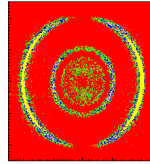


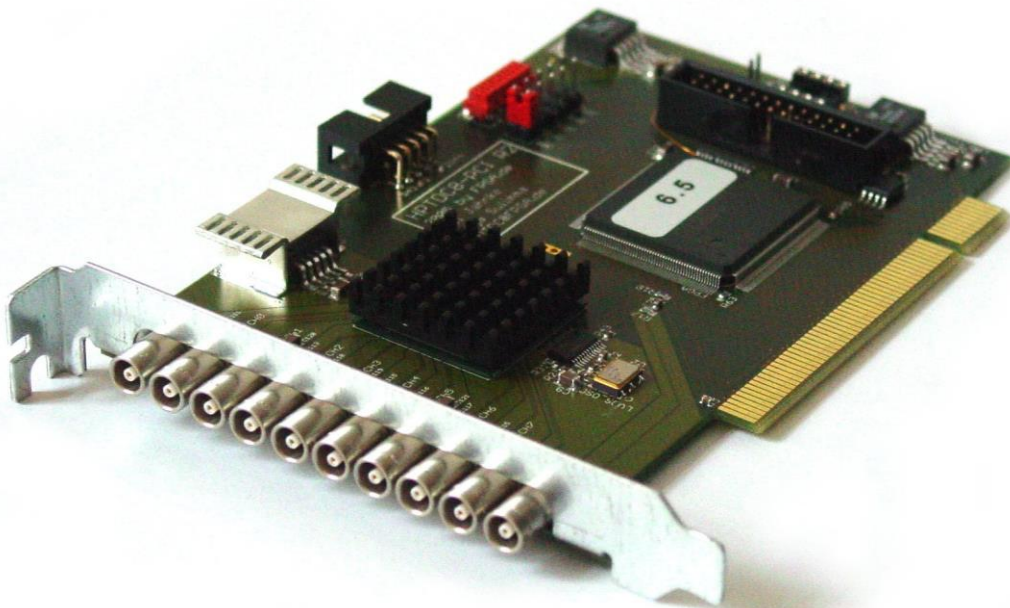
The TDC8HP(i) multi-hit Time-to-Digital Converter



RoentDek
Handels GmbH
Supersonic Gas Jets
Detection Techniques
Data Acquisition Systems
Multifragment Imaging Systems

The **TDC8HP** is the latest version of the well-established TDC8-series (www.roentdek.com). It is similar in function but has superior performance characteristics:

- 8 channels with high time resolution < 35 ps RMS with 25 ps LSB
- unlimited number of hits per channel
- range between $-209 \mu\text{s}$ to $+209 \mu\text{s}$ or unlimited in “wrap around” mode
- throughput up to 2.000.000 particles/s¹
- double hit dead-time < 10 ns²
- 10 additional low resolution TDC channels (12.8 ns bin size) that can also be used to record the high/low states of control levels.
- supports Windows 7 to Windows 10 (32bit and 64bit)
- supports LabView



The **TDC8HP** has 8 high-resolution multi-hit inputs for NIM signals and one low-resolution input*. A 10th input channel is reserved for an external clock signal to synchronize up to three **TDC8HP** cards.

The TDC8HP can be seamlessly synchronized with the **RoentDek** [fADC4](#) digitizers.

Notes:

¹ this is an upper limit, which depends on the computer hardware and data acquisition mode.

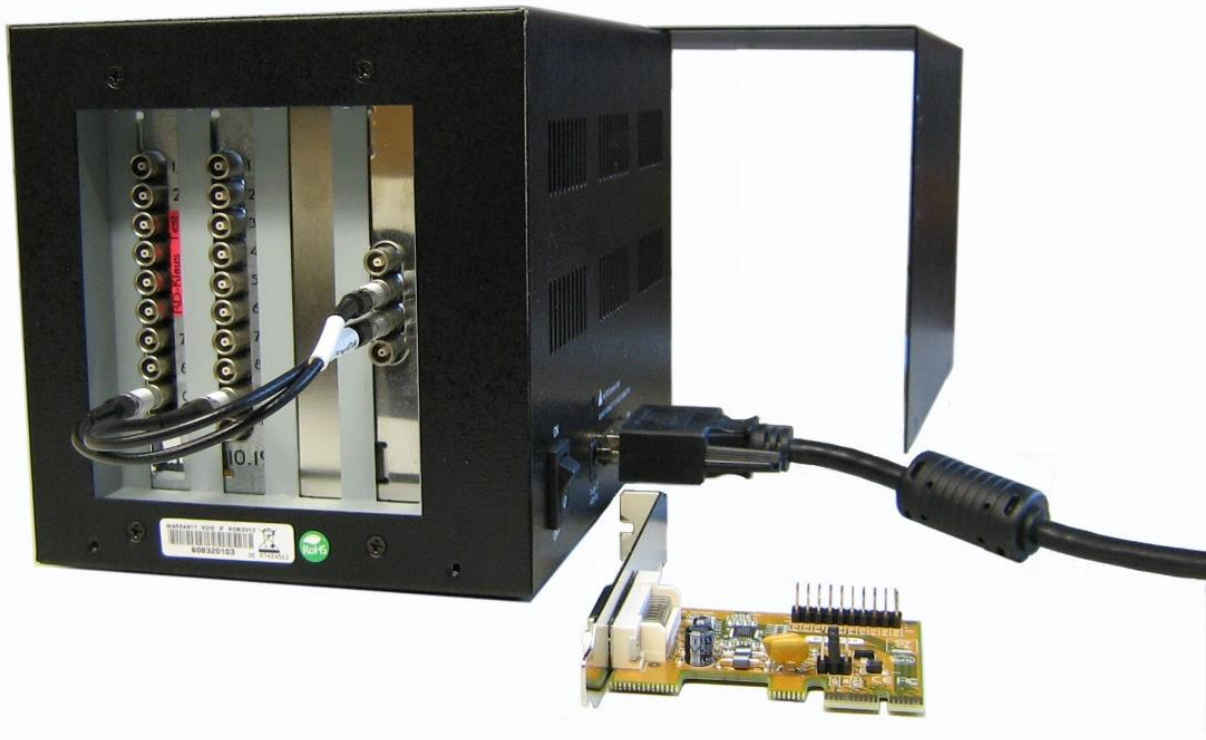
² the dead-time between two hits may be as low as 5 ns, but once more than four hits are registered, every 100 ns only four additional hits can be collected (with 100 ps time precision).

* The bin-size of the low-res channels is with 12.8 ns. 10 additional low-resolution channel can be addressed.

TDC8HPi

The product combination of **TDC8HP** and the **RoentDek PCI2PCIe** is defined as **TDC8HPi**.

The **PCI2PCIe** crate allows operation of up to three **TDC8HP** cards via PCIe bus. The package contains a plug-in card to a desktop PC's PCIe bus or to an equivalent input port of a Laptop/Notebook computer.



PCI2PCIe crate, here with two TDC8HP boards and clock card inserted for synchronization. A PCIe adapter card and cable connection is shown on the lower right side. Not shown is the mains adapter (12V, 3A) with cable.

Using the **PCI2PCIe** crate does not require any other software or driver beyond the standard **TDC8HP** program package when operated via the internal PCI bus of a desktop PC.

Since a PCI bus is not a standard on modern PC any more or has slow chipsets, **RoentDek** provides the **PCI2PCIe** crate standardly with newly purchased **TDC8HP**.

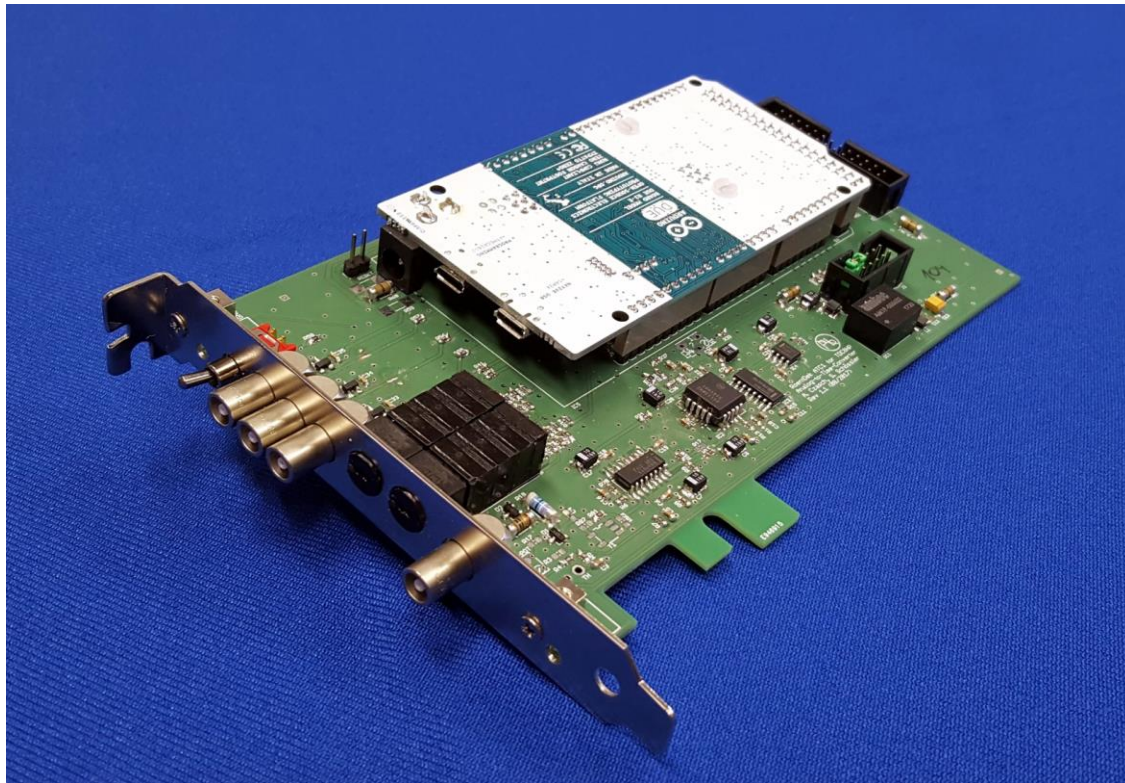
The size of the **PCI2PCIe** box is 140* x 150 x 205 mm³.

* not taking into account the sideways cable connection

Accessories:

The **TDC8HP** has 10 additional low resolution channel accessible on the board. They can be used as additional low-resolution TDC channels with a precision of 12.8 ns. **RoentDek** can supply a flat ribbon cable for the input (far end open for custom confection).

The **RoentDek ATC1** is a “slow” 3-channel ADC board which is read out through connection with the **TDC8HP**. At least one channel (#1) can operate at up to 100 kHz, its read-out triggered by a NIM signal and at least one channel (#3) is read out independently every second. Channel #2 can be selected to operate either like channel #1 or channel #3. The minimum width of the analog signal must be 3.3 μ s. For the triggered channel(s) the delay between conversion moment and trigger signal can be varied by several microseconds, backward and forward in time.



For details please refer to the [ATC1 manual](#).

The analog sampling data can be correlated time-tagged to TDC timing data.

Examples of applications:

- measurement of the laser intensity shot by shot.
- measurement of the synchrotron ring current or of an ion gauge.