

# NODE-600 Series

Industrial Rugged Computer with 4 Expansion Slots



## INTRODUCTION

NODE-600 series is a wall mounted, industrially rugged computer. It is primarily composed by a standard industrial, Intel® based CPU board with standard PC I/Os, a four slots passive backplane, an industrial grade, 75 watts power supply and a 4G DOM as storage, 3 ISA slots and 1 PCI slots or 2 ISA and 2 PCI slots are available for I/O expansion. The card cage is designed to provide versatility to accommodate expansion boards which connector at the front/side as a general PC based card does.

## SPECIFICATIONS

### Standard System Functions

- **CPU Support** Intel® Atom™ 1.6GHz processor
- **System Memory** One 1GB DDR2 standard, 2GB DDR2 optional
- **Storage Device** 4GB DOM standard, 2.5" 40G HDD optional
- **Series Ports** One RS-232 port (COM1) and One RS-422/RS-485 (COM2)
- **Ethernet** One RJ45, 10/100 Based-T
- **Keyboard/Mouse** One standard PS/2 port
- **USB Interface** Support two USB 2.0 ports
- **VGA Port** One DB-15 connector

### Cooling System

Two 8cm double ball bearing fans (42.5CFM) for the CPU unit.

## FEATURES

- Wall mounted, industrially rugged card cage with 3 ISA and 1 PCI slots / 2 ISA and 2 PCI backplane
- Intel® Atom™ N270 1.6GHz industrial grade CPU board
- Fully compatible PC-based peripherals
- Accommodate front or side panel I/O expansions
- Field removed fans and air filter

## APPLICATIONS

- Perfect for "Blended" programmable controls applications
- Flying Probe Tester Machine Controls Applications
- Tube Bending Machine Controls Applications
- Teaching Robot Machine Controls Applications
- Wrapper Machine Controls Applications
- Micro PU Casting Machine Controls Applications
- 11-Axis Spring CNC Machine Controls Applications

### Power Requirements

- +12V@5A max.
- Support AC input 75 watts industrial grade (option)

### Environmental Specifications

- **Operating Temperature** 0 to 50°C
- **Storage Temperature** -20 to +60°C
- **Operating Humidity** 10% to 90%RH, Non-condensing
- **Vibration** 5 to 500HZ 1G RMS Random Vibration

**Expansion Slot:** 3 ISA & 1 PCI / 2 ISA and 2 PCI slots

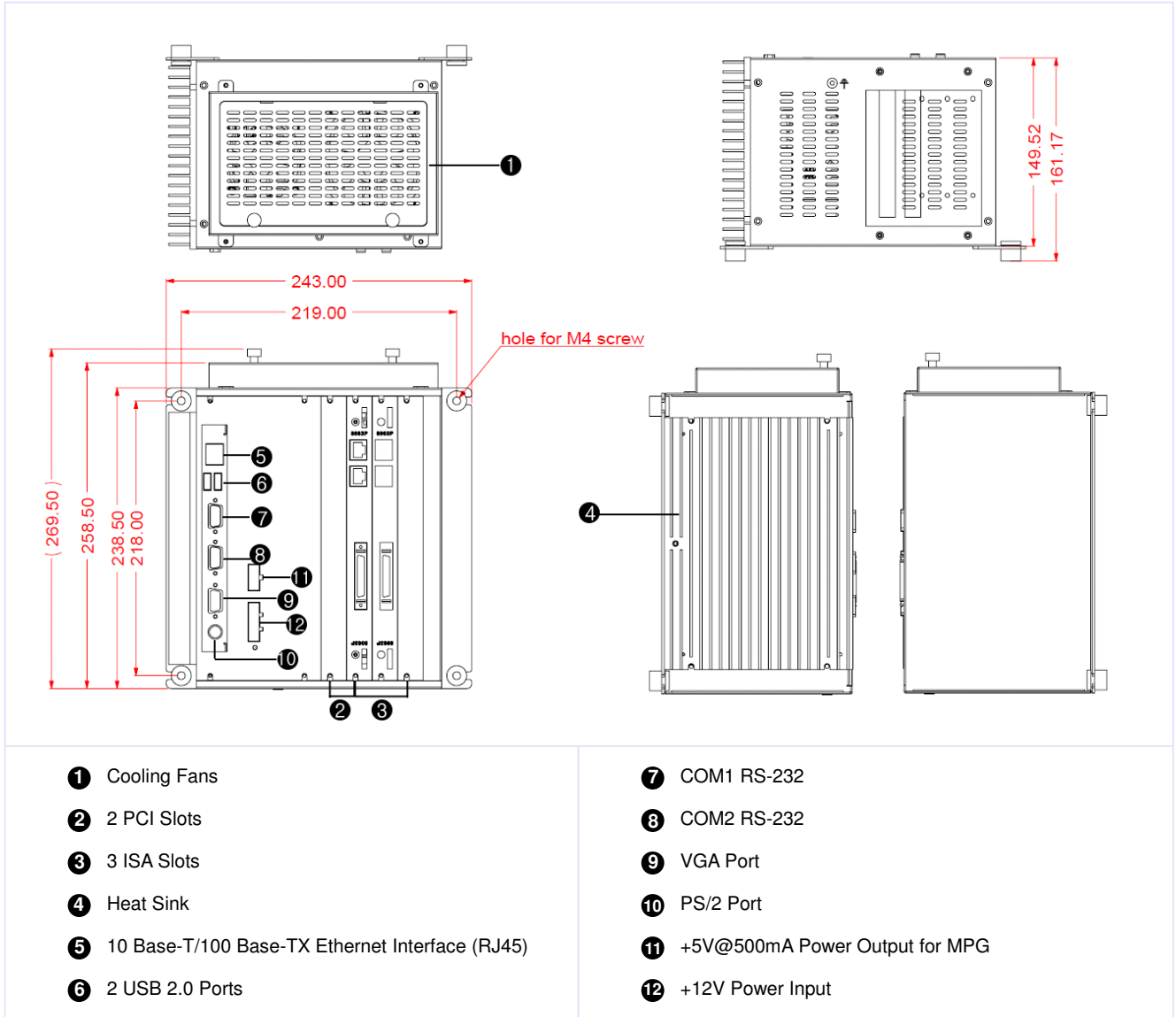
**Dimension (W x H x D):**

243 x 269.5 x 161.1mm (9.57" x 10.6" x 6.3")

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## PRODUCT OVERVIEW



## ORDERING INFORMATION

### INDUSTRIAL RUGGED COMPUTER

- **NODE-600** Industrial Rugged Computer with 4 Expansion Slots

### DISPLAY

- **FPD-080T** 8" Flat Panel Display with Touch Screen
- **FPD-104T** 10.4" Flat Panel Display with Touch Screen
- **FPD-121T** 12.1" Flat Panel Display with Touch Screen
- **FPD-150T** 15" Flat Panel Display with Touch Screen
- **FPD-170T** 17" Flat Panel Display with Touch Screen

### PERIPHERAL I/O BOARD

- **HAL-8063P** High Density, Isolated 40 Local DI/O and Remote 256 DI/O Board
- **HAL-8068** High Density, Isolated 40 Local DI/O, 80 Expansion DI/O and Remote 256 DI/O Board
- **HAL-8184F** Isolated Free-Running 8 A/D & 4 D/A with High Speed Counters on Board
- **HAL-8185F** Isolated Free-Running 8 A/D & 4 D/A Board
- **HAL-8308F** 8 Channels Temperature Control Board
- **PCI-8516** PCI-bus 6-axis Soft Motion Interface Board

### SELECTION GUIDE

#### Display

MODEL	FPD-080T	FPD-104T	FPD-121T	FPD150T	FPD-170T
LCD Display Size	8"	10.4"	12.1"	15"	17"
Max. Resolution	800 x 600	800 x 600	800 x 600	1024 x 768	1280 x 1024
LCD Colors	262K	262K	262K	16.7M	16.2M
Touch Screen Type	Resistive	Resistive	Resistive	Resistive	Resistive

#### System I/O Board

MODEL	HAL-8063P	HAL-8068
Digital I/O Channels	24DI/ 16DO (Extension up to 256 Remote DI/O)	64DI/ 56DO (Extension up to 256 Remote DI/O)
Digital Input Type	Source type or Sink type	Source type or Sink type
Digital Output Type	Source type or Sink type	Source type or Sink type
Isolation	2500 V <sub>DC</sub>	2500 V <sub>DC</sub>
I/O Configuration	Front-end	Front-end

#### Analog I/O Board

MODEL	HAL-8184F	HAL-8185F
Analog I/O Channels	8 A/D with 12-bit resolution & 4 D/A with 16-bit resolution	8 A/D with 12-bit resolution & 4 D/A with 16-bit resolution
A/D Type	Differential	Differential
D/A Type	Single-ended or differential output	Single-ended or differential output
High-Speed Counter	2 channels	--
Isolation	2500 V <sub>rms</sub>	2500 V <sub>rms</sub>
I/O Configuration	Front-end	Front-end

#### Process Control Board

MODEL	HAL-8308F
Control Channels	8 CH. Temperature Controls
A/D Resolution	16 bits
Thermocouple Type	E, J, K, T, R, S
Control Output	PWM Output with 10-bit resolution and
CT Input	8 CH. Current Transformer Input
TC Isolation	500V <sub>DC</sub>
I/O Configuration	Front-end

#### Motion Control Board

MODEL	PCI-8516
Control Channels/ Pulse Output	6-axis pulse train output for position mode
Control Channels/ DAC Output	6-axis 16-bit DAC output for velocity mode
Encoder input Channels	6-axis
Local Digital I/O	26 system DI/O and 26 general I/O
Watchdog Timer	1

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## FLAT PANEL DISPLAY



MODEL	FPD-080T	FPD-104T	FPD-121T	FPD-150T	FPT-170T
LCD Display Size	8"	10.4"	12.1"	15"	17"
LCD Type	SVGA TFT LCD	SVGA TFT LCD	SVGA TFT LCD	XGA TFT LCD	SXGA TFT LCD
Max. Resolution	800 x 600	800 x 600	800 x 600	1024 x 768	1280 x 1024
LCD Colors	16.7M	262K	262K	16.7M	16.2M
Pixel Pitch (mm)	0.2025 x 0.2025	0.264 x 0.264	0.3075 x 0.3075	0.297 x 0.279	0.264 x 0.264
Luminance (cd/m <sup>2</sup> )	250 (Typ.)	300 (Typ.)	400 (Typ.)	300 (Typ.)	300 (Typ.)
Contrast Ratio	500:1 (Typ.)	400:1 (Typ.)	500:1 (Typ.)	800:1 (Typ.)	500:1 (Typ.)
Response Time	20ms (Typ.)	25ms (Typ.)	30ms (Typ.)	8ms (Typ.)	12ms (Typ.)
View Angle (H, V)	125°(H), 140°(V)	130°(H), 100°(V)	130°(H), 110°(V)	140°(H), 140°(V)	140°(H), 130°(V)
Lamp Life Time	50,000/hrs (Typ.)	20,000/hrs (Min.)	50,000/hrs (Min.)	50,000/hrs (Min.)	50,000/hrs (Typ.)
VGA Signal	Analog	Analog	Analog	Analog	Analog
Touch Screen Type	Resistive	Resistive	Resistive	Resistive	Resistive
Power Requirement	20W	30W	30W	30W	40W
Front Panel Compliance	IP65	IP65	IP65	IP65	IP65
Operating Temperature	0 to 50°C	0 to 50°C	0 to 50°C	0 to 50°C	0 to 50°C
Storage Temperature	-20 to 70°C	-20 to 70°C	-20 to 70°C	-20 to 70°C	-20 to 70°C
Dimensions (WxHxD)	230.2 x 176.8 x 56.2mm	336 x 261.9 x 55.6mm	336 x 261.9 x 55.2mm	390 x 314 x 54.2mm	471 x 380 x 48mm
Mounting	Panel mount	Panel mount	Panel mount	Panel mount	Panel mount

### PERIPHERAL I/O BOARD

#### SYSTEM I/O BOARD



##### HAL-8063P

High Density, Isolated 40 Local DI/O and 256 Remote DI/O Board

##### SPECIFICATION

###### Digital Input

Local input channels: 24  
Remote input channels: up to 128 remote digital input  
Input type: source type or sink type  
DC input: 4 ~ 30V<sub>DC</sub>  
Threshold voltage: 3V  
Opto-isolator response time: 20μs  
Over-voltage protect: 50V<sub>DC</sub>  
Response time: <1ms(remote)  
Optical isolated: 2500V<sub>DC</sub>  
Interrupt I/O: edge or level

###### Digital Output

Local output channels: 16  
Remote output channels: up to 128 remote digital output  
Output type: sink type or source type  
Output range: 10 ~ 40 V<sub>DC</sub>  
Opto-isolator response time: 20μs  
Driving capacity: 100mA max./channel  
Response time: <1ms (remote)  
Output initial state: OFF  
Optical isolation: 2500V<sub>DC</sub>

###### Programmable Interval Time

Channel: 1  
Resolution: 16-bit  
Range: 0.5μs ~ 33ms

###### Battery Backup RAM (NVRAM)

Size: 8K Bytes



##### HAL-8068

High Density, Isolated 40 Local DI/O, Expansion 80 DI/O and 256 Remote DI/O Board

##### SPECIFICATION

###### Digital Input

Local input channels: 24  
Expansion input channels: 40  
Remote input channels: up to 128 remote digital input  
Input type: source type or sink type  
DC input: 4 ~ 30V<sub>DC</sub>  
Threshold voltage: 3V  
Opto-isolator response time: 20μs  
Over-voltage protect: 50V<sub>DC</sub>  
Response time: <1ms(remote)  
Optical isolated: 2500V<sub>DC</sub>  
Interrupt I/O: edge or level

###### Digital Output

Local output channels: 16  
Expansion output channels: 40  
Remote output channels: up to 128 remote digital output  
Output type: sink type or source type  
Output range: 10 ~ 40 V<sub>DC</sub>  
Opto-isolator response time: 20μs  
Driving capacity: 100mA max./channel  
Response time: <1ms (remote)  
Output initial state: OFF  
Optical isolation: 2500V<sub>DC</sub>

###### Programmable Interval Time

Channel: 1  
Resolution: 16-bit  
Range: 0.5μs ~ 33ms

###### Battery Backup RAM (NVRAM)

Size: 8K Bytes

#### ANALOG I/O BOARD



##### HAL-8184F

Isolated Free-Running 8 A/D & 4 D/A with High Speed Counters on Board

##### SPECIFICATION

###### Analog Input (A/D)

Channels: 8  
Resolution: 12 bits  
Input type: differential input  
Cycle time: 1ms (free running)  
Input range: ±10V, ±5V, 0-10V, 0-5V  
Software zero/span calibrate  
Connector: 37-Pin female D-sub

###### Analog Output (D/A)

Channels: 4  
Resolution: 16 bits  
Output type: single-ended or differential output  
Cycle time: 128μs (free running)  
Voltage output: ±10V  
Software zero/span calibrate  
Accuracy: 0.1% FSR  
Connector: 37-pin female D-sub

###### High-Speed Counter

Number of counters: 2  
Counter width: 32 bits  
Input frequency: 500KHz  
Data format: excess or 2's complement  
Input interface: DIFF/S.E  
Input types: A/B, up/down or pulse/direction  
A/B phase: x1, x2, x4  
Connector: 37-Pin female D-Sub

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## ANALOG I/O BOARD



### HAL-8185F

Isolated Free-Running 8 A/D & 4 D/A Board

#### SPECIFICATION

##### Analog Input (A/D)

Channels: 8  
Resolution: 12 bits  
Input type: differential input  
Cycle time: 1ms (free running)  
Input range:  $\pm 10V$ ,  $\pm 5V$ , 0-10V, 0-5V  
Current: 0-20mA  
Software zero/span calibrate  
Connector: 37-Pin female D-sub

##### Analog Output (D/A)

Channels: 4  
Resolution: 16 bits  
Output type: single-ended or differential output  
Cycle time: 128 $\mu$ s (free running)  
Voltage output:  $\pm 10V$   
Current drive:  $\pm 5mA$   
Current output: 0-20mA sink  
Current output excitation voltage: 9-44V  
Software zero/span calibrate  
Accuracy: 0.1% FSR  
Connector: 37-pin female D-sub

## PROCESS CONTROL BOARD



### HAL-8308F

8 Channels Temperature Control Board

#### SPECIFICATION

##### Temperature Input (T/C)

Thermocouple: E, J, K, T, R, S  
Channels: 8 (Free-running)  
A/D resolution: 16 bits  
Span: -100°C~1150°C  
Accuracy:  $\pm 1%$  or  $\pm 1^\circ C$   
Resolution:  $\pm 0.3^\circ C$   
Cycle time: 100 ms per CH  
Software zero/span calibrate  
Connector: 5.08mm 16P TB  
T/C open-circuit detection:  
T/C isolation: Photo-MOS contactor & isolation 500V<sub>DC</sub>

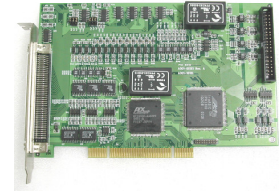
##### PWM Output

Channels: 8  
Output cycle time: 100ms  
Resolution: 10 bits  
Output type: open-collector  
External voltage: +20~+28V  
Output: single 100mA max & total output 350mA max.  
Cable connector: 44P D-Sub

##### Current Transformer Input

Current Transformer Open Detection  
Channels: 8  
Input voltage: 0.5V~4.0V with 0.5V adjustable  
Cable connector: 44P D-Sub

## MOTION CONTROL BOARD



### PCI-8516

6-Axis Soft Motion Interface Board

#### SPECIFICATION

##### Analog Outputs

Channels: 6  
Resolution: 16-bit

##### Pulse Train Outputs

Pulse output format: Pulse/Direction, CW/CCW, A/B phase  
Error counter: 16 bits

##### Encoder Interface

Channels: 6 quadrature differential line drivers  
Signal: Pulse/Direction, CW/CCW, A/B phase  
Max. Count rate: 20MHz  
Mechanism: encoder-loss detection, noise filtering, position compare and latching

##### Programmable Servo Clock

Interval timer channel: 1  
Timer interrupt: 0.1ms – 33ms

##### Watchdog Timer

Channel: 1  
Trigger mode: Under voltage, host failure  
Action: Force DA, DO and disable system state

##### Digital I/O

Input voltage: 20-28VDC, source type or sink type  
Output type: Sink or source type  
Output voltage: 10-40VDC  
Output current: 100mA max per channel