COUNTEX – new pulse counter

Development status

Phase 3

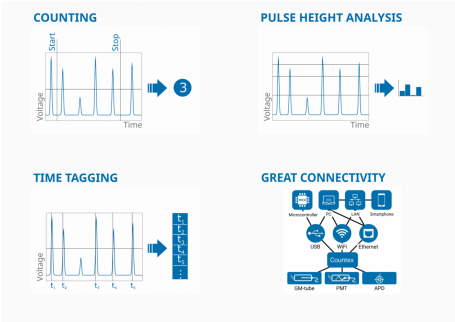
Technology validation and implementing it in real environment. Testing the technology outside of the laboratory and its adjustment to external conditions.

IP protection status

Know-How

Partnering strategy

Collaboration, licensing



Institution

Palacký University Olomouc

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Challenge

In our experiments we detected photons, the carrier of quantum information, by single-photon detectors. The output of these detectors is a series of voltage pulses which we counted using conventional scientific-grade counters. As we added more detectors and logic preprocessing, our NIM bin was full of counter modules, that we had to daisy-chain. Then we asked ourselves “can’t we develop something quicker, something with up-to-date connectivity, something universal and convenient for our needs? Our goal was therefore possibility to use multiple input channels, to have faster response and last but not least, to have a device with a modern connectivity interface.

Description

Countex is an FPGA-based scientific-grade electronic pulse counter. It allows for high-speed counting of periodic as well as aperiodic signals with temporal resolution down to few nanoseconds. It also features advanced functionality and connectivity. The main benefits for countex users are variable discrimination level, connectivity and transparent protocol, plug and play system, multiple input channels, excellent parameters and wide functionality. We embedded digitally tunable discriminator in each channel. As a result, you do not need any additional level shifters, amplifiers, or discriminators for input signals ranging from -5V to +5V. With digital threshold level control, we can implement signal autodetection to help you set proper discrimination level or perform a sequential pulse-height analysis. We will provide a clear description of how to communicate with the device over a virtual serial port. Any operating system or even a microcontroller can control Countex. We also provide a WiFi and Ethernet connectivity. We will provide you free software for detailed control and code snippets to help you integrate Countex into your software systems. Countex allows for device-independent remote control to facilitate a quick start and easy operation. Programming is not necessary to operate Countex at the basic level. Instead, you can connect Countex to your local network, type the IP address into your browser, and simply control Countex using e.g. your phone. We can easily provide 16 input channels in a single Countex device, all equipped with standard BNC or SMA connectors. In many experiments, this saves your time and resources by avoiding daisy-chaining of multiple counters. With

Countex, you would not miss a nanosecond pulse with pulse-pair resolution as good as few nanoseconds. Countex goes beyond simple counting – you can easily obtain statistics and create count histograms, perform a pulse-energy analysis, and, optionally, take time tags of detection events.

Commercial opportunity

Countex goes beyond simple counting – you can easily obtain statistics and create count histograms, perform a pulse-energy analysis, and, optionally, take time tags of detection events. Coutex is device designed for for scientific work in wide range of laboratories, where there are detected both, periodic and non-periodic signals. End users are especially laboratories focused on detection and measurement of electronic and optical signals, eventually laboratories dealing with other types of radiation. Our partners for collaboration and licencing are therefore manufacturers of laboratory devices, especially manufacturers of electronic and optic devices.