

ChronoLogic Legato – Universal Timing Device (UTD)

- USB-inSync™ Timing & Triggering Device
- High-speed USB 2.0
- Choice of either BNC or RJ45 Connectors
- Typically $\pm 1\text{ns}$ accuracy between Legato modules
- I/O Cable propagation delay compensation
- Easily expandable to multiple devices



Overview

ChronoLogic's Legato series of Universal Timing Devices (UTD) are part of the USB-inSync™ product family. The Legato UTD provides a means to precisely control external equipment, trigger events, and provide synchronous clocks to users' existing laboratory equipment.



The Legato UTD can be synchronously used with other USB-inSync™ products to build large virtual instrument setups, where multiple hardware devices with different functionality appear and can be controlled in software as one multifunction device. These simple and affordable timing devices provide users with a unique range of scalable, distributed timing solutions combined with the ease and efficiency of USB based PC control. Legato UTD's are available with either BNC connectors or RJ45 connectors (when you require differential signalling using inexpensive Cat5 or Cat6 cable). The RJ45 model (2250) can also be used in conjunction with ChronoLogic's Sonda Signal Conditioning Units, extending the range of the 2250 up to 100m per channel.

The Legato UTD can be used to generate a sequence of events at a predefined time. This means that software configurable, synchronous control sequences or bit patterns can be created and distributed across multiple Legato devices in a test setup. The Legato UTD can also be used to synchronize a device under test with external test equipment and a DAQ module, whether it is a ChronoLogic USB DAQ Module, or other third party test & measurement equipment.

The Legato UTD can also be used to distribute externally referenced absolute time signatures (such as GPS time, IRIG time codes or IEEE 1588 time) around a local environment. All Legato devices contain I/O cable propagation delay compensation for phase accurate compensation of signals right up to your device under test. Multiple Legato devices can be combined with signal conditioning units (ChronoLogic Sonda) to create a virtual instrument covering distances of several hundred metres. Beyond practical cabling distances they can also be combined with our GPS enabled Master Timing Hubs to provide worldwide synchronization.

Choice of 2 Models

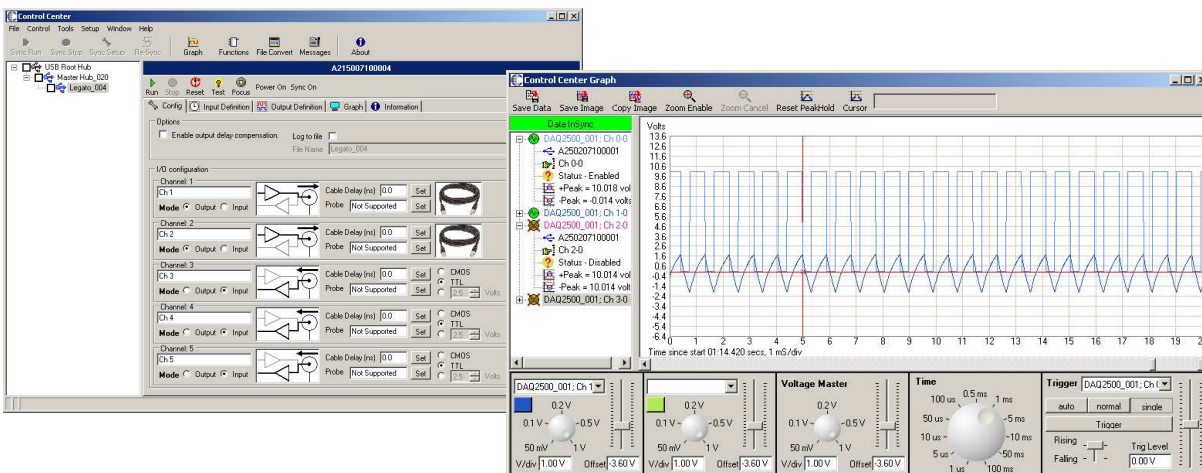
Legato UTD Model	BNC Connectors	Differential Signalling (RJ45 Connectors)
Legato UTD-2150	X	
Legato UTD-2250		X

Features and Benefits

- 5 independent software configurable I/O lines
- Synchronous Clock outputs with software selectable frequency
- Galvanic isolation for protection of PC and Equipment
- Typically ± 1 ns synchronous timing accuracy between Legato Modules
- I/O cable propagation delay compensation
- Distribute timing signals across multiple Legato devices with up to 1ns accuracy
- Software selectable trigger output signals to synchronize existing equipment
- 4Mb of on-board buffer RAM enabling distributed logic analysis
- Software Macro functions for Counters, Timers, Quadrature decoders (for angle or distance measurement etc.)
- Plug and Play functionality of USB makes the Legato UTD easy to set up and reconfigure.
- Supplied with FREE ChronoLogic Control Center software suite with simple to use GUI, COM server and LabVIEW™ drivers

Software

To provide flexibility and easy control, the Legato UTD is supplied with ChronoLogic's Control Center software platform, complete with a simple to use Graphical User Interface (GUI). For advanced users, access to extended low-level device functionality is available through our COM Server. This enables interfacing through Windows based software application including MS Office, Visual Studio and National Instruments LabVIEW™. Additional LabVIEW™ device drivers are available so that USB-inSync™ devices can be quickly implemented within an existing test environment.



Detailed Product Specifications

Description	Specification
General	
Operating System (for supplied software)	Windows XP/Vista
Bus Interface	USB 2.0 (480Mb/s)
Timing Accuracy/Synchronization	Typically ± 1 ns between Legato modules
Dimensions	160mm(w) x 100mm(d) x 33mm(h)
Weight	280grams
Number of Channels	5 I/O (independently configurable)
Operating Temperature	0°C - 50°C (non-condensing)
Storage Temperature	-10°C - 70°C
Input Threshold	CMOS / TTL / User Defined
Frequency	10MHz – DC
Jitter: Channel to Channel	200ps max
Jitter: Device to Device	2ns max
Power Supply	
Connector Type	2mm coax low voltage type
Operating Voltage Range	11 – 28 VDC
Power Consumption	6W (Connectors in output mode and terminated into 50 Ω)
BNC Model (2150) in Output Mode	
Low Output Voltage	< 0.6V (no load) < 0.1V (terminated with 50 Ω)
High Output Voltage	> 4.2V (no load) > 1.8V (terminated with 50 Ω)
Maximum Data Rate	10MHz / 20 Mbit/s
Maximum load current	+ / - 60mA (overload protected)
BNC Model (2150) in Input Mode	
Trigger Level	Programmable between 1.0V and 4V
Hysteresis	60mV
Minimum input voltage	-7V
Maximum input voltage	12V
Impedance	50 kohm
RJ45 Model (2250)	
Differential output swing (not terminated)	0V to 5V
Differential output swing (terminated)	Typ. 2.5V when terminated with 100 ohm (recommended)
Differential input voltage	-7V to 12V
Input termination	100 ohm
Differential Input Hysteresis	60mV
Maximum Data Rate (Interface is fully RS422 compatible)	10MHz / 20 Mbit/s
Maximum cable length	100m (shielded CAT5e cable) - when used in conjunction with ChronoLogic Sonda Signal Conditioning Units
RJ45 Pin Assignment	1: TX+ 2: TX- 3: RX+ 4: Driver Enable Output (5V TTL) 5: Remote On/Off Output (5V TTL) 6: RX- 7: DC Output 11V to 28V 8: GND

Certifications & Standards

The Legato Universal Timing Device meets the requirements for the following certifications:

Safety

- EN 61010-1 2nd Edition

EMC/EMR

- FCC – Part 15, Class A
- EN 61326: 1997 + A1: 1998 + A2: 2001 + A3: 2003
 - CISPR11 Conducted & radiated emissions
- EN 61000-3-2 Harmonics
- EN 61000-3-3 Harmonics & Flicker
- EN 61000-4 (2,3,4,5,6,11) Immunity

In addition, the Legato-UTD meets the Australian C-tick verifications

-  C-tick – ACA C-tick number: N14788