# Xilinx
# Zynq FPGA
# TI DSP MCU 기반의
# 프로그래밍 및 회로 설계 전문가


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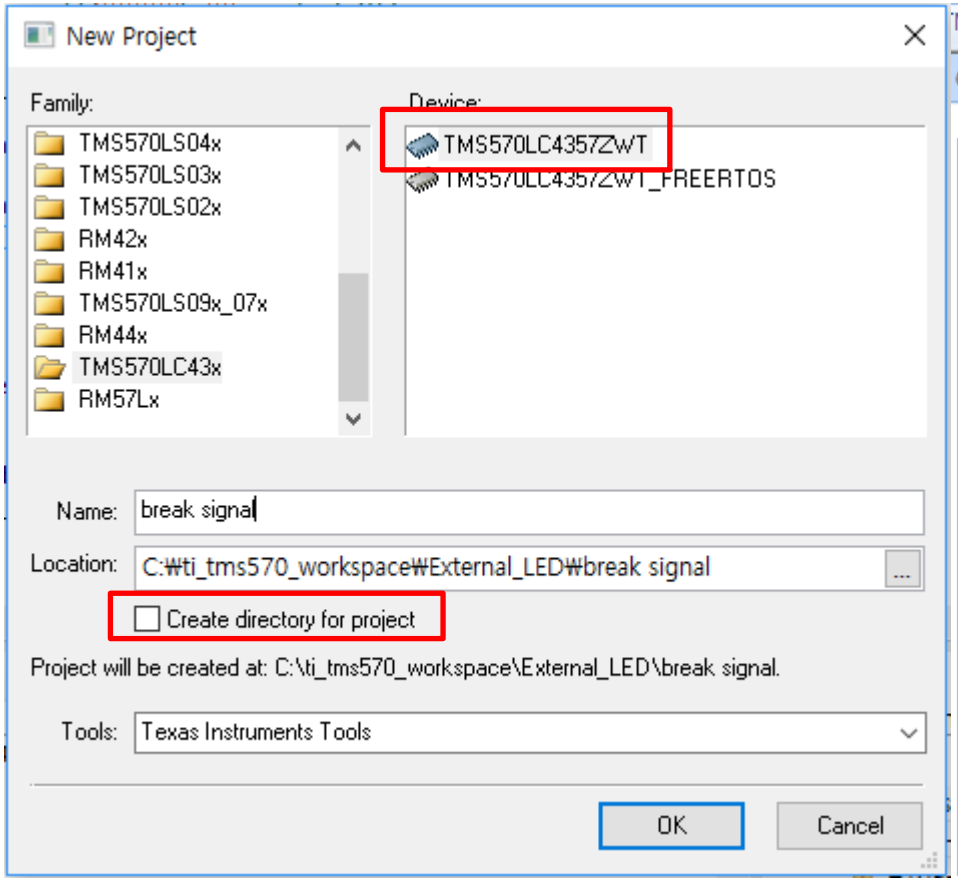
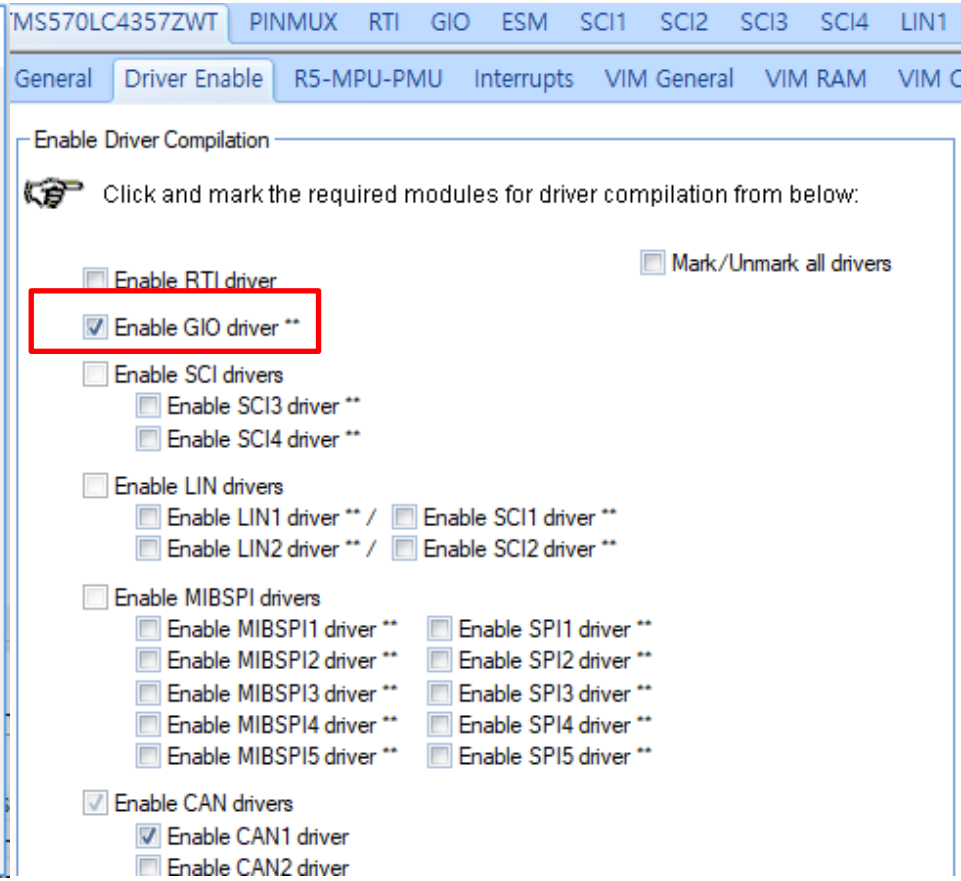
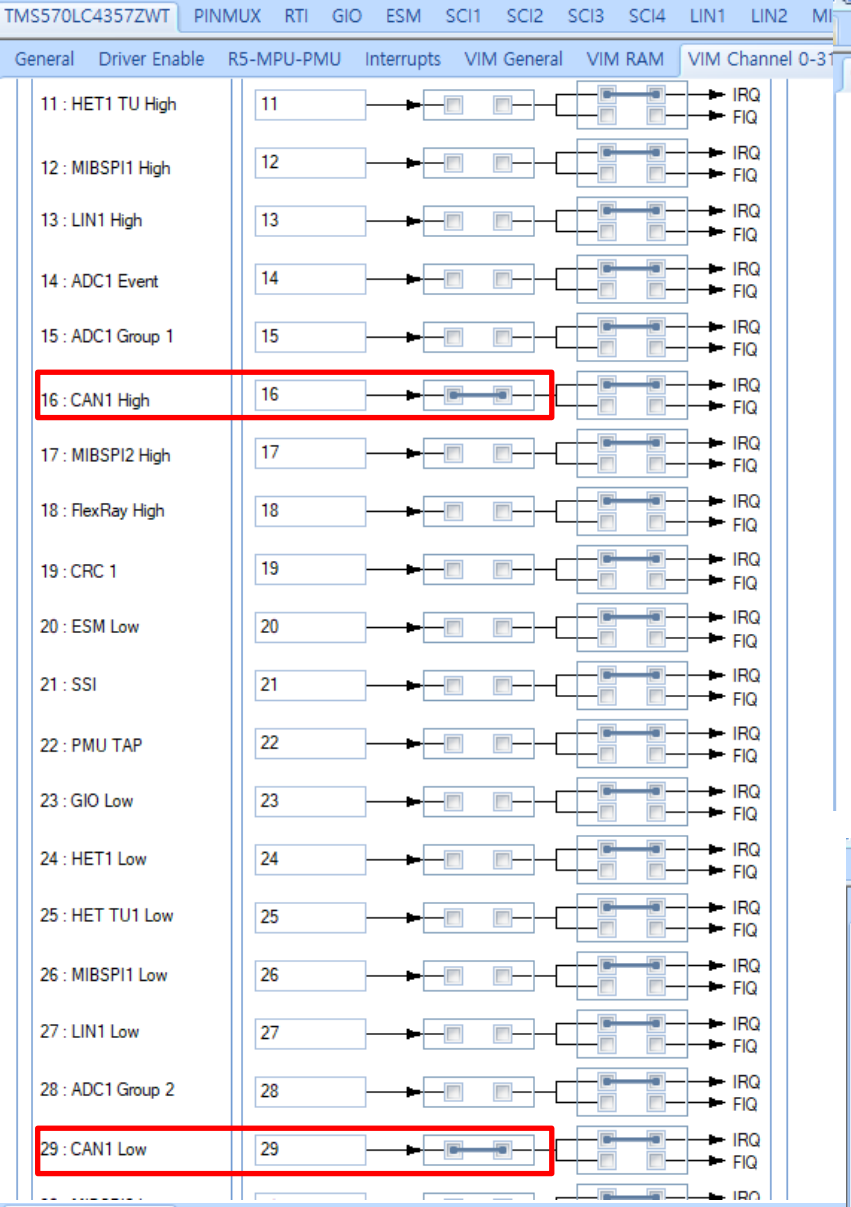
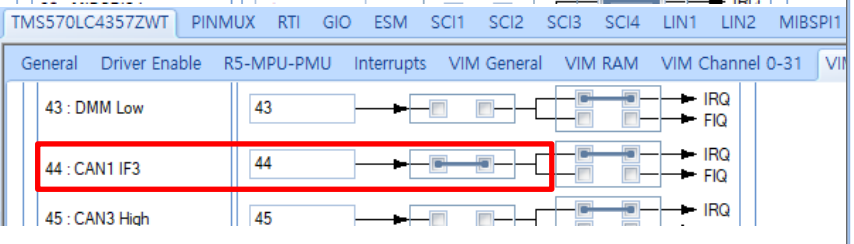
**학생 김민호**
**minking12@naver.com**

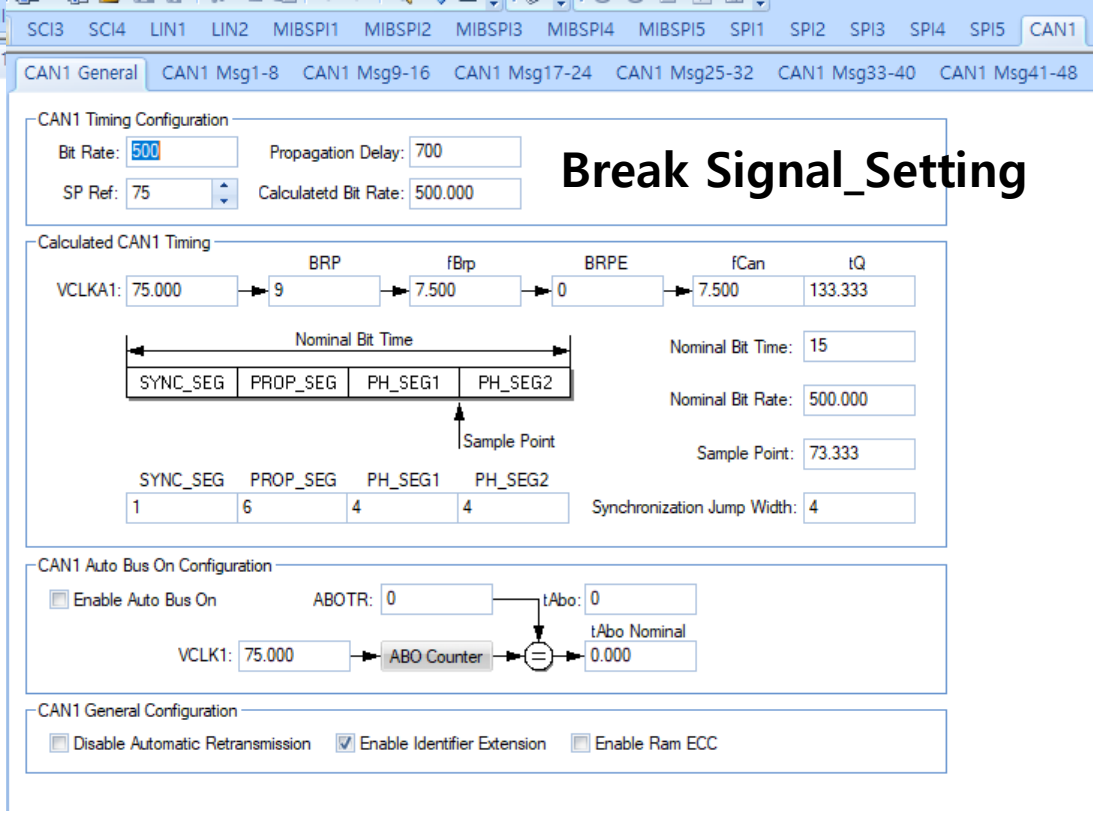

# Break Signal_Setting

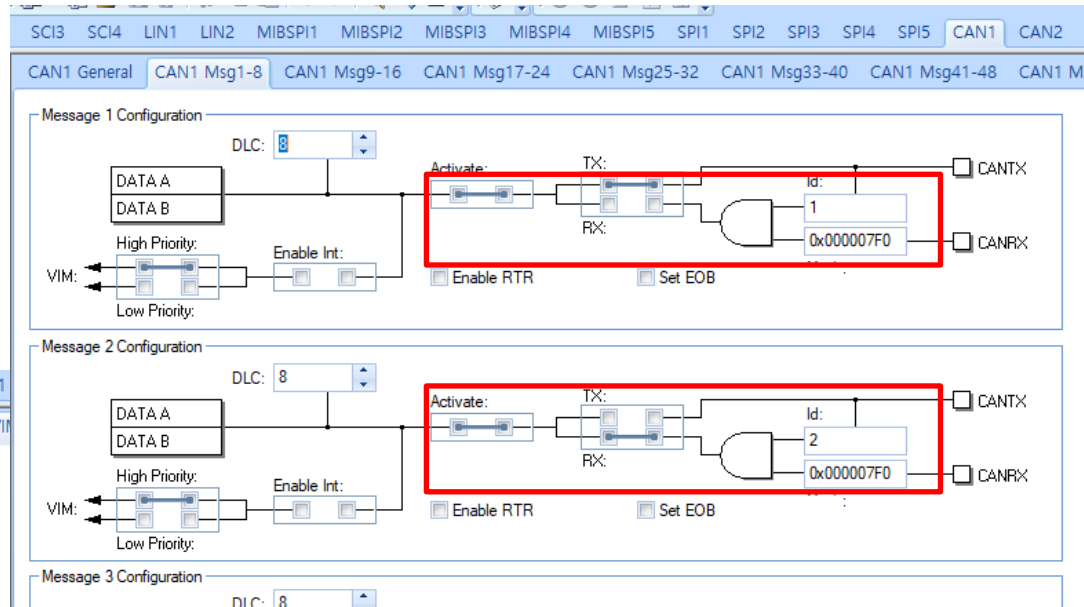



TMS570LC4357ZWT
PINMUX
RTI
GIO
ESM
SCI1
SCI2
SCI3
SCI4
LIN1
LIN2
General
Driver Enable
R5-MPU-PMU
Interrupts
VIM General
VIM RAM
VIM Channel 0-31
11 : HET1 TU High
12 : MIBSPI1 High
13 : LIN1 High
14 : ADC1 Event
15 : ADC1 Group 1
16 : CAN1 High
17 : MIBSPI2 High
18 : FlexRay High
19 : CRC 1
20 : ESM Low
21 : SSI
22 : PMU TAP
23 : GIO Low
24 : HET1 Low
25 : HET TU1 Low
26 : MIBSPI1 Low
27 : LIN1 Low
28 : ADC1 Group 2
29 : CAN1 Low
IRQ
FIQ


TMS570LC4357ZWT
PINMUX
RTI
GIO
ESM
SCI1
SCI2
SCI3
SCI4
LIN1
LIN2
MIBSPI1
General
Driver Enable
R5-MPU-PMU
Interrupts
VIM General
VIM RAM
VIM Channel 0-31
43 : DMM Low
44 : CAN1 IF3
45 : CAN3 High
IRQ
FIQ


SCI3
SCI4
LIN1
LIN2
MIBSPI1
MIBSPI2
MIBSPI3
MIBSPI4
MIBSPI5
SPI1
SPI2
SPI3
SPI4
SPI5
CAN1
CAN1 General
CAN1 Msg1-8
CAN1 Msg9-16
CAN1 Msg17-24
CAN1 Msg25-32
CAN1 Msg33-40
CAN1 Msg41-48
CAN1 Timing Configuration
Bit Rate: 500
Propagation Delay: 700
SP Ref: 75
Calculatetd Bit Rate: 500.000
Break Signal_Setting
Calculated CAN1 Timing
BRP
fBrp
BRPE
fCan
tQ
VCLKA1: 75.000
9
7.500
0
7.500
133.333
Nominal Bit Time
SYNC_SEG
PROP_SEG
PH_SEG1
PH_SEG2
Sample Point
Nominal Bit Time: 15
Nominal Bit Rate: 500.000
Sample Point: 73.333
1
6
4
4
Synchronization Jump Width: 4
CAN1 Auto Bus On Configuration
Enable Auto Bus On
ABOTR: 0
tAbo: 0
VCLK1: 75.000
ABO Counter
tAbo Nominal
0.000
CAN1 General Configuration
Disable Automatic Retransmission
Enable Identifier Extension
Enable Ram ECC


SCI3
SCI4
LIN1
LIN2
MIBSPI1
MIBSPI2
MIBSPI3
MIBSPI4
MIBSPI5
SPI1
SPI2
SPI3
SPI4
SPI5
CAN1
CAN2
CAN1 General
CAN1 Msg1-8
CAN1 Msg9-16
CAN1 Msg17-24
CAN1 Msg25-32
CAN1 Msg33-40
CAN1 Msg41-48
Message 1 Configuration
DLC: 8
DATA A
DATA B
Activate:
TX:
RX:
Id:
1
0x000007F0
CANTX
CANRX
High Priority:
Low Priority:
VIM:
Enable Int:
Enable RTR
Set EOB
Message 2 Configuration
DLC: 8
DATA A
DATA B
Activate:
TX:
RX:
Id:
2
0x000007F0
CANTX
CANRX
High Priority:
Low Priority:
VIM:
Enable Int:
Enable RTR
Set EOB
Message 3 Configuration

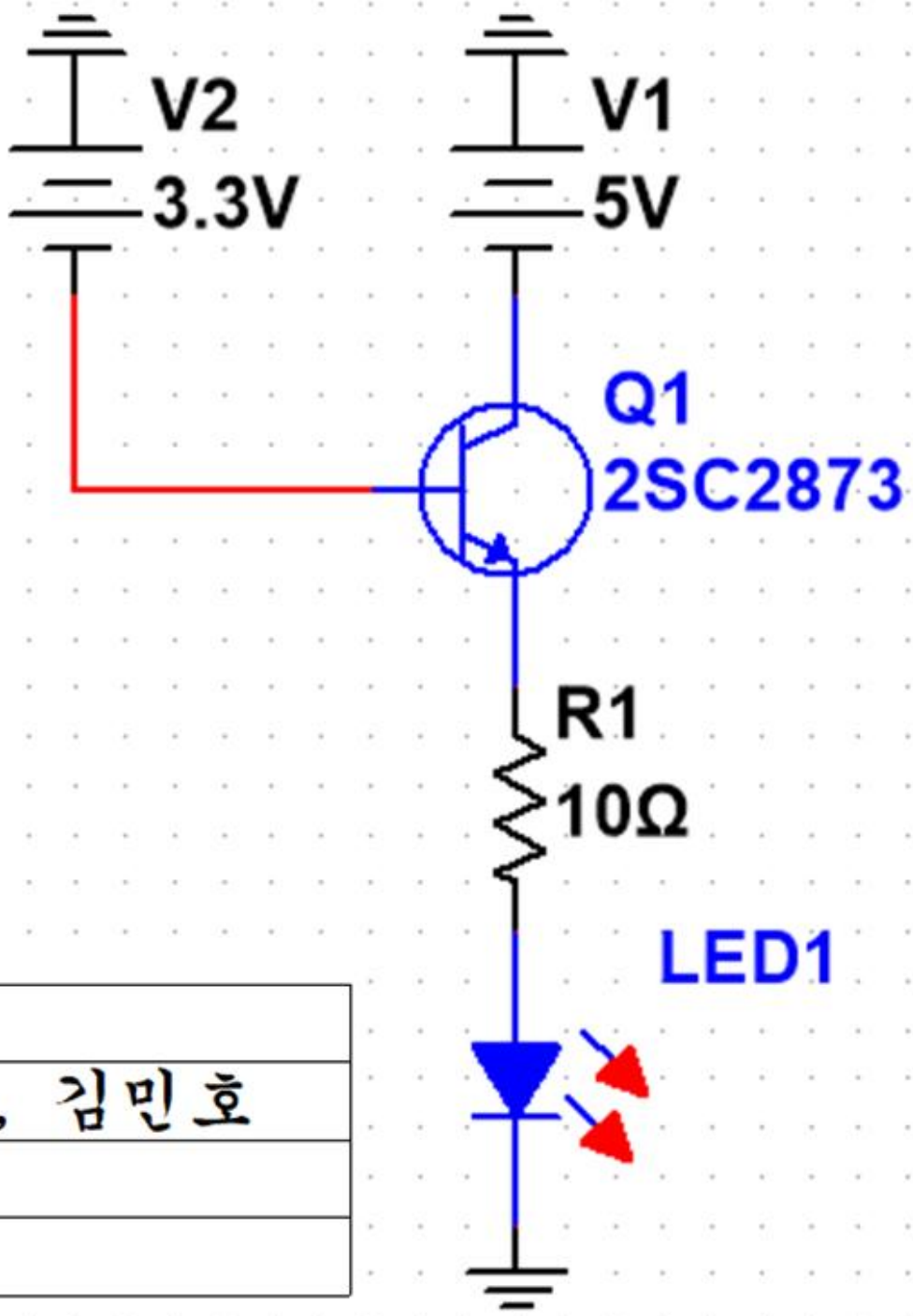
```c
#include <HL_can.h>
#include <HL_gio.h>
#include <HL_reg_can.h>
#include <HL_reg_gio.h>
#include <stdio.h>
#include <math.h>

int a, d, e, f, g, ex_data, cur_data;
char data_flag = 0;
char tr[5] = { 0, };
char re[5] = { 0, };

void delay(int time)
{
    int i;
    for (i = 0; i < time; i++)
        ;
}
int main()
  {
    gioInit();
    canInit();
    while (1)
    {
        delay(1000000);
        for (a = 0; a < 5; a++)
        {
            canTransmit(canREG1, canMESSAGE_BOX1, &tr[a]);
        }
        delay(10000000);
        if (canIsRxMessageArrived(canREG1, canMESSAGE_BOX2))
        {
            for (a = 0; a < 5; a++)
            {
                canGetData(canREG1, canMESSAGE_BOX2, &re[a]);
            }
            if (data_flag == 0)
            {
                for (a = 1; a < 5; a++)
                {
                    d = d + (re[a]) * pow(10, 4 - a);
                }
                ex_data = d;
                d = 0;
                printf("ex_data = %d₩n", ex_data);
                data_flag = 1;
            }
            else
            {
                if (!ex_data == 0)
                {
                    for (e = 1; e < 5; e++)
                    {
                        g = g + (re[e]) * pow(10, 4 - e);
                        //printf("rx =%d₩n", g);
                    }
                }
                cur_data = g;
                g = 0;
                printf("cur_data = %d₩n", cur_data);
                f = ex_data - cur_data;
                printf("f = %d₩n", f);
                if (f < 0)
                {
                    printf("bigger than ex_data₩n");
                    gioSetBit(gioPORTB, 0, 1);
                }
                else if(f > 0)
                    gioSetBit(gioPORTB, 0, 0);
                f = 0;
                ex_data = cur_data;
                cur_data = 0;
            }
        }
    }
}
```

## Break Signal_Setting


CAN




| Break Signal_CAN |
| --- |
| Designer : 황수정, 김민호 |
| 2018.08.29 |
| Project AI CAR |

USB2CAN UI

NTREX ㈜엔티렉스

# USB2CAN UI

Version 1.10 (2016. 9. 20)

UI Config.

USB(VCP) Devices

NTREX USB2CAN(FIFO) [NT2CPBK3]

Search

Connect

Disconnect

CAN Configuration

Bitrate: 500K bps

Filter Identification: 1 (Hexa)

Filter Mask: 7F0 (Hexa)

Set

CAN Messages

| Time | ID(Hex) | Flags | Data(Hex) |
|---|---|---|---|
| 46974.066381 | 1 | Ext | 00 00 00 00 00 01 00 00 (8) |
| 46972.349737 | 2 | Self Ext | 01 01 02 00 00 (5) |
| 46972.043712 | 1 | Ext | 00 00 00 00 00 01 00 00 (8) |
| 46971.640877 | 1 | Ext | 00 00 00 00 00 01 00 00 (8) |
| 46968.701762 | 1 | Ext | 00 00 00 00 00 01 00 00 (8) |
| 46968.685901 | 1 | Self Ext | 01 01 04 00 00 (5) |
| 46968.296912 | 1 | Ext | 00 00 00 00 00 01 00 00 (8) |
| 46967.894162 | 1 | Ext | 00 00 00 00 00 01 00 00 (8) |
| 46967.491404 | 1 | Ext | 00 00 00 00 00 01 00 00 (8) |
| 46967.087661 | 1 | Ext | 00 00 00 00 00 01 00 00 (8) |
| 46966.684959 | 1 | Ext | 00 00 00 00 00 01 00 00 (8) |
| 46966.281229 | 1 | Ext | 00 00 00 00 00 01 00 00 (8) |
| 46964.190206 | 1 | Self Ext | 01 01 03 04 05 (5) |
| 46964.077795 | 1 | Ext | 00 00 00 00 00 01 00 00 (8) |
| 46963.674929 | 1 | Ext | 00 00 00 00 00 01 00 00 (8) |
| 46963.271123 | 1 | Ext | 00 00 00 00 00 01 00 00 (8) |
| 46962.868434 | 1 | Ext | 00 00 00 00 00 01 00 00 (8) |

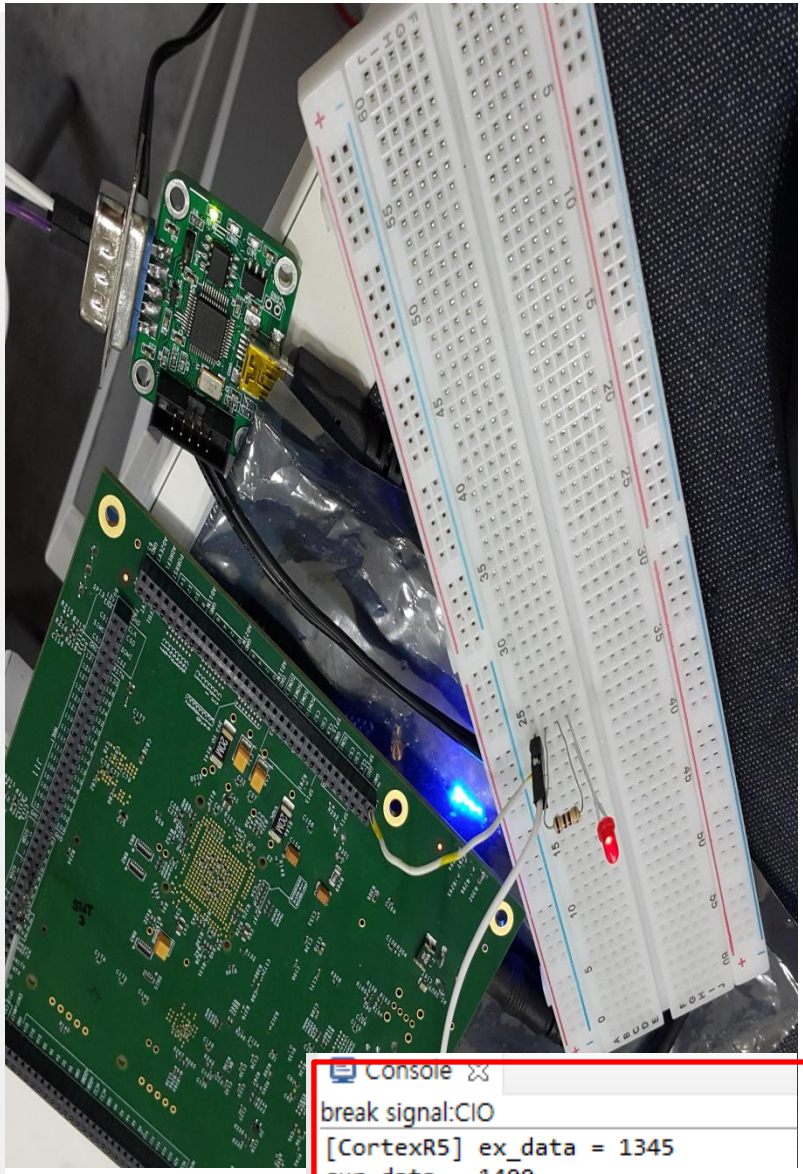
Receive CAN Message

Clear

Transmit Message

| | | | | | | |
|---|---|---|---|---|---|---|
| ID(Hexa) | 1 | Ext | RTR | Data(Hexa) | 11345 | Send |
| ID(Hexa) | 1 | Ext | RTR | Data(Hexa) | 11400 | Send |
| ID(Hexa) | 2 | Ext | RTR | Data(Hexa) | 11200 | Send |

오후 2:11



Console

```
break signal:CIO
[CortexR5] ex_data = 1345
cur_data = 1400
f = -55
bigger than ex_data
cur_data = 1200
f = 200
cur_data = 1400
f = -200
```