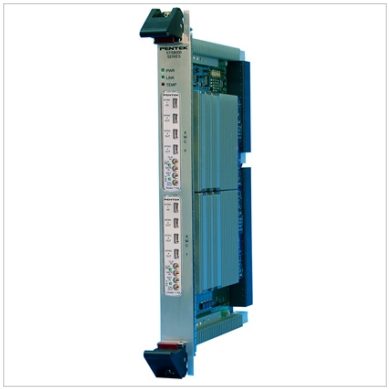
Models 5791 and 5891

Programmable multifrequency clock synthesizers – 6U VPX

Simultaneous synthesis of up to five or ten different clocks

- Eight or 16 SMC clock outputs
- Typical phase noise: -105 dBc/Hz @ 1 kHz offset
- All clocks are phase-locked to input reference signal
- Input reference frequency of 5 to 100 MHz



The 5791 and 5891 generate up to eight or 16 synthesized clock signals suitable for driving A/D and D/A converters in high-performance real-time data acquisition and software radio systems. The clocks offer exceptionally low phase noise and jitter to preserve the signal quality of the data converters. These clocks are synthesized from on-board programmable VCXOs (voltage controlled oscillators) and can be phase-locked to an external reference signal.

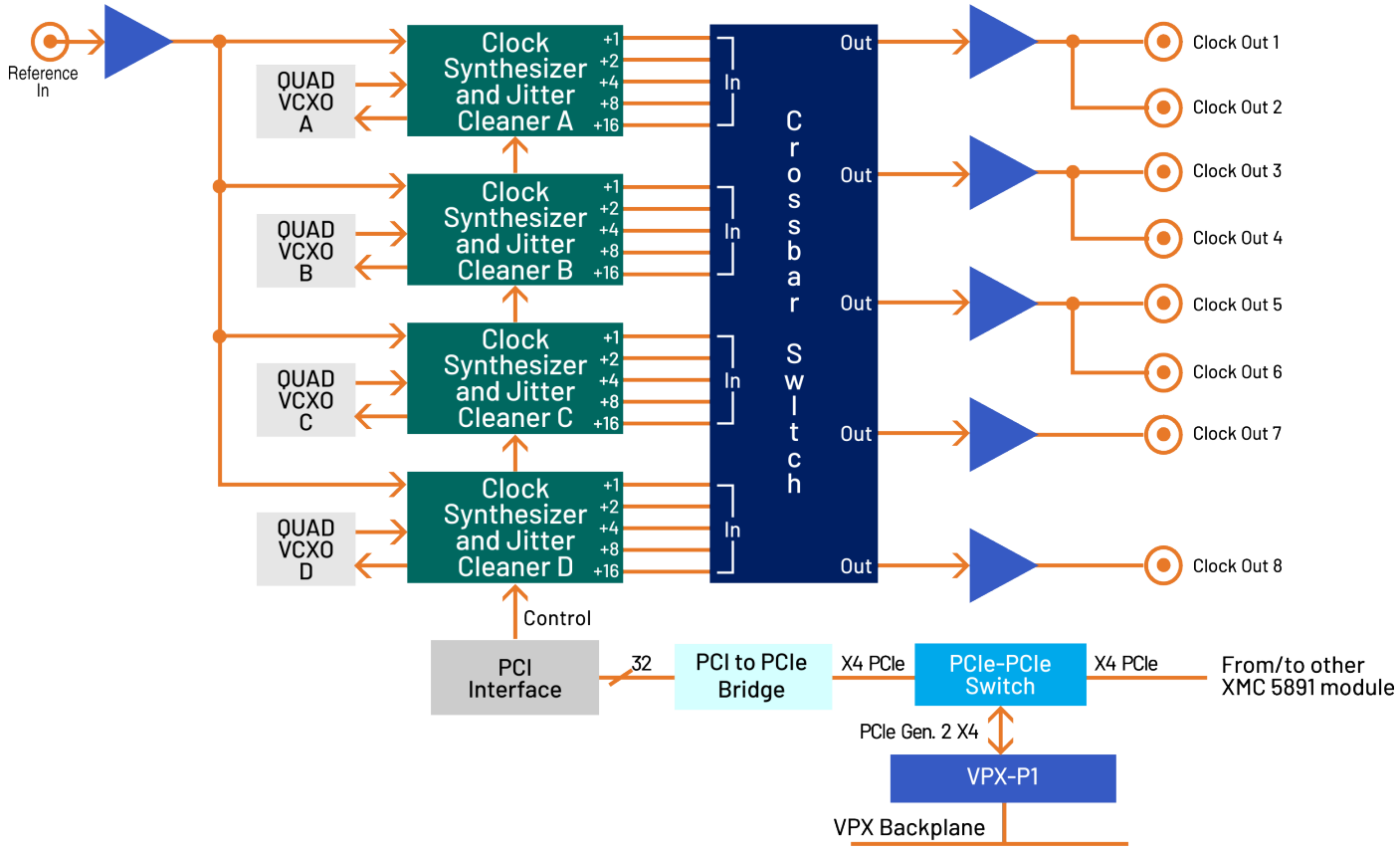
CLOCK SYNTHESIZER CIRCUITS

These models use four or eight Texas Instruments CDC7005 clock synthesizer and jitter cleaner devices. Each CDC7005 is paired with a dedicated VCXO to provide the base frequency for the clock synthesizer. Each of the four VCXOs can be independently programmed to a desired frequency between 50 and 700 MHz with 32-bit tuning resolution. The CDC7005 can output the programmed frequency of its associated VCXO, or generate submultiples using divisors of 2, 4, 8 or 16. The CDC7005's can output up to five frequencies each and be programmed to route any of these frequencies to the board's five or 10 output drivers.

The CDC7005 includes phase-locking circuitry that locks the frequency of its associated VCXO to an input reference clock. This reference is a 5 to 100 MHz signal supplied to a front panel SMC connector. Eight or 16 front panel SMC connectors supply synthesized clock outputs driven from the clock output drivers, as shown in the block diagram. This supports a single identical clock to all outputs or up to five or 10 different clocks to various outputs.

With four or eight independently programmable VCXOs and each CDC7005 capable of providing up to five different submultiple clocks, a wide range of clock configurations is possible. In systems where more than 10 different clock outputs are required simultaneously, multiple 5891s can be used and phase-locked with a 5 to 100 MHz system reference.

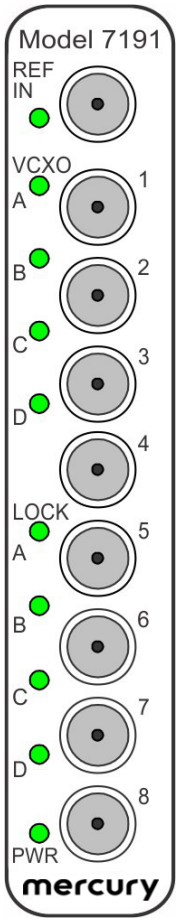
BLOCK DIAGRAM



Model 5891 doubles all resources except the PCIe-to-PCIe switch.

FRONT PANEL CONNECTIONS

The front panel includes one SMC connector for a reference signal input, eight SMC connectors for clock outputs and ten LED indicators. Please use the cables described in Ordering Information.



- **Reference Input Connector:** One SMC receptacle, labeled **REF IN**, for input of an external reference clock.
- **Clock Output Connectors:** Eight SMC connectors for the Clock signal inputs labeled **CLK 1 - 8**. The clock output signal is within the range of +4 dBm. This output is driven into 50 Ω output impedance.
- **REF IN LED:** A green LED labeled **REF IN** illuminates when a reference clock input is applied to the board.
- **VCXO LEDs:** Four green LEDs labeled **VCXO A-D** illuminate when the associated VCXO input is valid (A is for VCXO 1, B for VCXO 2, C for VCXO 3, D for VCXO 4).
- **Lock LEDs:** Four green LEDs labeled **LOCK A-D**illuminate when the associated VCXO PLL is locked (**A** is for VCXO 1, **B** for VCXO 2, **C** for VCXO 3, **D** for VCXO 4).
- **Power LED:** A green LED labeled **PWR** illuminates when a +5VDC is applied to the board.

SPECIFICATIONS

Front Panel Reference Input

Connector Type: SMC

Input Impedance: 50 ohms

Reference Frequency: 5 to 100 MHz

Input Level: –6 dBm to +10 dBm

PLL Clock Synthesizers & Jitter Cleaners

Quantity: Model 5791: 4; Model 5891: 8

Type: Texas Instruments CDC7005

Frequency Dividers: 1, 2, 4, 8 and 16

Programmable VCXOs (Quantity: 4 or 8)

Frequency Range: 50 to 700 MHz

Tuning Resolution: 32 bits

Unlocked Accuracy: ±20 ppm

Front Panel Clock Outputs (Quantity: 8 or 16)

Connector Type: SMC

Output Impedance: 50 ohms

Output Level: +3 dBm @ 700 MHz

Typ. Phase Noise: –105 dBc/Hz @ 1 kHz (dependent on reference source stability

PCI Express Interface

PCI Express Bus: Gen. 1, 2 : x4, control and status

Environmental

Operating Temp: 0° to 50° C

Storage Temp: –20° to 90° C

Relative Humidity: 0 to 95%, non-cond.

Size

233 mm x 160 mm (9.173 in. x 6.299 in.)

SOFTWARE

If you are using a Cobalt or Onyx board in conjunction with 5791 or 5891, software support is provided by Mercury's ReadyFlow® Board Support Packages (BSP). There is a ReadyFlow BSP to support Model 5791 or 5891 and a separate ReadyFlow BSP to support the Cobalt or Onyx board.

Support for the 5791 or 5891 is provided by the ReadyFlow Board Support Package (BSP) for Model 7191, which has Windows and Linux versions:

- Model 4995A Option 191 Windows ReadyFlow BSP for Model 7191
- Model 4994A Option 191 Linux ReadyFlow BSP for Model 7191

ORDERING INFORMATION

Model	Description
5791*	Programmable Multifrequency Clock Synthesizer - 3U VPX Single Density
5891*	Programmable Multifrequency Clock Synthesizer - 3U VPX Double Density

*Specify frequencies of factory-installed quad VCXOs between 50 and 700 MHz. Contact techsales@mrcy.com to order specific frequencies.

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