



# LpS 2016 Bregenz Horticulture Lighting Workshop

# About

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- Tobias Hofer CEO HSi-Elektronik AG
- Affiliated Company Astra Led GmbH
- Electronic Development
- Component supplier for the lighting industry
- Customized solutions

# Project

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- Support of a KTI Research project “polyculture” from ZHAW
- Growing Wasabi / Watercress on the surface of the water for higher added value of the whole system
- Question: What is the best light spectrum for the plants?



# Find the right spectrum

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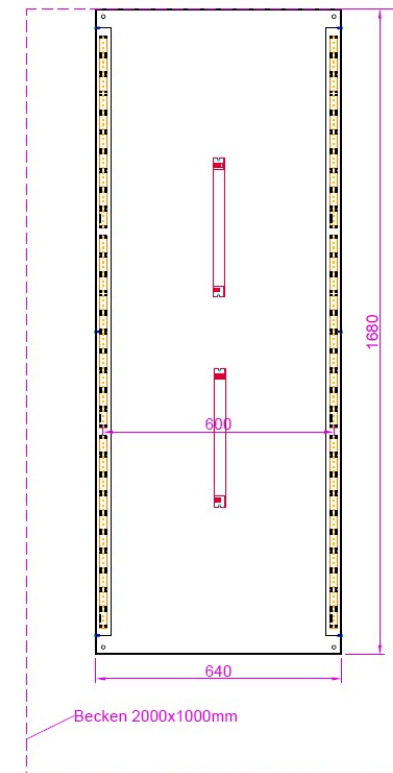
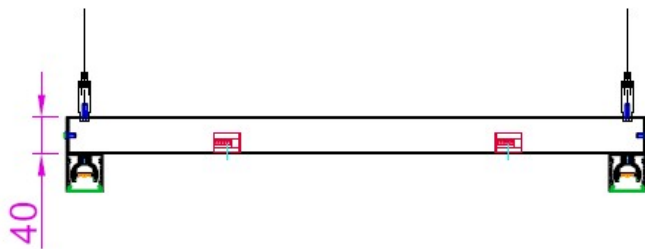
- Support of ZHAW with providing an easy to use technology to adjust the spectrum
- Development of customized LED module (Deep Blue 450nm / Hyperred 660nm / White 6500K / Far Red 730nm Osram LED)



# Installation



- Easy installation next to the plants with linear solution on aluminium plate
- Distance adjustment to plant with wire
- Constant Current LED Drive inside



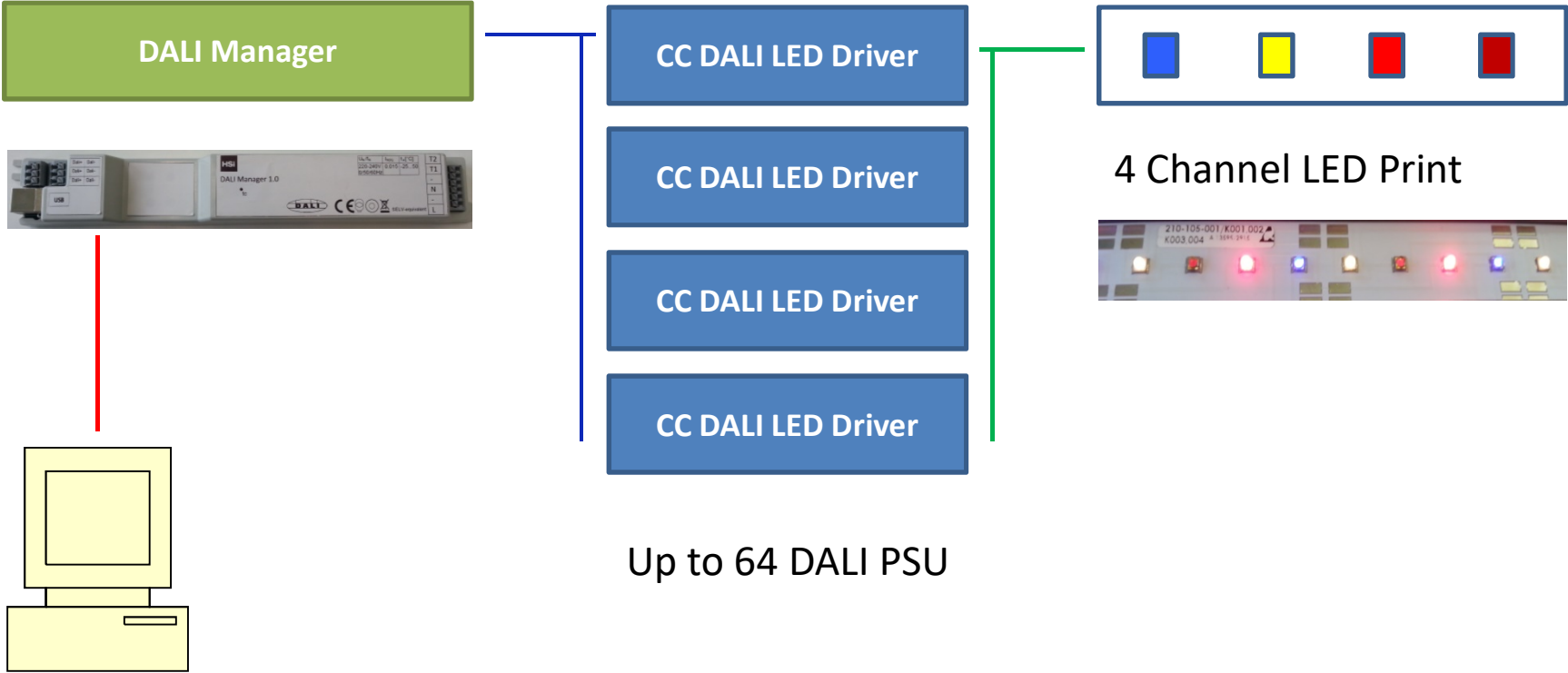
# Controlling the Spectra

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- LED constant current controlled
- Looking for an easy way to control hundreds of constant current LED driver
- Scientist must be able to adjust the spectrum
- Scientist must be able to adjust the on- off time of every spectrum and channel
- Decision to use the DALI Bus and to develop a DALI Master with a windows software

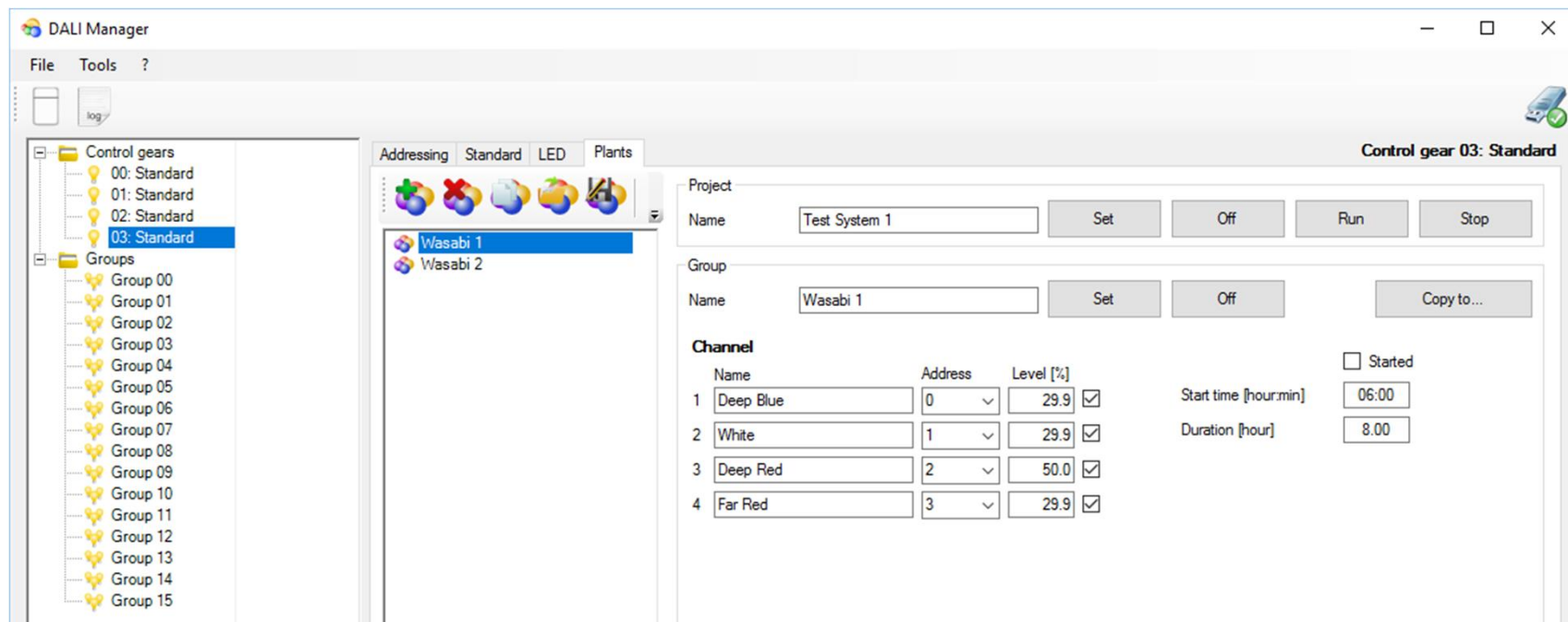
# DALI Controller Concept



# Software Concept



- USB Connection
- Windows Configurator





# Group Settings



- Need for Test Settings

Independent Timer / Group

Project Name: Test System 1 [Set] [Off] [Run] [Stop]

Group Name: Wasabi 1 [Set] [Off] [Copy to...]

Started

| Name        | Address | Level [%]                                |
|-------------|---------|--|
| 1 Deep Blue | 0       | 29.9 <input checked="" type="checkbox"/> |
| 2 White     | 1       | 29.9 <input checked="" type="checkbox"/> |
| 3 Deep Red  | 2       | 50.0 <input checked="" type="checkbox"/> |
| 4 Far Red   | 3       | 29.9 <input checked="" type="checkbox"/> |

Start time [hour:min]: 06:00

Duration [hour]: 8.00

Project Name: Test System 1 [Set] [Off] [Run] [Stop]

Group Name: Wasabi 2 [Set] [Off] [Copy to...]

Started

| Name        | Address | Level [%]                                 |
|-------------|---------|---|
| 1 Deep Blue | 4       | 100.0 <input checked="" type="checkbox"/> |
| 2 White     | 5       | 100.0 <input checked="" type="checkbox"/> |
| 3 Deep Red  | 6       | 100.0 <input checked="" type="checkbox"/> |
| 4 Far Red   | 7       | 100.0 <input checked="" type="checkbox"/> |

Start time [hour:min]: 06:00

Duration [hour]: 8.00

# First Test Watercress



Control Group



Spectrum 1



Spectrum 2



Spectrum 3



# Polyculture System

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- Installation

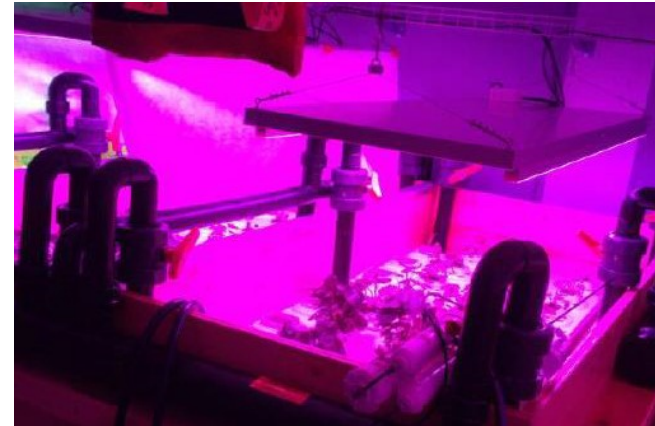


# Results

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- Scientist can easy control the spectra's and can build test groups
- Due to the customized LED and DALI manager solution they found the right spectra
- No programming for test setup





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# Thank you for your attention