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

Decay curves measured in seconds
Sequential recording
Fluorescence decay of single molecules
Fluorescence correlation

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Covered by patents DE 43 39 784 and DE 43 39 787
Photon Channels
- Principle: Constant Fraction Discriminator (CFD)
- Time Resolution (FWHM / RMS, electr.): 6 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: 0 to 200 MHz
- Zero Cross Adjust: 1-4

Synchronisation Channels
- Principle: Constant Fraction Discriminator (CFD)
- Opt. Input Voltage Range: -50 mV to -1 V
- Min. Input Pulse Width: 400 ps
- Threshold: 3.3 ns to 2 us
- 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, 256, 64
- max. Counts / Channel: 64
- Overflow Control: none / stop / repeat and correct
- Collection Time: 0.1 us to 1000 s
- Display Interval Time: 10ns to 1000 s
- Repeat Time: 0.1 us to 1000 s
- Curve Control (external Routing): Programmable Hardware Sequencer
- Count Enable Control: 1 bit TTL
- Experiment Trigger: 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 / Macrot ime / 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
- SPC-134 EM 4-channel TCSPC modules
- Simple-Tau 154 compact 4-channel TCSPC systems
- DCS-120 confocal scanning FLIM system
- HPM-100 GaAsP and GaAs hybrid detectors
- PML-SPEC and MW-FLIM multi-wavelength detectors
- PMC-100 cooled PMT modules
- id-100 SPAD detector modules
- DCC-100 detector controller
- BDL-SCMC ps diode lasers
- BHLP-700 picosecond diode lasers
- DGG-200 laser multiplexing controller

Related Literature
- 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.