

Installation, Wiring, and Specifications

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Mounting and Wiring Guidelines

Panel Layout & Clearances

There are many things to consider when designing a panel layout. We suggest you consider the following items (but there may be additional requirements depending upon your application).

- The D4-470 must be mounted horizontally for proper ventilation.
- There should be a minimum of 7.2" between the D4-470 and the closest expansion base.
- A minimum clearance of 2" between the D4-470 and the top, bottom, and sides of the cabinet should be provided.
- There must be a minimum clearance of 2" between the panel door and the nearest D4-470, DL205 or DL405 component.
- Connect the ground terminal on the D4-470 to a single point ground. Use copper stranded wire to achieve a low impedance. Copper eye lugs should be crimped and soldered to the ends of the stranded wire to ensure good surface contact. Remove anodized finishes and use copper lugs and star washers at termination points. A rule of thumb is to achieve 0.1 Ω of DC resistance between the D4-470 base and the single point ground.
- There must be a single point ground (e.g. copper bus bar) for all devices in the panel requiring an earth ground return. The single ground point must be connected to the panel ground termination.

The panel ground termination must be connected to earth ground. For this connection you should use #12 AWG stranded copper wire as a minimum. Minimum wire sizes, color coding, and general safety practices should comply with appropriate electrical codes for your area. A good common ground reference (Earth ground) is essential for proper operation of the D4-470, which include:

- a) Installing a ground rod as close to the panel as possible.
 - b) Connection to incoming power system ground.
- Installations where the ambient temperature may approach the lower or upper limits of the specifications should be evaluated carefully. To do this place a temperature probe in the panel, close the door and operate the system until the ambient temperature has stabilized. If the ambient temperature is not within the operating specification for the D4-470, measures such as installing a cooling/heating source must be taken to get the ambient temperature within the D4-470 operating specifications.
 - Device mounting bolts and ground braid termination bolts should be #10 copper bolts or equivalent. Tapped holes instead of nut-bolt arrangements should be used whenever possible. To assure good ground contact on termination areas impediments such as paint, coating or corrosion should be removed in the area of contact.

Enclosures

Your selection of a proper enclosure is important to ensure safe and proper operation of your D4-470 system. Applications of D4-470 systems vary and may require additional features. The minimum considerations for enclosures include:

- Conformance to electrical standards
- Protection from the elements in an industrial environment
- Common ground reference
- Maintenance of specified ambient temperature
- Access to equipment
- Security or restricted access
- Sufficient space for proper installation, cooling, and maintenance

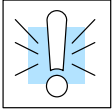
Agency Approvals

Some applications require agency approvals. The D4-470 has received the following agency approvals:

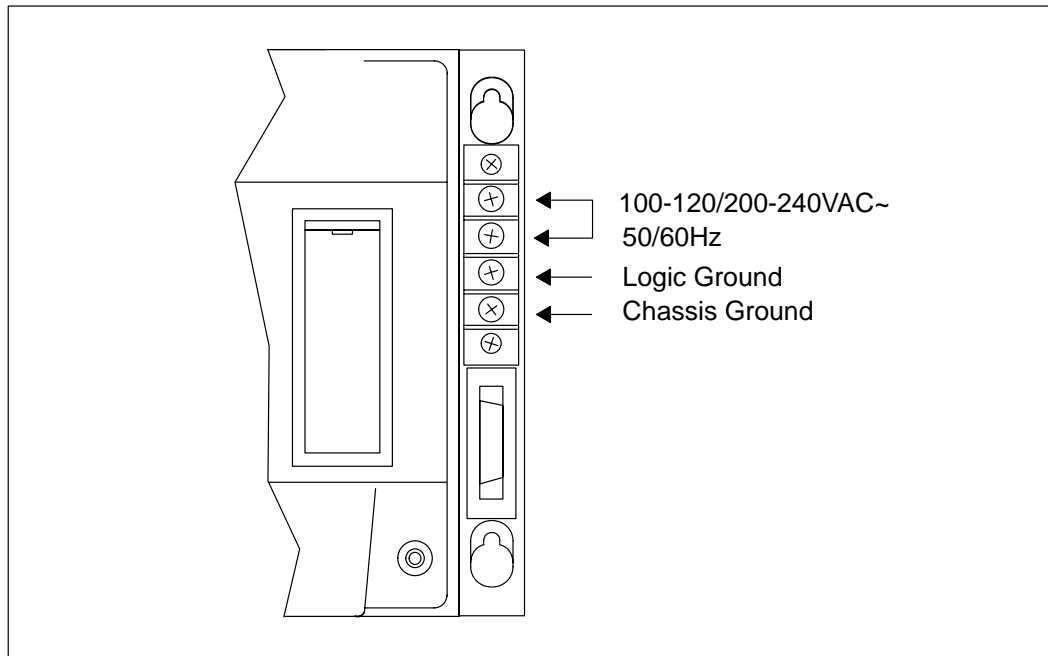
- UL (Underwriter's Laboratories, Inc.)
- CUL (Canadian Underwriter's Laboratories)

Power Wiring

The power wiring is attached to the terminals on the right side of the D4-470. Follow the legend on the upper right corner of the hinged lid as shown in the diagram below.



WARNING: Do not strip wire insulation more than 8–10mm, or approximately 0.3875 inches. Use spade or ring lugs if possible. Exposed conductors longer than this length could make contact with the metal case of the D4-470. Contact between the conductors and the case could be hazardous.



NOTE: We recommend including an on-off switch in the power circuit of the D4-470. This will make it easier to cycle power to the unit when necessary.

Internal Power Supply

The D4-470's internal power supply distributes power to the CPU-board, the CPU fan, the hard disk drive, and the floppy disk drive. Additional power is also available to power the expansion slots. Three voltages are provided to power internal devices: +5, +12, and -12 VDC. You will find the current limits for each voltage in the specifications on page 2-7. Be sure the total power consumption does not exceed the available power limits.

Power Supply Limitations

Many peripheral devices consume more power than the D4-470 can furnish. We recommend that you do not attempt to power external devices using the internal power supply. **Do not attempt to power a CD-ROM drive using the D4-470's internal power supply. Use an external power source.**

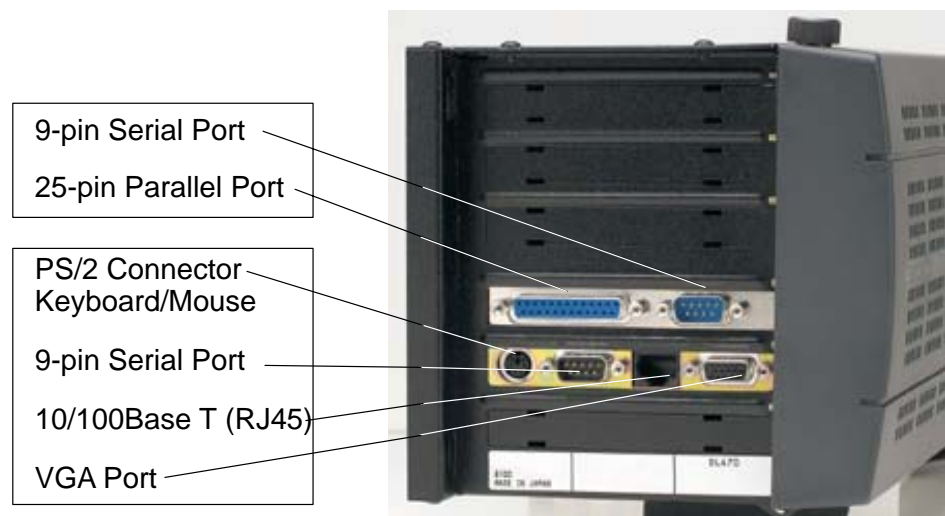
Ports and Connectors

Left Side

On the left side of the D4-470 you will find a standard 15-pin port for your VGA monitor. Follow the recommendations of your monitor's manufacturer in setting up your monitor. The 10/100 Base-T port is compatible with our Ethernet Base Controller or our Ethernet Communications Module. See the manual for those devices for more information about developing or connecting to an Ethernet network. This port is also compatible with standard hubs, routers, etc.

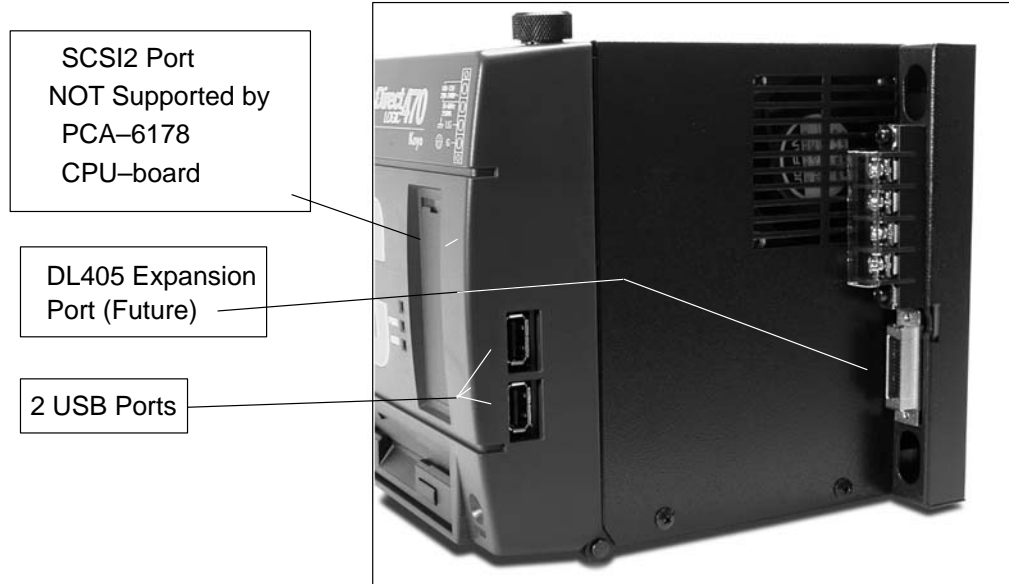
Connect the Y-adapter that came with the D4-470 to the PS/2 connector. The keyboard and mouse that also came with the D4-470 will connect to the other ends of the Y-adapter. Both devices can be used simultaneously with conflict.

As shown below, two serial ports and a parallel port are also provided. Any accessory boards you add will also have ports on the left side of the D4-470.



Right Side

The two USB ports are on the far right side of the D4-470 lid. USB ports are supported by Windows® 98 and Windows® 2000, but at this time they are not supported by Windows® NT. An active DL405 expansion port is located next to the power connections. This port is provided for future use by PC-based Control developers. Software drivers are not currently available to support its use. There is a SCSI2 port located in a recess covered by a snap out plastic door. The SCSI2 is not supported by the PCA 6168 CPU card.



Technical and Environmental Specifications

General Specifications of the D4-470

Item	Specification
External Power Supply	94-120 VAC / 190/240 VAC (Autochange) 50-60Hz
Acceptable Range	85-132 VAC / 170/265 VAC (Autochange) 47-63 Hz
Power Consumption	Max. 250 VA
Internal Power Supply Output Voltage/Current	Max. 5 VDC / 15 A, +12 VDC / 2.3 A, -12 VDC / 0.1 A
Voltage/Current supplied to the Expansion Cards	Max. 5 VDC / 8 A, +12 VDC / 2.1 A, -12 VDC / 0.08 A
Acceptable External Power Drop	Max. 10 ms
Operating Temperature	41-122°F (5-50°C)
Storage Temperature	-4-140°F (-20-60°C)
Operating Humidity	30-80%
Storage Humidity	30-90%
Atmosphere	No corrosive gases, the level for environmental pollution = 2. (UL 840)
Vibration Resistance	Operating: 4.9m/s ² , 5-500Hz (Sine wave) Not Operating: 19.6m/s ² , 5-500Hz (Sine wave)
Shock Resistance	Operating: 392m/s ² , Half-sine wave, 11ms Not Operating: 784m/s ² , Half-sine wave, 11ms
Voltage Withstand	1500VAC
Insulation Resistance	500VDC, 10MΩ
Noise Immunity	Comply with NEMA ICS3-304, impulse 1us 1000V FCC CLASS A
Size	17.36W x 5.9H x 6.3D (in.) / 441W x 150H x 160D (mm)
Weight	5200g
Agency Approvals	UL, CUL

Functional Specifications

Item	Specification
CPU	Intel Celeron® 566MHz processor Replaceable with Socket 370 Pentium® III or Celeron® Processors up to 850MHz
BIOS	AWARD: Flash BIOS, Plug & Play supported, 2Mbit
Chip Set	Intel® 82440BX
Main Memory	168-pin DIMM slot x 3, Max. 768MB SDRAM One stick 128MB pre-installed; 16, 32, 64, 128, or 256MB DIMMs are available (use PC100-compliant)
Cache	128 KB on CPU L2
Video Port	ATI: 3D Rage Pro Turbo VGA controller, Display memory 4MB Max: 1280 x 1024, 24 bit colors Max: 1152 x 864, 32 bit colors 15 pin VGA connector
Keyboard/Mouse Port	PC/AT keyboard supported (Mini DIN 6-pin) D4-470 comes with Y-adapter cable (Mini DIN 6-pin to DIN 5-pin + Mini DIN 6-pin) A keyboard and mouse can be used simultaneously with this adapter
FDD	3.5" FDD (1.44MB/720KB) x 1
IDE HD Interface	2.5" HD bay x 2 (One bay has a 6.0GB HD, the other bay is unoccupied) The height of HD must be less than 9.5mm Transfer speed: 16.67 MB/sec (PIO transfer mode 4) 33MB/sec (Ultra DMA/33 transfer)
Serial Port	2 Ports COM1, 2: RS-232C, 9-pin D-sub connector 16C550 compatible UART Max. 115.2kbps
Parallel Port	1 Port 25-pin D-sub connector This port supports the following modes: SPP (Standard Parallel Port) EPP (Enhanced Parallel Port) ECP (Extended Capabilities Port)
LAN Port	1 Port RJ-45 connector Chipset: Intel 82558 Supports 10/100 Base-T Ethernet networking
SCSI port	Not Supported- No SCSI Interface on CPU-board

Functional Specifications (cont'd)

Item	Specification																		
USB Port	2 Ports, electronically fused USB Type A connector USB Rev 1.0																		
DL405 I/O Expansion Port	Future use																		
Expansion Slot	4 Slots Maximum size of board PCI/ISA slot x 1: 4.8H x 13.3L (inches) 122H x 338L (mm) PCI slot x 2 4.8H x 7.1L (inches) 122H x 180L (mm) 4.8H x 6.7L (inches) 122H x 170L (mm) ISA slot x 1 4.8H x 7.3L (inches) 122H x 185L (mm)																		
RTC/CMOS Backup	Lithium battery (on the CPU board) Battery life of 7 years (77°F - 25°C)																		
LED Indicator	2 Indicators PWR: On when the DC power supply provides 5VDC to the CPU board HDD: On when the internal HDD is accessed																		
Reset Switch	1 Switch																		
Fan	5VDC																		
Terminal Block for the External Power Supply	<table border="0"> <tr> <td>○</td> <td></td> <td></td> </tr> <tr> <td>⊖</td> <td>AC Power</td> <td>□ 94-120VAC/190-240VAC</td> </tr> <tr> <td>⊖</td> <td>AC Power</td> <td></td> </tr> <tr> <td>⊖</td> <td>LG: Logic ground</td> <td></td> </tr> <tr> <td>⊖</td> <td>G: Frame ground</td> <td></td> </tr> <tr> <td>○</td> <td></td> <td></td> </tr> </table> <p>Logic ground and frame ground are internally connected</p>	○			⊖	AC Power	□ 94-120VAC/190-240VAC	⊖	AC Power		⊖	LG: Logic ground		⊖	G: Frame ground		○		
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Dimensions

