**Attachment 1 B - Order description**

The order includes components to develop multi-channel near infrared spectroscopy system. The number of detecting channels is 32, what involves 32 TCSPC (time correlated single photon counting) units combined with 32 single photon counting detectors (PMTs). The 32 TCSPC units must be implemented in a module or modules (TCSPC MODULES), that can be implemented in 19’’ rack system. The number of modules must not exceed 4. The modules must connect with host PC with a USB connector or PCI-express slot. The host PC is not part of this tender.

All 32 channels must be synchronized e.g. all 32 DTOFs must be acquisitioned at exactly the same time stamp. Moreover, if necessary the start of acquisition time of each DTOF (distribution of time of flight of photons) for all 32 channels must be started with an external TTL signal (typically 10-20Hz) to achieve synchronous measurements of each DTOF. It means that, the synchronization must be independent from operating system (software) clock.

The 32 single photon PMT detectors must be in form of 32 ready to use modules, each module must include high voltage generator and preamplifier. The PMT modules can be powered from external power supply or power supplies or with PCI card or cards. When PCI cards are involved, they must be implemented in 19’’ rack mount module (POWER MODULES). Detectors overload protection must be provided.

TCSPC MODULES, single photon detectors and POWER MODULES compatible allowing for time correlated single photon counting measurements with maximum countrates > 3 MHz.

List of components:

32 TCSPC units implemented in TCSPC MODULES

32 single photon detectors

32 detector power supply units (POWER MODULES)

Set of accessories (cables, attenuators, etc)

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| *„32 kanałowy system pomiarowy do skorelowanego w czasie zliczania pojedynczych fotonów” (ang. „32-channel time correlated single photon counting detecting system”)* |
| 1. | Technical parameter | Required value of the parameter |
| 1.1 | Number of detecting channels | 32 |
| 1.2 | Number of TCSPC units | 32 |
| 1.3 | Maximum number of TCSPC MODULES | 4 |
| 1.4 | Connection to host PC | USB or PCIe |
| 1.5 | TCSPC MODULES mounting | 19’’ rack |
| 1.6 | Time resolution | < 5 ps |
| 1.7 | Minimum acquisition time of a single DTOF | < 50 ms |
| 1.8 | Maximum countrate | > 3 MHz |
| 1.9 | Detector spectral range (minimum range) | 600-900nm |
| 1.10 | Active area of the detector | ≥ 3 mm |
| 1.11 | Instrument Response Function width, full cathode area (FWHM) | < 150 ps |