

ver. B2

LED



1. LED

1-1.

LED

LED

1-1-1.

- LED (200 ns)
- /
-
- (dual mode)

1-1-2.

LED

가

- 2 W LED
- , 가 DC 가

1-1-3.

- PC USB , 2
- LED 가 , 10V 2 mV

1-1-4.

tm ing

trigger

1-1-5. Busrt Mode

()

(1 Mega counter) /

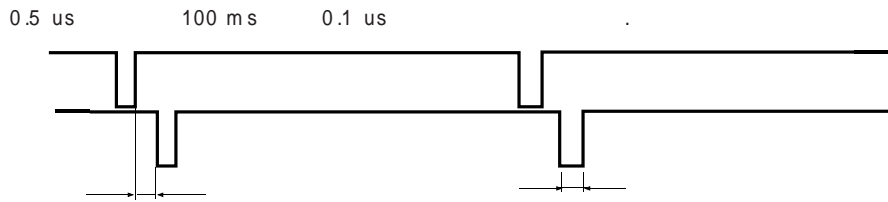
1-2.

1-2-1.

: 12V
: (LED) + () , 140 mA
) LED 500 mA , 1.2 A

1-2-2.

- : 2
- : 0 ~ 10 V , 0.0024 V , ±0.1V
- : 800 mA 가
- : 0.2 us 102.4 us 0.1 us
가 (, 101 us, 10 kHz) DC 가
- :



1-2-3.

- / 가
- TTL

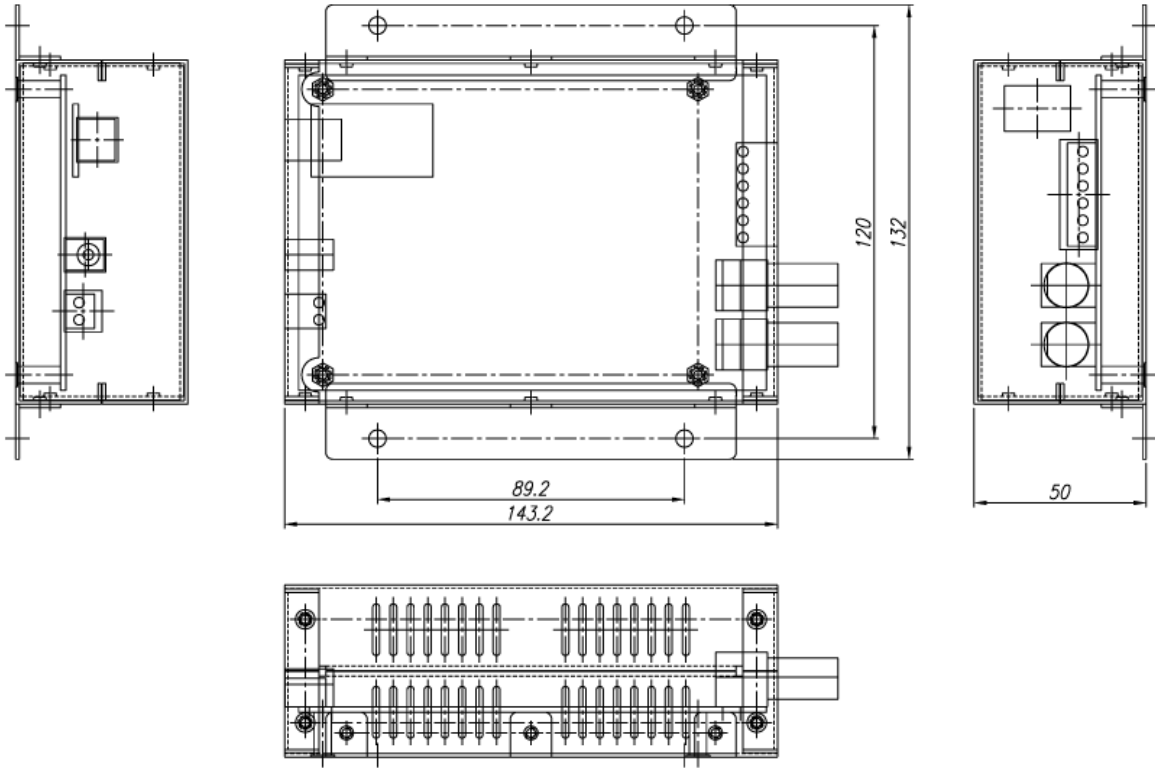
1-2-4.

-
- Hz , . 0.1 us 0.2 us 100 ms
- 10 Hz ~ 1000 kHz 가

1-2-5.

- / (burst)
- 20 , 1 Mega count 가

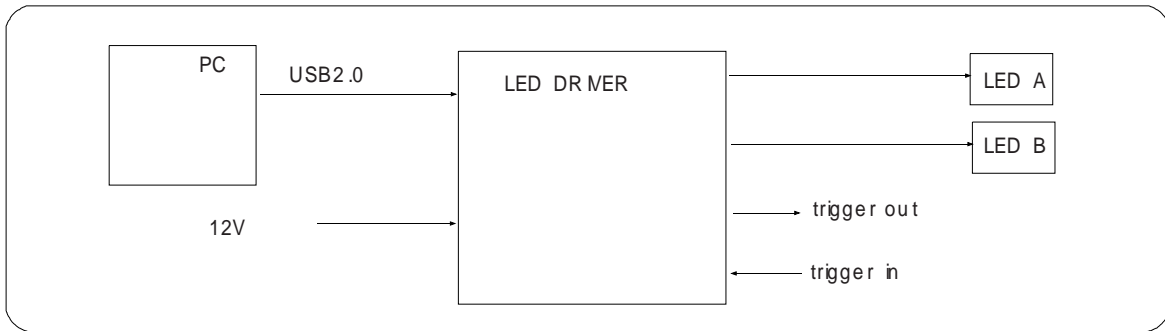
1-3.



2.

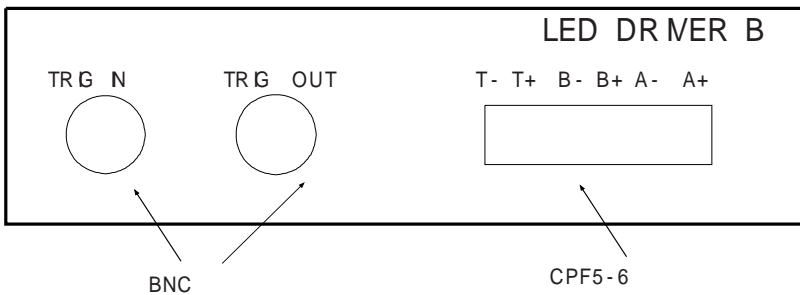
2-1.

PC USB 2.0 (2.0), LED



1.

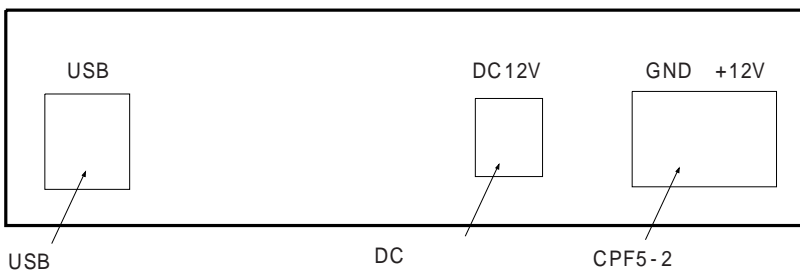
2-2. LED



2.

TRG_N : TTL , T- /T+ , BNC TRG_N T- /T+
 T+ , T-
 TRG_OUT: 가 TTL TRG_N TRG_N
 가 가
 A+, A-, B+, B- : A, B , (+) LED ANODE , (-) CATHODE
 A+, B+ , A- B- turn off fbating , turn on 0 V 가

2-3. LED



3.

USB : USB-A USB 2.0
 DC 12V : 5mm

* : = STELVVD , = CPF5

3.

Borland C++ : leddriver.exe 가 (Visual C++)
LEDDL.DLL, LEDDLL.H, LEDDLL.LB
Visual C++ : VisualC . LB
LabView : LabView DLL
Visual Basic : VisualBasic , DLL calling convention standard call ,
Borland ,
USB

3-1.

DLL , Borland C++ Builder, Visual C++, LabView , Visual Basic (.net)
LEDDL.H
#ifndef LEDDLLH
#define LEDDLLH

extern "C" {
int __declspec(dllimport) LEDSelectDevice(int device); // device = 0 ~ 9
int __declspec(dllimport) LEDInit(int id); // id = 0 , default
void __declspec(dllimport) LEDsetBrightness(int channel,double volt); // ch=0~1, value=0~10.0
void __declspec(dllimport) LEDsetLEDDelay(int channel,double us); // ch=0~1, 0~ period of trigger frequency
void __declspec(dllimport) LEDsetLEDWidth(int channel,double us); // 0~102.4 us
void __declspec(dllimport) LEDsetTriggerFrequency(double Hz); // 9.5 Hz ~ 1000 kHz
void __declspec(dllimport) LEDsetTriggerWidth(double us); // 0~102.4 us
void __declspec(dllimport) LEDenableTrigger(int onoff); // tum on /off : 1=on, 0=off
void __declspec(dllimport) LEDsetTrigger(int external,int posedge); // external: 0=default internal, 1=external, posedge: 0=pos, 1=neg
void __declspec(dllimport) LEDsetDropCount(int count); // 20 bits counter : 1 Mega count, if count = 0 , then infinite.
int __declspec(dllimport) LEDDropCompleted(void); // 0: burst counter is running, 1: finish counting.
void __declspec(dllimport) LEDsetMode(int channel,int mode); // ch = 0~1, mode: 0=single (default), 1=double
int __declspec(dllimport) LEDwriteD(int id); // D = 1 ~ 127
int __declspec(dllimport) LEDreadD(void);
int __declspec(dllimport) LEDloadFirmware(char *filepath);
void __declspec(dllimport) LEDsetTrigger(int option); // option = 0 : trigger signal, 1 : sync signal of port A
void LEDsetInterval(int interval); // 1 ~ 255 1 = continuous
}

#endif

3-2.

3-2-1. int LEDSelectDevice(int device); // device = 0 ~ 9

LED 2 가 , PC 1 LED
10

3-2-2. int LEDinit(int id); // id = 0 , default

LED 가
1 ,
id PC LED 가 1 , 0
LED 가 D LED read D , LEDwrite D

3-2-3. void LEDsetBrightness(int channel,double volt); // ch=0~1, value=0~10.0

channel 0 = A , channel 1 = B
, volt 0 ~ 10.0 , 0.0024 (10 V/ 4096)
LEDinit 0
LEDinit

3-2-4. void LEDsetLEDDelay(int channel,double us); // ch=0~1, 0~ period of trigger frequency

delay
channel 가 , 0 = A , 1 = B
micro second 0.5 us ~ 100 ms. 0.1 us.
0.5 us 0.5 us
, delay
LEDinit 0.0 us (0.5 us)

3-2-5. void LEDsetLEDWidth(int channel,double us); // 0~102.4 us

, 0.2 us ~ 102.4 us 0.1 us
LEDinit 1.0 us

3-2-6. void LEDsetTriggerFrequency(double Hz); // 9.5 Hz ~ 1000 kHz

, 9.5 Hz 1,000,000 Hz 가
0.1 us
500 kHz LEDsetTriggerWidth 1 us
LEDinit 1000 Hz

3-2-7. void LEDsetTriggerWidth(double us); // 0~102.4 us

TRIG_OUT , LEDinit 1.0 us

3-2-8. void LEDenableTrigger(int onoff); // turn on /off : 1=on, 0=off

on/off

3-2-9. void LEDsetTrigger(int external,int posedge); // external: 0=default internal, 1=external, posedge: 0=pos, 1=neg

external : 1 , 0
posedge : 1 , positive edge . 0 negative edge
LEDinit external=1, posedge = 1

3-2-10. void LEDsetDropCount(int count); // 20 bits counter : 1 Mega count, if count = 0 , then infinite.
 Burst 가
 20 bit 1M 가 가 / 가
 LEDenableTrigger (1)
 count = 0 , Burst 가 disable
 0 count Burst 가 enable

3-2-11. int LEDdropCompleted(void); // 0: burst counter is running, 1: finish counting.
 Burst
 LEDdropCompleted
 Burst 1 , Burst 0

3-2-12. void LEDsetMode(int channel,int mode); // ch = 0~1, mode: 0=single (default), 1=double
 channel 0, 1 single mode (0), dualmode (1)
 1) channel A single mode
 2) channel B single mode
 3) channel A dualmode
 4) channel B dualmode
 4. mode
 channel A, B single mode , 4 1), 2)
 channel A dualmode , A 3) B 2)
 dualmode , 3), 4)

3-2-13. int LEDwriteD(int id); // D = 1 ~ 12 , int LEDreadD(void);
 D LED , 가 가

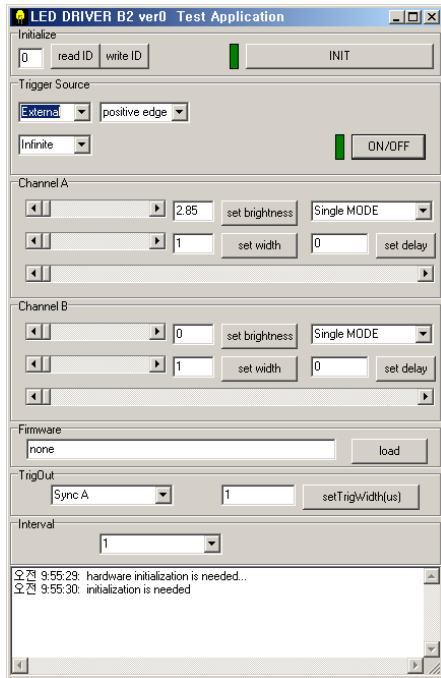
3-2-14. int LEDloadFirmware(char *filepath);
 firmware

3-2-15. LEDsetTriggerAlter(int option); // option = 0 : trigger signal, 1 : sync signal of port A
 0 trigger 가 trig_out . option=1 , channel A
 trig_out . sync

3-2-16. void LEDsetInterval(int interval); // 1 ~ 255 1 = continuous
 trigger N 가 10 kHz , interval 10
 LED 1kHz

3-3.

5 Borland C++ Builder 6



5.

Initialize

- INIT
- read ID, write ID (LED 가 (LED .))

Trigger Source

- External/Internal
 - External positive / negative edge
 - Internal frequency Hz (가) , set frequency
- Infinite/Burst
 - Infinite , ON/OFF ON/OFF
 - Burst , Burst Count , setBurstCount
 - ON/OFF , Burst Count trigger 가 OFF
 - (OFF . ON/OFF update
 - LEDDropCompleted Burst .)
- ON/OFF
 - ON/OFF
 - Burst Mode OFF

Channel A/B

- setBrightness
 - EdiBox , 가 가
 - volt
- setWidth
- setDelay
 - trigger

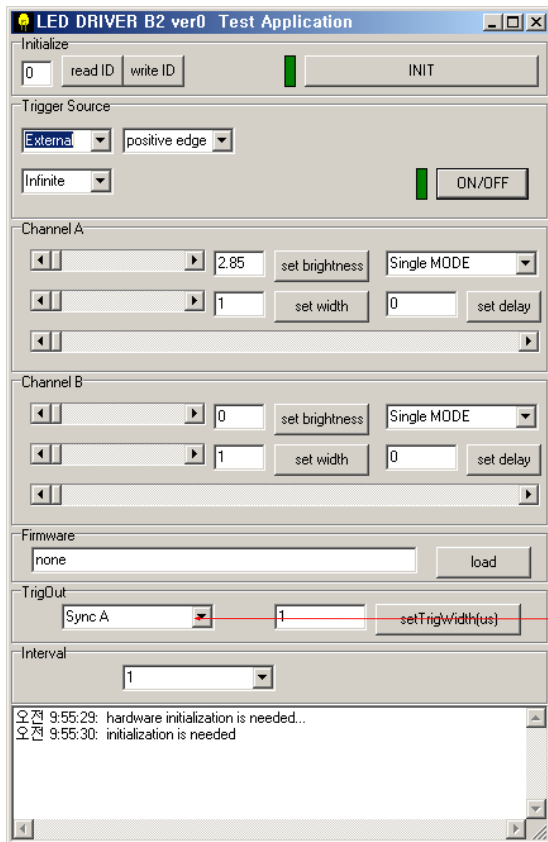
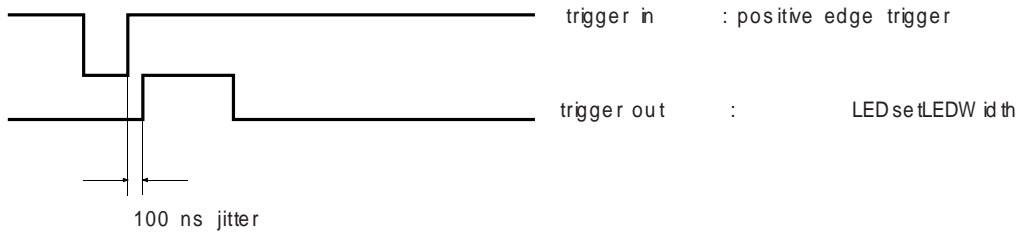
Firmware

- firmware

3-4. sync 가

```

trigger out      trigger      A port
void LEDsetTrigAlter(int option);// option = 0 : trigger signal, 1 : sync signal of port A
    가      , option = 0      trigger      가      ,
option = 1      , port A
    positive pulse
    
```



3-5. LED D

PC LED

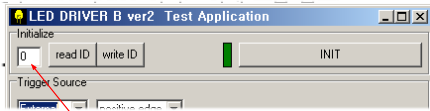
3-5-1. PC, LED, application

가) LED A, B

) A

) LED in it(0)

, D 0 NIT



D

) LEDw rite D

D D 1 ~ 127
D 1, w rite D (A D=1 .)

) A, B

) LED in it(0)

, D 0 NIT

) LEDw rite D

D D 1 ~ 127
D 2, w rite D (B D=2 .)

)

)

```
LEDSelecDevice(0);
LEDinit(1); // 0 D=1 (A 0 .)
LEDSelecDevice(1);
LEDinit(2); // 1 D=2 (B 1 .)
...
// A
LEDSelecDevice(0);
LEDsetTriggerWidth(1.2);
LEDenableTrigger(1);
...
// B
LEDSelecDevice(1);
LEDenableTrigger(1); // B
...
```

3-5-2. PC, LED, application

LEDSelecDevice 가

3-5-1 (가) ~ ()

)

Application P A . Application Q B

Application P:

```
LEDinit(1);
LEDenableTrigger(1);
...
```

Application Q:

```
LEDinit(2);
LEDenableTrigger(1); ...
```

4. Support

- :
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 -
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