The **RoentDek FanO4** NIM signal multiplexer (Fan out)

The **RoentDek FanO4** module multiplexes NIM signals on four independent channels (fourfold logical fan-out function). A special circuit design guarantees negligible transit time jitter and time crosstalk < 10 ps for all channels. Each channel provides at least 4 output signals, multiplexing a NIM signal given into the respective channel's input. All sockets are of "lemo" coax type. The top channel has a fifth output socket, the bottom channel an additional inverted NIM signal output.

The **FanO4** multiplexer module is especially designed for time-critical applications where an independence of all channels and a constant signal transit time under all operation conditions is of great importance, e.g. for delay-line detector read-out or multiple TOF channel operations.

Due to the "logic" nature of the circuit, a NIM-like signal with a signal height > 0.2 V (negative) on 50 Ohm termination at the input socket will trigger standard NIM output signals (- 0.8 V on 50 Ohm termination). Therefore, the module can also be used to "refresh" a NIM-like signal which has experienced damping. However, the timing precision might be affected if the input signal height is < 0.5 V. The signal width of the output signals is identical to the input signal width within 1 ns.*

The **FanO4** module is designed as a standard 1/12 NIM case and usually requires a NIM-bin for operation (with - 6V, 1.2A). An external mains adapter 100-250 VAC is also available.

The bandwidth is 250 MHz (approximately < 2 ns minimum rise/fall time) with 50 Ohm impedance. The smallest signal width on in-/output is 4 ns The dead-time between two consecutive signals on one channel is 5 ns.

The channels can be cascaded for higher output signal multiplicity.

The variation of transit time between the 4 common outputs of each channel is < 200 ps (larger for the fifth output), but **constant within < 5 ps** for each output socket, after 10 minutes of "warm-up" (power on).

Variation of transit time as a function of temperature:
3 ps/K between 20 and 50 °C, after 10 minutes of "warm-up" (power on)

Variation of transit time as a function of signal rate:
< 5 ps (up to 1 MHz)

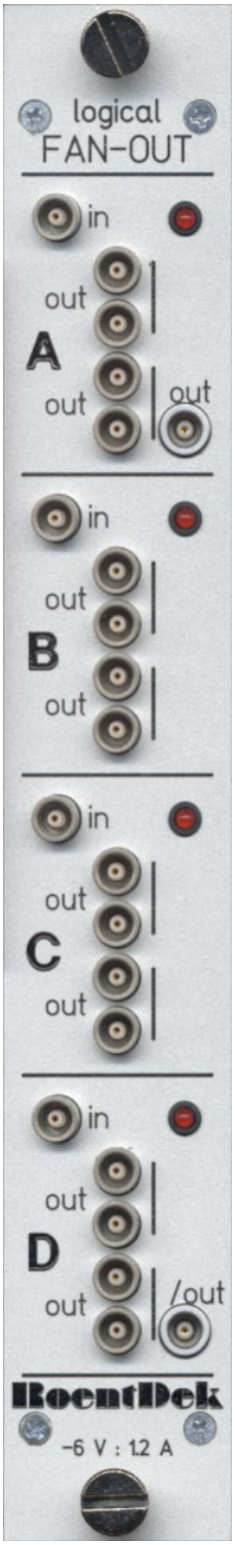

*Figure: front panel of the **RoentDek FanO4** module*

* Note that the **RoentDek MixA4** module can also provide a NIM out function, but it will maintain the signal shape of the input signal (analog fan function).