

Dimleme Yöntemleri

- **Dimming**

- Üçü bir arada (3-in-1)
- AC tarafından dimleme (AC phase cut)
- DC ÇIKIŞ tarafından (Output PWM)
- Timmer dim
- DALI

Üç şekilde dim yapabilme özelliği (R : Direnç ile, 1..10V, PWM)

• Dimming 1

– 3-in-1 (R, DC 1-10V, PWM)

※ Reference resistance value for output current adjustment (Typical)

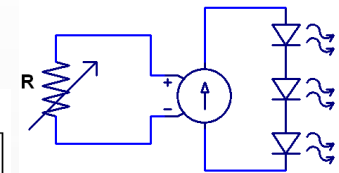
Resistance value	10KΩ	20KΩ	30KΩ	40KΩ	50KΩ	60KΩ	70KΩ	80KΩ	90KΩ	100KΩ	OPEN
Output current	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	100%~108%

※ 1 ~ 10V dimming function for output current adjustment (Typical)

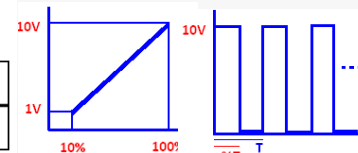
Dimming value	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V	OPEN
Output current	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	100%~108%

※ 10V PWM signal for output current adjustment (Typical): Frequency range : 100Hz ~ 3KHz

Duty value	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	OPEN
Output current	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	100%~108%

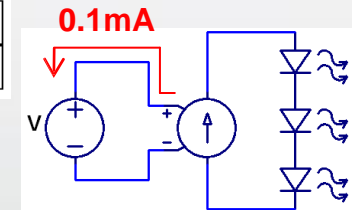


Resistor



DC 1-10V

PWM



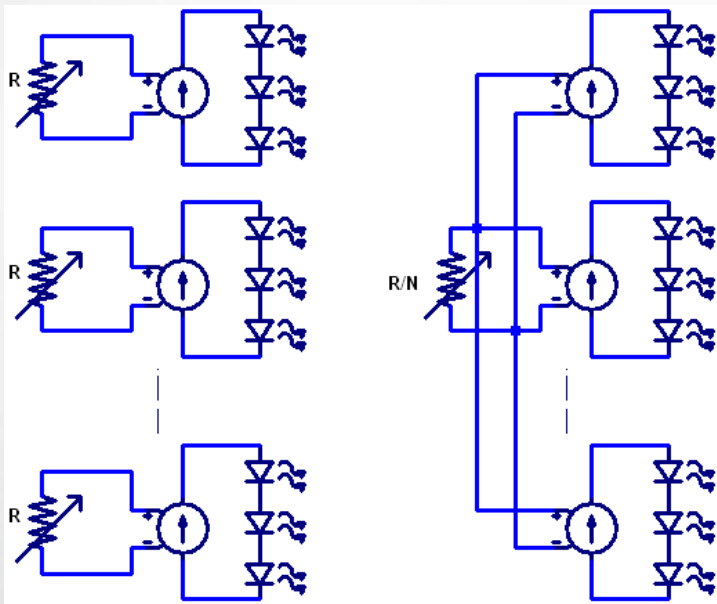
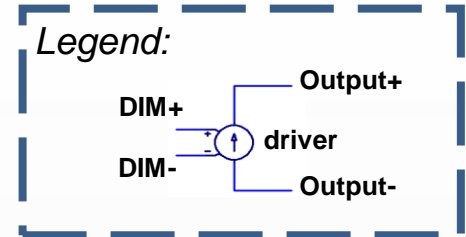
➡ **Output current changes analog to DIM control**

➡ **Multiple control is possible with precaution**

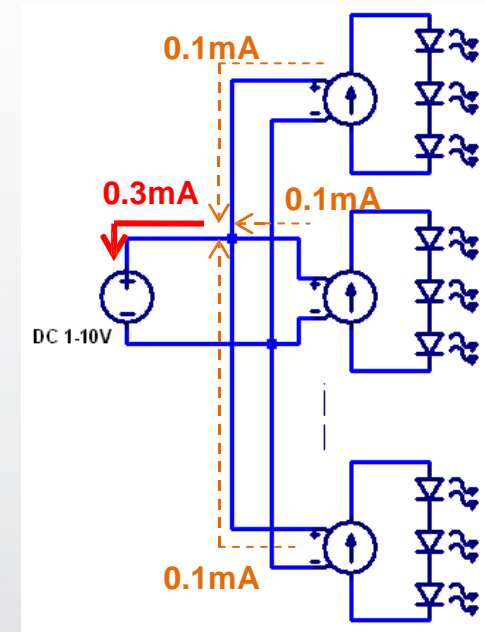
Electrical Structures

- **Dimming 1**

— 3-in-1 : Çoklu dimleme bağlantısı (Multiple unit dimming)



R / N for N x dimming units



DC1-10V to sink N x 0.1mA

Dimleme örnekleri

- **1-(3-in-1 : DC 1-10V example)**

Easy-Net Demo Box 2:

Power: HLG-80H-42

CC region 25.2~42V Rated current 1.95A

LED: Samsung HW-DC-WA6

$V_{fwd} = 17.9V$ $I_{fwd} = 550mA$

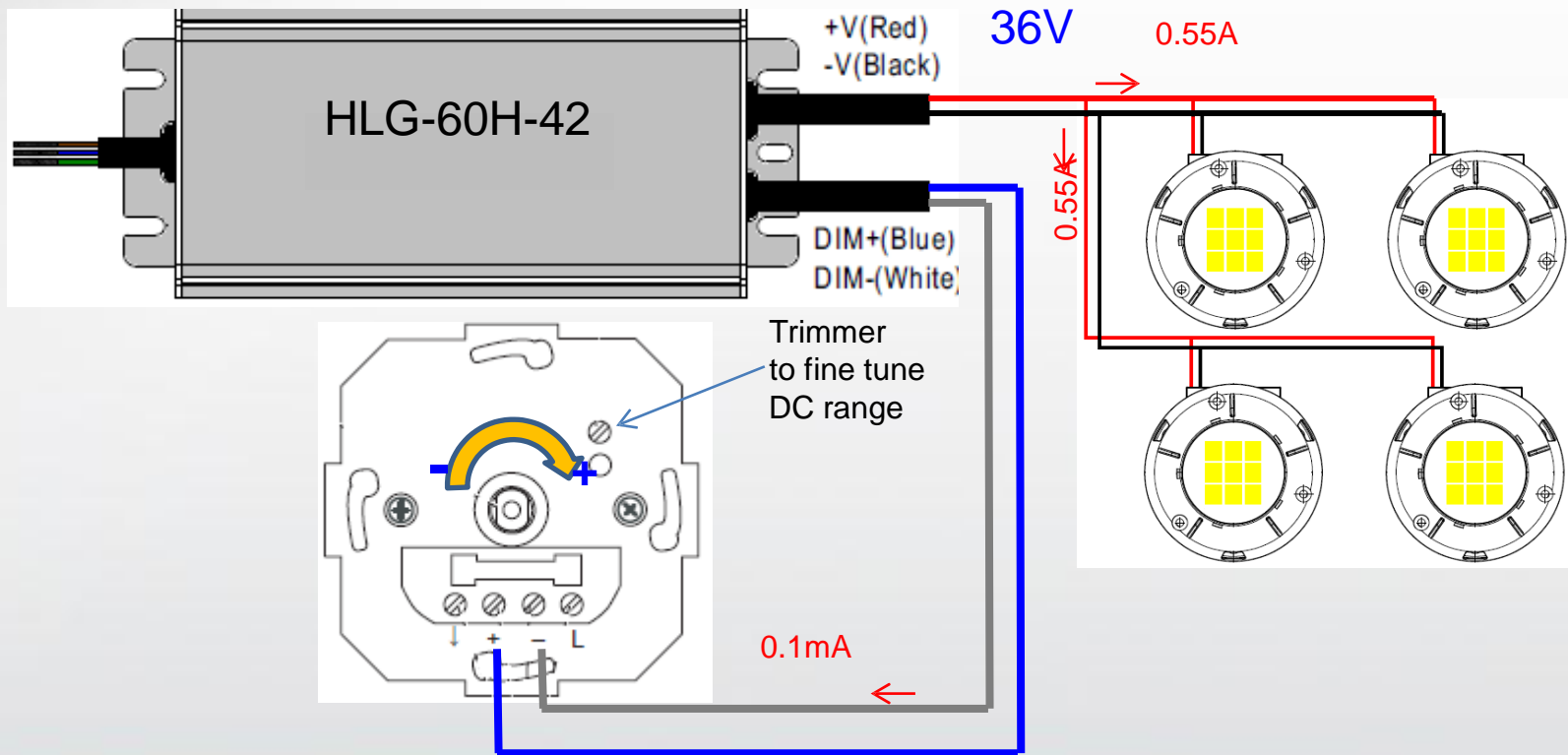
Driving: 2 (series) x 2 (parallel) array; direct CC drive

Dimmer: Osram DIM MCU

Control output capacity: Max. 40mA (flow in)

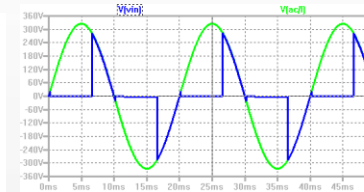
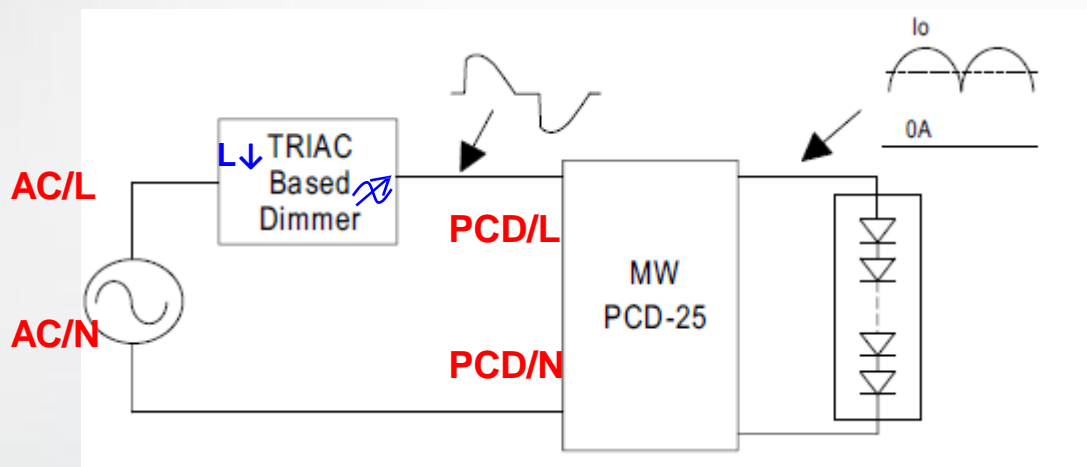
(theoretically can control : 400 HLG unit at the same time)

- (3-in-1 : DC 1-10V example)

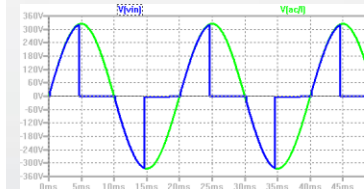


- 2.Yöntem

– AC phase cut



Leading-edge (Triac dimmer)



Trailing-edge (Transistor dimmer)



Dimmer performance largely influence overall dimming



AC voltage is a factor of dimming performance also

- **2.Yöntemiçn Örnek (AC phase cut example)**

Easy-Net Demo Box 1:

Power: PCD-25-1050

CC region 16~24V Rated current 1.05A

LED: Helieon 180081-23x0

$V_{fwd} = 17.9V$ $I_{fwd} = 1050mA$

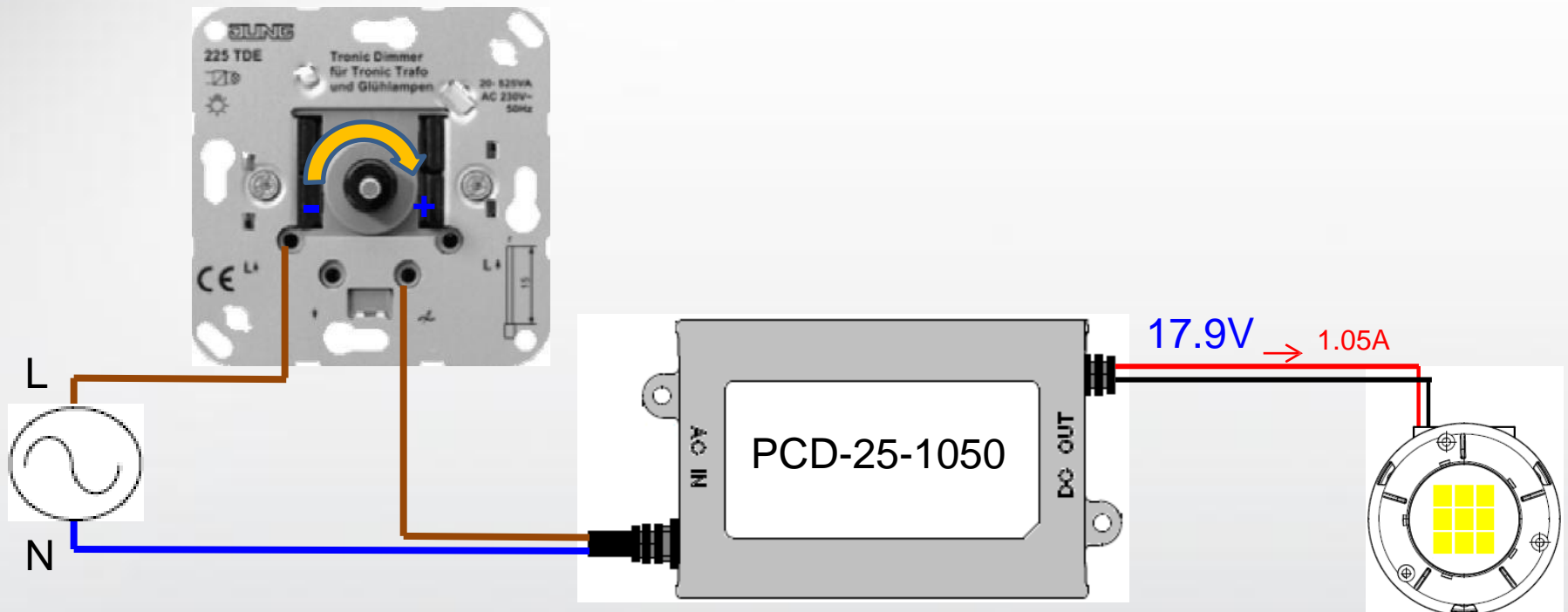
Driving: single LED module; direct CC drive

Dimmer: Jung 225 TDE

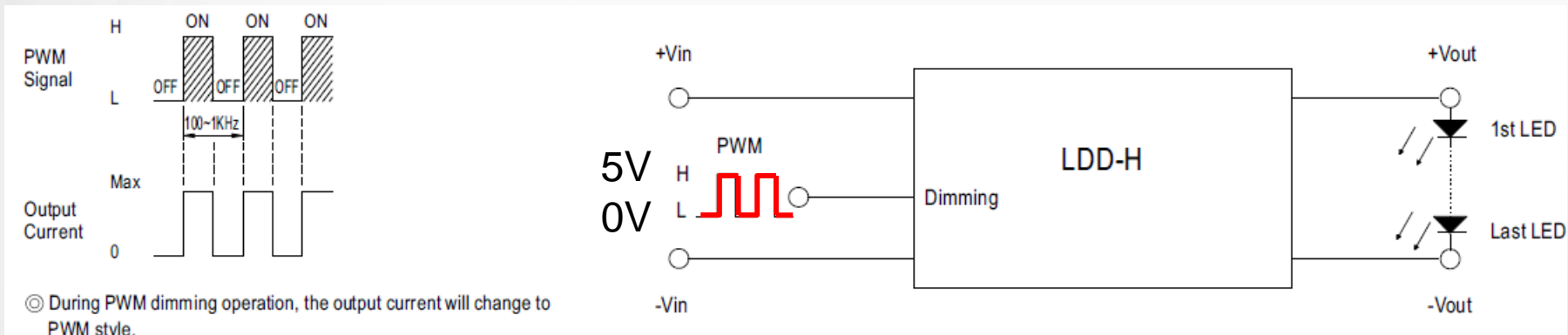
Trailing edge dimmer

Electrical Structures

- **Dimming 2 (AC phase cut example)**



- 3.Yöntem
 - Output PWM



Dimming is done with on/off duty cycle on LED



Good for color and luminance control

Electrical Structures

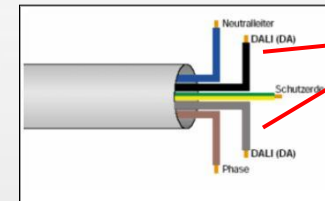
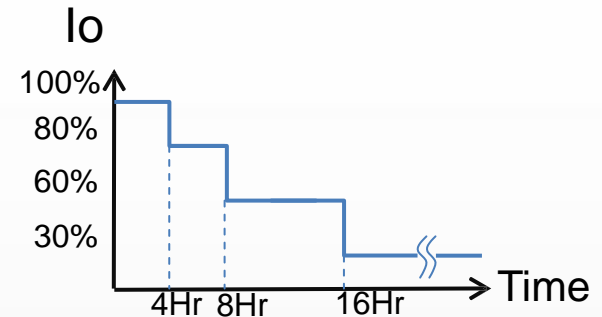
- **4/5 Yöntem**

- Timmer dim (*D-type*)

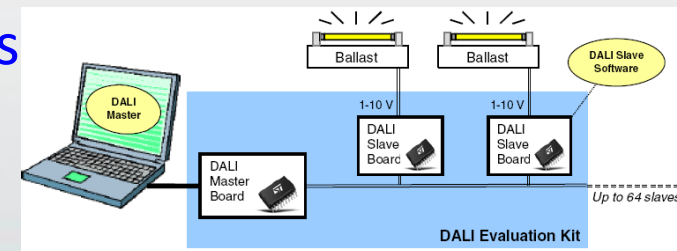
- 4 current levels with steps of 5%
- Timing step in hours with tolerance $\pm 5\text{min}$ per 4hours
- Reset by re-power on

- DALI

- Digital addressable dimming
- Programmable groups and scenes
- MW product *next year* !



DALI
2 control lines
without polarity



Electrical Structures

- Dimming vs. Mean Well Products**

Model	3-in-1 dimming			Timmer	Phase-cut	Output PWM
	Resistor	DC 1-10	PWM			
HLG/N/P		√		√		
LPF		√				
HVGC		√		√		
PCD					√	
LDD						√
ELN-□ -D/P		D-type	P-type			

