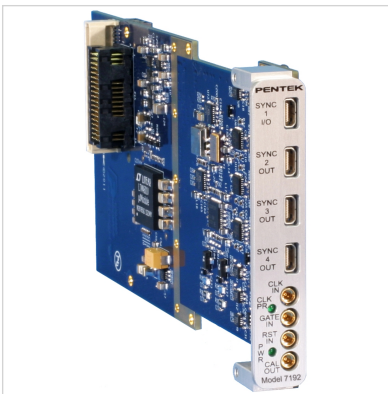**mercury**

Model 7192
High-speed synchronizer and distribution PMC/XMC module

Synchronizes up to four Cobalt, Onyx, or Jade I/O boards

- Synchronizes sampling and data acquisition for multichannel systems
- Synchronizes gating and triggering functions

- Clock rates up to 1.8 GHz
- Front panel MMCX connectors for input signals

The Model 7192 High–Speed Synchronizer and Distribution Board synchronizes multiple Cobalt, Onyx, and Jade modules within a system. It enables synchronous sampling and timing for a wide range of multichannel high-speed data acquisition, DSP, and software radio applications.

Up to four modules can be synchronized using the 7192, with each receiving a common clock along with timing signals that can be used for synchronizing, triggering and gating functions. Model 7192 is compatible with the products listed in Supported Products.
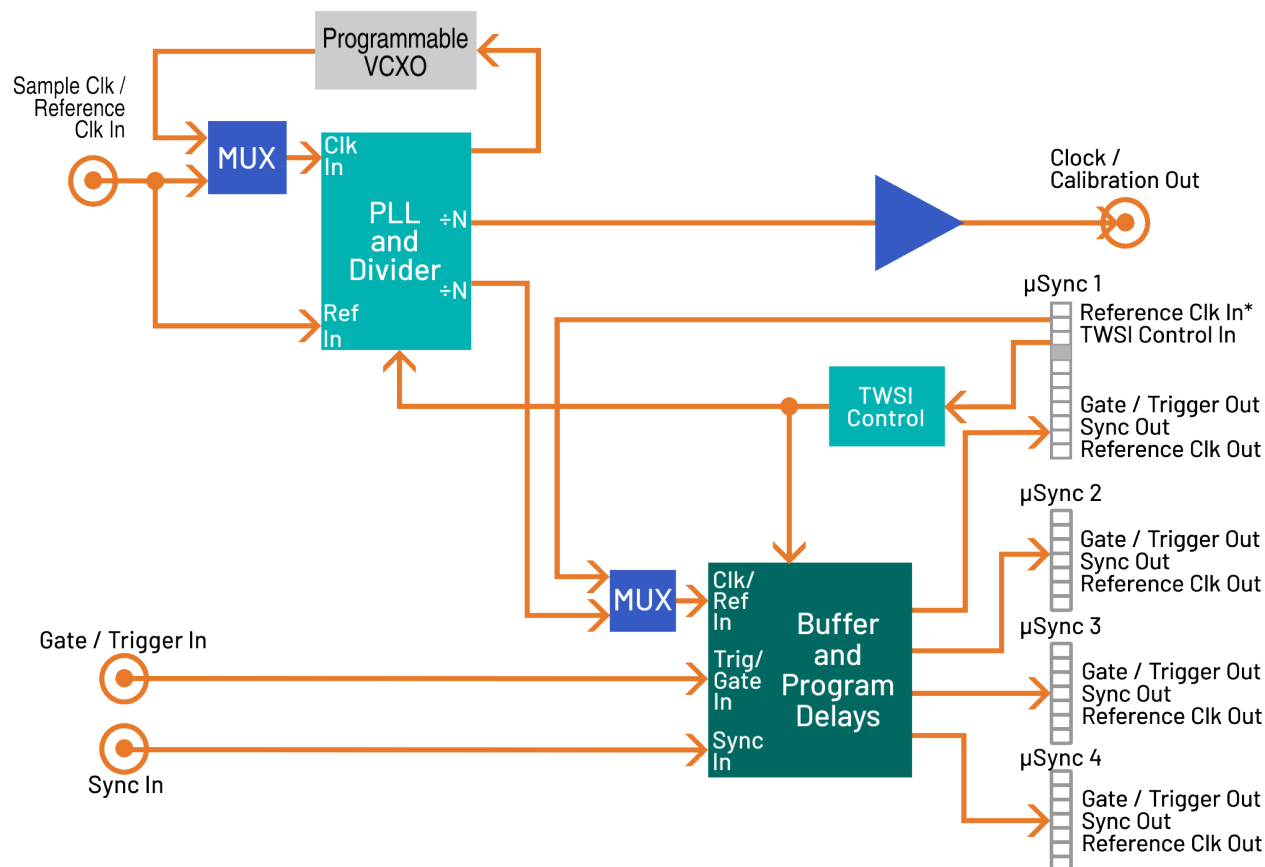
INPUT SIGNALS

Model 7192 provides three front panel MMCX connectors to accept input signals from external sources: one for clock, one for gate or trigger and one for a synchronization signal. Clock signals can be applied from an external source such as a high performance sine-wave generator. Gate/trigger and sync signals can come from an external system source. In addition to the MMCX connector, a reference clock can be accepted through the first front panel µSync output connector, allowing a single Cobalt, Onyx, Flexor, or Jade board to generate the clock for all subsequent boards in the system.

OUTPUT SIGNALS

The 7192 provides four front panel µSync output connectors, compatible with a range of high-speed Cobalt, Onyx, Flexor, and Jade boards. The µSync signals include a reference clock, gate/trigger and sync signals and are distributed through matched cables, simplifying system design.

BLOCK DIAGRAM

GATE AND SYNCHRONIZATION SIGNALS

The 7192 features separate inputs for gate/trigger and sync signals. A programmable delay allows the user to make timing adjustments on the gate/trigger and sync signals before they are sent to buffers for output through the µSync output connectors.

CLOCK SIGNALS

The 7192 can accept a user-supplied external clock on its front panel MMCX connector. As an alternative to the external clock, the 7192 can use its on-board programmable voltage controlled crystal oscillator (VCXO) as the clock source. The VCXO can operate alone or be locked to a system reference clock signal delivered to the front panel reference clock input.

The external or on-board clock can operate at full rate or be divided and used to register all sync and gate/trigger signals as well as providing a reference clock to all connected boards. In addition, the clock is available at the Clock Out MMCX as a sample or reference clock for other boards in the system.

CALIBRATION

The 7192 features a calibration output specifically designed to work with the 71640/41, 71741 and 71841 3.6 GHz A/D XMC modules to provide a signal reference for phase adjustment across multiple A/Ds.

PROGRAMMING

The 7192 allows programming of operating parameters including: VCXO frequency, clock dividers, and delays that allow the user to make timing adjustments on the gate and sync signals. These adjustments are made before they are sent to buffers for output through the µSync connectors.

The 7192 is programmed via a TWSI control interface on the first µSync connector. The control interface is compatible with the front panel µSync connectors of all high-speed Cobalt, Onyx, and Jade modules, thereby providing a single cable connection that carries both control and timing signals.

FRONT PANEL CONNECTIONS

The front panel includes four µSync input/output connectors, four MMCX connectors, and two LEDs. Note that the µSync output connectors are custom–wired and NOT compatible with standard µHDMI cables. Use the cables described in Accessories.

Model 7192A
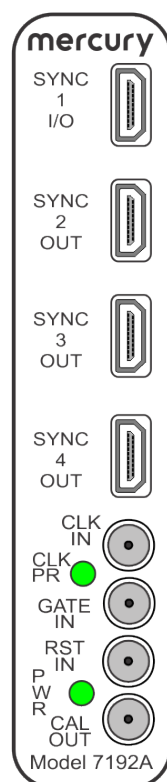
- **Synchronization In/Out:** A µSync 19–pin connector, labeled **SYNC I/O**, provides a reference clock input and TWSI control input; and sync, reference clock, and gate outputs for synchronizing multiple boards. This connector includes TWSI (I2C) bus pins which allow a Cobalt, Onyx, or Flexor board to control the 7192.

- **Synchronization Outputs:** Three front–panel µSync 19–pin connectors, labeled **SYNC 2 OUT**, **SYNC 3 OUT**, and **SYNC 4 OUT**, provide sync, reference clock, and gate outputs for synchronizing multiple Cobalt, Onyx, or Flexor boards.

- **Sample Clock / Reference Input:** An MMCX connector, labeled **CLK IN**, is used for a sample clock or reference input.

- **Clock Present LED:** A green LED labeled **CLK PR** illuminates when the sample clock is working.

- **Gate/Trigger Input:** An MMCX connector, labeled GATE IN, is used for a gate/trigger LVTTL input (do not exceed 3.3V).

- **SYNC Input:** An MMCX connector, labeled **SYNC IN**, is used for a sync LVTTL input (do not exceed 3.3V).

- **Power LED:** A green LED labeled **PWR** illuminates when a +5VDC is applied to the board.

- **Clock/Calibration Output:** An MMCX connector, labeled **CAL OUT** is used for clock/calibration output.

SUPPORTED PRODUCTS

The 7192 supports the following Jade, Onyx, and Cobalt products:

- Jade models 71131, 71132, 71141, and 71841
- Onyx models 71730 and 71741
- Cobalt models 71630, 71640, 71641, 71670, 71671

SOFTWARE

If you are using a Cobalt, Onyx, or Flexor board in conjunction with 7192, software support is provided by Mercury's ReadyFlow® Board Support Packages (BSP). There is a ReadyFlow BSP to support 7192 and a separate ReadyFlow BSP to support the Cobalt, Onyx, or Flexor board.

If you are using a Jade board in conjunction with 7192, software support is provided by Mercury's Navigator® Board Support Package (BSP). In addition to supporting the Jade board, Navigator BSP supports 7192 via the I2C interface on the Jade board.

SPECIFICATIONS

Front Panel Sample Clock/Reference Input

Connector Type: MMCX

Input Impedance: 50 ohms

Input Level: 0 dBm to +10 dBm, sine wave

Sample Clock Frequency: 100 MHz to 2 GHz

Reference Frequency: 5 to 100 MHz

Front Panel Gate/Trigger & Sync Inputs

Connector Type: MMCX

Input Level: LVTTL

Front Panel µSync Inputs/Outputs

Quantity: 4

Connector Type: 19-pin µHDMI

Signal Level: CML

Signals (µSync connector 1): Reference Clock In, TWSI control In, Reference Clock Out, Gate/Trigger Out, Sync Out

Signals (µSync connectors 2–4): Reference Clock Out, Gate/Trigger Out, Sync Out

Front Panel Clock / Calibration Output

Connector Type: MMCX

Output Impedance: 50 ohms

Output Level: +6 dBm nominal, sine wave

Sample Clock Frequency: 100 MHz to 1.8 GHz

Programmable VCXO

Frequency Ranges: 10-945 MHz, 970-1134 MHz, and 1213-1417.5 MHz

Tuning Resolution: 32 bits

Unlocked Accuracy: ±20 ppm

PLL, Divider & Jitter Cleaner

Type: Texas Instruments CDCM7005

Frequency Dividers: 1, 2, 3, 4, 6, 8 and 16

PMC/XMC Interface

Power only on PMC P1 or XMC P15

Environmental

Operating Temp: 0° to 50° C

Storage Temp: –20° to 90° C

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

Size

Standard PMC module: 2.91 in. x 5.87 in.

ORDERING INFORMATION

Model	Description
7192	High-Speed Synchronizer and Distribution Board – PMC/XMC

ACCESSORY PRODUCTS

Model	Description
	4 ea. 18" µSync cables are supplied; additional cables may be ordered:
2192-018	µSync cable - 18"
2192-036	µSync cable - 36"

mercury

Corporate Headquarters

50 Minuteman Road
Andover, MA 01810 USA
+1 978.967.1401 tel
+1 866.627.6951 tel
+1 978.256.3599 fax

**International Headquarters
Mercury International**

Avenue Eugène-Lance, 38
PO Box 584
CH-1212 Grand-Lancy 1
Geneva, Switzerland
+41 22 884 5100 tel

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Visit: mrcy.com/go/MP7192

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mrcy.com/go/CF7192

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