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CAMTIMER

TTL and RS-644 (LVDS) timing input-output unit

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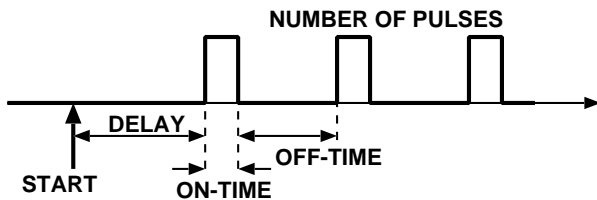
Overview

CAMTIMER is a standalone unit for generating and measuring multichannel timing pulses in TTL and/or RS-644 (LVDS) format. Although it is primarily designed for digital camera timing applications CAMTIMER can be effectively used for many other purposes as well. The unit can be controlled from a host computer through an RS-232 serial line. Measured time data are also transmitted on the same serial line from CAMTIMER to the computer.

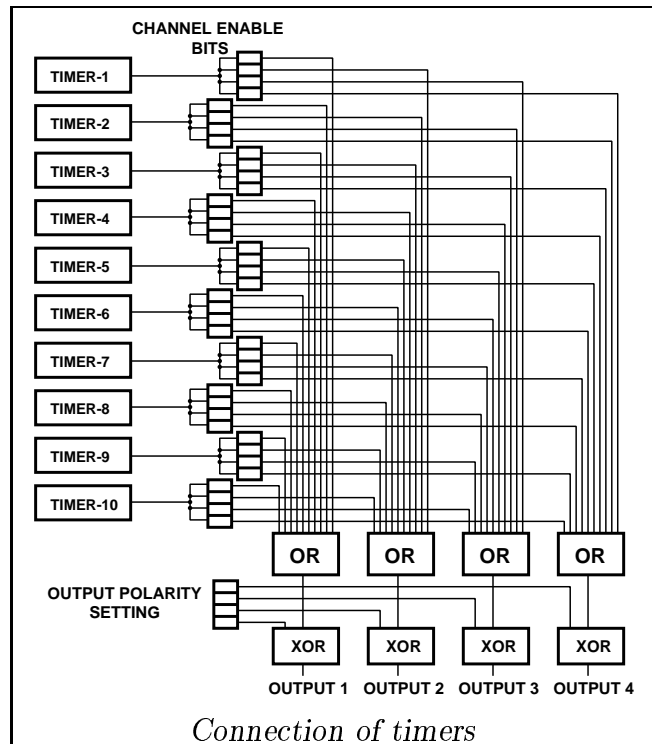
Timing output

Timing pulses are generated by 10 identical timers, each capable of generating a sequence of pulses. The output of these timers can be combined to form 4 output pulse sequences as shown on the figure.

Each timer has 4 individually settable parameters: start delay of the sequence, on-time, off-time and number of pulses as shown below.



Parameters of one timer.



Timing input

An edge (negative or positive) of incoming pulses can be measured on four timing input channels. Each pulse generates a frame transmission from CAMTIMER to the host. The frame contains a pulse counter, a channel identifier and time data. Additionally to the four timer inputs a time measurement can be initiated from the host by a software command as well. On response CAMTIMER sends a similar frame as in response to a hardware pulse.

Digital I/O

8 digital input and 8 output lines are available on CAMTIMER. The input lines can be simply read into the host by a software command. The output digital values are generated from a register stack. Each timer has an associated digital output byte which is placed on the output lines when the timer finishes pulse generation. An additional value can be set as output before the first timer finishes, this way an arbitrary output pattern can be generated.

Timebase

Signal generation and time measurement is based on an internal 10MHz crystal oscillator or an external TTL clock. The selected clock is output enabling synchronization of multiple CAMTIMERS. The base clock can be divided by a factor between 1-255. Time 0 is given by an external TTL trigger or by a software command. The clock-trigger subsystem is optically isolated from the rest of CAMTIMER.

Signal formats

All 4 timing and digital outputs are available as TTL and RS-644 (LVDS) signals. Separate inputs (4 timing and 8 digital) are available in TTL and RS-644 format. For flexibility 8 BNC connectors are located on the front panel where TTL signals can be connected. Two 9-pin D-sub connectors are located on the backplate which can accommodate a selection of TTL/RS-644 signals. The pin-out of both TTL and D-sub connectors can be configured by jumpers. Two internal connectors (one for TTL and one for RS-644 signals and powers) serve for future expansion boards (e.g. line driver outputs).

Host communication

Host communication is done through a standard RS-232 serial line with speeds up to 230.4 kbaud. CAMTIMER is programmed by sending data in standardized frames. Information from CAMTIMER (register contents, time information) are sent to the host using the same frame format.

Operating modes

CAMTIMER can be in one of three states: idle, armed or running. In armed mode the unit is waiting for a hardware or software trigger. In run mode output pulses are generated and input pulses are measured. When the last timer finishes pulse generation CAMTIMER stops and falls back to either idle, armed or run mode depending on register values.

Specifications

Supply voltage	9-12 V DC (2× for optoisolated clock-trigger subsystem)
Maximum clock frequency	10 MHz
Clock/trigger I/O	External clock in, clock out, trigger in (TTL on BNC)
Outputs	4 timing, 8 digital bits (TTL and RS-644)
Inputs	4 timing, 8 digital bits (TTL and RS-644)
Signal connectors	8×BNC, 2×9-pin D-sub
Size	203×65×185 mm (W×H×D)

Other camera data acquisition products

CAMTESTER Image for testing camera exposure length and time. CAMTESTER consists of 50 light emitting diodes lit in a changing pattern. Time information is revealed by the pattern on the image.

CAMLINK Fiber optical remote data acquisition unit. 16/32 RS-644 digital input lines, bus mastering PCI card on PC end. FIFO memory in front-end to prevent data loss during strong PC activity. 19" rack mount unit with optional second fiber link for RS-232 camera control.

For more information on the CAMTIMER unit, other camera data acquisition products and for custom solutions contact:

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