

BD430(Default type IO Board)

BD431(Bidirectional output type IO Board)

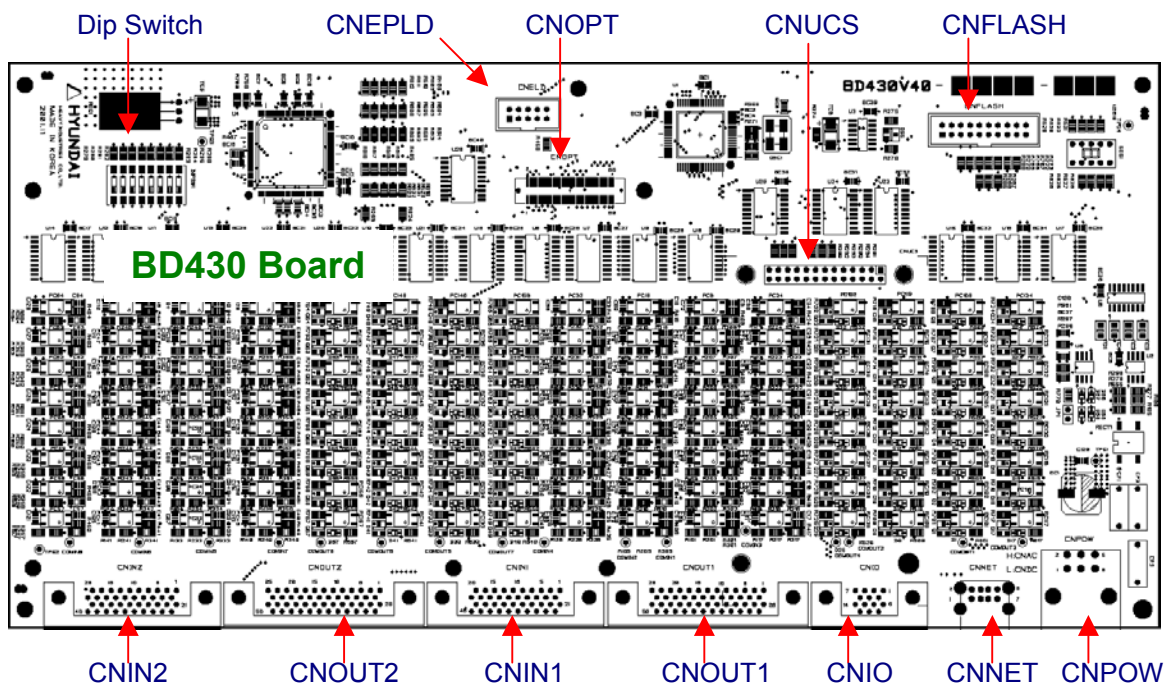
Installation & Maintenance Manual

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1. INTRODUCTION

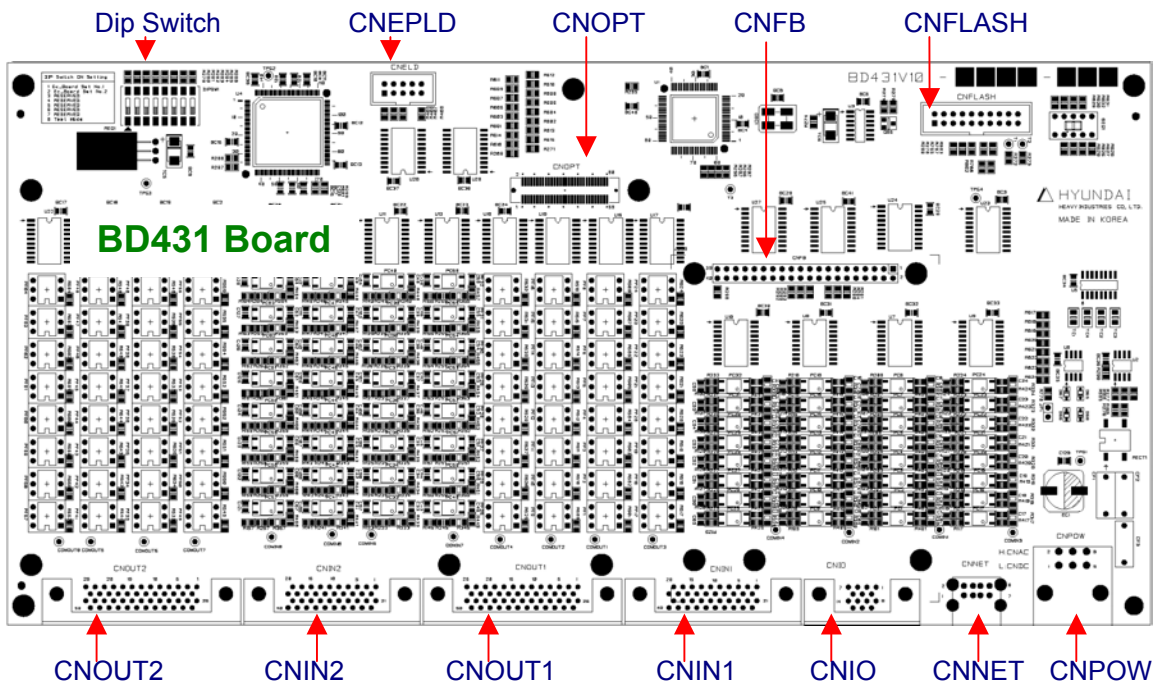
1) BD430 Board

- Common (+) digital input 64 points (8 ports)
- Common (-) digital output 64 points (8 ports)
- Various option board installation
 - ✓ BD481 Board : Analog I/O, Conveyor Pulse Count, Arc Welding Machine I/F
 - ✓ UCS Module
 - ✓ CC-Link Module (with BD471 Board)
- IO expansion : 192 points (24 ports)
- AC fault detecting
- RS-232C communication with BD411(Main Board) : 57600bps



2) BD431 Board

- Common (+) digital input 64 points (8 ports)
- **Common (+) or common(-) digital output** 64 points (8 ports)
- Various option board installation
 - ✓ BD481 Board : Analog I/O, Conveyor Pulse Count, Arc Welding Machine I/F
 - ✓ UCS Module
 - ✓ CC-Link Module (with BD471 Board)
 - ✓ *Hilscher COM Module (with BD472 Board) for fieldbus systems*
- IO expansion : 192 points (24 ports)
- AC fault detecting
- RS-232C communication with BD411(Main Board) : 57600bps



2. DIGIATAL INPUT CONNECTION

1) Pin Description

● CNIN1

| Pin No. | Symbol | Description (for expanded board / for base board) |
|---------|--------|---|
| 1 | SDI01 | general-purpose input 1 / MOTON ON SW input |
| 2 | SDI02 | general-purpose input 2 / reserved system input |
| 3 | SDI03 | general-purpose input 3 / START SW input |
| 4 | SDI04 | general-purpose input 4 / STOP SW input |
| 5 | SDI05 | general-purpose input 5 / reserved system input |
| 6 | SDI06 | general-purpose input 6 / reserved system input |
| 7 | SDI07 | general-purpose input 7 / reserved system input |
| 8 | SDI08 | general-purpose input 8 / reserved system input |
| 9 | COMIN1 | common voltage input (user's power) |
| 10 | COMIN1 | : +24 V or 0V for SDI01~SDI08 |
| 11 | SDI09 | general-purpose input 9 / AUTO/MAN SW input |
| 12 | SDI10 | general-purpose input 10 / OL input |
| 13 | SDI11 | general-purpose input 11 / MSHPON input |
| 14 | SDI12 | general-purpose input 12 / DMAN input |
| 15 | SDI13 | general-purpose input 13 / EM STOP input |
| 16 | SDI14 | general-purpose input 14 / TSP input |
| 17 | SDI15 | general-purpose input 15 / OVT input |
| 18 | SDI16 | general-purpose input 16 / ARM input |
| 19 | COMIN2 | common voltage input (user's power) |
| 20 | COMIN2 | : +24 V or 0V for SDI09~SDI16 |
| 21 | SDI17 | general-purpose input 17 / EX MON input |
| 22 | SDI18 | general-purpose input 18 / PB DET input |
| 23 | SDI19 | general-purpose input 19 / OH input |
| 24 | SDI20 | general-purpose input 20 / OV input |
| 25 | SDI21 | general-purpose input 21 / MSPRIN input |
| 26 | SDI22 | general-purpose input 22 / AMP TYP input |
| 27 | SDI23 | general-purpose input 23 / SG input |
| 28 | SDI24 | general-purpose input 24 / reserved system input |

| | | |
|----|--------|--|
| 29 | COMIN3 | common voltage input (user's power) |
| 30 | COMIN3 | : +24 V or 0V for SDI17~SDI24 |
| 31 | SDI25 | general-purpose input 25 / WCR input |
| 32 | SDI26 | general-purpose input 26 / COLLISION SEN input |
| 33 | SDI27 | general-purpose input 27 / WIRE STICK input |
| 34 | SDI28 | general-purpose input 28 / WELDER ERR input |
| 35 | SDI29 | general-purpose input 29 / WIRE STATE input |
| 36 | SDI30 | general-purpose input 30 / GAS STATE input |
| 37 | SDI31 | general-purpose input 31 / reserved system input |
| 38 | SDI32 | general-purpose input 32 / reserved system input |
| 39 | COMIN4 | common voltage input (user's power) |
| 40 | COMIN4 | : +24 V or 0V for SDI25~SDI32 |

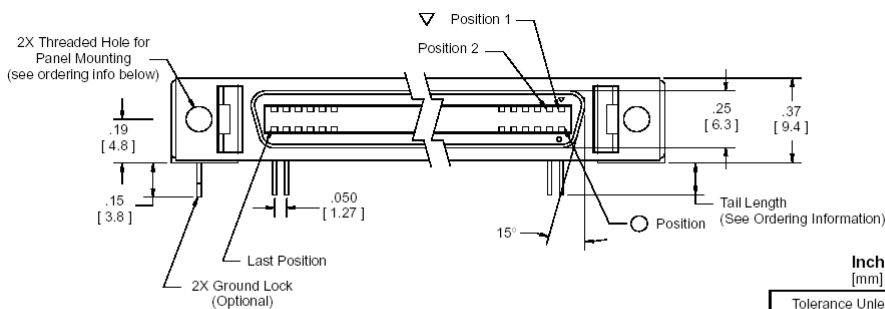
● CNIN2

| Pin No. | Symbol | Description |
|---------|--------|-------------------------------------|
| 1 | DI01 | general-purpose input 1 |
| 2 | DI02 | general-purpose input 2 |
| 3 | DI03 | general-purpose input 3 |
| 4 | DI04 | general-purpose input 4 |
| 5 | DI05 | general-purpose input 5 |
| 6 | DI06 | general-purpose input 6 |
| 7 | DI07 | general-purpose input 7 |
| 8 | DI08 | general-purpose input 8 |
| 9 | COMIN5 | common voltage input (user's power) |
| 10 | COMIN5 | : +24 V or 0V for DI01~DI08 |
| 11 | DI09 | general-purpose input 9 |
| 12 | DI10 | general-purpose input 10 |
| 13 | DI11 | general-purpose input 11 |
| 14 | DI12 | general-purpose input 12 |
| 15 | DI13 | general-purpose input 13 |
| 16 | DI14 | general-purpose input 14 |
| 17 | DI15 | general-purpose input 15 |
| 18 | DI16 | general-purpose input 16 |
| 19 | COMIN6 | common voltage input (user's power) |

| | | |
|----|---------------|--|
| 20 | COMIN6 | |
| | DI17 | general-purpose input 17 |
| 22 | DI18 | general-purpose input 18 |
| 23 | DI19 | general-purpose input 19 |
| 24 | DI20 | general-purpose input 20 |
| 25 | DI21 | general-purpose input 21 |
| 26 | DI22/WI | general-purpose input 22(welding complete signal input) |
| 27 | DI23/EX_START | general-purpose input 23(external start signal input) |
| 28 | DI24/EX_STOP | general-purpose input 24(external stop signal input) |
| 29 | COMIN7 | common voltage input (user's power) |
| 30 | COMIN7 | : +24 V or 0V for DI17~DI24 |
| 31 | DI25/PI1 | general-purpose input 25(external program select signal 1) |
| 32 | DI26/PI2 | general-purpose input 26(external program select signal 2) |
| 33 | DI27/PI3 | general-purpose input 27(external program select signal 3) |
| 34 | DI28/PI4 | general-purpose input 28(external program select signal 4) |
| 35 | DI29/PI5 | general-purpose input 29(external program select signal 5) |
| 36 | DI30/PI6 | general-purpose input 30(external program select signal 6) |
| 37 | DI31/PI7 | general-purpose input 31(external program select signal 7) |
| 38 | DI32/PI8 | general-purpose input 32(external program select signal 8) |
| 39 | COMIN8 | Common voltage input (user's power) |
| 40 | COMIN8 | : +24 V or 0V for DI25~DI32 |

2) Connector Specification

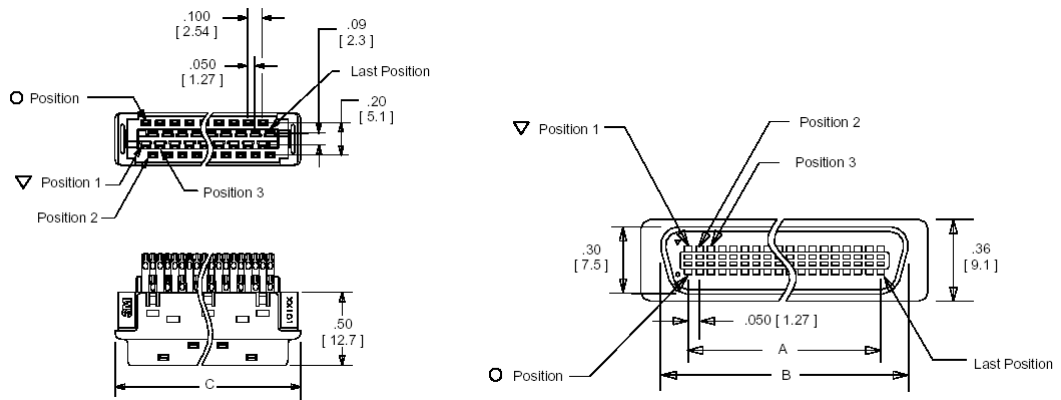
- Board-side : 3M MDR 10240-52A2JL



| Inch [mm] | | | |
|------------------------|-----|------|-------|
| Tolerance Unless Noted | | | |
| | .0 | .00 | .000 |
| Inch | ±.1 | ±.01 | ±.005 |

[] Dimensions for Reference only

- Plug-side : 3M MDR 10140-3000VE (HOOD;10340-55F0-008)

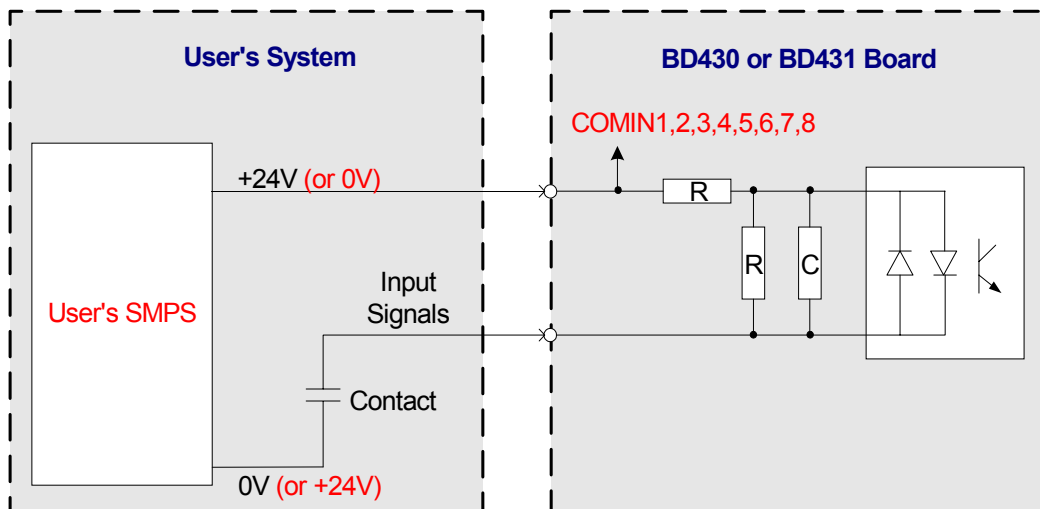


3) Connection Specification

- Input port device : AC input type photocoupler
- Input impedance = $3k\Omega$
- Common (+) input voltage = 24VDC
- Common (-) input voltage = 0VDC

4) Connection Diagram

- Common (+) or (-) voltage



3. DIGIATAL OUTPUT CONNECTION

1) Pin Description

● CNOT1

| Pin No. | Symbol | Description (for expanded board / for base board) |
|---------|---------|--|
| 1 | SDO01 | general-purpose output 1 / MOTOR ON LED output |
| 2 | SDO02 | general-purpose output 2 / reserved system output |
| 3 | SDO03 | general-purpose output 3 / START LED output |
| 4 | SDO04 | general-purpose output 4 / STOP LED output |
| 5 | SDO05 | general-purpose output 5 / reserved system output |
| 6 | SDO06 | general-purpose output 6 / reserved system output |
| 7 | SDO07 | general-purpose output 7 / reserved system output |
| 8 | SDO08 | general-purpose output 8 / reserved system output |
| 9 | COMOUT1 | common voltage input (user's power) |
| 10 | COMOUT1 | : +24 V or 0V for SDO01~SDO08 |
| 11 | SDO09 | general-purpose output 9 / SYS ERR LED output |
| 12 | SDO10 | general-purpose output 10 / reserved system output |
| 13 | SDO11 | general-purpose output 11 / TORCH SW output |
| 14 | SDO12 | general-purpose output 12 / INCHING output |
| 15 | SDO13 | general-purpose output 13 / RETRACT output |
| 16 | SDO14 | general-purpose output 14 / STICK CHK output |
| 17 | SDO15 | general-purpose output 15 / GAS VALVE output |
| 18 | SDO16 | general-purpose output 16 / WELDOUT RSV output |
| 19 | COMOUT2 | common voltage input (user's power) |
| 20 | COMOUT2 | : +24 V or 0V for SDO09~SDO16 |
| 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 | N.C | no connection |
| 27 | N.C | no connection |
| 28 | N.C | no connection |

| | | |
|----|---------|--|
| 29 | N.C | no connection |
| 30 | N.C | no connection |
| 31 | SDO17 | general-purpose output 17 / MOTOR POWER ON output |
| 32 | SDO18 | general-purpose output 18 / BRAKE RELEASE ON1 output |
| 33 | SDO19 | general-purpose output 19 / BRAKE RELEASE ON2 output |
| 34 | SDO20 | general-purpose output 20 / BRAKE RELEASE ON3 output |
| 35 | SDO21 | general-purpose output 21 / BRAKE RELEASE ON4 output |
| 36 | SDO22 | general-purpose output 22 / BRAKE RELEASE ON5 output |
| 37 | SDO23 | general-purpose output 23 / reserved system output |
| 38 | SDO24 | general-purpose output 24 / PLAYBACK output |
| 39 | COMOUT3 | common voltage input (user's power) |
| 40 | COMOUT3 | : +24 V or 0V for SDO17~SDO24 |
| 41 | SDO25 | general-purpose output 25 / RELEASE output |
| 42 | SDO26 | general-purpose output 26 / MSPRON output |
| 43 | SDO27 | general-purpose output 27 / reserved system output |
| 44 | SDO28 | general-purpose output 28 / reserved system output |
| 45 | SDO29 | general-purpose output 29 / reserved system output |
| 46 | SDO30 | general-purpose output 30 / reserved system output |
| 47 | SDO31 | general-purpose output 31 / reserved system output |
| 48 | SDO32 | general-purpose output 32 / reserved system output |
| 49 | COMOUT4 | common voltage input (user's power) |
| 50 | COMOUT4 | : +24 V or 0V for SDO25~SDO32 |

● CNOUT2

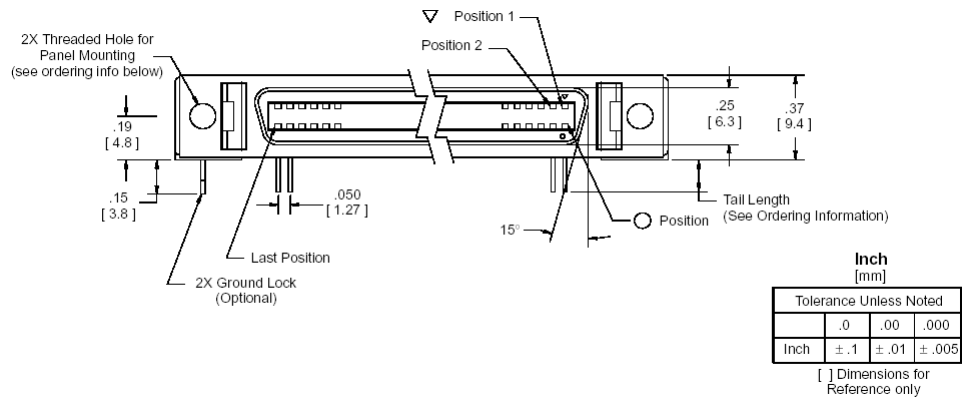
| Pin No. | Symbol | Description |
|---------|---------|-------------------------------------|
| 1 | DO01 | general-purpose output 1 |
| 2 | DO02 | general-purpose output 2 |
| 3 | DO03 | general-purpose output 3 |
| 4 | DO04 | general-purpose output 4 |
| 5 | DO05 | general-purpose output 5 |
| 6 | DO06 | general-purpose output 6 |
| 7 | DO07 | general-purpose output 7 |
| 8 | DO08 | general-purpose output 8 |
| 9 | COMOUT5 | common voltage input (user's power) |
| 10 | COMOUT5 | : +24 V or 0V for DO01~DO08 |

| | | |
|----|---------------|--|
| 11 | DO09 | general-purpose output 9 |
| 12 | DO10 | general-purpose output 10 |
| 13 | DO11 | general-purpose output 11 |
| 14 | DO12 | general-purpose output 12 |
| 15 | DO13 | general-purpose output 13 |
| 16 | DO14 | general-purpose output 14 |
| 17 | DO15 | general-purpose output 15 |
| 18 | DO16 | general-purpose output 16 |
| 19 | COMOUT6 | common voltage input (user's power) |
| 20 | COMOUT6 | : +24 V or 0V for DO09~DO16 |
| 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 | N.C | no connection |
| 27 | N.C | no connection |
| 28 | N.C | no connection |
| 29 | N.C | no connection |
| 30 | N.C | no connection |
| 31 | DO17 | general-purpose output 17 |
| 32 | DO18 | general-purpose output 18 |
| 33 | DO19 | general-purpose output 19 |
| 34 | DO20 | general-purpose output 20 |
| 35 | DO21 | general-purpose output 21 |
| 36 | DO22 | general-purpose output 22 |
| 37 | DO23/GUN1 | general-purpose output 23 / Gun signal output 1 |
| 38 | DO24/GUN2 | general-purpose output 24 / Gun signal output 2 |
| 39 | COMOUT7 | common voltage input (user's power) |
| 40 | COMOUT7 | : +24 V or 0V for DO17~DO24 |
| 41 | DO25/MX | general-purpose output 25 / MX signal output |
| 42 | DO26/PROG_END | general-purpose output 26 / program end output |
| 43 | DO27/TOT_ERR | general-purpose output 27 / system error output |
| 44 | DO28/IL_ERR | general-purpose output 28 / interlock error output |
| 45 | DO29/START'G | general-purpose output 29 / robot playback output |

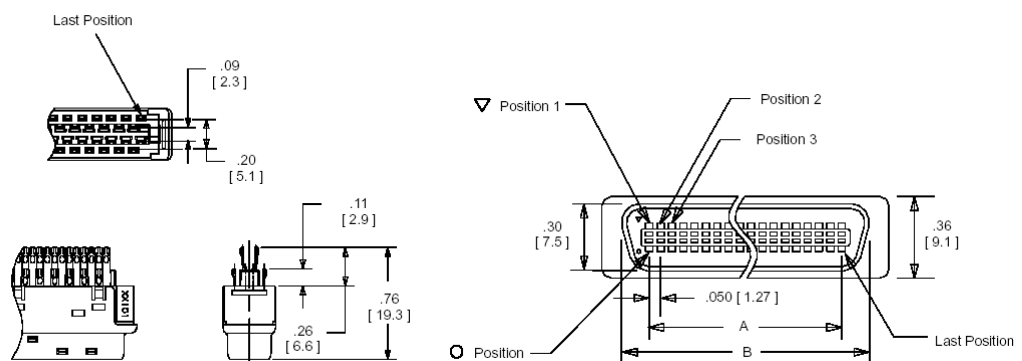
| | | |
|----|---------------|--|
| 46 | DO30/AUTO_MD | general-purpose output 30 / AUTO mode output |
| 47 | DO31/ROBOT_OK | general-purpose output 31 / robot-start preparation complete |
| 48 | DO32/ORG_POS | general-purpose output 32 / original position status output |
| 49 | COMOUT7 | common voltage input (user's power) |
| 50 | COMOUT7 | : +24 V or 0V for DO25~DO32 |

2) Connector Specification

- Board-side : 3M MDR 10250-52A2JL



- Plug-side : 3M MDR 10150-3000VE (HOOD;10350-52F0-008)



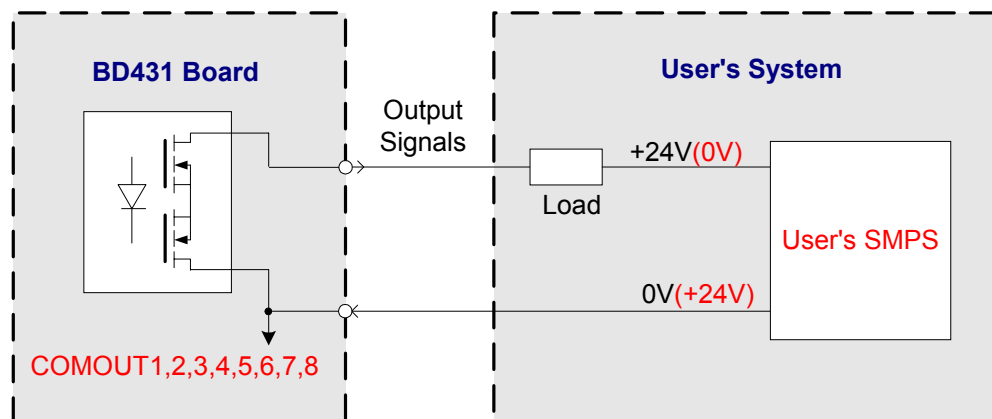
3) Connection Specification

- BD430 Board
 - ✓ output port device : PNP transistor open collector
 - ✓ Output rating = 125mA(Continuous load current), 24VDC

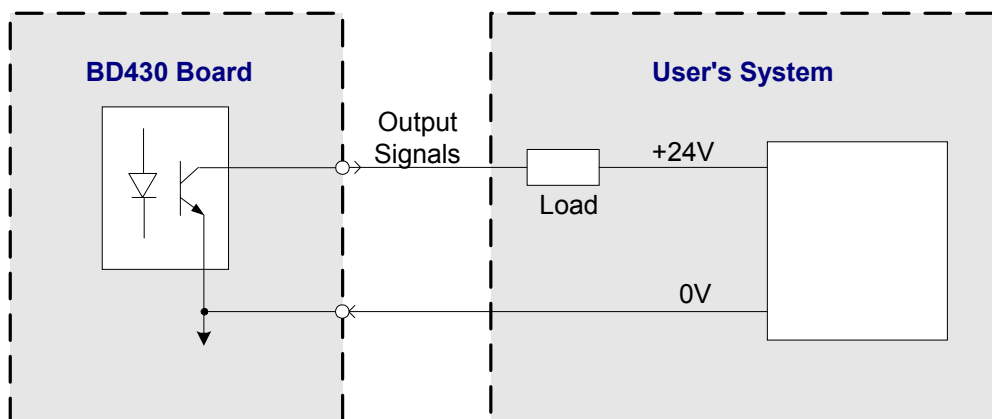
- ✓ Common (-) input voltage = 0VDC
- BD431 Board
 - ✓ output port device : MOS relay
 - ✓ Output rating = 125mA(Continuous load current), 24VDC
 - ✓ Common (+) input voltage = 24VDC
 - ✓ Common (-) input voltage = 0VDC

4) Connection Diagram

- BD431 Board : Common (+) or (-) voltage



- BD430 Board : Common (-) voltage **only**



4. DIP SWITCH SETTING

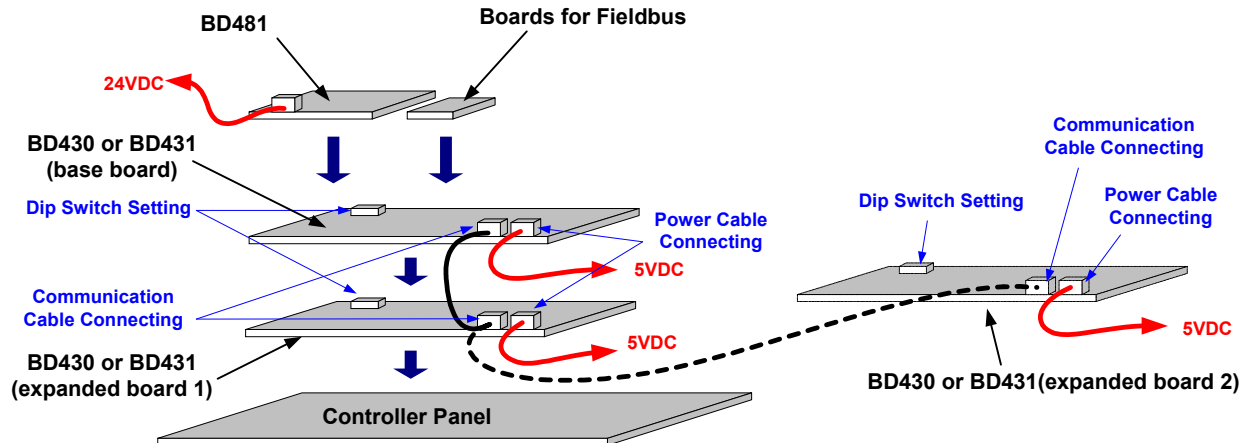
1) BD430 Board

| Pos. No. | Status | Description | Default |
|----------|--------|--|---------|
| 1 | - | Expanded board number setting | OFF |
| 2 | - | Board Number = $2^{(\text{Pos.2})} + 2^{(\text{Pos.1})}$ where Pos.2, Pos.1 = 1 (at ON) 0 (at OFF) | OFF |
| 3 | OFF | BD48X board is not installed. | OFF |
| | ON | BD48X board is installed. | |
| 4 | OFF | AC fault signal (VE) is enabled. | OFF |
| | ON | AC fault signal (VE) is disabled. | |
| 5 | OFF | CPU error signal is disabled. | ON |
| | ON | CPU error signal is enabled. | |
| 6 | OFF | Downloading to Flash Memory(ROM) is disabled. | OFF |
| | ON | Downloading to Flash Memory(ROM) is enabled. | |
| 7 | OFF | Communication Baudrate with Main = 38400bps | ON |
| | ON | Communication Baudrate with Main = 57600bps | |
| 8 | OFF | Normal Operating Mode | OFF |
| | ON | Board Test Mode | |

2) BD431 Board

| Pos. No. | Status | Description | Default |
|-----------|--------|--|---------|
| 1 | - | Expanded board number setting | OFF |
| 2 | - | Board Number = $2^{(\text{Pos.2})} + 2^{(\text{Pos.1})}$ where Pos.2, Pos.1 = 1 (at ON) 0 (at OFF) | OFF |
| 3,4,5,6,7 | - | Reserved | OFF |
| 8 | OFF | Normal Operating Mode | OFF |
| | ON | Board Test Mode | |

5. INSTALLATION



1) BD430 Board

When use BD430 as expanded board,

- Dip switch no. 4 must be on (AC fault signal disabled) and no.5 must be off (CPU ERR signal disabled).
- Dip switch no.1,2 must be set specific expanded board number.(Ref.4-1))
- Install expanded boards, base board (and BD481, board for fieldbus).
- Connect communication cable(RS485), power cable.
- Power on

2) BD431 Board

When use BD431 as expanded board,

- Dip switch no.1,2 must be set specific expanded board number.(Ref.4-2))
- Install expanded boards, base board (and BD481, board for fieldbus).
- Connect communication cable(RS485), power cable.
- Power on