DVI-CL01

User Manual

Version 1.0

Contents

1. DVI-CL01 Introduction

The DVI-CL01 board functions to convert DVI data received from a DVI output device (PC, etc.) into CAMERA LINK.
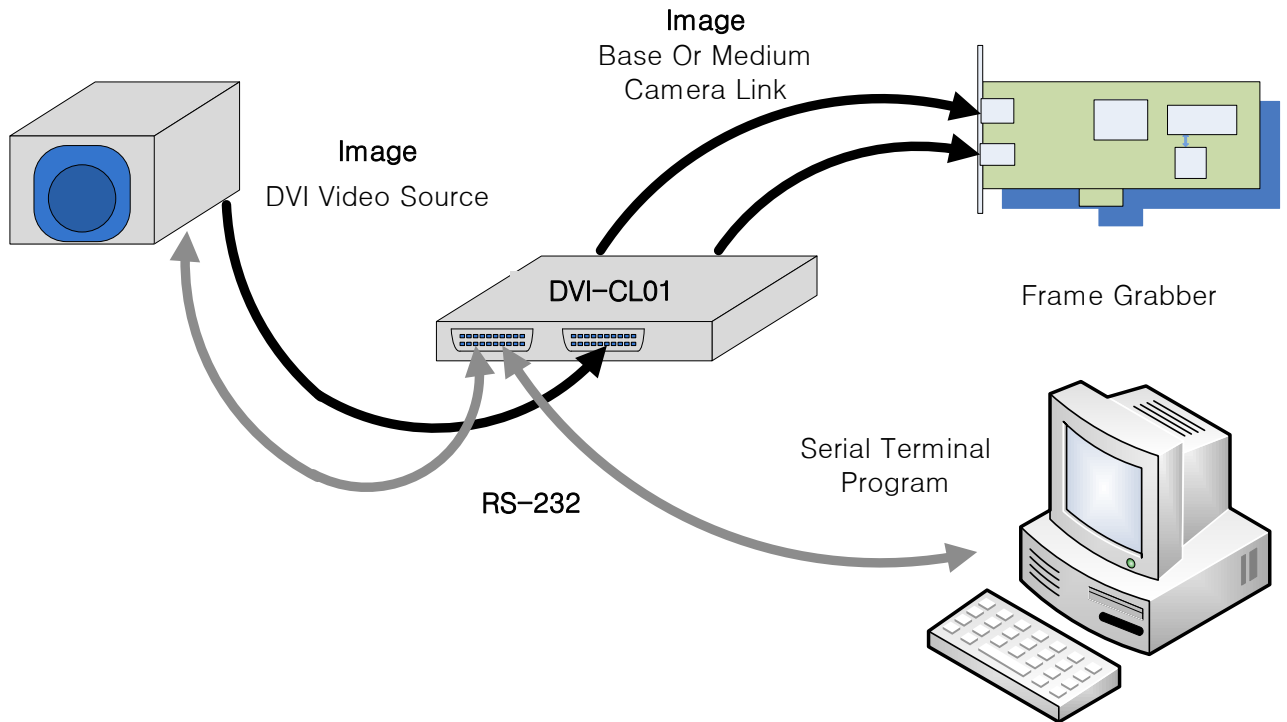
[Figure 1-1.   DVI-CL01 Connection]

Main Features of DVI-CL01
- 24 or 48 bits data output selectable
- Supports standard Camera Link specifications
- Support up to 85Mhz Pixel Clock
- Supports LVAL, FVAL, DVAL Signals
- SerTFG / SerTC serial communication
- Use DVI power (+5V)
- Built-in EDID

Applications
- Industrial & Medical & Scientific Imaging
- Machine Vision and Metrology
- Frame Grabber Camera 대체
- Frame Grabber Board Test

2. DVI-CL01 Function

DVI-CL01 interfaces the image data received through the DVI cable to the Base or Medium camera link, and each name and function description is as follows.
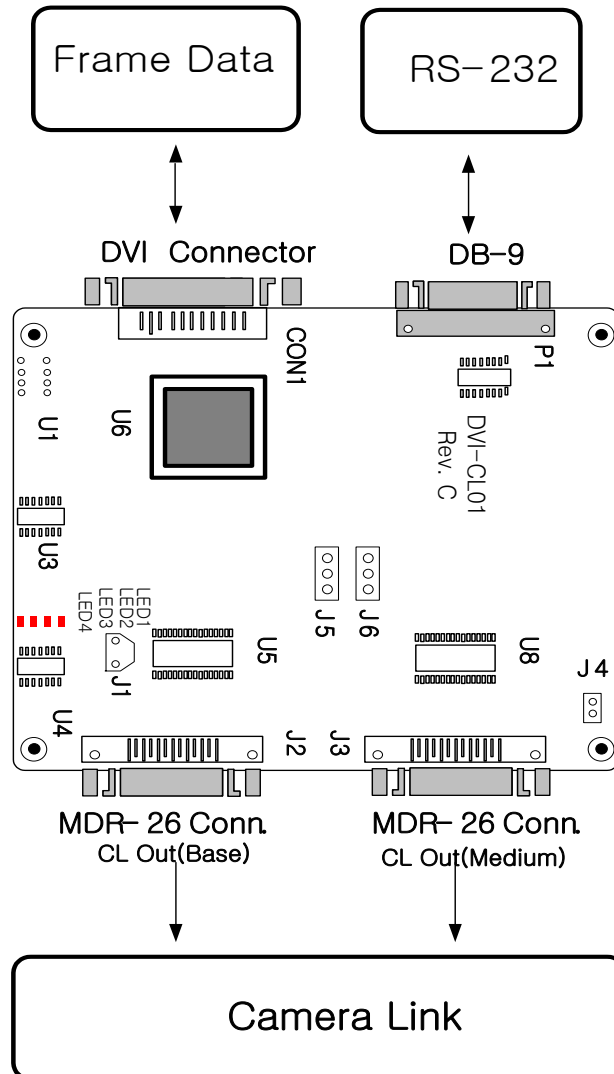
[Figure 2-1.　DVI-CL01 Block Diagram]

No.	Name	Description
1	U6	DVI Receiver
2	J1	3.3V output (when using external power)
3	U5	LVDS 28bit Camera Link (Base)
4	U8	LVDS 28bit Camera Link (when using Medium)
5	J4	Base or Medium Camera Link Select

* If you do not use the DDC inside the board and provide a DVI input from the outside, remove the EEPROM before use.
* In case of external DVI input, it is stable to give the clock within 40Mhz.
   => It is possible to input up to 160Mhz depending on the performance of the user's PC.

(1) Connect the DVI cable that receives the image to the DVI connector. For power inside the board, use the 5V power supplied from the DVI connector when no external resources are used.다.

[Figure 2-2.   DVI-CL01 Case Input Port]

(2) After setting the desired resolution, connect one or two camera link cables. That is, the DVI output is holed, It can be output by dividing it into even pixels.

[Figure 2-3.   DVI-CL01 Case Output Port]

(Note) The default setting is 24-bit output. (J2 connector output or CL Out(Base))
        For 48-bit output, see Section 4-6, Using J4 Jumper.
        (48bit output: J4 open, 24bit output: J4 short)

(3) In Base Mode, both even and odd pixels are output from the MDR26 connector. (See Table 1.)

[Table 1.   One pixel per Clock Mode Data Mapping]

DATA	One Pixel per Clock Output	
	18bpp	26bpp
BLUE[7..0]	QE[7..0]	QE[7..0]
GREEN[7..0]	QE[15..10]	QE[15..8]
RED[7..0]	QE[23..18]	QE[23..16]

In **Medium Mode**, even pixels are output from the left Single Output Connector (J2) of [Figure 2-1] and odd pixels are output from the remaining right connector (J3), and the pixel clock frequency is half of that of Base mode.
(See Table 2.)

[Table 2.   Two pixel per Clock Mode Data Mapping]

DATA	Two Pixel per Clock Output	
	18bpp	26bpp
BLUE[7..0] – Odd	QE[7..0]	QE[7..0]
GREEN[7..0] - Odd	QE[15..10]	QE[15..8]
RED[7..0] - Odd	QE[23..18]	QE[23..16]
BLUE[7..0] – Even	QO[7..0]	QO[7..0]
GREEN[7..0] - Even	QO[15..10]	QO[15..8]
RED[7..0] - Even	QO[23..18]	QO[23..16]

(4) RS232 communication is possible through the Serial communication (SerTFG/SerTC) part of Cameral Link and the Dusb9 pin connector.

3. Connector Pin Map

DVI-CL01 has all 4 connectors and 2 jumpers. This chapter describes the description of connectors and the functions of jumpers.

3-1 CON1(DVI) Connector

[Figure 3-1] below shows the pin map of the CON1 connector of the board.
All pin specifications are input/output based on the DVI standard, so please refer to the DVI standard for details. Please refer to the documentation.
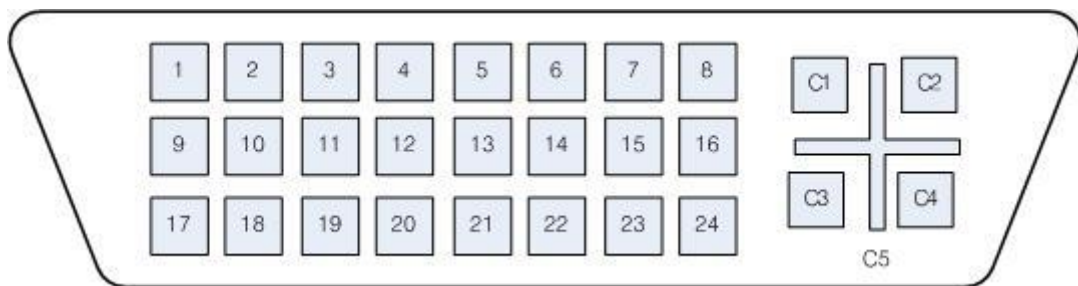
[Figure 3-1.　DVI-CL01 CON1 Connector Pin-out]

[Table 3.　CON1 Connector]

Pin #	Signal	Pin #	Signal
1	TMDS Data2-	16	Hot Plug Detect
2	TMDS Data2+	17	TMDS Data0-
3	TMDS Data2/4 Shield-	18	TMDS Data0+
4	TMDS Data4-	19	TMDS Data0/5 Shield
5	TMDS Data4+	20	TMDS Data5-
6	DDC Clock	21	TMDS Data5+
7	DDC Data	22	TMDS Clock Shield
8	Analog V sync	23	TMDS Clock+
9	TMDS Data1-	24	TMDS Clock-
10	TMDS Data1+		
11	TMDS Data1/3 Shield	C1	Analog Red
12	TMDS Data3-	C2	Analog Green
13	TMDS Data3+	C3	Analog Blue
14	+5V Power (used as board internal power)	C4	Analog H sync
15	GND	C5	Analog Ground

3-2. P1(DB-9) Connector

[Figure 3-2] below shows the pin map of the P1 connector, which is the RS-232 port of the DVI-CL01 board.
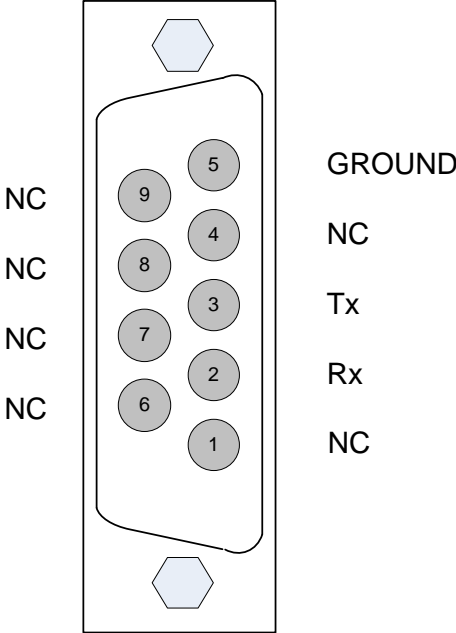
[Figure 3-2.   DVI-CL01 D-sub9 Connector핀]

[Table 4.   DVI-CL01 D-sub 9Pin Connector]

Pin No.	Name	Description	Remark
1	NC	Unused	
2	Rx	RECEIVER	
3	Tx	TRANCEIVER	
4	NC	Unused	
5	GROUND	Ground	
6	NC	Unused	
7	NC	Unused	
8	NC	Unused	
9	NC	Unused	

3-3 J2(MDR26) Connector

The figure below shows the pin map of the J2 connector on the board.

All pin specifications are input/output based on the Camera Link standard, so please refer to the Camera Link standard document for details.

Frame Grabber

Inner shield	26 13	Inner shield
CC4-	25 12	CC4+
CC3+	24 11	CC3-
CC2-	23 10	CC2+
CC1+	22 9	CC1-
SerTFG+	21 8	SerTFG-
SerTC-	20 7	SerTC+
X3+	19 6	X3-
Xclk+	18 5	Xclk-
X2+	17 4	X2-
X1+	16 3	X1-
X0+	15 2	X0-
Inner shield	14 1	Inner shield
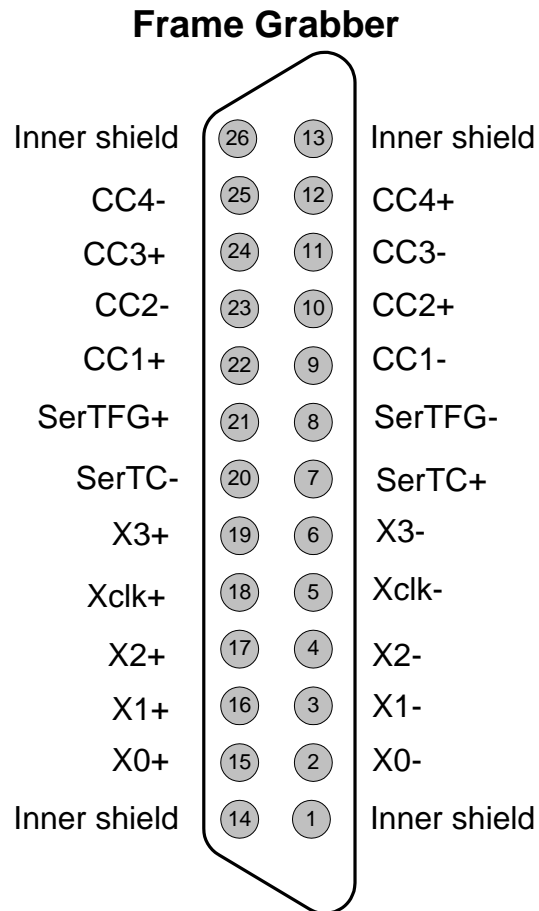
[Figure 3-3. DVI-CL01 J2 Connector Pin-out]

[Table 5. J2 Connector]

No.	Name	Description	Remark
1	**Inner Shield**	Cable shield	
2	**X0-**	Camera link LVDS transmit data0-	
3	**X1-**	Camera link LVDS transmit data1-	
4	**X2-**	Camera link LVDS transmit data2-	
5	**Xclk-**	Camera link LVDS transmit clock-	
6	**X3-**	Camera link LVDS transmit data3-	
7	**SerTC+**	Serial to Camera+	
8	**SerTFG-**	Serial to Frame grabber-	
9	**CC1-**	Camera Control input 1-	
10	**CC2+-**	Camera Control input 2+	
11	**CC3-**	Camera Control input 3-	
12	**CC4+-**	Camera Control input 4+	
13	**Inner Shield**		
14	**Inner Shield**		
15	**X0+**	Camera link LVDS transmit data0 +	
16	**X1+**	Camera link LVDS transmit data1 +	
17	**X2+**	Camera link LVDS transmit data2 +	
18	**Xclk+**	Camera link LVDS transmit clock +	
19	**X3+**	Camera link LVDS transmit data3 +	
20	**SerTC-**	Serial to Camera-	
21	**SerTFG+**	Serial to Frame grabber +	
22	**CC1+**	Camera Control input 1+	
23	**CC2-**	Camera Control input 2-	
24	**CC3+**	Camera Control input 3+	
25	**CC4-**	Camera Control input 4-	
26	**Inner Shield**		

(Note) For detailed specifications, refer to the Camera Link standard document.

3-4　J3(MDR26) Connector

　　The figure below shows the pin map of the J3 connector on the board.

All pin specifications are input/output based on the Camera Link standard, so please refer to the Camera Link standard document for details.

Frame Grabber

Inner shield	26	13	Inner shield
N.C	25	12	N.C
N.C	24	11	N.C
N.C	23	10	N.C
N.C	22	9	N.C
N.C	21	8	N.C
N.C	20	7	N.C
X3+	19	6	X3-
Xclk+	18	5	Xclk-
X2+	17	4	X2-
X1+	16	3	X1-
X0+	15	2	X0-
Inner shield	14	1	Inner shield
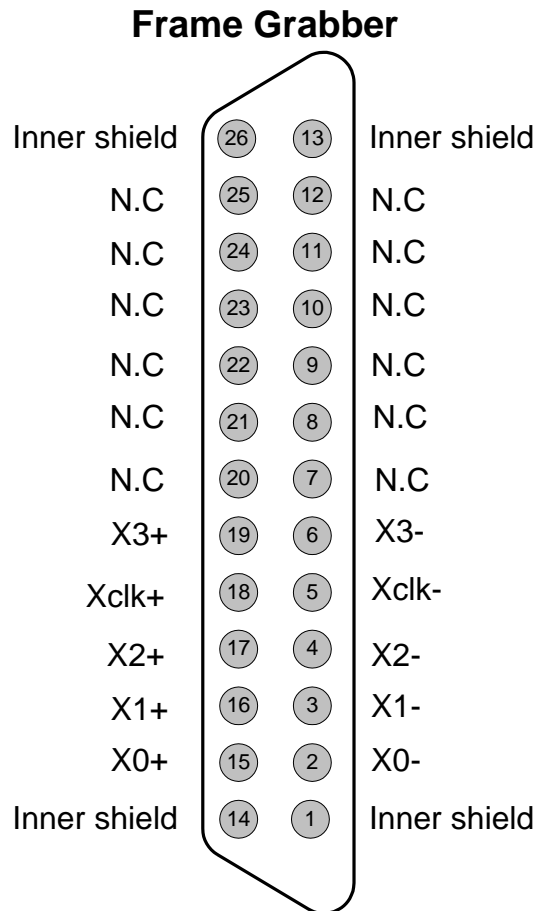
[Figure 3-4.　DVI-CL01 J3 Connector Pin-out]

[Table 6.   J3 Connector]

No.	Name	Description	Remark
1	Inner Shield	Cable shield	
2	X0-	Camera link LVDS transmit data0-	
3	X1-	Camera link LVDS transmit data1-	
4	X2-	Camera link LVDS transmit data2-	
5	Xclk-	Camera link LVDS transmit clock-	
6	X3-	Camera link LVDS transmit data3-	
7	N.C	No Connection	
8	N.C	No Connection	
9	N.C	No Connection	
10	N.C	No Connection	
11	N.C	No Connection	
12	N.C	No Connection	
13	Inner Shield		
14	Inner Shield		
15	X0+	Camera link LVDS transmit data0 +	
16	X1+	Camera link LVDS transmit e data1 +	
17	X2+	Camera link LVDS transmit data2 +	
18	Xclk+	Camera link LVDS transmit clock +	
19	X3+	Camera link LVDS transmit data3 +	
20	N.C	No Connection	
21	N.C	No Connection	
22	N.C	No Connection	
23	N.C	No Connection	
24	N.C	No Connection	
25	N.C	No Connection	
26	Inner Shield		

(Note) For detailed specifications, refer to the Camera Link standard document.

3-5   J1 Jumper Setup

J1

External Power
Connector

[Figure 3-5.   J1 Connector Pin-out]

(Note) When using an external power supply, apply 3.3V. It is optimal to use a DVI standard power supply.

3-6   J4 Jumper Setup

**Open** : Use Two Pixels (48-bits). Used as Medium Camera Link.
Use the first Pixel QE[23..0], the second Pixel QO[23..0]. i.e. using J2, J3 connectors
(Use both Clock Base and Medium)
Short : Use One Pixel (24-bits) per clock mode. That is, using J2 connector (using Clock(Base))

3-7   J5, J6 Jumper Setup

The J5 (Base Configuration) and J6 (Medium, Full Configuration) jumper settings allow you to select LVAL (Hsync) or DVAL created from the DVI port and use it as a valid signal (LVAL or Hsync) of the camera link. When using a PC's DVI port, LVAL may change depending on PC specifications and resolution, so it is recommended to connect DVAL (default setting).
Hsync or Vsync signal can be selected with LVDS_SetDeUse() function among API functions.

J5, J6 Setup

LVAL(DVI)   DVAL(DVI)

LVAL or Hsync(Camera Link)
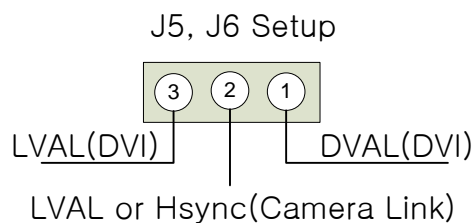
[Figure 3-6.   J4 Connector Pin-out]

When connecting 1 - 2 : Use DVAL (Data Valid) as a valid signal
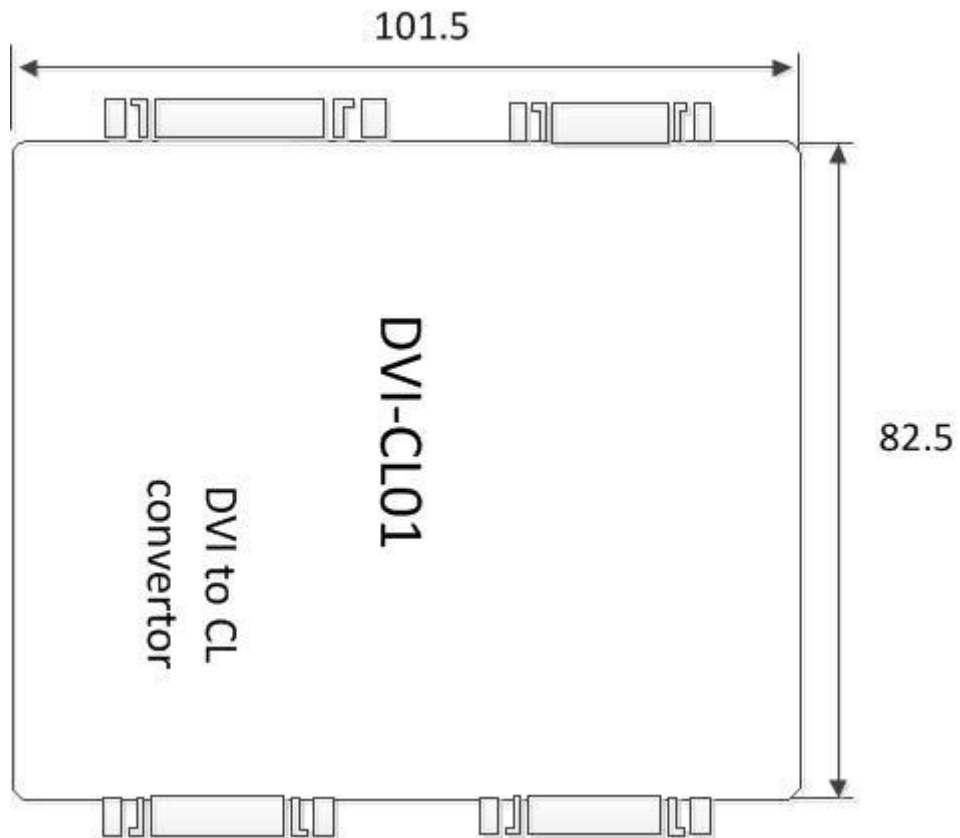When connecting 2 - 3 : Use LVAL (Hsync) as a valid signal

(Note) J5, J6 valid when J4 is open. In case of J4 Short, only J5 is valid.

Appendix

A-1   Board Size

The external sizes of the board are as follows.

Please contact the person in charge for detailed figures.

A-2   Repair Regulations

　Thank you for purchasing DAQ SYSTEM's product. Please refer to the following regarding Customer Service stipulated by DAQ SYSTEM.

(1)　Please read the user's manual and follow the instructions before using the DAQ SYSTEM product.

(2)　When returning the product to be repaired, please send it to the head office with the symptoms of the malfunction as well.

(3)　All DAQ SYSTEM products have a one-year warranty.
　　-. The warranty period is counted from the date the product is shipped from DAQ SYSTEM.
　　-. Peripherals and third-party products not manufactured by DAQ SYSTEM are covered by the manufacturer's warranty.
　　-. If repair is required, please contact the contact points below.

(4)　Even during the free repair warranty period, paid repairs are made in the following cases.
　　① Failure or damage caused by not following the user's manual
　　② Failure or damage caused by customer negligence during product transportation after purchase
　　③ Natural phenomena such as fire, earthquake, flood, lightning, pollution, etc. or power supply exceeding the recommended range malfunction or damage
　　④ Failures caused by inappropriate storage environment (eg, high temperature, high humidity, volatile chemicals, etc.) damaged
　　⑤ Failure or damage due to unreasonable repair or modification
　　⑥ Products whose serial number has been changed or intentionally removed
　　⑦ In the event that DAQ SYSTEM determines that it is the customer's negligence for other reasons

(5)　The customer must bear the shipping cost of returning the repaired product to DAQ SYSTEM.

(6)　The manufacturer is not responsible for any problems caused by incorrect use regardless of our warranty provisions.

MEMO

Contact Point

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DAQ SYSTEM
Measurement & Automation