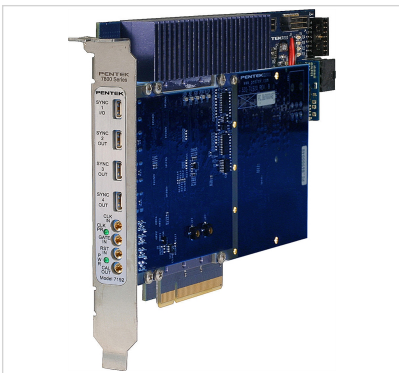# Model 7892

High-speed synchronizer and distribution PCIe board

Synchronizes multiple Cobalt, Onyx, Flexor, or Jade 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 7892 High-Speed Synchronizer and Distribution PCIe Board synchronizes multiple Cobalt, Onyx, Flexor, or Jade boards 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 boards can be synchronized using the 7892, with each receiving a common clock along with timing signals that can be used for synchronizing, triggering and gating functions.
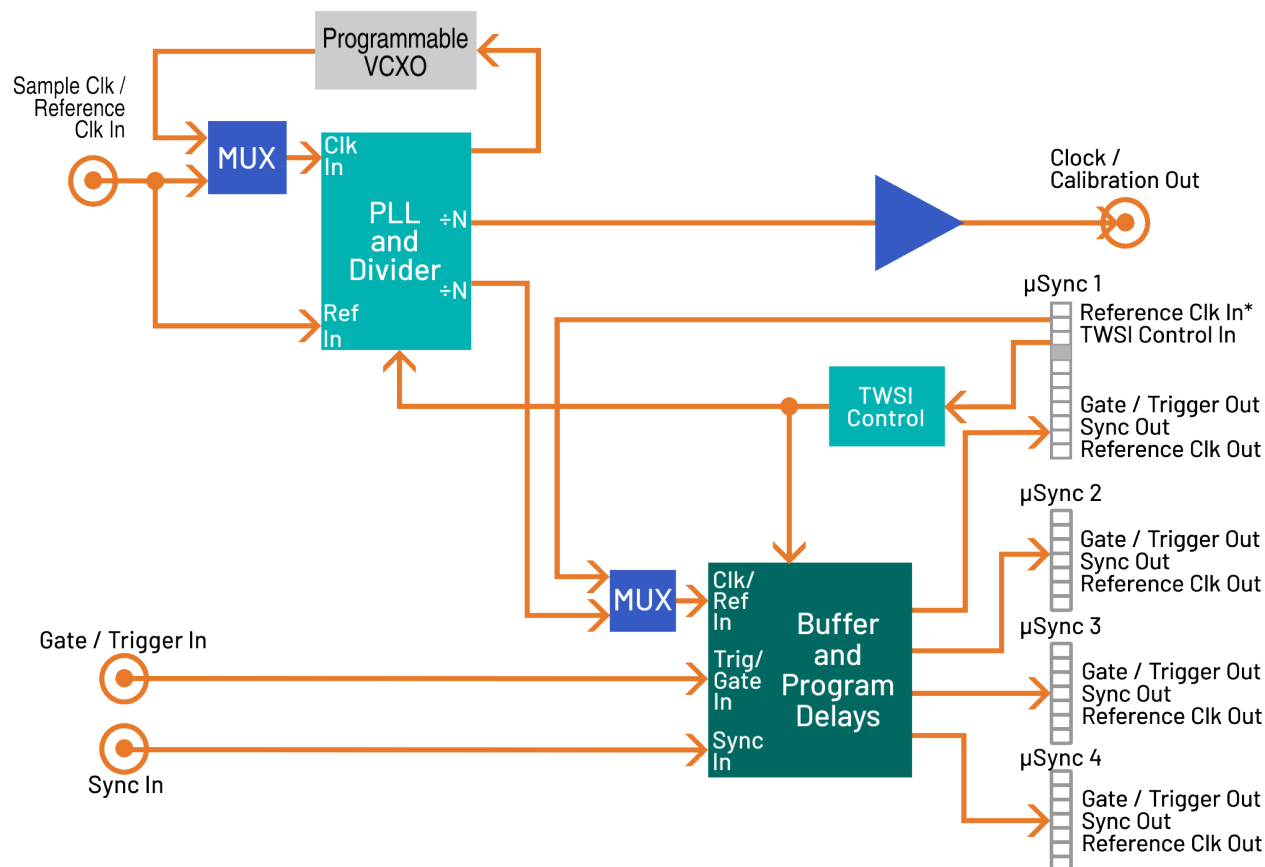
INPUT SIGNALS

Model 7892 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, and Jade board to generate the clock for all subsequent boards in the system.

OUTPUT SIGNALS

The 7892 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 7892 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 7892 can accept a user-supplied external clock on its front panel MMCX connector. As an alternative to the external clock, the 7892 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 7892 features a calibration output specifically designed to work with the 78640 or 78740 3.6 GHz A/D board and provide a signal reference for phase adjustment across multiple D/As.
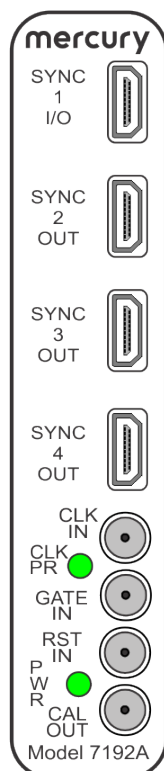
PROGRAMMING

The 7892 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 7892 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.

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SYNC 1 I/O

SYNC 2 OUT

SYNC 3 OUT

SYNC 4 OUT

CLK IN
CLK PR
GATE IN
RST IN
PWR
CAL OUT

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 or Onyx 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 or Onyx 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.

SOFTWARE

If you are using a Cobalt, Onyx, or Flexor board in conjunction with 7892, software support is provided by Mercury's ReadyFlow® Board Support Packages (BSP). There is a ReadyFlow BSP to support 7892 and a separate ReadyFlow BSP to support the Cobalt, Onyx, or Flexor board.

If you are using a Jade board in conjunction with 7892, software support is provided by Mercury's Navigator® Board Support Package (BSP). In addition to supporting the Jade board, Navigator BSP supports 7892 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

PCI Express Interface

PCIe Bus: x4 or x8, power only

Environmental

Operating Temp: 0° to 50° C

Storage Temp: –20° to 90° C

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

Size

Half length PCIe card, 4.38 in. x 7.13 in. (111.25 mm x 181.10 mm)

SUPPORTED PRODUCTS

Model 7892 supports the following Jade, Onyx, Cobalt, and
Flexor products:

- Jade models 78131, 78132, 78141, and 78841
- Flexor models 7070-312, 7070-313, 7070-316, 7070-317, 7070-320, and 7070-324
- Onyx models 78730 and 78741
- Cobalt models 78630, 78640, 78641, 78670, 78671

ORDERING INFORMATION

Model	Description
7892	High-Speed Synchronizer and Distribution Board - PCIe

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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

Learn more
Visit: mrcy.com/go/MP7892

For technical details, contact:
mrcy.com/go/CF7892