TestResultaten

Test 1: Basis 31 LEDs vermogen test

31 LEDS

intensiteit	verwachte spanning	gemeten spanning	stroom	Vermogen
rood 25%	5V	4.5V-4.6V	73mA	337mW
rood 50%	5V	4.5V-4.6V	113mA	615mW
rood 75%	5V	4.5V-4.6V	194mA	895mW
rood 100%	5V	4.5V-4.6V	253mA	1.154W
wit 25%	5V	4.5V-4.6V	221mA	1.02W
wit 50%	5V	4.5V-4.6V	381mA	1.756W
wit 75 %	5V	4.5V-4.6V	544mA	2.5W
wit 100%	5V	4.5V-4.6V	734mA	3.376W

ESP:

ESP verbruik
3.3V 26mA 97mW

Real time clock is van internet op controller met +- 0.5s delay en van mµ naar ledstrip is geen visueel verschil

Total power consumption calculations:

Color - Brightness - ALL3
MAX MAX MAX
(734mA + 26mA)/ 31 * 30 * 5 = 3,68A voor 1 ledstrip

Conclusion:

We can conclude out of a small scale test we have a power consumption of ± 4A / ledstrip. (On full power) So our 5A power supply is more than enough knowing that we will never illuminate the whole ledstrip showing the time.

Test 2: 300 LEDs (max) vermogen test

intensiteit	verwachte spanning	gemeten spanning	stroom	Vermogen
rood 25%	5V	4.5V-4.6V	68mA	3,067W
rood 50%	5V	4.5V-4.6V	1,272A	5,728W
rood 75%	5V	4.5V-4.6V	1.863A	8,385W
rood 100%	5V	4.5V-4.6V	2,455A	11,050W
wit 50%	5V	4.5V-4.6V	2,290A	10,30W
wit 100%	5V	4.5V-4.6V	3,335A	15W

witRGB 50%	5V	4.5V-4.6V	3,130A	14,090W
witRGB 100%	5V	4.5V-4.6V	4,510A	20,50W

Conclusion:

We can conclude that the white RGB LEDs consume much more power in comparison to the red RGB LEDs. The power does not exceed the limitations of our power supply, as we reached a maximum of 20W, while our power supply can deliver 25W if necessary. Of course, this test contains the absolute maximum values we could have, and normally we will never reach these limits with our program, as the clock will never lighten all the LEDs at the same time.

And with the ESP and the other small components (so full project) we will probably have a max max of 21W still under our max.

Improvement:

We can code that if the 3 RGB values get closer to each other in the value of 5 and are higher than 50% we switch them to white white.

	R	G	B	
So if	10	20	30	NOTHING
	20	22	23	NOTHING
	128	200	250	NOTHING
	190	192	188	CHANGE TO WHITE

!! Door dit te doen is de stroom consumptie van gehalveerd bij het echte wit !!

Test 3: Number of leds per grid

We hebben ongeveer 4 leds per letter en dan +-6 extra over de lengte die een beetje verdeeld zijn dan aan elke kant hebben we nog 6 hangen voor van boven naar onder te gaan.

We hebben dus 560 LEDS in gebruik ongeveer
56 per lengte waarvan 6 de overbrugging is.

```
int fiveMinutes[]       = {33,34,35,36,  37,38,39,40,    41,42,43,44,45,  46,47,48,49,  83,84,85,86,    87,88,89,90,91};
//                          T     I     E     N     O     V     E     R
int tenMinutes[]        = {88,89,90,91,  92,93,94,95,  96,97,98,99,    100,101,102,103,104,105,    112,113,114,115,  116,117,118,119,  120,121,122,123,  124,125,126,127,128,129};
//                          K     W     A     R     T     O     V     E     R
int fifteenMinutes[]    = {140,141,142,143,  144,145,146,147,    148,149,150,151,    152,153,154,155,    156,157,158,159,160,161,  168,169,170,171,  172,173,174,175,    176,177,178,179,    180,181,182,183,184,};
//                          T     I     E     N     V     O     O     R     H     A     L     F
int twentyMinutes[]     = {88,89,90,91,  92,93,94,95,  96,97,98,99,    100,101,102,103,104,105,    57,58,59,60,  61,62,63,64,    65,66,67,68,    69,70,71,72,73,  200,201,202,203,204,    205,206,207,208,    209,210,211,212,    213,214,215,216};
//                          V     I     J     F     V     O     O     R     H     A     L     F
int twentyFiveMinutes[] = {33,34,35,36,  37,38,39,40,    41,42,43,44,45,  46,47,48,49,  57,58,59,60,  61,62,63,64,    65,66,67,68,    69,70,71,72,73,  200,201,202,203,204,    205,206,207,208,    209,210,211,212,    213,214,215,216};
//                          H     A     L     F
int thirtyMinutes[]     = {200,201,202,203,204,    205,206,207,208,    209,210,211,212,    213,214,215,216};
//                          V     I     J     F     N     A     H     A     L     F
int thirtyFiveMinutes[] = {33,34,35,36,  37,38,39,40,    41,42,43,44,45,  46,47,48,49,  83,84,85,86,    87,88,89,90,91,  200,201,202,203,204,    205,206,207,208,    209,210,211,212,    213,214,215,216};
//                          T     I     E     N     O     V     E     R     H     A     L     F
int fortyMinutes[]      = {88,89,90,91,  92,93,94,95,  96,97,98,99,    100,101,102,103,104,105,    112,113,114,115,  116,117,118,119,  120,121,122,123,  124,125,126,127,128,129,  200,201,202,203,204,    205,206,207,208,    209,210,211,212,    213,214,215,216};
//                          K     W     A     R     T     V     O     O     R
int fortyFiveMinutes[]  = {140,141,142,143,  144,145,146,147,    148,149,150,151,    152,153,154,155,    156,157,158,159,160,161,  224,225,226,227,  228,229,230,231,    232,233,234,235,    236,237,238,239,240};
//                          T     I     E     N     V     O     O     R
int fiftyMinutes[]      = {88,89,90,91,  92,93,94,95,  96,97,98,99,    100,101,102,103,104,105,  224,225,226,227,  228,229,230,231,    232,233,234,235,    236,237,238,239,240};
//                          V     I     J     F     O     V     R
int fiftyFiveMinutes[]  = {33,34,35,36,  37,38,39,40,    41,42,43,44,45,  46,47,48,49,  224,225,226,227,  228,229,230,231,    232,233,234,235,    236,237,238,239,240};
//                          U     U     R
int sixtyMinutes[]      = {503,504,505,506,507,508,  509,510,511,512,  513,514,515,};
```

```
int one[]       = {2,3,4,5,    6,7,8,9,    10,11,12,13,    20,21,22,23,    24,25,26,27,    256,257,258,259,  260,261,262,263,    264,265,266,267};
//                   H     E     T     I     S     T     W     E     E
int two[]       = {2,3,4,5,    6,7,8,9,    10,11,12,13,    20,21,22,23,    24,25,26,27,    312,313,314,315,  316,317,318,319,    320,321,322,323,    324,325,326,327,328};
//                   H     E     T     I     S     D     R     I     E
int three[]     = {2,3,4,5,    6,7,8,9,    10,11,12,13,    20,21,22,23,    24,25,26,27,    280,281,282,283,  284,285,286,287,    288,289,290,291,    292,293,294,295,296,297};
//                   H     E     T     I     S     V     I     E     R
int four[]      = {2,3,4,5,    6,7,8,9,    10,11,12,13,    20,21,22,23,    24,25,26,27,    336,337,338,339,  340,341,342,343,    344,345,346,347,    348,349,350,351,352,353};
//                   H     E     T     I     S     V     I     J     F
int five[]      = {2,3,4,5,    6,7,8,9,    10,11,12,13,    20,21,22,23,    24,25,26,27,    355,356,357,358,  359,360,361,362,    363,364,365,366,    367,368,369,370};
//                   H     E     T     I     S     Z     E     S
int six[]       = {2,3,4,5,    6,7,8,9,    10,11,12,13,    20,21,22,23,    24,25,26,27,    372,373,374,375,  376,377,378,379,    380,381,382,383,384};
//                   H     E     T     I     S     Z     E     V     E     N
int seven[]     = {2,3,4,5,    6,7,8,9,    10,11,12,13,    20,21,22,23,    24,25,26,27,    418,419,420,  421,422,423,424,    425,426,427,428,    429,430,431,432,    433,434,435,436,437,438,439};
//                   H     E     T     I     S     A     C     H     T
int eight[]     = {2,3,4,5,    6,7,8,9,    10,11,12,13,    20,21,22,23,    24,25,26,27,    447,448,449,  450,451,452,453,    454,455,456,457,    458,459,460,461,462,463,464};
//                   H     E     T     I     S     N     E     G     E     N
int nine[]      = {2,3,4,5,    6,7,8,9,    10,11,12,13,    20,21,22,23,    24,25,26,27,    391,392,393,  394,395,396,397,    398,399,400,401,    402,403,404,405,    406,407,408,409,410,411,412};
//                   H     E     T     I     S     T     I     E     N
int ten[]       = {2,3,4,5,    6,7,8,9,    10,11,12,13,    20,21,22,23,    24,25,26,27,    466,467,468,  469,470,471,472,    473,474,475,476,    477,478,479,480,481,482};
//                   H     E     T     I     S     E     L     F
int eleven[]    = {2,3,4,5,    6,7,8,9,    10,11,12,13,    20,21,22,23,    24,25,26,27,    483,484,485,486,  487,488,489,490,    491,492,493,494,    495,496};
//                   H     E     T     I     S     T     W     A     A     L     F
int twelve[]    = {2,3,4,5,    6,7,8,9,    10,11,12,13,    20,21,22,23,    24,25,26,27,    526,527,528,529,530,531,  532,533,534,535,    536,537,538,539,    540,541,542,543,    544,545,546,547,    548,549,550,551};
```

Test 4: Light dissipation to neighboring grids

We hebben nu overal tussen de woorden een schijding staan. En zoals je ziet hebben we geen last van overlopend licht naar andere letters….

De acryl plaat doet ook goed zijn werk met het licht te dissiperen. Over de hele letter… In het echt zie je de ledstrip(individuele leds emmitie) wel nog meer maar van op een afstand word dit wel weer dan beter

Conclusion:

Het systeem werkt heel goed er is geen licht overschrijding en de defusie werkt ook redelijk goed.

Test 5: Hitte test

Omdat de ledstrip waar maximum 42W door gaat komen door onze tests en deze in een houten doos komt te staan hebben we een test gedaan waar we de klok voor 4 uur aan lieten…

De woorden: “het” & “is” zijn de enige die altijd aanstaan…
We hebben hier is gevoeld en het was niet koud maar ook zeker niet te warm op de ledstrip zelf.

Conclusion:

De LetterClock zal niet oververhitten.

Checklist

of all the tests we still need to do…

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