

High Performance Experimental Controller (HPEC)

The HPEC is a second generation device based on the 'Time Frame Generator' is a VME based electronic timing module that has been designed by the *Science and Technology Facilities Council (STFC)* to support high speed time-resolved science on the light sources, and has been successfully deployed on the SRS and Diamond synchrotrons in the UK.

In particular, the HPEC provides all the high speed digital timing input/output for both the control of external equipment and the synchronisation of triggers in NCD and scanning XAFS science environments.

Time Frame resolution to 10ns is possible, with full programmability of live and dead frames (10ns to 24hrs), repetitive frame patterns (1 to 2^{32}) either synchronous or asynchronous to the synchrotron beam bunch structure or other external clock.

Key Benefits

- Very strong timing performance
- Fully flexible interface
- Programmable timing signal generator

Features

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|------------------------------|----------------------------------------------------------------|
| Time Frame resolution | 10ns |
| Time Frame length | from 10ns to 24hr |
| Time Frames | Up to 43 million |
| Cycles | Up to 2^{32} |
| Time Frame Output connectors | 6 with variable polarity and drive strengths |
| External Trigger Inputs | 9 individual, including LVDS and variable threshold inputs |
| Clock Inputs | 6 including LVDS and the ability to lock to the beam clock |
| | 11 VETO, FRAMING and FRAME 0 outputs in TTL and LVDS standards |
| Combined Time Frame Outputs | 3 on VHDIC connectors |
| Time Frame output | via VME J2 backplane |
| Scaler Calibration Channels | 8 x 100MHz |
| ADC Calibration Channels | Provision for 8 high speed high resolution |
| VME Module | 6U high, 3-slot wide |

