

For **tantalum capacitors** please attend to the connection wire marked "+". This wire has to correspond to the printed mark on the pc-board.

The **resistor-networks** are marked at one end for the assembly position with "...103..." and additionally with a printed circle or a square. Assemble this component that way that the marking corresponds with the marking at the first bore of the pc-board. Additionally is the first bore marked with "1".

**Integrated circuits (IC)** are either marked with a half round notch on one end or a printed point for the correct mounting position. Push the IC`s into the correct socket assuring that the notch or the printed point is corresponding to the half-rounded marking on the pc-board. The **IC2** has for identification the printed tag **24C256** or **2EB 1**.

Please attend to the sensitivity of the ICs to **electrostatic discharge**, which will cause immediate damage of the IC. Before touching those components please discharge yourselves by contacting an earthed metal (e.g. earthed radiator) or work with an electrostatic safety pad.

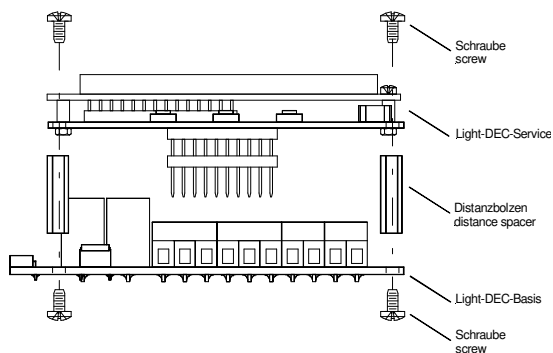
## Assembly of the Light-DEC-Service PC-Board:

After placing all components onto the pc-board of the Light-DEC-Basic and the Light-DEC-Service PC-board, the Light-DEC-Service will be assembled onto the Light-DEC-Basic PC-board.

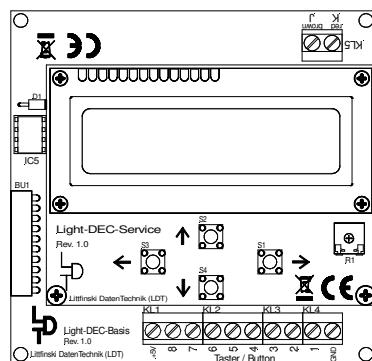
Firstly please tighten the two distance spacer to the basic pc-board with two of the four cross section screws.

Apply now the Light-DEC-Service PC-Board into the socket bar-ST1 of the basic pc-board. Pay attention that there is no offset of the Light-DEC-Service PC-Board to the socket. The Light-DEC-Service PC-Board is in correct position at the socket bar ST1 of the basic pc board if you can screw the Light-DEC-Service PC Board to the distance bolts.

The following picture 1 show the assembly procedure from the side view and the picture 2 show the assembled unit with sight from the top.



Picture 1



Picture 2

Littfinski DatenTechnik (LDT)

Assembly Instruction



# Basic-Module for the Layout- Light-Control Light-DEC

from the *Digital-Professional-Series* !

Light-DEC-Basis-B Part-No.: 810221

>> kit <<

**Light-DEC** is a **universal layout-light-control** for **analogue** and **digital model railway layouts**.

Various **light-functions** can be assigned to up to **160 light outputs** and can be **automatically controlled within the daylight-cycle** or can be **switched ON or OFF via push buttons** or **DCC-commands**.

The universal **layout-light-control Light-DEC** consist of the **Basic-Module** and **at-least one Light-Module (Light-Display or Light-Power)** which will be **plugged** onto the side of the **Basic-Module**.

This product is not a toy! Not suitable for children under 14 years of age! The kit contains small parts, which should be kept away from children under 3! Improper use will imply danger of injuring due to sharp edges and tips! Please store this instruction.



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## Introduction:

You have purchased the **Basic-Module for the layout light control Light-DEC-Basis** as a kit for your model railway supplied within the assortment of Littfinski DatenTechnik (LDT). These kits are of high quality and easy to assemble.

**We are wishing you having a good time for assembling and application of this product!**

## General:

### Tools required for the assembly

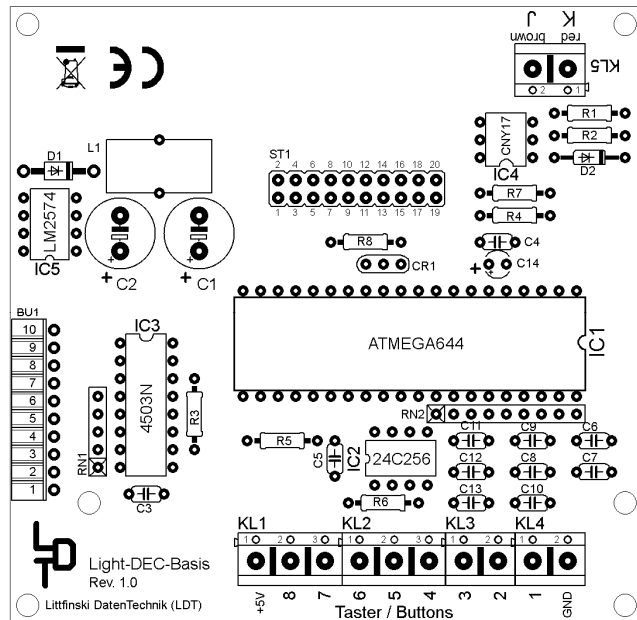
Please assure that the following tools are available:

- a small side cutter
- a mini soldering iron with a small tip
- solder tin (if possible 0.5mm diameter)

### Safety Instructions (attend as well to the rear side of this assembly instruction).

- We designed our devices for indoor use only.
- All electrical and electronic components included in this kit shall be used on low voltage only by using a tested and approved voltage transducer (transformer). All components are sensitive to heat. During soldering the heat shall be applied for a very short period only.
- The soldering iron develops a heat up to 450°C. Please keep continual attention to this tool. Keep sufficient distance to combustible material. Use a heat resistant pad for this work.
- This kit contains small parts which can possibly be swallowed from children. Children (especially under 3 years) shall not participate on the assembly without supervision.

## Assembly Plan:



## Assembly List:

| Pos. | Qty. | Components                  | Remarks                       | Ref.      | Done |
|------|------|-----------------------------|-------------------------------|-----------|------|
| 1    | 1    | Printed circuit board       |                               |           |      |
| 2    | 1    | Diodes 1N5819               | attend to polarity!           | D1        |      |
| 3    | 1    | Diodes 1N4148               | attend to polarity!           | D2        |      |
| 4    | 2    | Resistors 1,5kOhm           | brown-green-black-brown       | R1, R2    |      |
| 5    | 1    | Resistor 4,7kOhm            | yellow-violet-black-brown     | R3        |      |
| 6    | 3    | Resistors 10kOhm            | brown-black-black-red         | R4...R6   |      |
| 7    | 1    | Resistor 220kOhm            | red-red-black-orange          | R7        |      |
| 8    | 1    | Resistor 1M0hm              | brown-black-black-yellow      | R8        |      |
| 9    | 1    | Netzwork 4*47kOhm           | attend to polarity! (473)     | RN1       |      |
| 10   | 1    | Netzwork 8*10kOhm           | attend to polarity! (103)     | RN2       |      |
| 11   | 11   | Capacitor 100nF             | 100nF = 104                   | C3...C13  |      |
| 12   | 1    | Tantalum cap. 10uF/10V      | attend to polarity!           | C14       |      |
| 13   | 1    | IC-socket 40poles           |                               | IC1       |      |
| 14   | 2    | IC-socket 8poles            |                               | IC2, 5    |      |
| 15   | 1    | IC-socket 16poles           |                               | IC3       |      |
| 16   | 1    | IC-socket 6poles            |                               | IC4       |      |
| 17   | 1    | Socket bar 10poles          |                               | BU1       |      |
| 18   | 1    | Socket bar 2x10poles        |                               | ST1       |      |
| 19   | 2    | Electrolytic cap. 470uF/35V | attend to polarity!           | C1, C2    |      |
| 20   | 1    | Storage choke               | fix with hot glue!            | L1        |      |
| 21   | 2    | Clamp 3poles                | build block prior to assembly | KL1, 2    |      |
| 22   | 3    | Clamp 2poles                | build block prior to assembly | KL3, 4, 5 |      |
| 23   | 1    | Resonator 20MHz             |                               | CR1       |      |
| 24   | 1    | IC: ATMEGA644               | attend to polarity!           | IC1       |      |
| 25   | 1    | IC: 24C256 or 2EB 1         | attend to polarity!           | IC2       |      |
| 26   | 1    | IC: 4503                    | attend to polarity!           | IC3       |      |
| 27   | 1    | IC: CNY17-3                 | attend to polarity!           | IC4       |      |
| 28   | 1    | IC: LM2574N-5               | attend to polarity!           | IC5       |      |
| 29   |      |                             | final control                 |           |      |

## Set-Up:

For the board assembly please follow exact the sequence of the above **assembly list**. Cross each line off as **done** after completing the insertion and the soldering of the respective part.

For the **diodes** please keep special attention the correct polarity (marked line for the cathode).

With reason to different makes of **electrolytic capacitors** you will find different markings of the polarity. Some are marked with "+" and some are marked with "-". Each capacitor has to be assembled to the board that the marking on the capacitor is in correspondence with the marking on the pc-board.