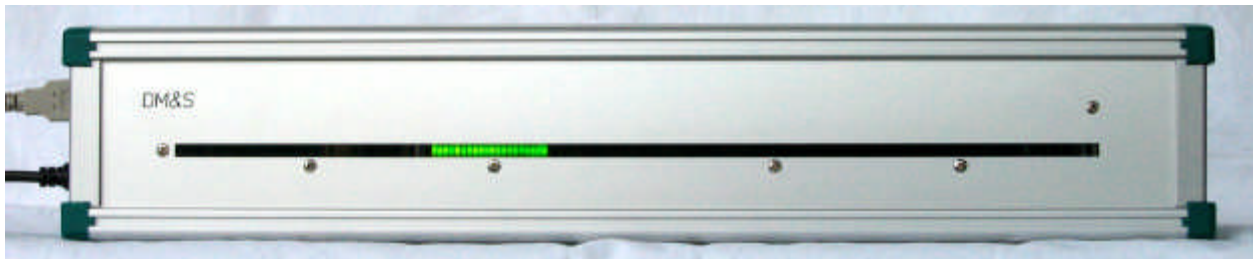




Reference Ticker™

Idealized display with transparent timing



Display-Metrology & Systems
D-76135 Karlsruhe
www.display-messtechnik.de

Version 06-03



Reference Ticker™

This device **is designed for performance checking and calibration of measurement devices for motion-blur analysis**. It can also be used for research of perception of motion by the human visual system. The **Reference Ticker** emulates a single line of a matrix-organized electronic visual display device with an exactly controlled timing (parameters listed below).

The display comprises 160 rectangular LEDs and a control-electronics PCB with USB interface.



160 LEDs in a linear arrangement represent one line of an electronic visual display



Air exhaust with fan

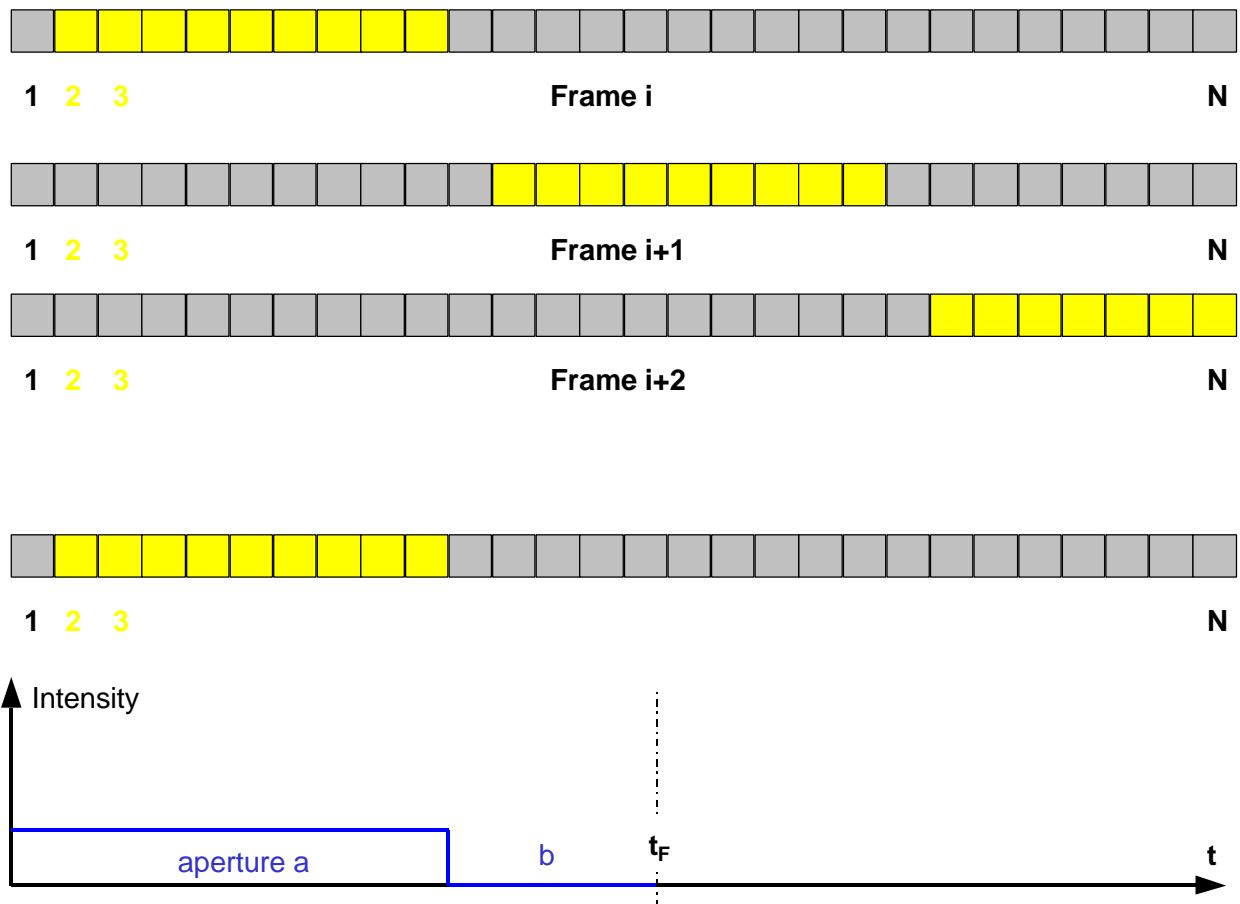


USB data interface & power supply plug

Parameters (programmable via USB)

| | |
|---------------------------------------|--|
| Frame frequency, f_{FR} | 1 Hz - 500 Hz (frame time t_{FR} 1s - 2 ms) |
| Aperture ratio, a | 0,391%- 99,61% of frame time (1/256 - 255/256) |
| Width of pattern, w | 1 - 160 elements (pixel) |
| Speed of advancement, Δ /frame | 0 - 160 elements (pixel) per frame |
| Response times | LEDs are turned ON and OFF < 100 ns |
| LED | 5 mm (height), 2 mm (width), yellow-green emission |
| Dimensions: | 42 cm (length), 8cm (height), 6 cm (depth) |





Graphical representation of an example for the timing of the Reference Ticker

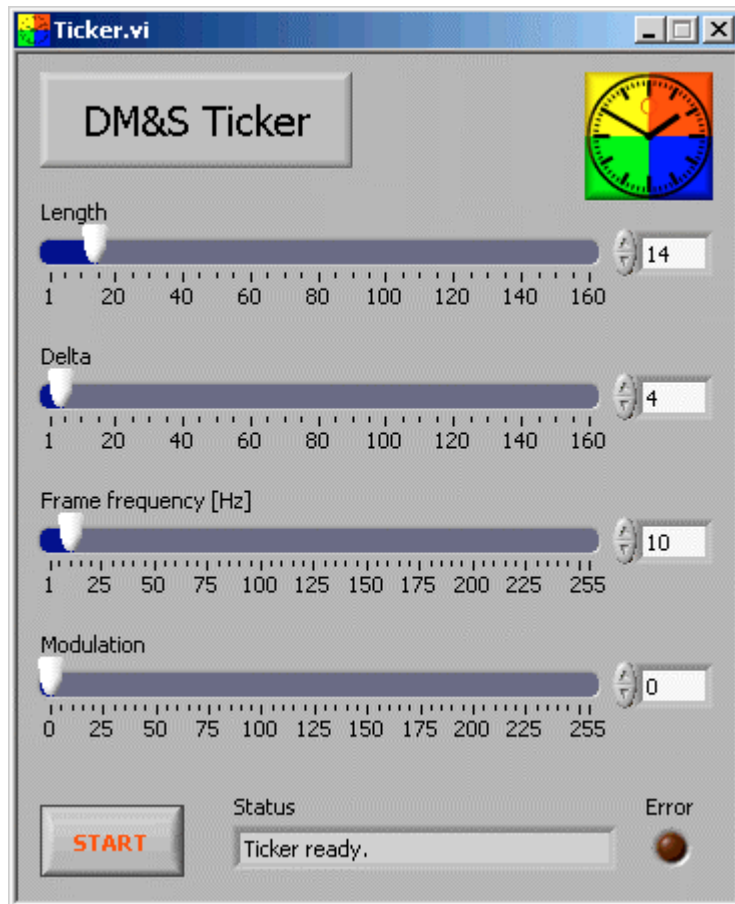
Timing example (see diagram above)

| | |
|-------------------------|---------------------------------------|
| Width of moving pattern | $w = 9$ elements (pixels) |
| Speed | $\Delta = 10$ elements / frame period |
| Aperture ratio (PWM) | $a / (a+b) = 2/3 = 66.6 \%$ |

By proper selection of the aperture ratio, a , the Reference Ticker can simulate both hold-type displays (e.g. LCDs with $a = 100\%$) and impulse-type displays (e.g. CRTs with $a \leq 1\%$). Blinking and scanning backlight approaches can also be simulated by appropriate choice of the aperture ratio parameter.



Reference-Ticker Control-Software



Width of block-pattern
[pixel]

Advancement of block-
pattern [pixel / frame period]

Frame frequency [Hz]

Aperture Ratio, a (ON-time)
0 continuous ON
1 ... 255 $a = \# / 256$

Screenshot of the GUI of the Reference-Ticker

Select the parameter values and push the START button to activate the predefined display on the ticker.

Installation

The installation is started by running **SetUp.exe** on the supplied data storage medium (usually CD). Follow the instructions of the installer.

When the installation of all required components is finished, connect the ticker to its power supply and then apply the USB connection. When Windows detects the new device and looks for a driver, enter the path to the directory where the ticker-software has been installed to.

Now, the ticker should be ready for operation.

