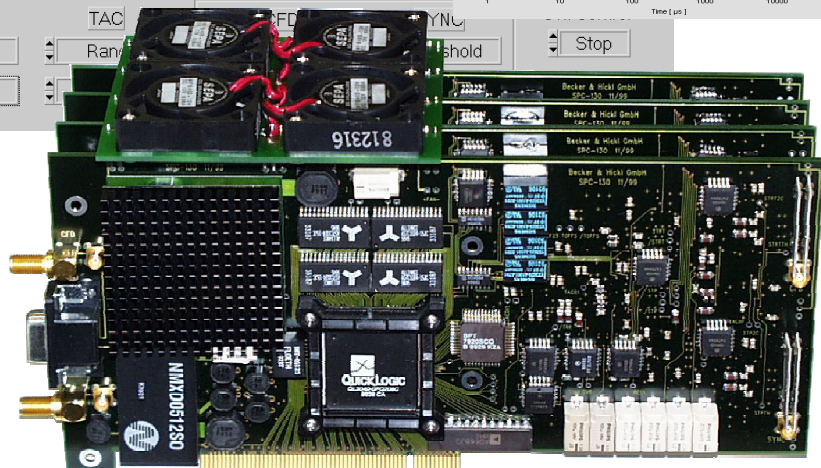
SPC-134

Four-Channel Time-Correlated Single Photon Counting Module

Four Fully Parallel TCSPC Channels
Ultra-High Data Throughput
Overall Saturated Count Rate 40 MHz
Channel Saturated Count Rate 10 MHz (Dead Time 100ns)
Dual Memory Architecture: Readout during Measurement
Reversed Start/Stop: Repetition Rates up to 200 MHz
Electrical Time Resolution down to 8 ps FWHM / 5 ps rms
Channel Resolution down to 813 fs
Up to 4096 Time Channels / Curve
Measurement Times down to 0.1 ms
Instrument Software for Windows 2000 / NT / XP
Direct Interfacing to most Detector Types
Single Decay Curve Mode
Oscilloscope Mode
Sequential Recording Mode
Spectrum Scan Mode with 8 Independent Time Windows
Continuous Flow Mode
FIFO / Time Tag Mode for FCS, FIDA, FILDA, BIFL



Software interface showing device state, measurement progress, and data display options. The interface includes a bar chart for 'Rate [Ph./s]' with values ranging from 2.70E+5 to 5.50E+5. It also shows 'Device state' with 'Measurement in progress' and 'SYNC OK' indicators. A status bar at the bottom indicates 'Displaying data from file c:\bhappl\spc\spc134.sdt'.



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Covered by patents DE 43 39 784 and DE 43 39 787

SPC-134

Photon Channels

Principle	Constant Fraction Discriminator (CFD)
Time Resolution (FWHM / RMS, electr.)	8 ps / 5 ps
Opt. Input Voltage Range	- 50 mV to - 1 V
Min. Input Pulse Width	400 ps
Lower Threshold	- 20 mV to - 500 mV
Upper Threshold	-
Zero Cross Adjust	- 100 mV to + 100 mV

Synchronisation Channels

Principle	Constant Fraction Discriminator (CFD)
Opt. Input Voltage Range	- 50 mV to - 1 V
Min. Input Pulse Width	400 ps
Threshold	- 20 mV to -500 mV
Frequency Range	0 to 200 MHz
Frequency Divider	1-2-4
Zero Cross Adjust	-100 mV to + 100 mV

Time-to-Amplitude Converters / ADCs

Principle	Ramp Generator / Biased Amplifier
TAC Range	50 ns to 2 us
Biased Amplifier Gain	1 to 15
Biased Amplifier Offset	0 to 100% of TAC Range
Time Range incl. Biased Amplifier	3.3 ns to 2 us
min. Time / Channel	813 fs
ADC Principle	40 ns Flash ADC with Error Correction
Diff. Nonlinearity	< 0.8% rms, typ. <2% peak-peak

Data Acquisition

Method	on-board 2-dimensional histogramming process
Dead Time	100 ns, independent of computer speed
max. Number of Curves in Memory	4096
Number of Time Channels / Curve	1024
max. Counts / Channel	256
Overflow Control	64
Collection Time	2 ¹⁶ -1
Display Interval Time	none / stop / repeat and correct
Repeat Time	0.1 us to 10000 s
Curve Control (internal)	10ms to 1000 s
Count Enable Control	0.1 us to 1000 s
Experiment Trigger	Programmable Hardware Sequencer
	1 bit TTL
	TTL

Data Acquisition (FIFO / Time-Tag Mode)

Method	Time-tagging of individual photons and continuous writing to disk
Dead Time	100 ns
Output Data Format (ADC / Macrotime / Routing)	12 / 12 / 3
FIFO buffer Capacity (photons)	128 k
Macro Timer Resolution, internal clock	50ns, 12 bit
Macro Timer Resolution, clock from SYNC input	10ns to 100ns, 12 bit
Curve Control (external Routing)	3 bit TTL
Count Enable Control	1 bit TTL

Operation Environment

Computer System	PC Pentium
Bus Connectors	PCI
Used PCI Slots	4
Power Consumption	approx. 45 W at +5V, 2 W at +12V
Dimensions	225 mm x 125 mm x 85 mm

Related Products

Simple-Tau 150 compact TCSPC systems	HPM-100 GaAsP and GaAs hybrid detectors	DCC-100 detector controller
SPC-134 EM 4-channel TCSPC modules	PML-SPEC and MW-FLIM multi-wavelength detectors	BDL-SMC ps diode lasers
Simple-Tau 154 compact 4-channel TCSPC systems	PMC-100 cooled PMT modules	BHLP-700 picosecond diode lasers
DCS-120 confocal scanning FLIM system	id-100 SPAD detector modules	DDG-200 laser multiplexing controller

Related Literature

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DCS-120 Confocal Scanning FLIM Systems, handbook. Available on www.becker-hickl.com
Modular FLIM systems for Zeiss LSM 510 and LSM 710 laser scanning microscopes, handbook. Available on www.becker-hickl.com
BDL-375-SMC, BDL-405-SPC, BDL-440-SMC, BDL-473-SMC NUV and blue picosecond diode lasers, handbook. Available on www.becker-hickl.com
Please see also www.becker-hickl.com, 'Literature', 'Application notes'



More than 15 years experience in multi-dimensional TCSPC. More than 1300 TCSPC systems worldwide.