

Digital 2 channel Capture board Version 3.0

(Multi card & Multi-application version :

DLL Version 3.05 .

Driver Version 3.02 .

Chip Version 3.02 .)

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2 468-2, 2

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1.

ENVY-ID2V3

PCI BUS

Differential Cable

LVDS

RS422

Version 1.0

Version 3.0

API

, ,

,API

가

가

가

가

2.

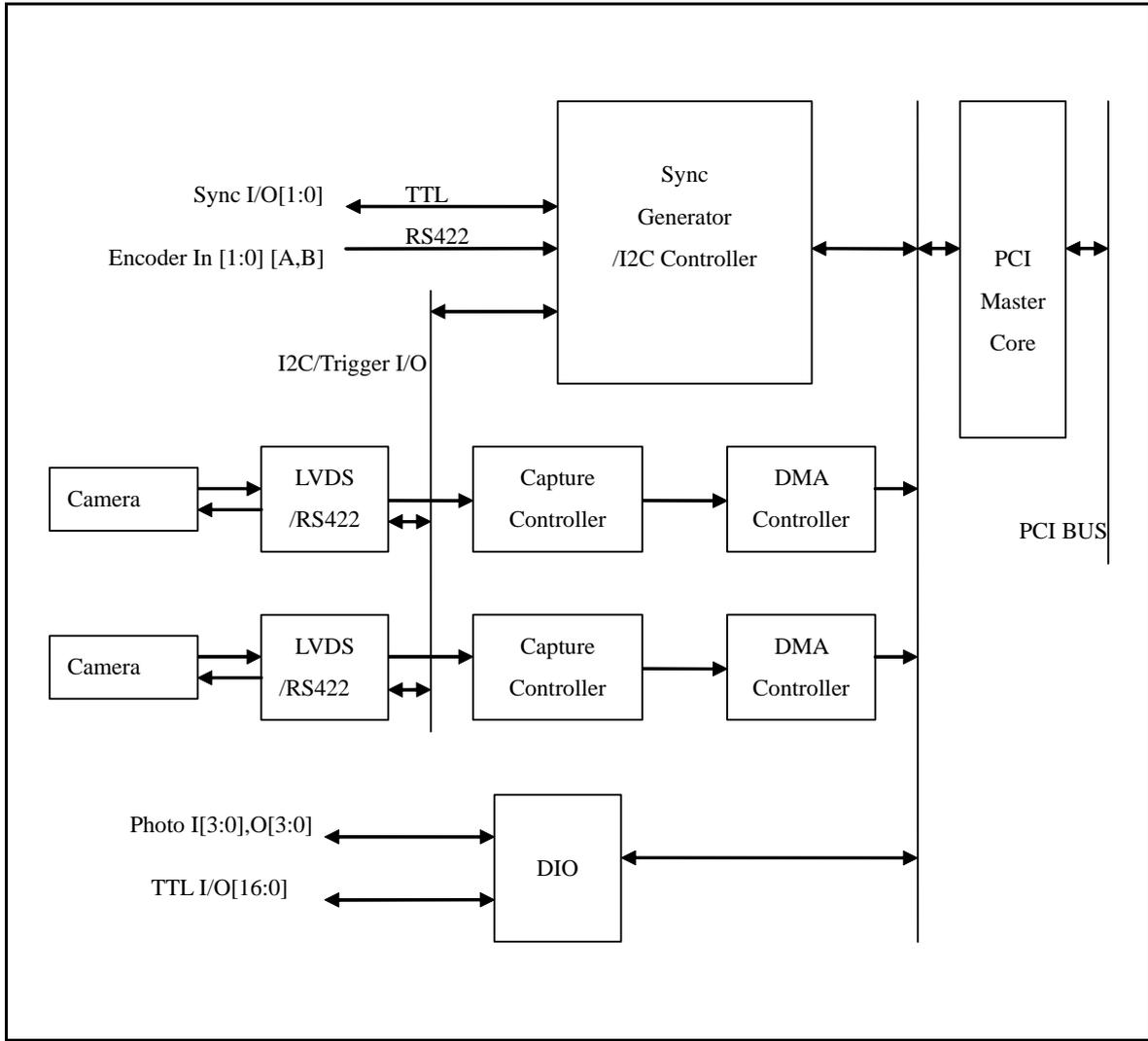
2D .
LVDS(RS-644) RS-422 ().
65MHz(LVDS) (RS-422) 20MHz).
(4 /) TTL(17bit I/O) DIO .
가 .
() () .
Offset, High-pass, Band-pass, Low-pass .
Lookup table , 1, 2, 4,8,16 가 .
2 channel DMA controller 32bit/33Mhz PCI BUS CPU 가 .

3.

3.1.



3.2.



<ENVY-ID2V3 >

3.3. Camera :

가 . 가
 . LVDS, RS-422 type Line Scan camera Area camera
 . Color CMOS/CCD sensor module mobile 가
 가 LVDS

3.4. LVDS/RS422 :

LVDS 65MHz 가 LVDS type RS-422 type
 가 RS-422 20Mhz

3.5. Capture Controller :

Bit ->

Offset->Filter->Lookup Table->Data Selector

3.6. DMA Controller :

CPU

가 가

3.7. Sync Generator/I2C controller :

Sync

Encoder

I2C_MODE

I2C

3.8. DIO :

Photo-Coupler

TTL

3.9. PCI Master Core :

Local BUS

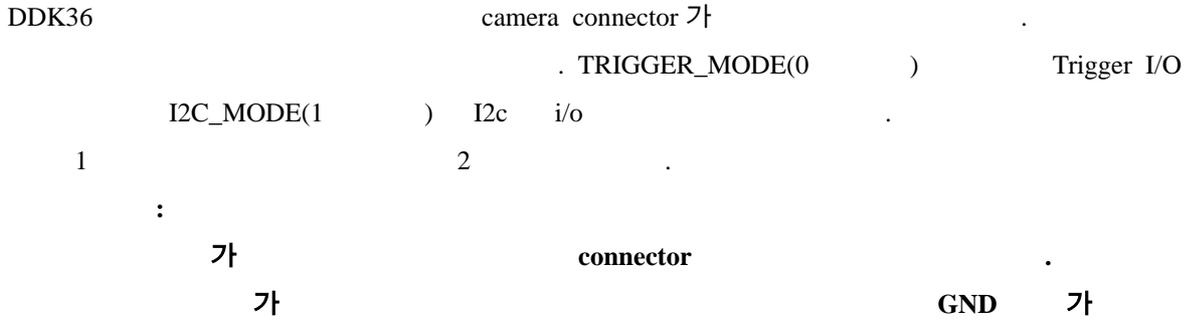
PCI BUS

가

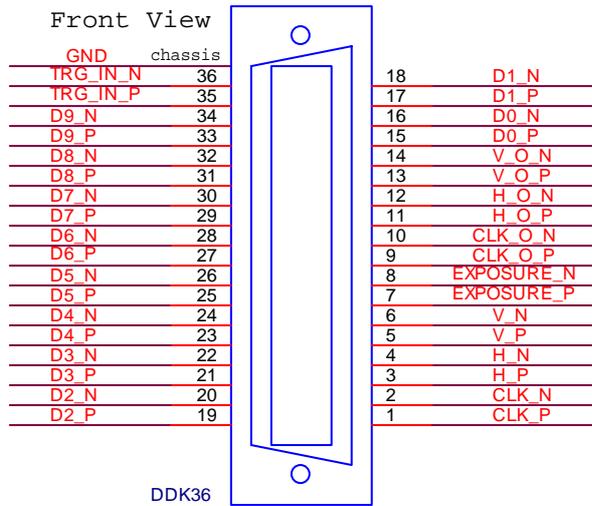
Host PCI BUS

4. I/O connector

4.1. Camera Connector



4.1.1. Bracket



4.1.2.

Pin Name	Pin Number	In/Out (Board side)	TRIGGER_MODE (Trigger Cable Mode)	I2C_MODE (I2C Cable Mode)
CLK_P	1	In	Clock input Normal	Clock input Normal
CLK_N	2	In	Clock input Inverse	Clock input Inverse
H_P	3	In	Horizontal sync input Normal	Horizontal sync input Normal
H_N	4	In	Horizontal sync input Inverse	Horizontal sync input Inverse
V_P	5	In	Vertical Sync input Normal	Vertical Sync input Normal
V_N	6	In	Vertical sync input Inverse	Vertical sync input Inverse
D0_P	15	In	Data bit 0 Normal	Data bit 0 Normal
D0_N	16	In	Data bit 0 Inverse	Data bit 0 Inverse
D1_P	17	In	Data bit 1 Normal	Data bit 1 Normal
D1_N	18	In	Data bit 1 Inverse	Data bit 1 Inverse
D2_P	19	In	Data bit 2 Normal	Data bit 2 Normal
D2_N	20	In	Data bit 2 Inverse	Data bit 2 Inverse
D3_P	21	In	Data bit 3 Normal	Data bit 3 Normal
D3_N	22	In	Data bit 3 Inverse	Data bit 3 Inverse
D4_P	23	In	Data bit 4 Normal	Data bit 4 Normal
D4_N	24	In	Data bit 4 Inverse	Data bit 4 Inverse
D5_P	25	In	Data bit 5 Normal	Data bit 5 Normal
D5_N	26	In	Data bit 5 Inverse	Data bit 5 Inverse
D6_P	27	In	Data bit 6 Normal	Data bit 6 Normal
D6_N	28	In	Data bit 6 Inverse	Data bit 6 Inverse
D7_P	29	In	Data bit 7 Normal	Data bit 7 Normal
D7_N	30	In	Data bit 7 Inverse	Data bit 7 Inverse
D8_P	31	In	Data bit 8 Normal	Data bit 8 Normal
D8_N	32	In	Data bit 8 Inverse	Data bit 8 Inverse
D9_P	33	In	Data bit 9 Normal	Data bit 9 Normal
D9_N	34	In	Data bit 9 Inverse	Data bit 9 Inverse
CLK_O_P	9	Out	Clock output Normal	Clock output Normal
CLK_O_N	10	Out	Clock output Inverse	Clock output Inverse
H_O_P	11	Out	H_O_P, Horizontal Sync output Normal	SCLK_O_P, I2C Serial Clock Output Normal
H_O_N	12	Out	H_O_N, Horizontal Sync output inverse	SCLK_O_N, I2C Serial Clock Output Inverse
V_O_P	13	Out	V_O_P, Vertical Sync output Normal	RESET_N_P, Camera Reset low active Normal
V_O_N	14	Out	V_O_N, Vertical Sync output inverse	RESET_N_N, Camera Reset low active Inverse
EXPOSURE_P	7	Out	EXPOSURE_P, Exposure output normal	SDA_OE_N_P, I2C data output enable low active normal
EXPOSURE_N	8	Out	EXPOSURE_N, Exposure output inverse	SDA_OE_N_N, I2C data output enable low active inverse
TRG_I_P	35	In	TRG_I_P, Trigger Input Normal	SDA_I_P, I2C data input Normal
TRG_I_N	36	In	TRG_I_N, Trigger Input Inverse	SDA_I_N, I2C data input Inverse
GND	chassis		GND	GND

4.1.2.1.

TRIGGER_MODE, I2C_MODE

4.1.2.1.1. CLK_P/CLK_N :

Clock input, 가

4.1.2.1.2. H_P,H_N :

Horizontal sync input, 가

4.1.2.1.3. V_P,V_N :

Vertical sync input , 가 . Area

4.1.2.1.4. D[9:0]_P,D[9:0]_N :

4.1.2.1.5. CLK_O_P,CLK_O_N :

4.1.2.1.6. GND :

. Connector

Board

GND 가

GND

4.1.2.2. Camera Cable Mode :TRIGGER_MODE

4.1.2.2.1. H_O_P,H_O_N :

가

. DC_SetTrgH

4.1.2.2.2. V_O_P,V_O_N :

가

. area

. DC_SetTrgV

4.1.2.2.3. EXPOSURE_P,EXPOSURE_N :

가

. DC_SetExposure

4.1.2.2.4. TRG_I_P,TRG_I_N :

. DC_SetTrgH,DC_SetTrgH, DC_SetSyncOut

4.2. (photo coupler) Encoder

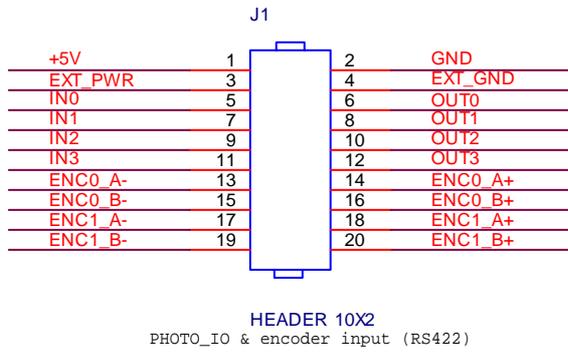
Photo Coupler

, 4

가 . 4 , 4

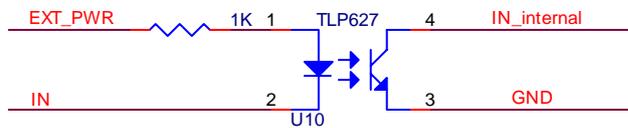
. JP1

connector



4.2.1. IN[3:0] :

4

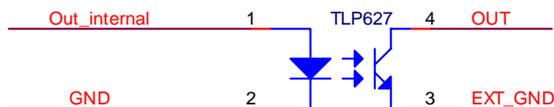


EXT_PWR 가 IN LOW Board LOW 가

EXT_PWR 4

4.2.2. OUT[3:0] :

4



Out internal High OUT

. EXT_GND 4

4.2.3. EXT_PWR :

, IN[3:0] . 24V
가 .

4.2.4. EXT_GND :

OUT[3:0] GND .

4.2.5. ENC0_A+,ENC0_A-,ENC0_B+,ENC0_B-, ENC1_A+,ENC1_A-,ENC1_B+,ENC1_B-

. RS422
ENC0, ENC1 A,B RS422
+,-

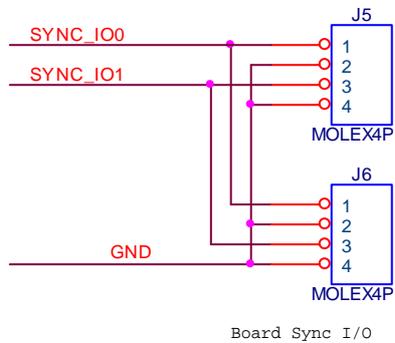
4.2.6. +5V :

+5V .

4.2.7. GND :

GND .

4.3. Board Sync In/Out



Board Sync I/O

connector 가 .

SYNC_IO0,SYNC_IO1 가

5.3. Lookup Table

Line Filter 1024X16bit

가 CPU

5.4. Data Selector

Data selector 1,2,4,8,16bit

Filter Lookup table

1,2,4

8,16bit

CPU

6.1.2.1.2.

TriggerSource always CountSource 1,2,3 Numbers 가 Width High

6.1.2.1.3.

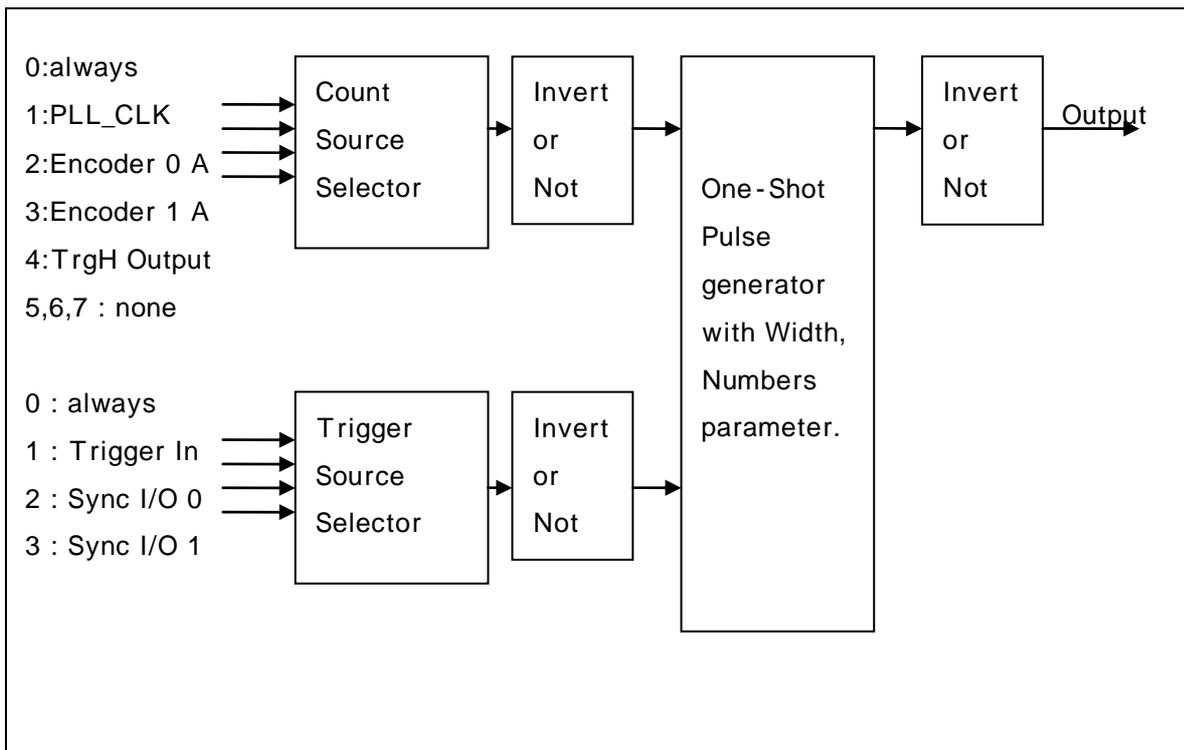
Trigger Source 1,2,3 가 CountSource 1,2,3 가 Numbers CountSource 가 Width High Numbers TriggerSource

6.2. (TrgV)

6.2.1.

Count Source Selector

4 가



< (TrgV) >

6.2.2.

CoutSource Numbers Width High pulse TrgH CountSource 4 TrgH

DC_SetTrgV

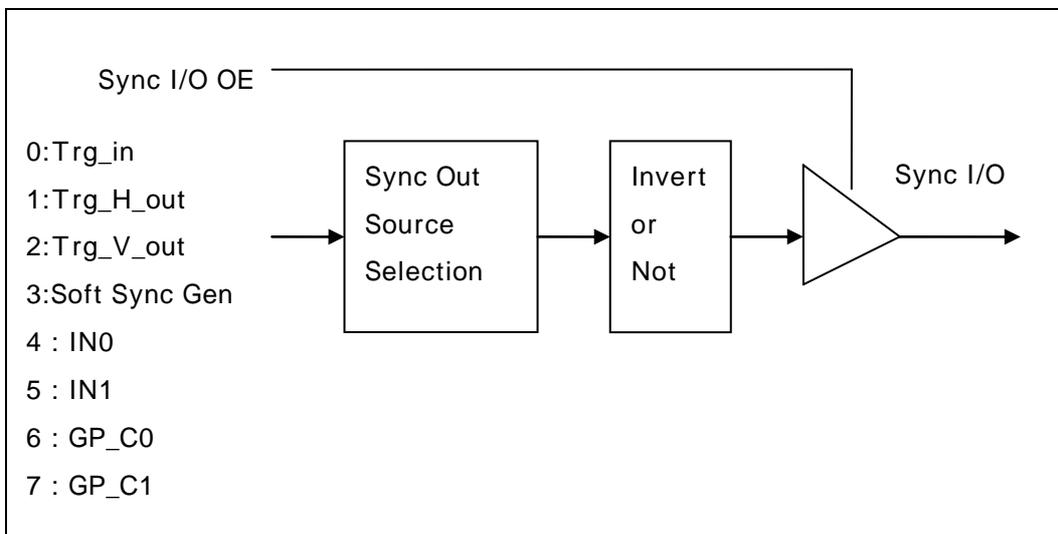
6.2.2.1. :
 CountSource always One-shot Pulse generator
 TrgSource Inversion

6.2.2.2. :
 TriggerSource always CountSource 1,2,3
 Numbers 가 Width
 High 가

6.2.2.3. :
 Trigger Source 1,2,3 가 CountSource 1,2,3,4 가
 Numbers 가 Width High Numbers
 TriggerSource

TrgH CountSource 4 TrgH
 가 TrgH

6.3. Sync I/O :



<Sync I/O >

Source Selection : Trigger Input, Trigger H out, Trigger V output, Soft Sync
Gen(DC_SyncOutToggle) IN0,IN1 TTL
GP_C0,GP_C1 .

Invert or not : inverse 가 가 .
Sync I/O OE : 가 가 .
DC_SetSyncOut .

7.

7.1.

API Capture DLL Photo Coupler capture

7.2. API Function List

7.2.1.

7.2.1.1. DC_Init

```
Int DC_Init(int *handle);
```

Parameters

handle : DLL I/O
I/O

return values

0,
DC_ERR_NO_DEVICE : 가
DC_ERR_NO_HANDLE :

7.2.1.2. DC_End

```
Int DC_End(int handle);
```

Parameters

handle : . DC_Init .

Return Values

0,
Error Code : DC_ERR_NOT_INITIALIZED

7.2.1.3. DC_GetMaxCards

return 1 0 가 1

Int DC_GetMaxCards(int handle);

Parameters

handle : DC_Init

Return Values

7.2.1.4. DC_SelectCard

I/O

Int DC_SelectCard(int handle,int card_number);

Parameters

handle : DC_Init

Card_number : 0 – (max_card_numbers-1)

0 가 N 0 N-1
가

Return Values

Error Code : DC_ERR_CARD_NUMBER_INVALID

7.2.1.5. DC_GetCurCardNumber

Int DC_GetCurCardNumber (int handle);

Parameters

handle : . DC_Init

Return Values

0

7.2.1.6. DC_GetVersion

DLL version, Device Driver Version, Board Chip version

DC_Init 가 ,

DLL version : 0x0305, Driver Version : 0x0302, Chip Version : 0x0302

```
int DC_GetVersion (int handle,DWORD *DllVer, DWORD *DrvVer, DWORD *ChipVer);
```

Parameters

handle : . DC_Init

DllVer: DLL version NULL

DrvVer: Driver version NULL

ChipVer: Chip Version NULL

Return Values

error code

7.2.2. I/O

7.2.2.1. DC_WriteReg

```
int DC_WriteReg(  
int handle,  
    DWORD offset,  
    DWORD data  
);
```

Parameters

handle : . DC_Init

Offset :

Data :

Return Values

0

7.2.2.2. DC_ReadReg

```
int DC_ReadReg (  
int handle,  
    DWORD offset,  
    DWORD *data  
);
```

Parameters

handle : . DC_Init
Offset : offset address from the base
data :

Return Values

error code

7.2.3. Digital I/O

7.2.3.1. DC_InIrqSet

. 0-3 가 connector photo coupler .

```
Int DC_InIrqSet(  
int handle,  
    DWORD ipen,  
    DWORD inen  
);
```

Parameters

handle : . DC_Init .
 ipen : 0-3 0-3 가 1
 가 .
 inen : 가 1 가

return values

error code

7.2.3.2. DC_InRead

```
Int DC_InRead(
int handle,
  DWORD *data
);
```

Parameters

handle : . DC_Init .
 data : . DWORD .
 *data [3:0] 가 .

return values

error code.

7.2.3.3. DC_InReadOvl

DC_InIrqSet 가 Sleep
 가 가 (*status)
 (*data) .

```
Int DC_InReadOvl(
int handle,
  DWORD *data,
  DWORD *status
```

);

Parameters

handle : . DC_Init
*status : 가 '1' 가
*data : (5us
) 1 0

return values

error code

7.2.3.4. DC_CancelReadOvl

ADDA_InReadOvl

Thread

thread

int DC_CancelReadOvl (int handle);

Parameters

handle : . DC_Init

Return values

Error code

7.2.3.5. DC_OutWrite

Int DC_OutWrite(int handle,DWORD data);

Parameters

handle : . DC_Init
Data : [3:0] 가 '1' photo
coupler 가

return values

error code.

7.2.3.6. DC_GpioReadIn

GPIO

```
Int DC_GpioReadIn(int handle,DWORD *data);
```

Parameters

handle : DC_Init
data : [17:0] GPIO
가 High 1 Low 0

return values

error code.

7.2.3.7. DC_GpioWriteOut

GPIO output register

```
Int DC_GpioWriteOut(int handle,DWORD data);
```

Parameters

handle : DC_Init
data : [17:0] GPIO Out

return values

error code.

7.2.3.8. DC_GpioWriteOE

GPIO output enable

```
Int DC_GpioWriteOE (int handle,DWORD data);
```

Parameters

handle :
data : [17:0] GPIO OE 가 '1'
GPIO Out Open

return values

error code.

7.2.4. Capture

2

7.2.4.1. DC_Open

가

```
BYTE *DC_Open(  
int handle,  
    int channel,  
    int Height,  
    int Width,  
    int Frames,  
    int BitsPerClk  
);
```

Parameters

handle :

channel : Capture channel 0 – 1.

Height : Frame

Width : Frame

Frames : Capture

BitsPerClk :

1,2,4,8,16

가

return values

Error Codes :

DC_ERR_CHANNEL_INVALID

DC_ERR_OPEN_BITS_PER_CLK_INVALID

DC_ERR_FRAMES_INVALID

DC_ERR_FRAME_SIZE_INVALID

DC_ERR_FRAME_BUFFER_ALLOC_FAILS

7.2.4.2. DC_Close

DC_Open . DC_Open

```
DC_Close (  
    int handle,  
    Int channel  
);
```

Parameters

handle :
channel : . 0 1.

return values

Error Codes :
DC_ERR_CHANNEL_NOT_OPENED
DC_ERR_CHANNEL_INVALID

7.2.4.3. DC_Start

```
Int DC_Start(  
    int handle,  
    int channel  
);
```

Parameters

handle :
channel : Capture channel 0 – 1.

return values

DC_ERR_ALREADY_STARTED,
DC_ERR_CHANNEL_NOT_OPENED.
DC_ERR_START_FAILS :

7.2.4.4. DC_Stop

DC_Start

```

Int DC_Stop(
    int handle,
    int channel
);

```

Parameters

handle : .
channel : Capture channel 0 - 1.

return values

Error Codes :
DC_ERR_CHANNEL_INVALID,
DC_ERR_NOT_STARTED.
DC_ERR_CHANNEL_NOT_OPENED.

7.2.4.5. DC_GetFrame

```

DC_Start          가          가
    buf          length
*length  1      가          1
가          . 1          DC_GetFrame
          1          no_blocked  0
          no_blocked  0
          가          가          thread  process

```

```

Int DC_GetFrame(
    int handle,
    Int channel,
    int no_blocked,
    BYTE **buf,
    WORD *length

```

);

Parameters

handle : .

channel : channel number.

no_blocked :
 1 가 length 0 buf 가
 0 가

buf : 가 가
 NULL

length : 가

0 : no_blocked 1 가

1- (Frames-1) :
 NULL

return values

DC_ERR_CHANNEL_INVALID

DC_ERR_FRAME_OVER_RUN : PCI CHIP 가

DC_ERR_BUFFER_OVERFLOW : CPU 가
 Frames-1 가

DC_ERR_CHANNEL_NOT_OPENED.

DC_ERR_DMA_TRANSFER_FAILS :

7.2.4.6. DC_CancelGetFrame

DC_GetFrame blocked thread 가 가

DC_GetFrame thread process

```
int DC_CancelGetFrame(  
    int handle,  
    int channel  
);
```

Parameters

handle :
channel : channel number

return values

Error Codes :
DC_ERR_CHANNEL_INVALID
DC_ERR_NO_GET_FRAME_PENDING.

7.2.5. Capture

Capture controller 가

7.2.5.1. DC_SetCameraCableMode

가

가 TRIGGER_MODE, I2C_MODE 가
Camera Cable

```
int DC_SetCameraCableMode (  
int handle,  
int channel,
```

```
int mode
);
```

Parameters

handle : .
channel : channel number 0 - 1.
mode : 0,1 가 .
0 : TRIGGER_MODE .
1 : I2C_MODE I2C control .

Return values

error code

7.2.5.2. DC_SetCapInfo

Capture controller .

```
int DC_SetCapInfo(
    int handle,
    int channel,
    int HBP,
    int VBP,
    int ClkEdgeHigh,
    int HSyncEdgeHigh,
    int VSyncEdgeHigh,
    BYTE LineArea,
    BYTE Input10Bits
);
```

Parameters

handle : .
channel : channel number .
HBP : 가 가 . 0 .
VBP : 가 가 .
0 .

ClkEdgeHigh: Camera 가 .

1 : , 0 :

HSyncEdgeHigh : 가 .

1 : , 0 :

VSynEdgeHigh : 가 .

1 : , 0 :

LineArea :

1 : Line Camera Mode, .

0 : Area Camera Mode,

Input10Bits : 10bit 8bit

10bit

가 .

cap_data[9:0], camera

cam_data[9:0]

1 : camera connector [9:0]

cap_data[9:0] = cam_data[9:0].

0 : camera connector [7:0]

[9:8]

cap_data[9:2] = cam_data[7:0];

cap_data[1:0] = 0;

return values

error code

7.2.5.3. DC_SetFilter

Digital Line filter

mode 0

int DC_SetFilter(
int handle,
int channel,
DWORD mode,
DWORD fsHz,
DWORD cutoffHz,
int offset,

```
float q
);
```

parameters

```
handle :
mode : Filter mode.
0 : direct mode. Filtering
1 : High pass filter mode. High pass filter
2 : Low pass filter mode.
3 : band pass filter mode.
```

```
fsHz : Video clock Hz
cutoffHz : filter cutoff Hz
offset : filter offset -1024 - +1024 가
q : Q float
```

return values

Error Codes.

7.2.5.4. DC_SetLookupTable

Lookup table Table
WORD data[1024]

```
int DC_SetLookupTable(
int handle,
int channel,
int index,
DWORD value
);
```

Parameters

```
handle :
channel : channel number
index : 0-1023 가
value : 16bit 가 가
```

return values

Error Codes :

DC_ERR_LUT_INDEX_RANGE_INVALID

7.2.5.5. DC_SetExposure

Camera Cable mode 가 0
Exposure

```
int DC_SetExposure(
    int handle,
    int channel,
    int enable,
    int ActiveHigh,
    WORD Width
);
```

Parameters

handle :
channel : channel
enable : 1 exposure Inactive
ActiveHigh : 1 Active High, 0 Active Low
width : . line mode clock area mode
input h_sync 가 가 .

return values

error code

7.2.6. Encoder

가 . A,B A
. A,B 32bit up/down counter
encoder .

7.2.6.1. DC_SetEncoderUpDownCounter

encoder A,B 32bit

```
int DC_SetEncoderUpDownCounter(  
    int handle,  
    int channel,  
    DWORD val  
);
```

Parameters

handle :
channel : channel number.
val : 32bit unsigned value . encoder

return values

error code.

7.2.6.2. DC_GetEncoderUpDownCounter

A,B

```
int DC_GetEncoderUpDownCounter(  
    int handle,  
    int channel,  
    DWORD *val  
);
```

Parameters

handle :
channel : channel number.
val : 32bit unsigned

Return values

error code

7.2.7. SYNC generator



7.2.7.1. DC_SetTrgH

가 0 가 H_SYNC_0

```

int DC_SetTrgH (
int handle,
int channel,
int CountSource,
int CntSrcInvert,
int TriggerSource,
int TrgSrcInvert,
int OutInvert,
WORD Width,
WORD Numbers
);
  
```

Parameters

- handle : .
- channel : channel number 0 – 1.
- CountSource :
 - 0 : 1
 - 1 : PLL Clock
 - 2 : Encoder 0 A
 - 3 : Encoder 1 A
 - 4,5,6,7 : none

CntSrcInvert : 가 가 . 1 0
encoder .

TriggerSource :

0 : always
 1 : trigger input, Camera connector TRG_I_P,TRG_I_N
 2 : Channel 0 Sync I/O input. Board Sync I/O connector SYNC_I00
 3 : channel 1 Sync I/O input. Board Sync I/O connector SYNC_I01

TrgSrcInvert : 가 가 . 1 0
 .
 OutInvert: 가 가 . 1 .
 Width : . 0-0xff 가 .
 Numbers : 가 . 0-0xffff 가 .

Return values

error code

7.2.7.2. DC_SetTrgV

가 0 가 . V_SYNC_0 .

```
int DC_SetTrgV (
int handle,
int channel,
int CountSource,
int CntSrcInvert,
int TriggerSource,
int TrgSrcInvert,
int OutInvert,
WORD Width,
WORD Numbers
);
```

Parameters

handle :
 channel : channel number 0 – 1.

CountSource :
 0 : always


```

    int Invert
);

```

Parameters

```

    handle :
channel : channel number
Source :
    0 :      Trigger input
    1 :      TrgH output
    2 :      TrgV output
    3 :      . DC_SyncOutToggle
    4 : IN0,      0
    5 : IN1,      1
    6 : GP_C0, general I/O input 0, LVTTL Level
    7 : GP_C1, general I/O input 1, LVTTL Level

```

```

OE : Output Enable, 1      Open
Invert :      가      가      . 1      0

```

return values

error code.

7.2.7.4. DC_SyncOutToggle

```

DC_SetSyncOut      3      가

```

```

DC_SyncOutToggle (
    int handle,
    int channel,
    WORD width
);

```

Parameters

```

    handle :
channel : channel number
width : toggle
us      가      CPU

```

return values

error code.

7.2.7.5. DC_SetClkOutFreq

PLL

F , $F = 40\text{Mhz} * \text{clk_o_number} / \text{ref_number}$

가

$F_{in} = F/\text{clk_o_number}$, $F_{fb} = 40\text{Mhz}/\text{ref_number}$

$35\text{kHz} < F_{in} \leq 1000\text{kHz}$

$35\text{kHz} < F_{fb} \leq 1000\text{kHz}$

, F 10Mhz – 75Mhz 가

clk_o_number, ref_number

```
int DC_SetClkOutFreq(
    int handle,
    int clk_o_number,
    int ref_number
);
```

parameters

handle :

clk_o_number : clock output

ref_number : 40Mhz clock

return values

error code

7.2.8. I2C command

Camera Cable mode I2C_MODE

7.2.8.1. DC_I2cInit

I2C

```
void DC_I2cInit(int handle,int channel,int DelayCnt);
```

parameters

handle : .
channel : channel number.
DelayCnt : I2C . 1-10 가
가 . 가
2 .

return values

error code

7.2.8.2. DC_I2cRst

Reset .

```
void DC_I2cRst(int handle,int channel);
```

parameters

handle : .
channel : channel number.

return values

error code

7.2.8.3. DC_I2cWrite

I2C 8bit .

```
void DC_I2cWrite(int handle,int channel,BYTE data);
```

parameters

handle :
channel : channel number.
data : 8bit data

return values

error code

7.2.8.4. DC_I2cRead

I2C 8bit data

```
int DC_I2cRead (int handle,int channel);
```

parameters

handle:
channel : channel number.
data : 8bit data

return values

7.2.8.5. DC_I2cStart

I2C Start

```
void DC_I2cStart(int handle, int channel);
```

parameters

handle :
channel : channel number.
data : 8bit data

return values

none

7.2.8.6. DC_I2cStop

I2C Stop

```
void DC_I2cStop(int handle,int channel);
```

parameters

handle :
channel : channel number.

return values

none

7.2.9.

7.2.9.1. DC_Prog

report :
class : FPGA hex EEPROM NULL

```
int DC_Prog(  
    int handle,  
    void *report,  
    char *filename  
);
```

parameters

handle :
report : EEPROM

NULL

filename : HEX 가

return values

EEPROM BYTE 0
가

7.3.

0 가

CAP_BASE_DEVICE_OPEN_ERROR :

CAP_BASE_NO_HANDLE :

CAP_CARD_CHANNEL_OVERFLOW :

DC_ERR_NO_DEVICE :

가

DC_ERR_NO_HANDLE:

API

handle

DC_ERR_NOT_INITIALIZED :

Library 가

: DC_Init

DC_ERR_CHANNEL_INVALID :

: DC_Open, DC_Close, DC_GetFrame, DC_GetFrameAtPos, DC_CancelGetFrame, ... channel

가

DC_ERR_OPEN_BITS_PER_CLK_INVALID :

1, 2, 4, 8, 16

: DC_Open

DC_ERR_FRAMES_INVALID :

Open

가

256

: DC_Open

DC_ERR_FRAME_SIZE_INVALID :

가 Width*Height 가 4 가 .
: DC_Open

DC_ERR_FRAME_BUFFER_ALLOC_FAILS :

: DC_Open

DC_ERR_CARD_NUMBER_INVALID :

가 .
: DC_SelectCard

DC_ERR_CHANNEL_NOT_OPENED :

: DC_Start

DC_ERR_ALREADY_STARTED :

가 .
: DC_Start

DC_ERR_START_FAILS :

DMA .
: DC_Start

DC_ERR_NOT_STARTED :

: DC_Stop

DC_ERR_ALREADY_PENDING :

DC_GetFrame .
: DC_GetFrame

DC_ERR_FRAME_OVER_RUN :

PCI BUS 가 가
DMA
10us
: DC_GetFrame

DC_ERR_DMA_TRANSFER_FAILS :

DMA 가 .

: DC_GetFrame

DC_ERR_LUT_INDEX_RANGE_INVALID :

Lookup table Index .

: DC_SetLookupTable

- -