User's Manual

2901280

Version 1.2

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SAFETY PRECAUTIONS

1 Prior to installing, moving, and modifying the panel PC, make sure the power is turned off and the power cord is disconnected.

2 Do not apply voltage levels that exceed the specified voltage range. Doing so will cause fire or an electrical shock.

3 Electric shocks can occur if the panel is opened. Do not drop or insert any objects into the ventilation openings of the panel PC.

4 Only qualified engineers from certified system integrators or VARs are allowed to make necessary functional modifications to the panel PC, e.g., adding a touch screen. Global American, Inc. (GAI) offers the customization service on a pre-order basis.

5 For installations related to human safety, connect a separately installed mechanical switch instead of the panel PC's power switch.

6 Designs with stand-alone and fault-tolerant hardware considerations should be implemented using the series models as a critical alarm or production line control.

7 If considerable amount of dust, water, or fluids entered the panel PC, turn off the power supply immediately, unplug the power cord, and contact the MPC industrial panel PC vendor.

8 Explosions may occur with installations in environments where flammable gases are present.

9 Fault-tolerant and failsafe designs should be implemented with the use of the series models on transportation vehicles, ships, safety/security devices, or medical devices not related to life-support functions. Users/integrators should take the responsibility for implementations with adequate levels of reliability and safety.

10 Preventive designs should be implemented so as to avoid the communications faults between the panel PC and the PC/workstation/terminals that controls it.

FURTHER PANEL PC PRECAUTIONS

1 Do not drop the panel PC against a hard surface. Doing so will damage the display.

2 Do not strike or exert excessive force onto the touch panel.

3 Touching the touch panel using a sharp object will damage the LCD panel.

4 Avoid environments exposed to direct sunlight, dust, or chemical vapors.

5 The panel PC is actively cooled. In no circumstances should the panel PC operate with the openings obstructed by foreign objects. However, the ambient temperature of the installation site should be observed and controlled to avoid overheating the panel PC.

6 Condensation might form inside the panel PC chassis if exposed to sudden changes in temperature.

7 Carefully route the power cord so that people cannot step on it. Do not place anything over the power cord.

8 If the equipment should be left unused for an extended period of time, disconnect it from the power source to avoid damage by transient over-voltage.

9 If any of the following situations arises, get the equipment checked by service personnel:

- The power cord or plug is damaged.
- Liquid has penetrated into the equipment.
- The equipment has been exposed to moisture.
- The equipment does not work properly, or cannot be made to work according to the user manual.
- The equipment has been dropped and damaged.
- The equipment shows obvious signs of breakage.

WARNING!

Any changes or modifications made to the equipment that are not expressly approved by the relevant standards could void the authority to operate the equipment.

ADDITIONAL INFORMATION AND ASSISTANCE

Maintain and Cleaning

Note the following precautions before starting to clean the panel PC.

When cleaning any single part or component of the computer, please read and understand the details below fully.

1 Except for the properly installed front LCD panel, never spray or squirt liquids directly onto any computer component. If the device needs to be cleaned, please rub it with a piece of dry and soft cloth or a slightly moistened cloth with the exterior casing.
2 The interior of the panel PC does not require cleaning. Keep fluids away from the panel PC and the interior of it.
3 Be cautious of the tiny removable components when using a vacuum cleaner to absorb the dirt on the floor.
4 Turn the system off before starting to clean up the panel PC.
5 Never drop any tiny objects through the openings of the panel PC or get circuit board damp or wet.
6 Be cautious of all kinds of cleaning solvents or chemicals when using them for the sake of cleaning. Some individuals may be allergic to the ingredients.
7 Avoid any food, drink or cigarette around the panel PC.

Cleaning Tools

Although many companies have created products to help improve the process of cleaning Panel PCs and peripherals, users can also use household items to clean their computers and peripherals. Below is a list of some items that may be needed or used when cleaning the panel PC or panel PC peripherals.

Please keep in mind that some components in panel PC components may only be cleaned using a product designed for cleaning that component, if this is the case it will be mentioned in the cleaning tips.

1 ***Cloth*** - A piece of cloth is the best tool to use when rubbing up a component. Although paper towels or tissues can be used on most hardware as well, it is still recommended that a piece of cloth is used to rub it.
2 ***Water or rubbing alcohol*** – Moisten a piece of cloth a bit with some water or rubbing alcohol and rub it on the computer.
3 Unknown solvents may be harmful to the plastics parts.
4 ***Vacuum cleaner*** - Absorb the dust, dirt, hair, cigarette particles, and other particles out of a computer can be one of the best methods of cleaning a computer. Over time these items can restrict the airflow in a computer and cause circuitry to corrode.

5 ***Cotton swabs*** - Cotton swaps moistened with rubbing alcohol or water are excellent tools for wiping hard to reach areas in the keyboard, mouse, and other locations.

6 ***Foam swabs*** - Whenever possible it is better to use lint free swabs such as foam swabs.

ESD PRECAUTIONS

Observe all conventional anti-ESD methods while handling the components contained within the LCD should the need arise for adding a functionality. The use of a grounded wrist strap and an anti-static work pad is recommended. Avoid dust and debris or other static-accumulating materials in the work area.

CONVENTIONS USED IN THIS MANUAL

WARNING!

Warnings appear where overlooked details may cause damage to the equipment or result in personal injury. Warnings should be taken seriously. Warnings are easy to recognize. The word “warning” is written as “**WARNING**,” both capitalized and bold and is followed by text in italics. The italicized text is the warning message.

CAUTION!

Cautionary messages should also be heeded to helps reduce the chance of losing data or damaging the system. Cautions are easy to recognize. The word “caution” is written as “**CAUTION**,” both capitalized and bold and is followed by text in italics. The italicized text is the cautionary message.

NOTE:

These messages inform the reader of essential but non-critical information. These messages should be read carefully as any directions or instructions contained therein can helps avoid making mistakes. Notes are easy to recognize. The word “note” is written as “**NOTE**,” both capitalized and bold and is followed by text in italics. The italicized text is the cautionary message.

Lists

Bulleted Lists: Bulleted lists are statements of non-sequential facts that can be read in any order. Each statement is preceded by a black square “□” or bullets in other shapes.

Numbered Lists: Numbered lists describe sequential steps should be followed in order.

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Chapter

1

Introduction

1.1 2901280 Flat Panel PC Overview

The 2901280 flat panel PC is a flexible, multi-functional flat panel PC that can be applied in diverse operational environments and implemented in multi-faceted applications. The 2901280 comes fully kitted with a high-performance motherboard, CPU, power supply unit and a host of other peripheral interface connectors. The 2901280 is designed for ease of use and easy installation.

1.1.1 2901280 Model Variation

Two 2901280 models are available. The models are listed in **Table 1-1**.

2901280	CPU	Socket	Touch screen
2901280A	Intel Pentium 4 / Celeron D FSB 533MHz	Socket 478	No
2901280B	Intel Pentium 4 / Celeron D FSB 533MHz	Socket 478	Yes

Table 1-1: 2901280 Model Variation

1.1.2 2901280 Flat Panel PC Applications

The 2901280 flat panel PC is designed for rigorous industrial environments where it may be exposed to both heat and moisture. Its durability and strength also makes it an ideal choice for public access computers. Some possible applications include:

- Automated manufacturing processes
- Public information gathering point

1.1.3 2901280 Flat Panel PC Features

Some of the features of the 2901280 flat panel PC include:

- Main stream panel PC designing with dual display function.
- Aluminum die-casting front panel meet IP65 water proof standard
- High performance Intel Pentium 4 / Celeron CPU support
- Dual DDR memory DIMM support up to 2GB SDRAM

- Serial ATA-150 connections
- Easy installing mechanism design
- High brightness 15” industrial grade panel
- Fully I/O function support:
  - 6 x COM (1 for Touch Screen)
  - 4 x USB 2.0 ports
  - 1 x PCI slot
  - 1 x CF socket
- Dual 10/100/Gigabit Ethernet supported
- RoHS compliance

1.2 2901280 External Overview

1.2.1 General Description

The 2901280 flat panel PC is a rectangular cubic structure that comprises of a screen, rear panel, top panel, bottom panel and two side panels (left and right). An aluminum frame surrounds the front screen. The rear panel provides screw holes for a wall-mounting bracket, and an arm mounting interface. The right panel provides access to a slim type CD drive bay and a floppy disk drive bay. The bottom panel provides access to external interface connectors that include GbE, USB 2.0, audio, parallel port, serial port connectors and CF card slot.

1.2.2 Front Panel

The front side of the 2901280 is a flat panel 15” TFT LCD screen surrounded by an aluminum frame.

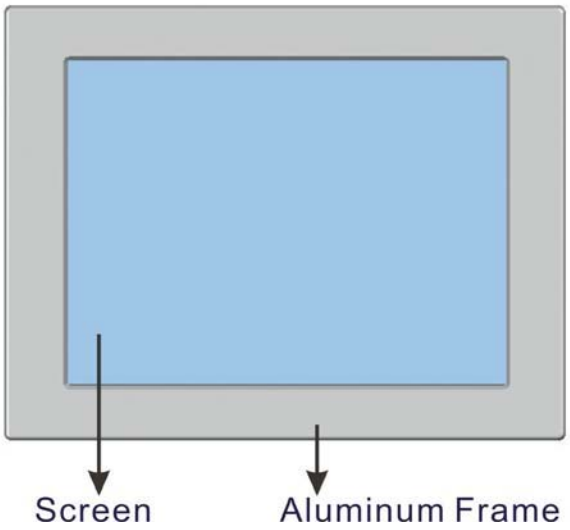

Figure 1-1: 2901280 Front View

1.2.3 Rear Panel

The rear panel provides access to fan ventilation vents and four retention screw holes that support a wall-mounting bracket. The retention screw holes are circled in **Figure 1-2**.

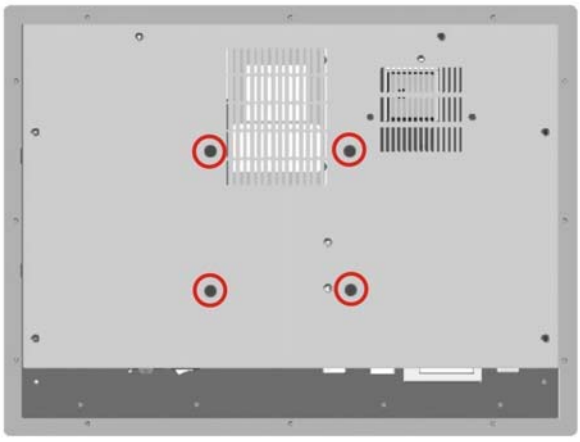

Figure 1-2: 2901280 Rear View

1.2.4 Top Panel

The top panel provides access to two retention screw holes that support to secure the elevated platform to the chassis. The retention screw holes are circled in **Figure 1-3** below.

Figure 1-3: 2901280 Top View

1.2.5 2901280 Bottom Panel

The bottom panel shown in **Figure 1-4** has the following interfaces:

- 1 x Power input connector
- 1 x Power switch
- 4 x USB connectors
- 1 x Reset button
- 2 x RJ-45 GbE connectors
- 2 x PS/2 keyboard/mouse connector
- 4 x Serial port (COM) connectors
- 1 x PCI add-on card slot
- 1 x Parallel port connector
- 3 x Audio jacks
- 1 x VGA connector
- 1 x Compact Flash slot

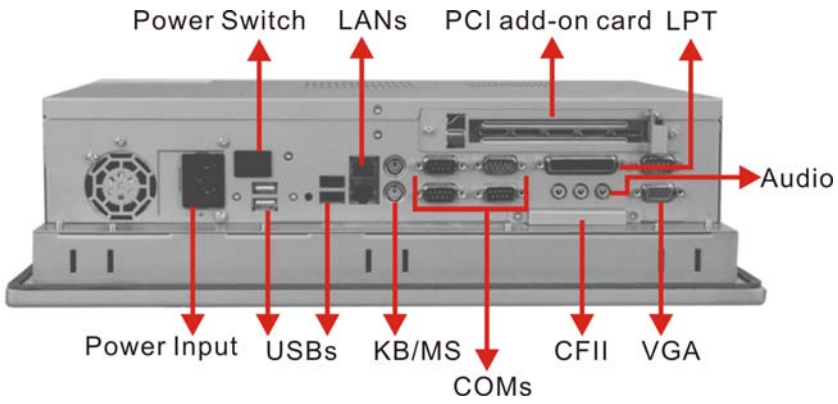

Figure 1-4: Bottom View

1.2.6 Left Panel

The left side panel provides access to two fan ventilation vents. (See **Figure 1-5**)

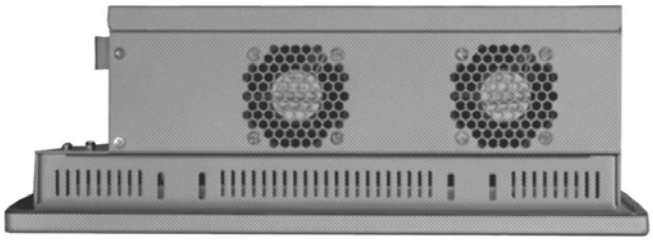

Figure 1-5: Right View

1.2.7 Right Panel

The right side panel provides access to a slim type CD drive bay and a FDD drive bay. (See **Figure 1-6**)

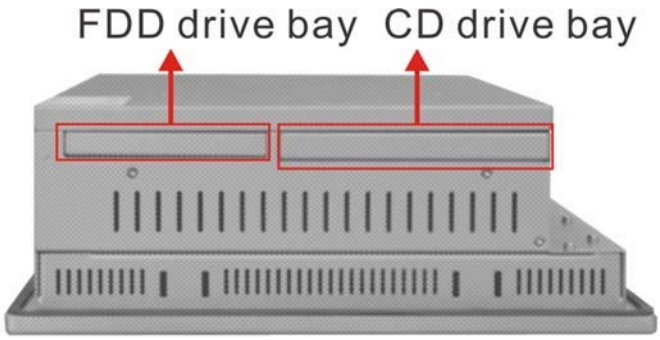

Figure 1-6: Left View

1.2.8 Frame

An aluminum frame surrounds the 15” TFT LCD screen. This aluminum frame has 12 small screw holes that are used when the flat panel PC is mounted into a rack-mounting bracket. These screws are circled in **Figure 1-7**.

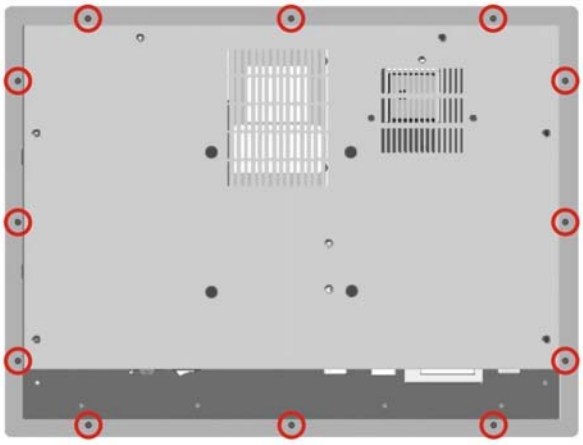

Figure 1-7: Frame Rear View (12 panel mount retention screw holes)

1.3 2901280 Internal Overview

The 2901280 internal components are configured in a three level format. An elevated platform on the right side of the chassis supports a HDD, a CD drive and a FDD. On the second level, below the elevated platform, are a motherboard and a PSU module. The motherboard and the PSU module are installed on a metal sheet that protects the rear of the 15" TFT LCD screen. Below the metal sheet is a circuit board that is connected to the screen and the motherboard.

1.4 2901280 Specifications

1.4.1 Preinstalled Hardware Components

The 2901280 flat panel PC has the following preinstalled components:

- 1 x Motherboard
- 1 x 15" TFT LCD screen
- 1 x Power supply

The technical specifications for these components and the system are shown in the sections below.

1.4.2 System Specifications

The technical specifications for the 2901280 system are listed in **Table 1-2**.

SPECIFICATION	DETAIL
Front Panel	Aluminum Front Panel meets IP65 standard
Chassis	Heavy-duty Steel
LCD Panel	15” High luminance TFT LCD
Resolution	1024 x 768 (XGA)
Brightness	350 cd/m2
Contrast Ratio	400:1
LCD MTBF	50,000 hrs
Backlight MTBF	30,000 hrs
Viewing Angle (H-V)	120/100
Touch Screen	Optional 5-wire resistive type touch screen with RS-232 interface
Display	Support Dual Display
Add-On Card (Optional)	Support PCI and CFII
Drive Bay	One 2.5” HDD bay with anti-shock One slim type CD drive bay One slim type FDD bay
Power	Input voltage: 100~240V AC, 50~60 Hz Output Rating: 180W Output voltage: 3.3V@16.8A, 5V@12A,12V@10A, -12V@0.8A, 5VSB@2A
Mounting Feature	Panel, Arm, Wall, or Rack/Cabinet
Color	Silver (PANTONE PMS-8001)
Operating Temperature	0~50 °C
Relative Humidity	5 ~ 95%, non-condensing

Vibration	5 - 17Hz, 0.1" double amplitude displacement.17 - 640Hz, 1.5G acceleration, peak to peak.
Shock	10G Acceleration, peak to peak (11ms)
Dimensions	410(W) x 309(H) x 110(D) mm
Net/Gross Weight	7/11 Kg
Environment	RoHS Compliant

Table 1-2: 2901280 Specifications

1.4.3 2901280 Motherboard Specifications

The 2901280 comes with a 2804140 motherboard. The technical specifications of the motherboard are listed in **Table 1-3**.

SPECIFICATION	DETAIL
CPU	Socket-478 base Intel Pentium 4 / Pentium 4-M / Celeron D
Northbridge	852GME
Southbridge	ICH5
Max. FSB	533 MHz
Memory	2 x DDR 266/333 DIMM socket up to 2GB
BIOS	AMI BIOS Label
Display	CRT integrated in Intel 852GME LVDS Dual 18-bit TTL LCD integrated in Intel 852GM
Expansion Interface	1 x PCI slot 1 x CFII
Audio	AC' 97 Codec
Ethernet	2 x Realtek RTL8110SC GbE controller
COM	1 x RS-232/422/485 port

	5 x RS-232 ports (1 for optional touch screen)
USB 2.0	4 x USB 2.0 ports
Drive Interfaces	2 x SATA drive connectors
LPT	2 x ATA 100 channels
KB/ MS	2 x PS/2 connector
IrDA	1 x IrDA interface

Table 1-3: Motherboard Specifications

1.4.4 Flat Panel Screen

The 2901280 comes with a 15" TFT LCD monitor at the front of the flat panel PC (see **Figure 1-1**). The specifications for the LCD monitor are shown in **Table 1-4** below.

SPECIFICATION	DETAILS
Model	AUO-G150XG01
Size	15"
Resolution	XGA (1024 x 768)
Active Area (mm)	304.1 x 228.1
Pixel Pitch (mm)	0.297
Mode	TN
Number of Colors	262K
Color Saturation (%)	60
View Angel (H/V)	120/100
Brightness (cd/m2)	350
Contrast Ratio	400:1
Response Time (ms) (at 25°C)	16
Power Consumption (W)	11.5

Interface	1ch LVDS
Supply Voltage (V)	3.3
Backlight	2 CCFL
Outline Dimensions (mm)	326.5 x 253.5 x 12.0
Weight (g)	1100

Table 1-4: 15" TFT LCD Monitor Specifications

1.4.5 Power Supply

The 2901280 flat panel PC comes with an 180W AC-DC 1U, RoHS compliant ATX power supply. The PSU has an MTBF greater than 100,000 hours. The maximum power output for the PSU is shown below.

1 +3.3V and +5V Combined Power 61W MAX
2 +3.3V, +5V and +12V Combined Power 160W MAX

WARNING:

Under no circumstances is the PSU case to be opened. The PSU module is not user serviceable and there are dangerous high-voltages inside the case. If there are any problems with the PSU module, please contact the dealer or reseller immediately.

The specifications for the PSU module are shown in (**Table 1-5**).

INPUT	**Voltage**	**90V ~ 264VAC Full Range**
	Frequency	**47 ~ 63Hz**
	Input Current	**4A(RMS)@115VAC** **2A(RMS)@230VAC**

	Inrush Current	**50A Max for 115VAC** **80A Max for 230VAC**				
OUTPUT	**Voltage (V)**	**+3.3V**	**+5V**	**+12V**	**-12V**	**5VSB**
	Min. Load (A)	**0.3A**	**0.3A**	**1.5A**	**0A**	**0A**
	Max. Load (A)	**16.8A**	**12A**	**10A**	**0.8A**	**2A**
	Ripple and Noise (mV)	**50mV**	**50mV**	**120mV**	**120mV**	**50mV**
	+3.3V & +5V 61W **+3.3V & +5V & +12V 160W**					
GENERAL	**Watt**	**180W**				
	PFC	**Active**				
	Hold-up time	**17ms minimum**				
	Efficiency	**68%**				
	MTBF	**100,000hrs**				
	Temperature	**0~50˚C (Operating)** **-20~80˚C (Storage)**				
	Dimension	**150mm (W) x 81.5mm(H) x 40.5mm (D)**				

Table 1-5: Power Supply Specifications

1.5 Dimensions

The dimensions of the 2901280 flat panel PC are shown in **Figure 1-8** below.

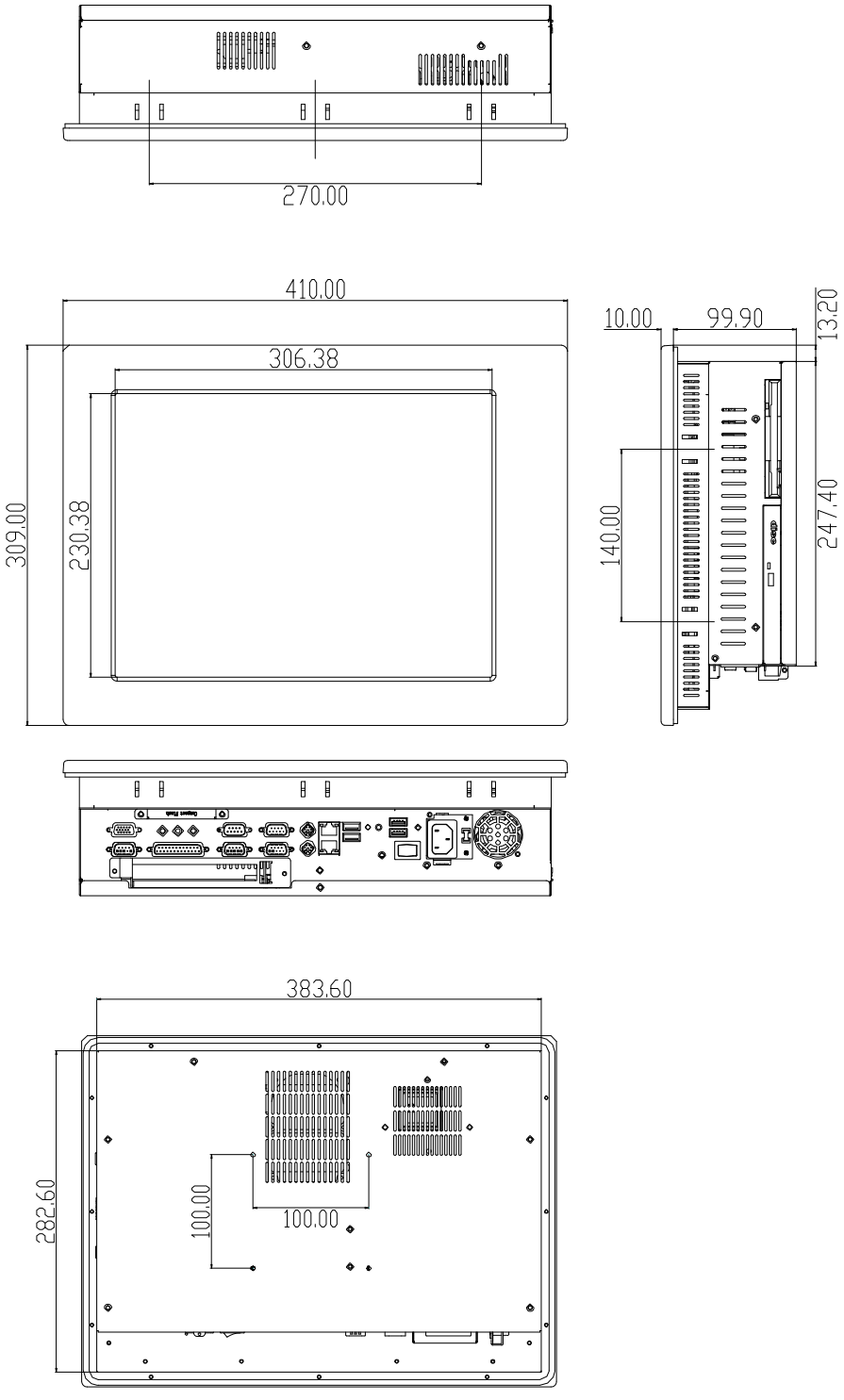

Figure 1-8: Dimensions (units in mm)

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Chapter

2

2804140 Motherboard

2.1 Introduction

The 2901280 flat screen PC contains a 2804140 motherboard. The motherboard is the heart of any computer and is responsible for transmitting, receiving and processing data as well as driving the different on-board devices. This chapter gives a brief introduction to the 2804140 motherboard. For more complete details on the connectors and the different implementations of the 2804140, please refer to the 2804140 user guide.

2.2 CPU Support

The 2804140 installed in the 2901280 supports socket 478, Intel Pentium 4 / Celeron D FSB 533 MHz CPU.

2.3 On-board Chipsets

2.3.1 Northbridge and Southbridge Chipsets

The following chipsets are preinstalled on the board:

- **Northbridge**: Intel 852GM
- **Southbridge**: ICH5

The following two sections (**Section 2.3.2** and **Section 2.3.3**) list some of the features of the 852GME and the ICH5 chipsets. For more information on these two chipsets please refer to the Intel website.

2.3.2 852GME Northbridge Chipset

The 852GME northbridge chipset comes with the following features:

- Supports the Intel Pentium 4 processor and Intel Celeron processor with Intel NetBurst® microarchitecture
- 400 MHz or 533 MHz system bus delivers a high-bandwidth connection between the processor and the platform
- Integrated graphics utilizing Intel® Extreme Graphics 2 technology
- AGP 4X support
- Three USB host controllers support up to six USB 2.0 ports.

- The latest AC '97 implementation delivers 20-bit audio for enhanced sound quality and full surround sound capability.
- LAN Connect Interface (LCI) provides network solutions for 10/100 Mbps Ethernet and 10/100 Mbps Ethernet with LAN manageability
- Dual Ultra ATA/100 controllers
- Error Correcting Code (ECC) support in integrated graphics mode only
- The Intel Application Accelerator software provides additional performance over native ATA drivers by improving I/O transfer rates and enabling faster O/S load time, resulting in accelerated boot times
- Display
  - Analog display support
  - Dual independent pipe support
  - DVO (DVOB and DVOC) support
  - Dedicated Local Flat Panel (LFP) LVDS interface
- Intel® Embedded Graphics Drivers
  - Graphics interface support
  - Multi-monitor support
  - Dynamic display-mode support
  - Embedded video BIOS

2.3.3 ICH5 Southbridge Chipset

The ICH5 southbridge chipset comes with the following features:

- PCI Bus Interface
  - New: Supports PCI Revision 2.3 Specification at 33 MHz
  - 6 available PCI REQ/GNT pairs
  - One PCI REQ/GNT pair can be given higher arbitration priority (intended for external 1394 host controller)
  - Support for 44-bit addressing on PCI using DAC protocol
- Integrated LAN Controller
  - Integrated ASF Management Controller
  - WfM 2.0 and IEEE 802.3 Compliant
  - LAN Connect Interface (LCI)
  - 10/100 Mbit/sec Ethernet Support
- Integrated Serial ATA Host Controllers
  - Independent DMA operation on two ports.

- Data transfer rates up to 1.5 Gb/s (150 MB/s).
- RAID Level 0 Support (ICH5R Only)

„ Integrated IDE Controller

- Supports “Native Mode” Register and Interrupts
- Independent timing of up to 4 drives
- Ultra ATA/100/66/33, BMIDE and PIO modes
- Tri-state modes to enable swap bay

„ Interrupt Controller

- Supports up to 8 PCI interrupt pins
- Supports PCI 2.3 Message Signaled Interrupts
- Two cascaded 82C59 with 15 interrupts
- Integrated I/O APIC capability with 24 interrupts
- Supports Front Side Bus interrupt delivery

„ High-Precision Event Timers

„ 1.5 V operation with 3.3 V I/O

- 5V tolerant buffers on IDE, PCI, USB Overcurrent and Legacy signals

„ Integrated 1.5 V Voltage Regulator (INTVR) for the Suspend wells

„ Enhanced DMA Controller

- Two cascaded 8237 DMA controllers
- PCI DMA: Supports PC/PCI — Includes two PC/PCI REQ#/GNT# pairs
- Supports LPC DMA
- Supports DMA Collection Buffer to provide Type-F DMA performance for all DMA channels

„ Real-Time Clock

- 256-byte battery-backed CMOS RAM
- Integrated oscillator components
- Lower Power DC/DC Converter implementation

2.4 Graphics Support

The Intel® Extreme Graphics 2 is integrated on the Intel® 852GME Northbridge chipset. The Intel® Extreme Graphics 2 features are listed below.

„ **Enhanced Rapid Pixel and Texel Rendering**: Optimized visual quality and performance from the addition of hardware to support of texel formatting, bicubic filter, color blending accuracy, and video mixing render, resulting in

optimized visual quality and performance.

- **Zone Rendering 2 Technology**: Enhances the performance of zone rendering by using larger zones and new commands that improve graphics pipeline efficiency.
- **Dynamic Video Memory Technology v2.0**: Increases total system performance by optimizing the efficiency of AGP dynamic video memory by increasing its size of Video RAM allocation to 96 MB.
- **Enhanced Intelligent Memory Management**: Improves memory bandwidth efficiency and platform performance by improving the memory management arbitration between CPU, system memory and graphics memory.

Intel® Extreme Graphics 2 specifications are listed below:

- Enhanced 2D:
  - 256-bit internal path
  - 8/16/32bpp
  - DirectDraw*, GDI, GDI+
  - Anti-aliased text support
  - Alpha blending
  - Alphas stretch blitter
  - Hardware alpha blended RGB cursor
  - Color space conversion
  - 5x2 overlay support
  - Rotate, scale and translate operations
- High-performance 3D:
  - 256-bit internal path
  - 32bpp/ 24ZorW/ 8 Stencil
  - DX7*/DX8*/OGL*1.1
  - DXTn texture compression
  - Up to 4 textures / pixel on a single pass
  - Cubic reflection map
  - Embossed/DOT3 bump mapping
  - Multi-texture
  - DOT3 bump-mapping
  - Point sprites
- Video and Display:

- DirectShow*/DirectVA*
- Hardware motion compensation support for DVD playback
- 4x2 overlay filter
- 350 MHz DAC frequency
- Maximum DVO pixel rate of up to 330MP/s
- Flat panel monitors and TV-out support via AGP Digital Display (ADD) cards
- 350 MHz DAC for 1800x1440 @ 85Hz max CRT resolution or 2048x1536@60Hz max FP resolution
- Synchronous display for dual monitor capabilities
- 350MHz RAMDAC for up to QXGA analog monitor support
- Dual DVO ports for up to QXGA digital display support
- Multiple display types (LVDS, DVI, TV-out, CRT)

2.5 Peripheral Device Interfaces, Connectors, and Slots

The peripheral device connectors, interfaces and slots on the 2804140 motherboard are listed in the sections below.

2.5.1 OEM Options

Many of the peripheral device connectors listed below are not connected to any devices. These connectors are reserved for OEM customizations. For a customized option, please contact the GAI sales representative.

2.5.2 Internal Slots

The slots listed below can all be found on the 2804140 motherboard.

- 2 x DDR DIMM sockets
- 1 x CFII slot
- 1 x PCI slot

2.5.3 Internal Peripheral Device Connectors

The peripheral device connectors listed below are located on the 2804140 motherboard. Pinouts for these connectors can be found in ***Appendix A***.

- 1 x ATX 12V power connector
- 1 x ATX power connector
- 2 x Audio connectors
- 1 x DIO connector
- 3 x Fan connectors
- 1 x FDD connector
- 2 x IDE device connectors
- 1 x IrDA connector
- 1 x Keyboard connector
- 1 x PS/2 mouse connector
- 1 x LCD backlight connector
- 1 x LVDS interface connector
- 1 x Multi panel connector
- 1 x Parallel port connector
- 1 x Reset connector
- 2 x Serial ATA connectors
- 5 x Serial port connectors
- 6 x USB connectors
- 1 x VGA connector

2.5.4 External Peripheral Device Connectors

The peripheral device connectors listed below are located on the rear panel of the 2804140 motherboard. Pinouts for these connectors can be found in ***Appendix A***.

- 3 x Audio jack connectors
- 1 x Keyboard connector
- 1 x Mouse connector
- 2 x RJ-45 Ethernet connectors
- 1 x Serial port connector (COM)
- 1 x VGA connector
- 2 x USB ports

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Chapter

3

Installation and Configuration

3.1 Installation Precautions

When installing the 2901280, please follow the precautions listed below:

1. **Power turned off**: When installing the 2901280 make sure the power is off. Failing to turn off the power may cause severe injury to the body and/or damage to the system.
2. **Certified Engineers**: Only certified engineers should install and modify on-board functions.
3. **Mounting**: The 2901280 is a heavy device. When mounting the system onto a rack, panel, wall or arm please make sure that at least two people are assisting with the procedure.
4. **Anti-static Discharge**: If a user open the rear panel of the 2901280, to configure the jumpers or plug in added peripheral devices, ground themselves first and wear and anti-static wristband.

3.2 Preinstalled Components

The following components are all preinstalled.

- Motherboard
- 15” TFT LCD
- 15” Touch screen (touch screen model only)
- Power switch
- Power supply
- Inverter board
- PCI riser card
- System cooling fans

Preinstalled OEM customizations may include the following.

- CPU
- HDD
- FDD
- CD drive
- DIMM

Removal and reinstallation of some of the components are described in **Chapter 4**.

3.3 Installation and Configuration Steps

The following installation steps must be followed.

Step 1: Unpack the 2901280.

Step 2: Set the jumper settings

Step 3: Install HDD, FDD and CD drive

Step 4: Mount the 2901280 flat panel PC.

Step 5: Connect peripheral devices to the bottom panel of the 2901280

Step 6: Configure the system

3.4 Unpacking

To unpack the 2901280 flat panel PC, follow the steps below:

WARNING!

The front side LCD screen has a protective plastic cover stuck to the screen. Only remove the plastic cover after the 2901280 flat panel PC has been properly installed. This ensures the screen is protected during the installation process.

Step 1: Use box cutters, a knife or a sharp pair of scissors to cut the tape that seals the top side of the external (second) box.

Step 2: Open the external (second) box.

Step 3: Use box cutters, a knife or a sharp pair of scissors to cut the tape that seals the top side of the internal (first) box.

Step 4: Lift the monitor out of the boxes.

Step 5: Remove both polystyrene ends, one from each side.

Step 6: Make sure all the components listed in the packing list are present.

3.4.1 Packing List

The 2901280 flat panel PC is shipped with the following components:

- 1 x Carton
- 1 x Power cord
- 1 x Screw kit
- 1 x HDD IDE cable (44 pin + 2 x 40 pin)
- 1 x HDD IDE cable (44 pin + 40 pin)
- 1 x HDD SATA cable
- 1 x Driver CD
- 1 x CPU cooler
- 1 x CD drive installation kit
- 1 x FDD installation kit
- 1 x HDD bracket
- 10 x Jumper clips
- 1 x Wall-mounting kit
- 1 x Panel-mounting kit
- 1 x Touch screen driver CD (touch screen model only)
- 1 x Touch pen (touch screen model only)

3.5 Jumper Settings

NOTE:

These jumper settings and the jumper locations are described in detail in the User Manual that came with the 2804140 motherboard. Please refer to this manual for a more detailed understanding of the jumper settings

NOTE:

A jumper is a metal bridge that is used to close an electrical circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To CLOSE/SHORT a

jumper means connecting the pins of the jumper with the plastic clip and to OPEN a jumper means removing the plastic clip from a jumper.

The 2804140 comes with fifteen jumpers. They are listed below.

Jumper	Type	Label
Clear CMOS Setup	**3-pin header**	**JP1**
COM# RI and Voltage Selection	**3-pin header**	**JP6** **JP7** **JP8** **JP9** **JP13** **JP14** **JP15** **JP16**
COM2 RS-232/422/485 Setup	**12-pin header**	**JP10**
	6-pin header	**JP20**
CompactFlash Card Setup	**2-pin header**	**JP12**
CPU Voltage Setting	**10-pin header**	**S3**
Keyboard/Mouse Power Source	**3-pin header**	**JP18**
LCD Voltage Select	**6-pin header**	**JP2**

Table 3-1: Onboard Jumpers

3.5.1 Remove the Back Cover

The back cover is secured to the chassis with nine retention screws, eight on the rear panel and one on the bottom panel. (See **Figure 3-1**) Remove the nine retention screws and lift the cover off the 2901280.

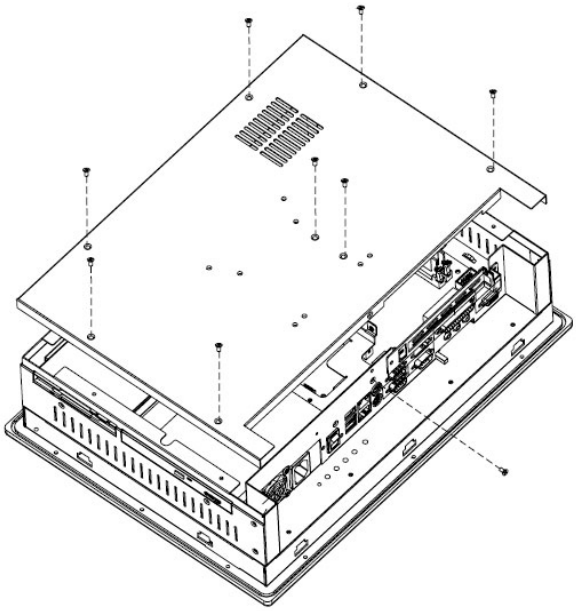

Figure 3-1: Back Cover Retention Screws

3.5.2 CF Card Setup (JP12)

The CF Card Setup jumper configures a CF card as either the slave or the master.

JP12	DESCRIPTION
Open	Slave (Default)
Close	Master

Table 3-2: CF Card Setup Jumper Settings

3.5.3 Clear CMOS Setup (JP1)

If the motherboard fails to boot due to improper BIOS settings, use this jumper to clear the CMOS data and reset the system BIOS information. To do this, use the jumper cap to close pins 2 and 3 for a few seconds then reinstall the jumper clip back to pins 1 and 2.

If the “CMOS Settings Wrong” message displays during the boot up process, try to correct the fault by pressing the F1 to enter the CMOS Setup menu. Then do one of the following:

- Enter the correct CMOS setting

„ Load Optimal Defaults

After one of the above has been done, save the changes and exit the CMOS Setup menu.

JP1	DESCRIPTION
1-2 closed	Normal (Default)
2-3 closed	Clear CMOS

Table 3-3: Clear CMOS Jumper Settings

3.5.4 COM2 Port RS232/422/485 Selection (JP10, JP20)

The COM Port jumper configures the COM2 serial port.

JP10	JP20	DESCRIPTION
1-2,4-5,7-8,10-11 closed	1-3 closed	RS232 (default)
2-3,5-6,8-9,11-12 closed	3-5, 2-4 closed	RS422
2-3,5-6,8-9,11-12 closed	3-5, 4-6 closed	RS485

Table 3-4: COM2 Port Jumper Settings

3.5.5 COM port RI and Voltage Selection

Use JP7 and JP9 to set pin 9 of COM1 as signal RI or voltage source.

JP9	DESCRIPTION
2-3 closed	COM1 RI PIN Use RI
1-2 closed	COM1 RI PIN Use Voltage

Table 3-5: COM1 RI and Voltage Selection Jumper

JP7	DESCRIPTION
2-3 closed	COM1 RI PIN Use Voltage +12V
1-2 closed	COM1 RI PIN Use Voltage +5V

Table 3-6: COM1 RI Voltage Selection Jumper

NOTE:

The use of pin 2-3 or pin 1-2 of JP7 does not make any difference when pin 2-3 of JP9 is in use.

Use JP6 and JP8 to set pin 9 of COM2 as signal RI or voltage source.

JP8	DESCRIPTION
2-3 closed	COM2 RI PIN Use RI
1-2 closed	COM2 RI PIN Use Voltage

Table 3-7: COM2 RI and Voltage Selection Jumper

JP6	DESCRIPTION
2-3 closed	COM2 RI PIN Use Voltage +12V
1-2 closed	COM2 RI PIN Use Voltage +5V

Table 3-8: COM2 RI Voltage Selection Jumper

Use JP13 and JP15 to set pin 9 of COM3 as signal RI or voltage source.

JP15	DESCRIPTION
2-3 closed	COM3 RI PIN Use RI
1-2 closed	COM3 RI PIN Use Voltage

Table 3-9: COM3 RI and Voltage Selection Jumper

JP13	DESCRIPTION
2-3 closed	COM3 RI PIN Use Voltage +12V
1-2 closed	COM3 RI PIN Use Voltage +5V

Table 3-10: COM3 RI Voltage Selection Jumper

Use JP14 and JP16 to set pin 9 of COM4 as signal RI or voltage source.

JP16	DESCRIPTION
2-3 closed	COM4 RI PIN Use RI

1-2 closed	COM4 RI PIN Use Voltage

Table 3-11: COM4 RI and Voltage Selection Jumper

JP14	DESCRIPTION
2-3 closed	COM4 RI PIN Use Voltage +12V
1-2 closed	COM4 RI PIN Use Voltage +5V

Table 3-12: COM4 RI Voltage Selection Jumper

3.5.6 CPU Voltage Setting (S3)

Two different types of CPU can be used on the 2804140 motherboard. One is Pentium 4 CPU and the other is Pentium4-M CPU. Use the CPU voltage setting jumper (S3) to configure the power of CPU. When using Pentium 4 CPU, please open S3 jumper. CPU VID automatically configures the power of CPU. When using Pentium 4-M CPU, short 1-2, 7-8, 11-12 pins and open 3-4, 5-6, 9-10 pins of S3. The power of CPU is then set to 1.3V.

S3	DESCRIPTION
All Open	Pentium 4 CPU (Default)
1-2, 7-8, 11-12 closed	Pentium 4-M CPU (1.3V)

Table 3-13: CPU Voltage Setting

3.5.7 Keyboard and Mouse Power Source Setting (JP18)

JP18	DESCRIPTION
1-2 closed	VCC (default)
2-3 closed	5VSB

Table 3-14: Keyboard and Mouse Power Source Setting

3.5.8 LCD Voltage Setup (JP2)

WARNING:

Do not change this voltage. This voltage has been preset and is compatible

with the currently installed 15" TFT LCD screen. Change this jumper setting may cause damage to the system.

The LCD Voltage Setup jumper sets the voltage for the LCD screen. This setting MUST NOT be changed.

JP2	DESCRIPTION
1-2 closed	+3.3V (default)
3-4 closed	+5V
5-6 closed	+12V

Table 3-15: LCD Voltage Setup Jumper Settings

3.6 HDD, FDD and CD Drive Installation

3.6.1 HDD Installation

To install the HDD, please follow the steps below:

Step 1: Remove the back cover. See **Section 3.5.1** above.

Step 2: The HDD bracket is attached to the elevated platform by four retention screws. Remove the four retention screws from the elevated platform. (See **Figure 3-2**)

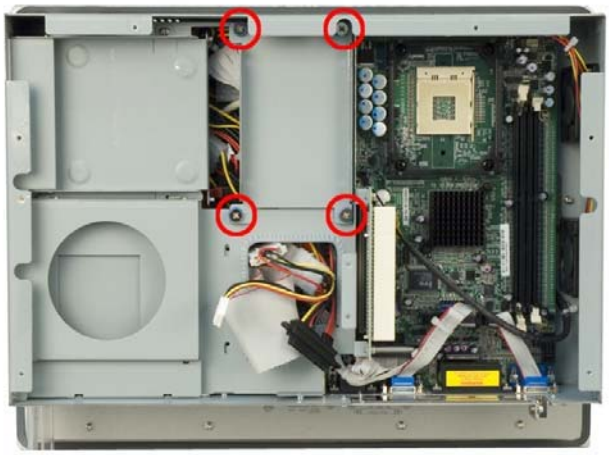

Figure 3-2: HDD Retention Screws

Step 3: Attach the HDD bracket to the HDD. To do this, align the four retention screw holes in both side of HDD bracket with the retention screw holes on the side of the HDD. Insert four retention screws into the bracket on both sides of the HDD.

Step 4: Install the HDD into the 2901280 by aligning the retention screw holes in the base of the HDD bracket with the retention screw holes on the elevated platform. Insert the four retention screws into the base of the HDD bracket.

Step 5: Connect the IDE/SATA cable from the IDE/SATA connector on the motherboard to the rear of HDD.

3.6.2 FDD Installation

To install the FDD, please follow the steps below:

Step 1: The FDD bracket is attached to the elevated platform by two retention screws. (see **Figure 3-3**) Remove the two retention screws from the elevated platform and the chassis. Remove the FDD bracket by sliding toward the HDD.

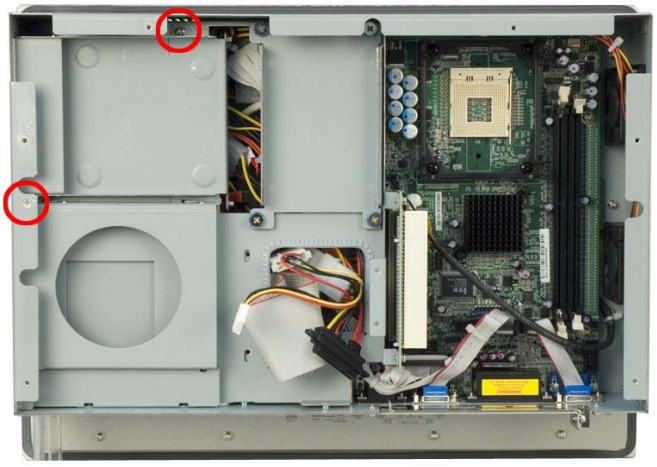

Figure 3-3: FDD Retention Screws

Step 2: Attach the FDD adapter to the FDD by aligning the two retention screw holes in the FDD adapter with the retention screw holes on the rear side of the FDD bracket. Insert two retention screws into the adapter. (See **Figure 3-4**) Connect the FDD adapter and FDD with the twisted cable.

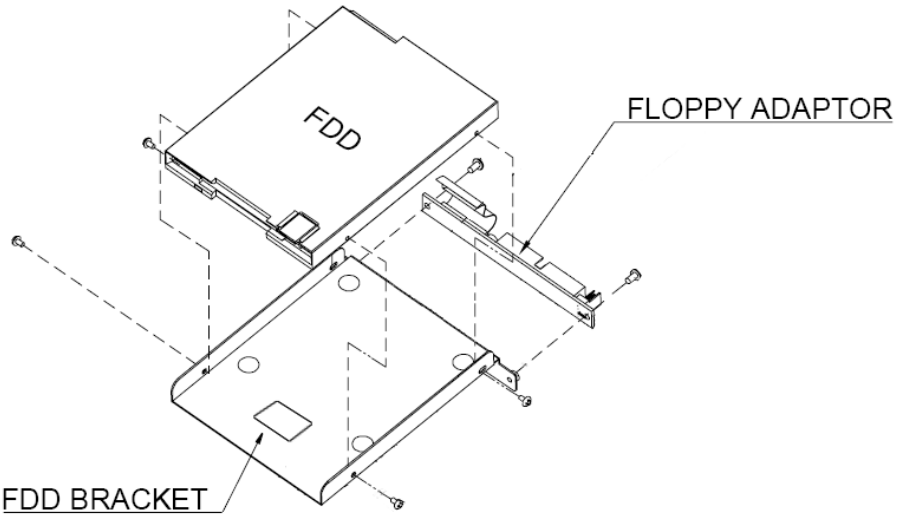

Figure 3-4: FDD Adapter and FDD Bracket Installation

Step 3: Attach the FDD bracket to the FDD. To do this, align the four retention screw holes in the FDD bracket with the retention screw holes on the sides of the FDD. Insert four retention screws into the bracket of the FDD.

Step 4: Slide the FDD into the 2901280 and align the retention screw holes in the base and top of the FDD bracket with the retention screw hole on the chassis panel and the metal sheet. Insert the two retention screws.

Step 5: Connect the FDD ribbon cable and the power cable from the connectors on the motherboard and the PSU to the rear of the FDD.

3.6.3 CD Drive Installation

To install the CD drive, please follow the steps below:

Step 1: Attach a CD drive adapter to a CD drive by aligning the two retention screw holes in the CD drive adapter with the retention screw holes on the rear side of the CD drive.

Step 2: Place two spacers between the CD drive and CD drive adapter.

Step 3: Insert two retention screws and secure the adapter to the CD drive (**Figure 3-5**)

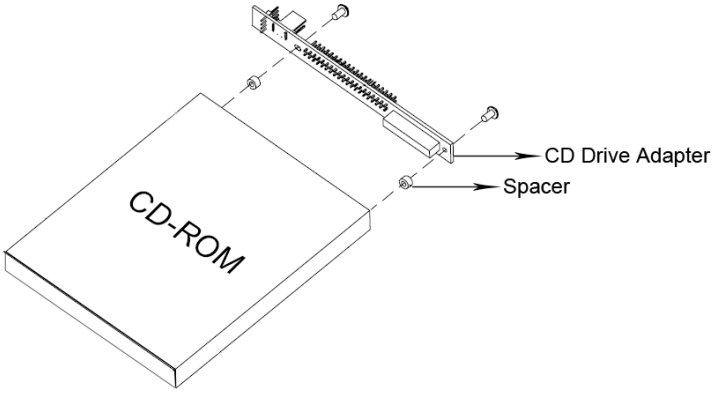

Figure 3-5: CD Drive Adapter Installation

Step 4: The CD drive blank plate assembly is attached to the rear panel by two retention screws (**Figure 3-6**).

Figure 3-6: CD Drive Retention Screws

Step 5: Remove the two retention screws from the bottom panel and slide the CD drive blank plate assembly toward the PCI riser card until it can be lifted out of the chassis (**Figure 3-7**).

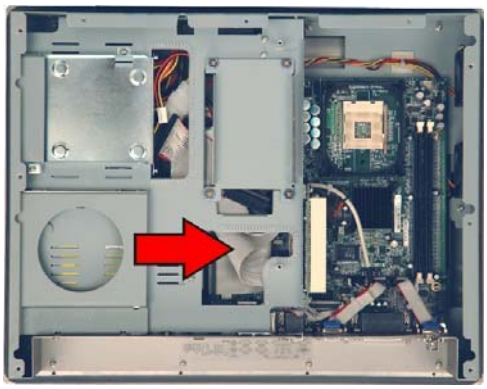

Figure 3-7: Remove CD Drive

Step 6: The CD drive blank plate assembly consists of a blank plate and two brackets that attach the assembly to the chassis. The two brackets each have two screws that attach them to the blank plate. Remove the four screws that attach the brackets to the blank plate. **Figure 3-8** shows the underside of the CD drive blank plate assembly with the four screws to be removed.

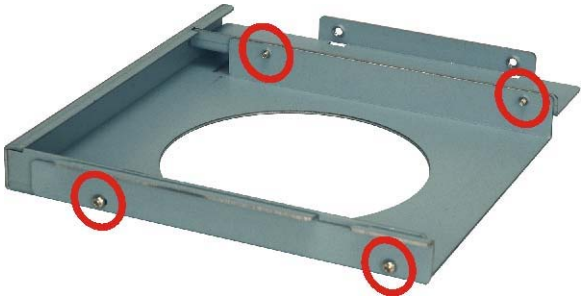

Figure 3-8: CD Drive Blank Plate Assembly

Step 7: Attach the two brackets to a CD drive with the four retention screws in the CD-ROM installation kit. Be sure to orient the brackets properly before attaching them to the CD drive. **Figure 3-9** shows two views of a CD drive with the brackets attached and the proper retention screws to use.

Figure 3-9: CD Drive Blank Plate Assembly

WARNING!

*The two screws (black M2*3) shown in the left image of **Figure 3-9** are different from the two screws (silver M2*2) shown in the right. Please secure the correct screws into the CD drive according to the images shown*

*in the **Figure 3-9**.*

Step 8: Slide the CD drive into the 2901280 and align the two retention screw holes in the side of the CD drive bracket with the retention screw holes on the bottom panel.

Step 9: Reinsert the two previously removed retention screws.

Step 10: Connect the CD ribbon cable and the power cable from the connectors on the motherboard and the PSU to the rear of the CD drive. **Figure 3-10** shows a properly installed CD drive.

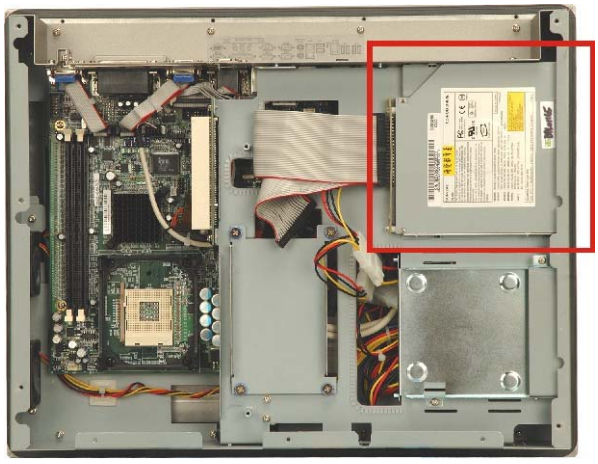

Figure 3-10: CD Drive Installed

3.7 Mounting the System

WARNING!

When mounting the 2901280 flat panel PC onto an arm, onto the wall or onto a panel, it is better to have more than one person to help with the installation to make sure the 2901280 does not fall down and get damaged.

The four methods of mounting the 2901280 are:

- Wall mounting
- Panel mounting
- Arm mounting
- Rack mounting

The four mounting methods are fully described below.

3.7.1 Wall Mounting

To mount the 2901280 flat panel PC onto a wall, please follow the steps below.

Step 1: Select the location on the wall for the wall-mounting bracket.

Step 2: Carefully mark the locations of the four bracket screw holes on the wall.

Step 3: Drill four pilot holes at the marked locations on the wall for the bracket retention screws.

Step 4: Align the wall-mounting bracket screw holes with the pilot holes.

Step 5: Secure the mounting-bracket to the wall by inserting the retention screws into the four pilot holes and tightening them (see **Figure 3-11**).

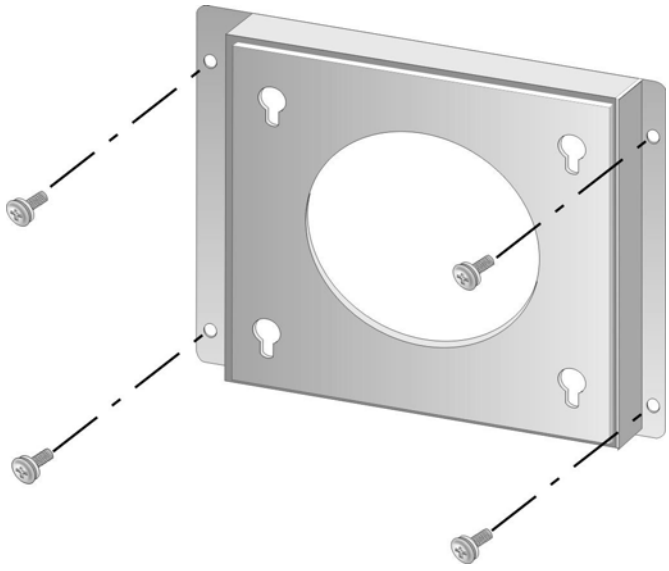

Figure 3-11: Wall-mounting Bracket

Step 6: Insert the four monitor mounting screws provided in the wall mounting kit into the four screw holes on the real panel of the monitor and tighten until the screw shank is secured against the rear panel (see **Figure 3-12**).

Step 7: Align the mounting screws on the monitor rear panel with the mounting holes on the bracket.

Step 8: Carefully insert the screws through the holes and gently pull the monitor downwards until the monitor rests securely in the slotted holes (see **Figure 3-12**). Ensure that all four of the mounting screws fit snuggly into their respective slotted holes.

NOTE:

In the diagram below the bracket is already installed on the wall.

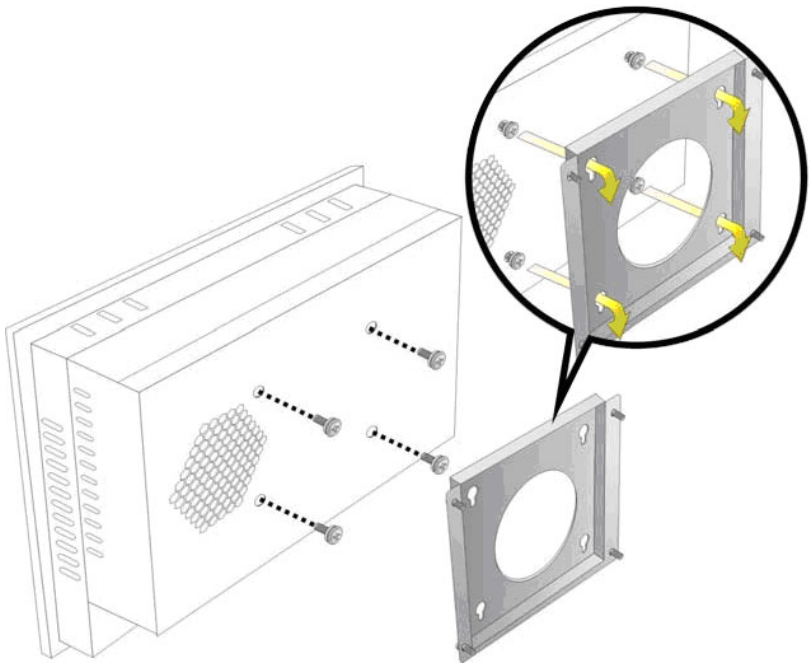

Figure 3-12: Mount the Chassis

Step 9: Secure the panel PC with the wall-mounting kit. To do this, stick the protective cushion to the wall-mounting kit first. Then, put the wall-mounting kit on the top panel of the panel PC. Carefully mark the location of the wall-mounting kit screw holes on the wall. Drill a pilot hole at the marked location on the wall. Secure the wall-mounting kit to the wall by inserting a retention screw into the pilot hole on the wall (**Figure 3-13**). This step is to avoid the panel PC being pushed apart from the wall-mounting bracket accidentally.

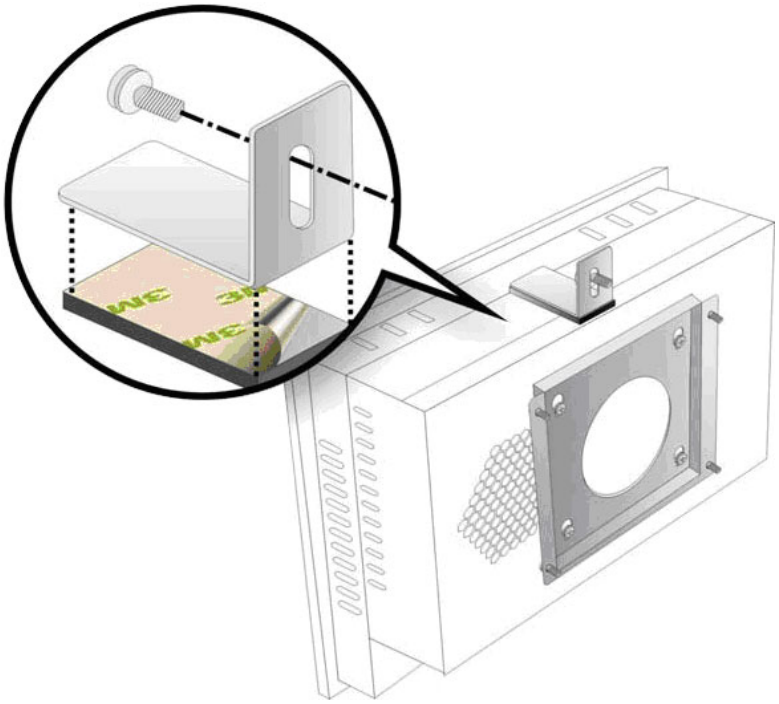

Figure 3-13: Secure the Chassis

3.7.2 Panel Mounting

To mount the 2901280 flat panel PC into a panel, please follow the steps below.

NOTE:

The maximum panel thickness should be no more than 6mm.

Step 1: Select the position on the panel to mount the 2901280.

Step 2: Cut out a section from the panel that corresponds to the rear panel dimensions of the 2901280. Take care that the panel section that is cut out is smaller than the overall size of the metal frame that surrounds the 2901280 but just large enough for the rear panel of the 2901280 to fit through (see **Figure 3-14**).

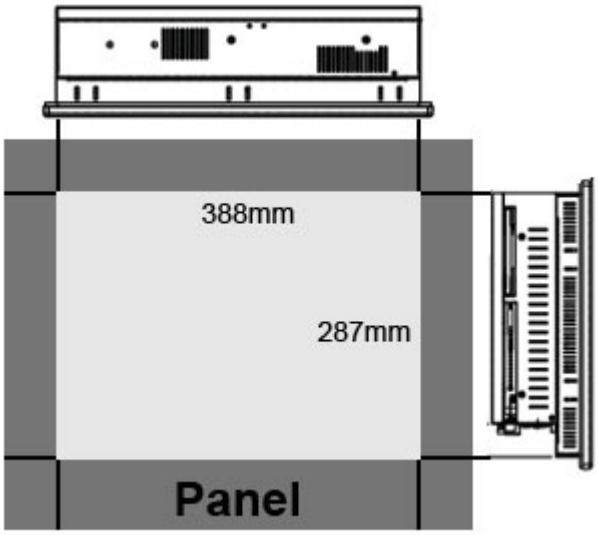

Figure 3-14: Cut the Panel

Step 3: Slide the 2901280 through the hole until the metal frame is flush against the panel.

Step 4: Insert the panel mounting clamps into the pre-formed holes along the edges of the 2901280, behind the metal frame. Refer to the mounting kit packing list for the required number of mounting clamps.

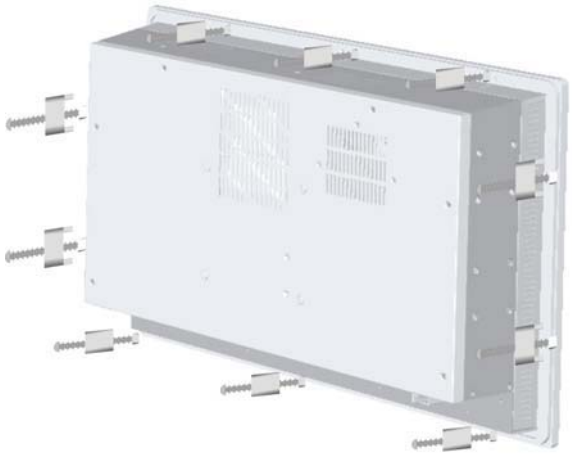

Figure 3-15: Panel Mounting Clamp Positions

Step 5: Tighten the screws that pass through the panel mounting clamps until the plastic caps at the front of all the screws are firmly secured to the panel (**Figure 3-16**).

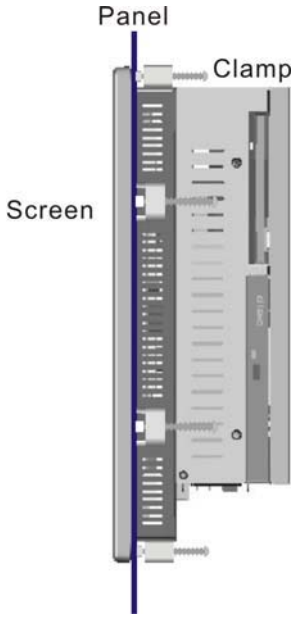

Figure 3-16: Tighten the Panel Mounting Clamp Screws

3.7.3 Arm Mounting

The 2901280 is VESA (Video Electronics Standards Association) compliant and can be mounted on an arm with a 100mm interface pad. To mount the 2901280 on an arm, please follow the steps below.

Step 1: The arm is a separately purchased item. Please correctly mount the arm onto the surface it uses as a base. To do this, refer to the installation documentation that came with the mounting arm.

NOTE:

When purchasing the arm please ensure that it is VESA compliant and that the arm has a 100mm interface pad. If the mounting arm is not VESA compliant it cannot be used to support the 2901280 flat panel PC.

Step 2: Once the mounting arm has been firmly attached to its surface, lift the 2901280 flat panel PC onto the interface pad of the mounting arm.

Step 3: Align the retention screw holes on the mounting arm interface with those in the 2901280 flat panel PC. The 2901280 flat panel PC arm mount retention screw holes are shown in **Figure 3-17**.

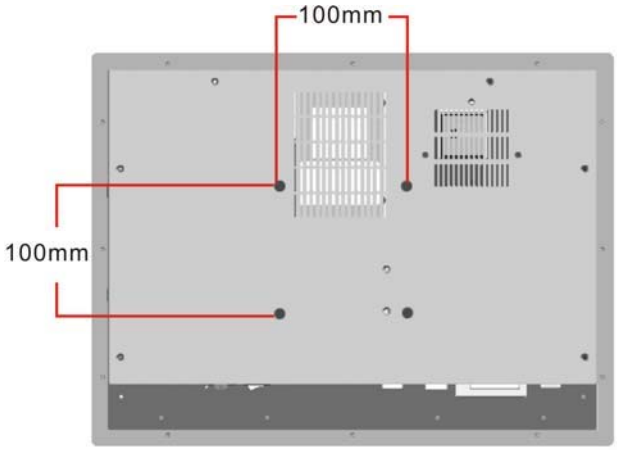

Figure 3-17: Arm Mount Retention Screw Holes

Step 4: Secure the 2901280 to the interface pad by inserting four retention screws through the mounting arm interface pad and into the 2901280 flat panel PC.

3.7.4 Cabinet and Rack Installation

The 2901280 flat panel PC can be installed into a cabinet or rack. To do this, please

follow the steps below.

Step 1: The back of the aluminum frame surrounding the 2901280 flat panel PC has 12 retention screw holes for a cabinet/rack installation bracket.

NOTE:

When purchasing the cabinet/rack installation bracket make sure it is compatible with both the 2901280 flat panel PC and the rack/cabinet into which the 2901280 is installed.

Step 2: Slide the 2901280 through the rack/cabinet bracket until the rear side of the 2901280 frame is flush against the front of the bracket.

Step 3: Make sure the retention screw holes at the rear of the 2901280 frame are aligned with the retention screw holes in the rack/cabinet bracket.

Step 4: Secure the rack/cabinet bracket to the 2901280 flat panel PC by inserting and tightening 12 retention screws. (See **Figure 3-18**)

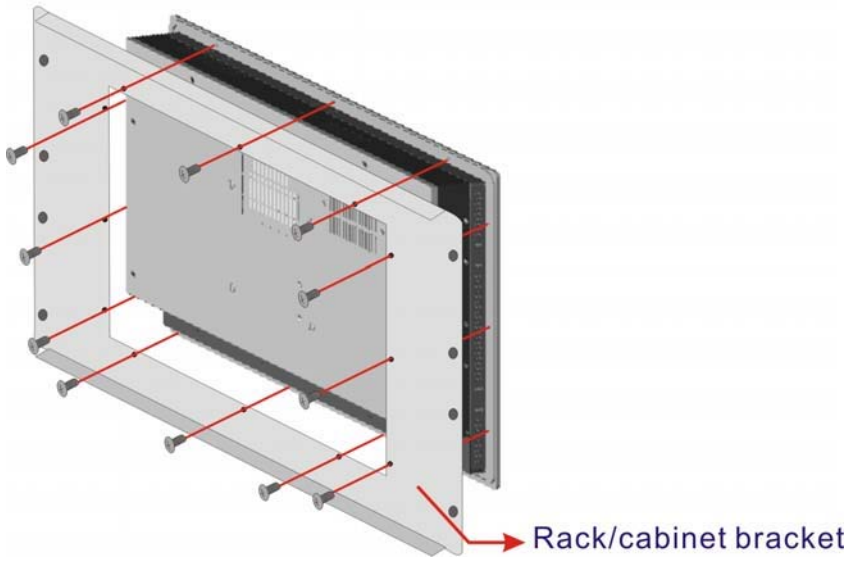

Figure 3-18: Secure the Rack/Cabinet Bracket

Step 5: Slide the 2901280 flat panel PC with the attached rack/cabinet bracket into a rack or cabinet. (See **Figure 3-19**)

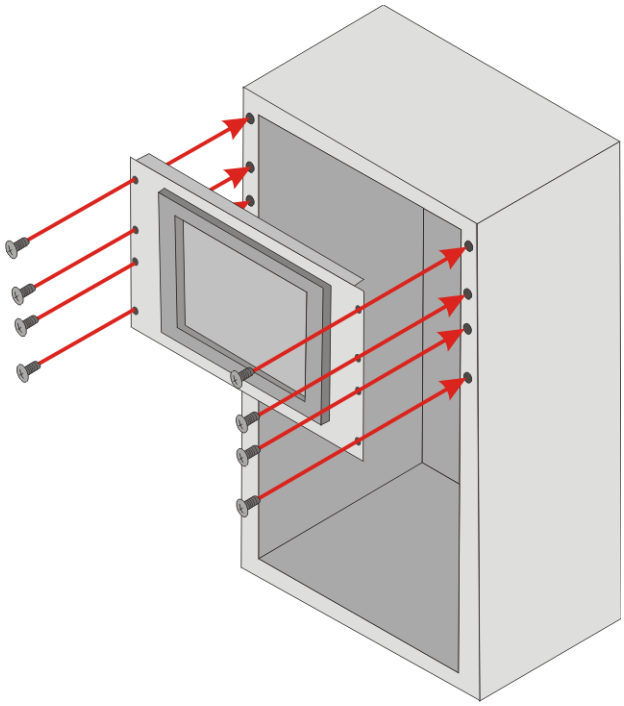

Figure 3-19: Install into a Rack/Cabinet

Step 6: Once the 2901280 flat panel PC with the attached rack/cabinet bracket has been properly inserted into the rack or cabinet, secure the front of the rack/cabinet bracket to the front of the rack or cabinet. (See **Figure 3-19**)

3.8 Rear Panel Connectors

3.8.1 LCD Panel Connection

A conventional CRT VGA 15-pin female D-SUB connector is located on the bottom panel to connect the 2901280 flat panel PC to a second monitor.

NOTE:

To use the dual screen option, please configure this option in the ***Intel®*** ***Extreme Graphics*** *configuration program. To do this, after Windows has*

*loaded, open the **Control Panel**, locate the **Intel® Extreme Graphics** icon, click on it. Once open, an option for **Multiple Display** is available. Select this option and select notebook as the primary device.*

3.8.2 Ethernet Connection

The two external peripheral interface RJ-45 connectors can be connected to an external LAN to provide Internet connectivity to the flat panel PC.

3.8.3 USB Connection

The external peripheral interface USB connectors provide easy and quick access to external USB devices. The external peripheral interface USB connectors are a standard connector and can easily be connected to other USB devices.

3.8.4 Keyboard and Mouse Connection

Two PS/2 connectors on the external peripheral interface panel facilitate the connection of a mouse and a keyboard. To connect either device, plug the PS/2 connector at the end of the keyboard or mouse cable into the corresponding PS/2 connector on the external peripheral interface panel.

3.8.5 Parallel Port Connection

The parallel port is typically connected to a printer, but can also be connected to other parallel devices.

Chapter

4

System Maintenance

4.1 System Maintenance Introduction

The following system components may require maintenance.

- CPU cooling fan
- PSU module
- DIMM module
- Motherboard

If these components fail, they must be replaced. Please contact the system reseller or vendor to purchase the replacement parts. Replacement instructions for the above listed components are described below.

4.2 Motherboard Replacement

A user cannot replace a motherboard. If the motherboard fails it must be shipped back to GAI to be replaced. If the system motherboard has failed, please contact a GAI sales person directly.

4.3 Back Cover Removal and Elevated Platform Detachment

4.3.1 Back Cover Removal

WARNING!

BEFORE REMOVING THE BACK COVER, MAKE SURE THE POWER IS OFF*. Failing to do so may lead to severe damage of 2901280 and injury to the body.*

WARNING!

PLEASE TAKE ANTISTATIC PRECAUTIONS WHEN WORKING WITH THE INTERNAL COMPONENTS. *The interior of the 2901280 contains very sensitive electronic components. These components are*

easily damaged by electrostatic discharge (ESD). Before working with the internal components make sure all the anti-static precautions described earlier have been observed.

To access the panel PC internal components, the back cover must be removed. To remove the back cover, please follow the steps below.

Step 1: Remove the 2901280 from its mount (panel, wall, rack, arm, etc.).

Step 2: The back cover is secured to the chassis with nine retention screws, eight on the rear panel and one on the bottom panel. (See **Figure 4-1**) Remove the nine retention screws and lift the cover off the 2901280.

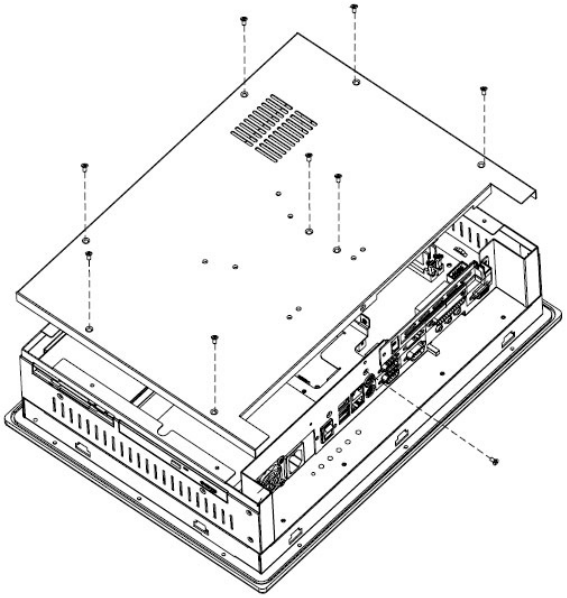

Figure 4-1: Rear Cover Retention Screws (Real Panel)

4.3.2 Detaching the Elevated Platform

To replace PSU module, the back cover of the 2901280 must be removed and the elevated platform must be detached. Back cover removal is discussed above (see ***Section 4.3.1***). To detach the elevated platform, please follow the steps below.

Step 1: The elevated platform is located on the right side of the 2901280 and

supports the FDD, the CD drive and the HDD.

Step 2: The elevated platform is secured to the chassis with eight retention screws, two on the platform (see **Figure 4-2**), two on the top panel (see **Figure 4-3**), two on the right panel (see **Figure 4-4**) and two on the bottom panel (see **Figure 4-5**). Remove these eight retention screws.

Figure 4-2: Internal Elevated Platform Retention Screws

Figure 4-3: Elevated Platform Retention Screws (Top Panel)

Figure 4-4: Elevated Platform Retention Screws (Right Panel)

Figure 4-5: Elevated Platform Retention Screws (Bottom Panel)

Step 3: A PCI riser card is attached to the side of the elevated platform with two retention screws. Remove the two retention screws and the PCI riser card from the chassis.

Figure 4-6: PCI Riser Card Retention Screws

4.4 DIMM Replacement

To install the DIMM please follow the steps below.

Step 1: Remove the back cover. See **Section 4.3.1** above.

Step 2: Locate the DIMM. It is on the motherboard near the top of the 2901280 flat screen PC. Push the white clips on the side of the DIMM down. The DIMM is dislodged from the DIMM socket. (See **Figure 4-7**)

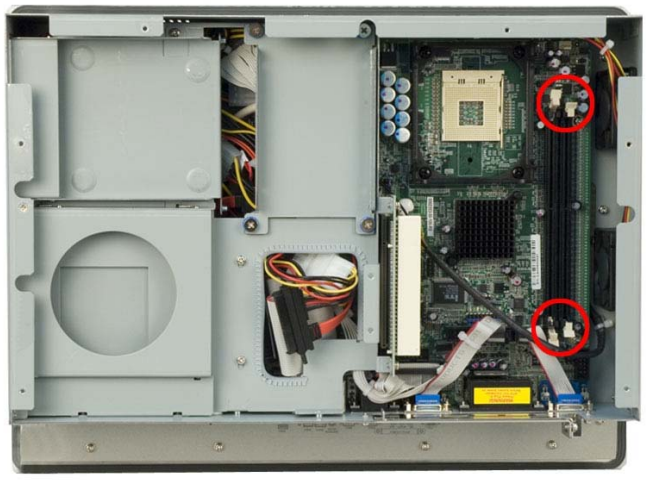

Figure 4-7: DIMM Socket Clip Locations

Step 3: Slowly slide the new DIMM module along the plastic guides at both ends of the socket. Press the DIMM module down into the socket until it clicks into position and the two handles have automatically locked the memory module into place.

4.5 PSU Module Replacement

If the PSU module has been damaged it must be replaced. To replace the PSU module, please follow the steps below.

Step 1: Remove the back cover. See **Section 4.3.1** above.

Step 2: Detach the elevated platform. See **Section 4.3.2** above.

Step 3: Remove and remove the elevated platform from the 2901280.

Step 4: Disconnect the PSU power cable connectors from the motherboard (**Figure 4-8**)

Figure 4-8: PSU Motherboard Connector

Step 5: The PSU module is secured to the 2901280 flat panel PC with four retention screws, two connect to the metal sheet at the back of the 15”TFT LCD screen (**Figure 4-9**) and the other two are inserted through the bottom panel and into the PSU module (**Figure 4-10**). Remove these four retention screws.

Figure 4-9: PSU Internal Retention Screws

Figure 4-10: PSU External Retention Screws

Step 6: Remove the PSU module from the 2901280 flat panel PC. The PSU module cables are connected together with ties. This is to help save space in the

chassis. Remove the plastic tie.

Step 7: Bundle the cables of the new PSU module, and secure them with a plastic tie, in a way similar to the old PSU module.

Step 8: Before inserting the new PSU module into the chassis, reconnect the PSU module connectors to the motherboard power connector (PW1 and PW2).

Step 9: Place the new PSU module into the 2901280 flat panel PC.

Step 10: Secure the new PSU module to the 2901280 flat panel PC by reinserting the two retention screws into the metal plate behind the 15” TFT LCD screen and the two retention screws through the bottom panel of the 2901280 flat panel PC.

Step 11: Reattach the elevated platform removed in Step 2.

Step 12: Replace the back cover.

Appendix

A

Interface Connectors

The 2901280 flat panel PC motherboard comes with a number of peripheral interface connectors and configuration jumpers listed in **Chapter 2**. The pinouts for these connectors are listed below:

A.1 Floppy Disk Drive Connector

2804140 board is equipped with a 34-pin daisy-chain driver connector cable.

PIN	Description	PIN	Description
1	GROUND	2	REDUCE WRITE
3	GROUND	4	N/C
5	GROUND	6	N/C
7	GROUND	8	INDEX#
9	GROUND	10	MOTOR ENABLE A#
11	GROUND	12	DRIVE SELECT B#
13	GROUND	14	DRIVE SELECT A#
15	GROUND	16	MOTOR ENABLE B#
17	GROUND	18	DIRECTION#
19	GROUND	20	STEP#
21	GROUND	22	WRITE DATA#
23	GROUND	24	WRITE GATE#
25	GROUND	26	TRACK 0#
27	GROUND	28	WRITE PROTECT#
29	GROUND	30	READ DATA#
31	GROUND	32	SIDE 1 SELECT#
33	GROUND	34	DISK CHANGE#

A.2 PCI E-IDE Disk Drive Connector

Four IDE (Integrated Device Electronics) hard disk drives can be attached to the 2804140 IDE controller.

IDE1, IDE2: Primary, Secondary IDE Connector

PIN	Description	PIN	Description
1	RESET#	2	GND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	GND	20	N/C
21	IDE DRQ	22	GND
23	IOW#	24	GND
25	IOR#	26	GND
27	IDE CHRDY	28	GND
29	IDE DACK	30	GND
31	INTERRUPT	32	N/C
33	SA 1	34	N/C
35	SA 0	36	SA 2
37	HDC CS0#	38	HDC CS1#
39	HDD ACTIVE#	40	GND

A.3 Parallel Port

This port is usually connected to printer. The 2804140 includes one on-board parallel port, accessed through 25-pin D-type female connector LPT1.

LPT1: (LPT1 DB-25 Female) Parallel Port Connector

PIN	Description	PIN	Description
1	STROBE#	2	DATA 0
3	DATA 1	4	DATA 2
5	DATA 3	6	DATA 4
7	DATA 5	8	DATA 6
9	DATA 7	10	ACKNOWLEDGE
11	BUSY	12	PAPER EMPTY
13	PRINTER SELECT	14	AUTO FORM FEED #
15	ERROR#	16	INITIALIZE
17	PRINTER SELECT LN#	18	GND
19	GND	20	GND
21	GND	22	GND
23	GND	24	GND
25	GND		

A.4 Serial Ports

The 2804140 offers six high speed NS16C550 compatible UARTs with Read/Receive 16 byte FIFO serial port (COM1/COM2/COM3/COM4/COM5/COM6)

COM1: Serial Port 2x5 pin header Connector

PIN	Description	PIN	Description
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTX
7	DTR	8	RI
9	GND	10	NC

CN20A: Serial Port DB-9 Male Connector (COM1)

PIN	Description
1	DATA CARRIER DETECT (DCD)
2	RECEIVE DATA (RXD)
3	TRANSMIT DATA (TXD)
4	DATA TERMINAL READY (DTR)
5	GROUND (GND)
6	DATA SET READY (DSR)
7	REQUEST TO SEND (RTS)
8	CLEAR TO SEND (CTS)
9	RING INDICATOR (RI)

COM2: Serial Port 2 x 5 Pin Header Connector

COM2 Support three modes: RS-232, RS-422, and RS-485 (For 2 x 5 pin header connector)

RS-232 Mode

PIN	Description	PIN	Description
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTX
7	DTR	8	RI
9	GND	10	NC

RS-422 Mode

PIN	Description	PIN	Description
1	TXD-	2	RX-
3	TXD+	4	RX+
5	NC	6	NC
7	NC	8	Voltage
9	NC	10	NC

RS-485 Mode

PIN	Description	PIN	Description
1	RTX-	2	NC
3	RTX+	4	NC
5	NC	6	NC
7	NC	8	Voltage
9	NC	10	NC

CN20B: Serial Port DB-9 Male Connector (COM2)

COM2 supports three modes: RS-232, RS-422 and RS-485 (via DB-9 Connector)

RS-232 Mode

PIN	Description	PIN	Description
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTX
4	DTR	9	RI
5	GND		

RS-422 Mode

PIN	Description	PIN	Description
1	TXD-	6	RX-
2	TXD+	7	RX+
3	NC	8	NC
4	NC	9	Voltage
5	NC		

RS-485 Mode

PIN	Description	PIN	Description
1	RTX-	6	NC

2	RTX+	7	NC
3	NC	8	NC
4	NC	9	Voltage
5	NC		

COM3: Serial Port 2x5 Pin Header Connector

PIN	Description	PIN	Description
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTX
7	DTR	8	RI
9	GND	10	NC

COM4: Serial Port 2x5 Pin Header Connector

PIN	Description	PIN	Description
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTX
7	DTR	8	RI
9	GND	10	NC

CN22: Serial Port DB-9 Male Connector (COM4)

PIN	Description
1	DATA CARRIER DETECT (DCD)
2	RECEIVE DATA (RXD)
3	TRANSMIT DATA (TXD)
4	DATA TERMINAL READY (DTR)
5	GROUND (GND)
6	DATA SET READY (DSR)
7	REQUEST TO SEND (RTS)
8	CLEAR TO SEND (CTS)
9	RING INDICATOR (RI)

COM5: Serial Port 2x5 Pin Header Connector

PIN	Description	PIN	Description
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTX
7	DTR	8	RI
9	GND	10	NC

COM6: Serial Port 2x5 Pin Header Connector

PIN	Description	PIN	Description
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTX
7	DTR	8	RI
9	GND	10	NC

A.5 Keyboard / Mouse Connector

2804140 provides one keyboard and one mouse box header connector, as well as external keyboard & Mouse connectors.

CN23A (Purple): Extended Keyboard 6-pin Mini Din Connector

PIN	Description
1	KB DATA
2	NC
3	GND
4	VCC
5	KB CLOCK
6	NC

CN23B (Green): Extended Mouse 6-pin Mini Din Connector

PIN	Description
1	MS DATA
2	NC
3	GND
4	VCC
5	MS CLOCK
6	NC

CN16: 5-pin Header Keyboard Connector

PIN	Description
1	KB CLOCK
2	KB DATA
3	N/C
4	GND
5	+5V

CN15: PS/2 Mouse 5-pin Header Connector

PIN	Description
1	MS CLOCK
2	MS DATA
3	N/C
4	GND
5	+5V

A.6 External Switches and Indicators

CN8: Multi Panel

PIN	Description	PIN	Description
1	SPEAKER	11	POWER-VCC
2	N/C	12	N/C
3	N/C	13	GND
4	+5V	14	KEYLOCK

5	RESET SW	15	GND
6	GND	16	GND
7	IDE LED -	17	N/C
8	IDE LED+	18	ATX POWER CONTROL
9	ATX POWER BUTTON	19	ATX 5VSB
10	GND	20	ATX 5VSB

A.7 USB Port Connector

2804140 has eight built-in USB ports for the future I/O bus expansion.

CN26, CN27,CN28: 8-PIN Header USB Connectors

PIN		Description
1	8	VCC
3	6	USBD0-
5	4	USBD0+
7	2	GND

CN25: 2 External USB Connectors

PIN		Description
1	5	VCC
2	6	USBD0-
3	7	USBD0+
4	8	GND

A.8 IrDA Infrared Interface Port

The 2804140 has a built-in IrDA port which supports Serial Infrared (SIR) or Amplitude Shift Keyed IR (ASKIR) interface. To use the IrDA port, configure the FIR or ASKIR model in the Peripheral Setup COM2 in BIOS. Then the normal RS-232 COM2 will be disabled.

IR1: IrDA Connector

PIN	Description
1	+5V
2	NC
3	IR-RX
4	GND
5	IR-TX
6	+5V

A.9 VGA Connector

The 2804140 provides one DB-15 female connector and one built-in 10-pin VGA box header connector that can be connected directly to a monochrome CRT monitor as well as high resolution color CRT monitor.

VGA1: DB-15 Female VGA Connector

PIN	Description	PIN	Description
1	RED	2	GREEN
3	BLUE	4	N/C
5	GND	6	GND
7	GND	8	GND
9	VCC	10	GND
11	N/C	12	DDC DAT
13	HSYNC	14	VSYNC
15	DDC CLK		

CN14: 10-pin Header VGA Connector

PIN	Description	PIN	Description
1	RED	2	SMCLK
3	GREEN	4	SMDATA

5	BLUE	6	GND
7	H-SYNC	8	GND
9	V-SYNC	10	GND

A.10 LAN RJ45 Connector

The 2804140 is equipped with two Gigabit Ethernet Controller RTL8110SC chipsets and two GbE LAN RJ-45 connectors.

CN31: Dual LAN RJ45 Connector

PIN	Description	PIN	Description
1	TX+ (or MDX0+)	5	N/C (or MDX2-)
2	TX- (or MDX0-)	6	RX- (or MDX1-)
3	RX+ (or MDX1+)	7	N/C (or MDX3+)
4	N/C (or MDX2+)	8	N/C (or MDX3-)
13	MDX0+	17	MDX2-
14	MDX0-	18	MDX1-
15	MDX1+	19	MDX3+
16	MDX2+	20	MDX3-

A.11 Fan Connector

The 2804140 provides three CPU cooling and system Fan connectors. The CPU cooling fan has a linear fan speed controlled by the BIOS. These connectors can supply 12V/500mA to the cooling fans.

FAN1: CPU Fan Connector

PIN	Description
1	GND
2	Linear control
3	Fan Sensor

FAN2: System Fan Connector

PIN	Description
1	GND
2	+12V
3	Fan Sensor

FAN3: System Fan Connector

PIN	Description
1	GND
2	+12V
3	Fan Sensor

A.12 Inverter (LCD Backlight) Connector

CN12: Inverter (LCD Backlight) Connector

PIN	Description	PIN	Description
1	NC	2	GND
3	+12V	4	GND
5	ENABKL		

A.13 LCD Panel LVDS Interface Connector

The 2804140 provides up to 48-bit color TFT LCD.

CN30: DF13-30DP-1.25 LVDS Interface Connector

PIN	Description	PIN	Description
1	GND	2	GND
3	A0P	4	A0M
5	A1P	6	A1M
7	A2P	8	A2M
9	CLK1P	10	CLK1M
11	A3P	12	A3M
13	GND	14	GND

15	A4P	16	A4M
17	A5P	18	A5M
19	A6P	20	A6M
21	CLK2P	22	CLK2M
23	A7P	24	A7M
25	GND	26	GND
27	LCD_VDD	28	LCD_VDD
29	LCD_VDD	30	LCD_VDD

A.14 Audio Connectors

CN7: Audio CD IN (2.54mm)

PIN	Description	PIN	Description
1	CD IN_L	2	GND
3	GND	4	CD IN_R

CN2: Audio LINE OUT (2.54mm)

PIN	Description	PIN	Description
1	LINEOUT_L	2	GND
3	GND	4	LINE OUT_R

CN24: Audio Jack

Color	Description
RED	MIC IN
BLUE	LINE IN
GREEN	SPEAK OUT

A.15 Digital Input / Output

CN6: Digital Input / Output

PIN	Description	PIN	Description
1	GND	2	+5V

3	Output 3	4	Output 2
5	Output 1	6	Output 0
7	Input 3	8	Input 2
9	Input 1	10	Input 0

A.16 Compact Flash TYPE II Storage Card Socket

The 2804140 configures Compact Flash TYPE II Storage Card in IDE Mode.

CF1: Compact Flash TYPE II Socket PIN Assignment

PIN	Description	PIN	Description
1	GROUND	26	CARD DETECT1
2	D3	27	D11
3	D4	28	D12
4	D5	29	D13
5	D6	30	D14
6	D7	31	D15
7	CS1#	32	CS3#
8	N/C	33	N/C
9	GROUND	34	IOR#
10	N/C	35	IOW#
11	N/C	36	OBLIGATORY TO PULL HIGH
12	N/C	37	IRQ15
13	VCC	38	VCC
14	N/C	39	MASTER/SLAVE
15	N/C	40	N/C
16	N/C	41	RESET#
17	N/C	42	IORDY
18	A2	43	N/C
19	A1	44	OBLIGATORY TO PULL HIGH
20	A0	45	ACTIVE#
21	D0	46	PDIAG#
22	D1	47	D8
23	D2	48	D9

24	N/C	49	D10
25	CARD DETECT2	50	GROUND

A.17 ATX Power Connector

PW2 is a 20-pin ATX Power Supply Connector with the following pin assignments.

PW2: ATX Power Supply Connector

PIN	Description	PIN	Description
11	3.3V	1	3.3V
12	-12V	2	3.3V
13	GND	3	GND
14	PS-ON	4	+5V
15	GND	5	GND
16	GND	6	+5V
17	GND	7	GND
18	-5V	8	Power good
19	+5V	9	5VSB
20	+5V	10	+12V

A.18 ATX 12V Power Connector

This connector supports the ATX power. Functions such as modem Ring on, and wake-up LAN and soft power off are supported.

PW1: ATX-12V Power Connector

PIN	Description	PIN	Description
1	GND	2	GND
3	+12V	4	+12V

NOTE:

The power from PW1 should support at least 6.5A current for the use of P4 CPU. If the power is not enough, the operation of CPU could be abnormal. Be sure the power from power supply is enough, and don't share this power with other devices, such as hard disk etc. Use GAI's special cable for connection if the power supply doesn't have suitable cable.

A.19 Internal Switches and Indicators

S2: Reset Switch

PIN	Description	PIN	Description
1	Reset	2	GND

D1: Standby Voltage LED Indicator.

A.20 Serial ATA Connector

The 2804140 provides two Serial ATA (SATA) ports.

SATA1, SATA2: Serial ATA Connector

PIN	Description	PIN	Description
1	S_TXP	3	S_RXN
2	S_TXN	4	S_RXP

Any advice or comments about our products and service, or anything we can help you with please don't hesitate to contact with us. We will do our best to support you for your products, projects and business.

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