⊙ steinberg

**Technical Note 0003 - October 2005**

# Nuendo and the Time Base - Red Light - Setup

This document describes how to control the studio red-light system via Nuendo and the Time Base.
This document is valid for Nuendo v.3.1 / 3.2 and Time Base v.1.40.

## Table of contents

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# 1. Introduction

System setup: Nuendo and the Time Base
This application note guides you through the basic hardware and software setup.
This application note is not intended as a manual!
If you are not familiar with the Time Base, have the Time Base manual on hand -
part 6 and 7 in the manual explain the different display-pages and their functions.

Before you start, select the video standard you are working with -
On the Time Base front panel select:
P.5 > SYS-VIDEO:xx - 25 fps in Europe, 29.97 in the USA, Canada and Japan.
If the SYS-VIDEO is changed, power-cycle the Time Base.

# 2. NUENDO controlling the Red Light Output

## 2.1  Hardware Setup:

Connections:   Time Base - USB - Nuendo (Bi-directional Control-information)
Time Base / AES/EBU out - Nuendo / AES/EBU in (System-link)
Time Base GPI/O - connector wired to the red light system.

Red Lights

Studio
Red Light
Controller

Time Base

GPI/O

Power

SL

USB

Nuendo
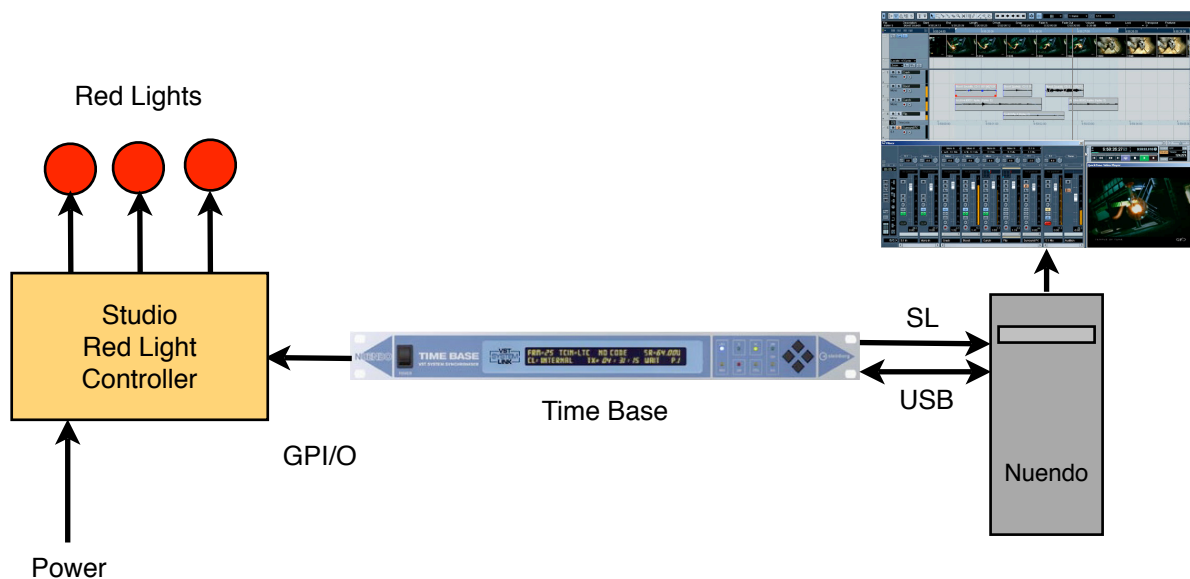
## 2.2. The Red Light "Hardware" in the Time Base.

The Time Base has "Open Collector" type outputs with a protection
resistor in series.
The output (Pin3) is **"active low"**, otherwise known as a switch to ground!

The Time Base has a "4.4V" output, to drive LEDs directly.
(4.4V - Time Base internal 5V via a protection diode and resistor.)



GPI/O connector
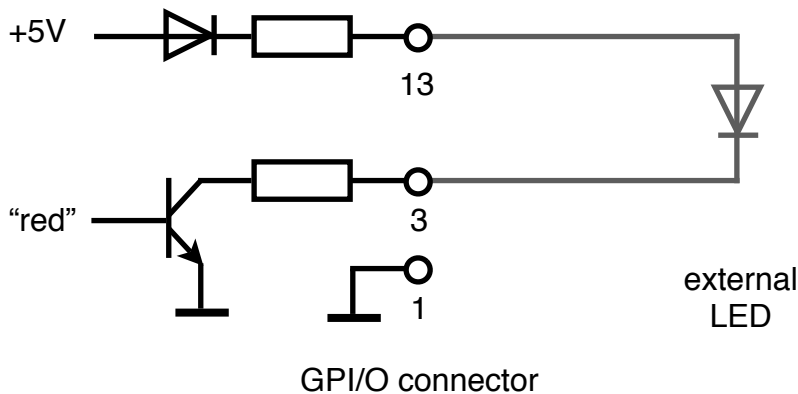
As a test connect a LED between pin 13 and pin 3
(See Time Base manual page 7 - 81)

## 2.3 NUENDO and the Time Base:

2.2.1 Power up the system. Check that the "LINK-LED" on the Time Base is on
- this happens after the driver is loaded and started from the computer.
If the LINK-LED stays off, check USB cable, check if Time Base driver is
installed, and, in the Time Base > P.5 - USBPORT : ON.
The LINK-LED must be on before NUENDO is started!
If you want to check again, unplug the USB cable, power-cycle the Time Base,
wait until it is fully up again and then re-plug the USB cable -
2~8 seconds after the USB connection is made, the LINK-LED should come up.
If this is not working, check the Computer USB installation and the Time Base
Driver Installation.

2.2.2 Start NUENDO and create a new "Empty" Project - safe as (i.e. -)
red light test.
Go to menu Devices, open Device Setup... and select Time Base.
In Device Setup/Time Base move the Nuendo Inserter Position control
(the 00:00:00:00 in the black square) a little.
On the Time Base the DATA LED will flash and the POS H/V values change
according to the mouse movement. This shows, that communication from
Nuendo to the Time Base is happening.

## 2.4. The whole system:

Click PLAY in the Transport Bar, click REC - the red light LED lights up -
leave REC by clicking REC again - the red light LED is off -.
Not working?
1.   At the Time Base select SP2. Check that "RED:C-102" is selected.
     C-102 is the "channel" used for red light switching from Nuendo.
2.   Check that the LED polarity is correct.
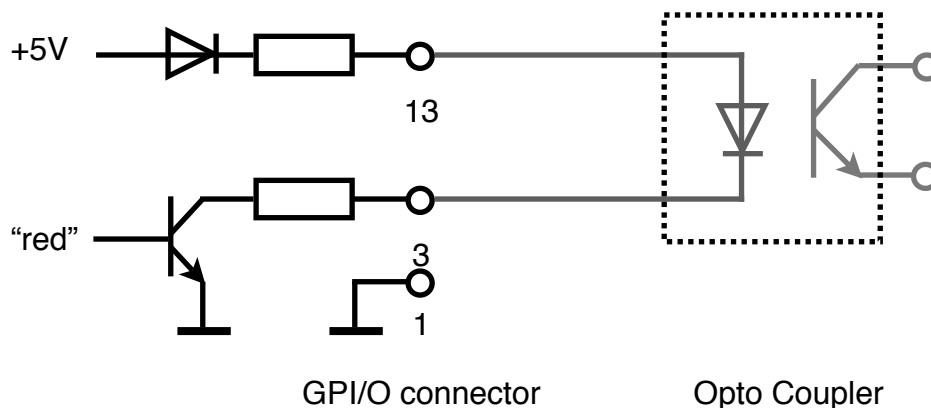
# 3. Connecting a Red Light Controller

The Time Base GPI/O connector is made for "low voltage" control
applications!

**NEVER CONNECT IT TO A MAINS OUTLET !**

## 3.1 Red Light controller with "Opto-Coupler" input:

The best way to drive your red light system:
Connect the Time Base output via an "Opto-coupler" - Input to the
red-light system.


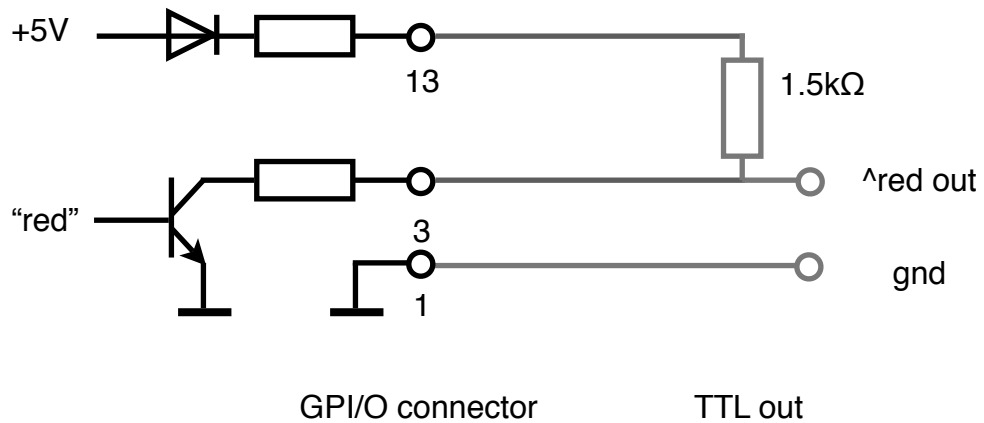
GPI/O connector                    Opto Coupler

(See Time Base manual page 7 -81)

This offers full (galvanic) isolation from the red light control system.
No **Earthloops**! (Earthloops are not only harmful to analog systems.)

## 3.2 Red Light controller with "TTL" or "Ground closure" input:

To drive a red light controller with a "TTL-type input" use the following circuit. The red light output is "active low".

+5V ⊳|——[ ]——○
        13

"red" ——[ transistor ]——[ ]——○
                        3
                        ○
                        1

1.5kΩ

○ ^red out

○ gnd

GPI/O connector          TTL out

The 1.5kΩ (1500Ω) pull-up resistor may be omitted if it is all ready integrated in the redlight controller - i.e. the red-light controller needs just a "Gnd closure".

The open collector output is able to handle pull-up resistors connected to a 12V supply as long as the current is below 20mA.