TRANSDUCTION

USER'S MANUAL

Version 1.0
01/29/16

TR-5197 HALF-FANLESS PANEL/RACK MOUNT INDUSTRIAL PC W/ INTEL DUAL ATOM PROCESSOR AND 19" LCD TOUCH SCREEN

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Important Information

The information in this document is subject to change without notice.

All relevant issues have been considered in the preparation of this document.

Should you notice an omission or any questionable item in this document, please feel free to notify Transduction.

Regardless of the foregoing st atement, Transduction assumes no responsibility for any errors that may appear in this document nor for results obtained by the user as a result of using this product.

Return policy

Warranty is 5 years for the whole system from the date of purchase. Product s returned for repair must be accompanied by a Return Material Authorization (RMA) number, obtained from Transduction prior to return. Freight on all returned items must be prepaid by the customer. The customer is responsible for any loss or damage caused by the carrier in transit.

To obtain an RMA number, call us at 905-625-1907. We will need the following information:

- Return company address and contract
- Model name, model number and serial number
- Description of the failure

Mark the RMA number clearly on the outside of each box, include a failure report and return the product to:

Transduction

5155 – 23 Spectrum Way

Mississauga ON Canada L4W 5A1

Attn: RMA Department

1

Introduction

This manual is designed to give you information on the TR-5197 industrial PC.The topics covered in this chapter are as follows:

TR-5197 Description 1

TR-5197 Specifications 2

TR-5197 Description

The TR-5197 is a half fanless version of our dependable TR-5195F fanless industrial computer. TR-5197 has been designed to meet long term demand of a high performance PC for electrical utility sub-stations and industrial automation. It is powered by a reliable telecom grade single board computer with Intel Dual ATOM processor at 1.8GHz. It is optimized for Windows 7 32/64-Bit.

This industrial PC can be supplied with 4GB DDR3 memory, high speed 2.5" SATA flash drive with a capacity of up to 256 GB or 2.5" 500GB hard drive. It can operate at a temperature range of 0 ~ 50ºC, under full system load. Internal heatsinks with air convection chimney have been used to remove the heat from processor and the chipset.

Panel Mount Version

Rack Mount Version

Back View

TR-5197 Specifications

Model	TR-5197 Half-Fanless Panel/Rack Mount Industrial PC With NEMA 4 Steel Baked Epoxy Black Front Panel
Processor	1.8GHz Intel Dual Atom D525 Processor Cooling - internal heatsinks with air convection chimney
Chipset	Intel ICH8M
BIOS	Award PnP Ver. 6.0
Display	19" TFT LCD, resolution 1280 x 1024 (SXGA) Backlight MTBF > 50,000 hours Brightness - 300cd/m², Contrast ratio - 750:1 (brightness and contrast software adjustable) USB resistive touch screen
Memory	4GB high temperature DDR3 1333MHz
Drive Bay	Internal 2.5" SATA flash drive up to 256GB or 2.5" 500GB SATA hard drive
Video	Intel GMA3150 Graphic Engineinterface, DB15 SVGA connector
Ethernet	2 x Realtek RT8111E Gigabit LAN ports
External I/O	1 x SVGA DB15 - mirror of LCD 1 x serial RS232 port 1 x parallel port 4 x USB 2.0 2 x RJ-45 LAN ports PS2 keyboard and mouse Optional BNC IRIG A/B port Optional up to 4 isolated RS-232 or RS-422/485 serial ports
System Monitor	Processor temerature, system temperature and DC power voltages Watchdog timer - 1 ~ 255 seconds
Power Requirements	Input voltage - 100 ~ 240VAC @ 50/60Hz Optional DC input power - 24V, 48V, 125V and 250V MTBF > 150,000 hours UL/cUL approved
Chassis Colour	Black, OEM colour optional
Dimensions	17.75" (W) x 15.25" (H) x 4.5" (D) Rack mount version is 8U high
Weight	Net weight - 22lbs, gross weight - 37lbs, CUFT - 6
Operating Temperature	0 ~ 50ºC (32º ~ 122ºF) or 60ºC for 2 hours @ 100% system load
Humidity	10 ~ 95% relative humidity, non-condensing
Shock	Shock - 25G, vibration - 5G
Warranty	5 year warranty
Ordering Information	TR-5197-PM - panel mount version TR-5197-RM - rack mount version
Options	8U rack mount version - allows the TR-5197 to be mounted in a standard 19" rack configuration, includes 3 USB ports Solid State Flash drives up to 256GB Safety glass, no touch screen 178º viewing angle LCD Up to 4 x isolated RS-232 or RS-422/485 COM ports
	Compatible with Windows 7, Windows XP, Windows 2000, QNX and LINUX kernel 2.4.16 or above

2

TR-5197 SBC

This chapter provides detailed information on the TR-5197 Single Board Computer. The topics covered are:

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Section 1 - Jumper Settings 10-14
Section 2 - Connectors 15-32
Section 3 - BIOS Configuration 33-77

2

Introduction

This section provides an overview on the TR-5197 Single Board Computer. The topics covered are:

Features 5
Specifications 6-8

❖*Features*

- Intel Dual Core Atom Processor D525 on board.
- Dual GbE LAN, Dual DDR3 socket for up to 4GB.
- Compact size design with rich I/O functions.
- Multiple I/O functions: 8 x USB2.0, 6 x COM, 3 x SATA, 1 x IRDA, 1x PIDE, 1x CF, 1x LPT, 1x DIO.
- Multiple display devices: VGA1, VGA2, HDM, Single Channel 24-bits LVDS LCDI.
- Single DC +12V input power for normal operation.
- Dual Mini Card Socket and one PCI 32-bits slot for flexible I/O expansion.
- 7.1 channels surrounding audio support.

❖Specifications

Processor

- Intel Dual Core Atom D525 processor on board.
- 1.8GHz Core Speed with dual Core and four Threads.

BIOS

- Award Standard PnP Flash BIOS 6.0.
- 8Mbit FlashROM with BootBlock for fail-safe.

System Memory

- Two DDR3 SO-DIMM Sockets.
- Supports DDR3-800 non-ECC memory up to 4.0 GB.

Chipset

- Intel ICH8M chipset.

Video

- Intel D525 Integrated GMA3150 graphic engine.
- One D-Sub female connector for CRT displays.
- One 40-pins connector for single 24-bits LVDS LCD.
- One HDMI for HD 1080p displays.
- Dual VGA display supported.
- Support dual Independent display, display devices can be selectable by BIOS or graphic drivers.

10/100M/1000M Ethernet

- Two Realtek RT8111E on board for Dual Gigabit LAN support.
- PXE Boot ROM and WOL supported.

On Board I/O

- Six serial ports as COM1~COM6. COM2 is RS232/422/485 selectable by jumper.
- COM1 and COM2 are D-Sub on rear panel. Pin9 is powered with either +5V or +12V by jumper.

- COM3~COM6 are pin-header for internal connections.
- One parallel port supports SPP/ECP/EPP mode.
- 1 x IrDA port. 1x DIO (8-bits).
- Dual Mini PCI-Express sockets.
- One PCI 32-bits slot, supports up to 3 master devices.
- Eight USB 2.0 ports. Four on real panel and four for internal connections.

PIDE and SATA

- PIDE controller built in ICH8M support up to UltraDMA mode 5 or ATA100 speed.
- One standard 44-pins box header to supports 2.5" HDD or DOM Flash Disk.
- Three SATA ports from ICH8M support up to SATA-II devices.
- One 50-pins CF-II socket for Compact Flash Card.

Watchdog Timer

- Programmable watchdog timer for 1~255 seconds.

CMOS

- On-board RTC with 242 bytes of Battery-back CMOS RAM.

Audio

- RealTek ALC888 High-Definition Audio chip on-board.
- Two Audio-Jacks on rear for Audio Line-out and MIC.
- 7.1 channel surrounding audio supported.

Power

- Single DC 12V input with 4-pins Mini-DIN connector.
- Supplies +5V and +12V output power for peripheral devices and LCD panel.

Software Compatibility

- Microsoft windows: Win7 32/64bits, Win XP 32/64bits, XP embedded standard, WinCE 6.0.
- Linux 32/64bits and DOS 6.22.

Cooling

- Three cooling FAN connectors.
- One for CPU cooler and two for System FAN.

Dimensions

- 190mm (W) x 135mm (L).
- 4 screw holes on four corners.

Operating Temperature

- 0 to 60 °C operating Range.
- Relative Humility: 5~95%, non-condensing.

2 Section 1 and 2

Jumper Settings & Connectors

This chapter provides information on the TR-5197 jumper settings and internal and external connectors. The topics covered are as follows:

Section 1 - Jumpers on the TR-5197 10-14
Section 2 - Connectors on the TR-5197 15-32

2 Section 1

Jumpers on the TR-5197 SBC

The jumpers on the TR-5197 SBC allow you to configure your board according to the needs of your applications. The following table lists the jumpers on TR-5197 SBC and their respective functions.

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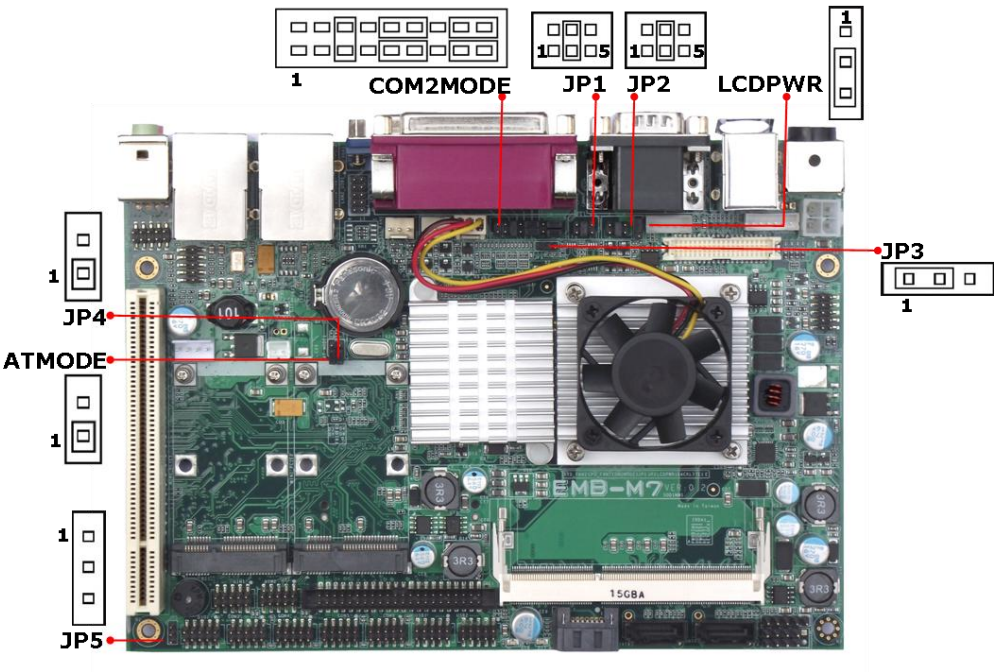
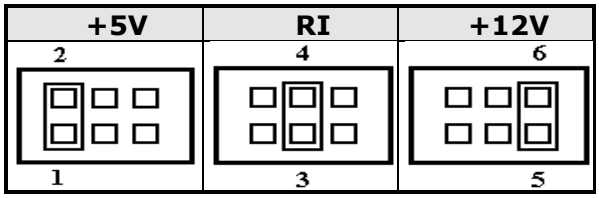
JP3: Clear CMOS RAM Data 12
JP4: CF Card Mode Selection 13
JP5: COM1 Power Pin (Pin9) 13
AT MODE: AT Mode Selection 13
LCDPWR: LCD PANEL Power Selection 14
COM2MODE: RS232/RS422/RS485 14

Jumper Locations on the TR-5197 SBC



JP1, JP2: COM Power Selection

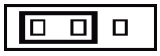
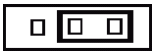
JP1, JP2 can be used to select the COM supple power: +5V, Ring-IN or +12V.
JP1: COM2Pin9 power or Ring-IN
JP2: COM1 pin9 power or Ring-IN



JP3: Clear CMOS RAM Data

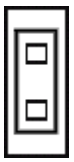
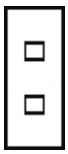
This 3-pin Jumper allows the user to disconnect the built-in 3V battery power to clear the information stored in the CMOS RAM. To clear the CMOS data:

1. Turn off the system power.
2. Remove Jumper cap from pin1&2.
3. Short the pin2 and pin3 for three seconds.
4. Put Jumper cap back to pin1 & 2.
5. Turn on your computer.
6. Hold Down <Delete> during boot up and enter BIOS setup to enter your preferences.

COMS	NORM	CLR
JP3	1-2 	2-3 

JP4: CF Card Mode Selection

This Jumper is to select the CF works as Secondary Channel Master Device or Slave Device.

Master	Slave
 JP4	 JP4

JP5: COM1 Power Pin (Pin9)

JP5 can be used to select the COM supple power: +5V or +12V.
JP5: COM6 Pin9 power

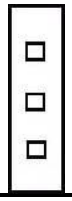
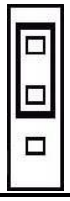
+5V	+12V
 1	 1

AT MODE: AT Mode Selection

AT Mode	ATX Mode
1 	1 

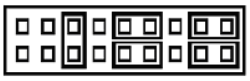
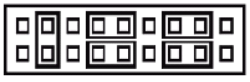
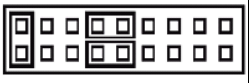
LCDPWR: LCD PANEL Power Selection

LCDPWR can be used to select the Panel LCD supple power: +3.3V or +5V.The default setting is on +3.3V.User need to check the LCD panel spec and adjust this jumper to make Panel work in specified power rail. This Jumper serves LVDS LCD connector.

LCDPWR	+5V	+3.3V
1	1	1
		

COM2MODE: RS232/RS422/RS485

COM2 support multi-protocols include RS232, RS422 and RS485, while COM3, COM4. COM5 and COM6 support diffused RS232 protocol.
The Protocols of COM2 can be set up through jumpers.
COM2MODE: COM2 Protocols selection.
The pin-out for each mode is illustrated on next chapter.

COM2MODE1	I/F TYPE
2 18  1 17	RS-232
2 18  1 17	RS-422
2 18  1 17	RS-485

2 Section 2

Connectors on the TR-5197

The connector on the TR-5197 allows you to connect external devices such as keyboard, floppy disk drives, hard disk drives, printers and etc. The following table lists the connectors on TR-5197 and their respective page number.

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IRDA Connector 18
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COM2 Serial Port..... 20
COM3, COM4, COM5,COM6 Serial Ports..... 21
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PWROUT2 Connector 21
LPT Port 22
PS/2 Keyboard & Mouse Connector.....23
PS2KBMS Connector 23
VGA Connector 24
VGA1 Connector.....24
VGA2 Connector..... 25
DCIN Connector 25
DCIN2 Power Connector..... 26
CPU Fan Power Connector 26
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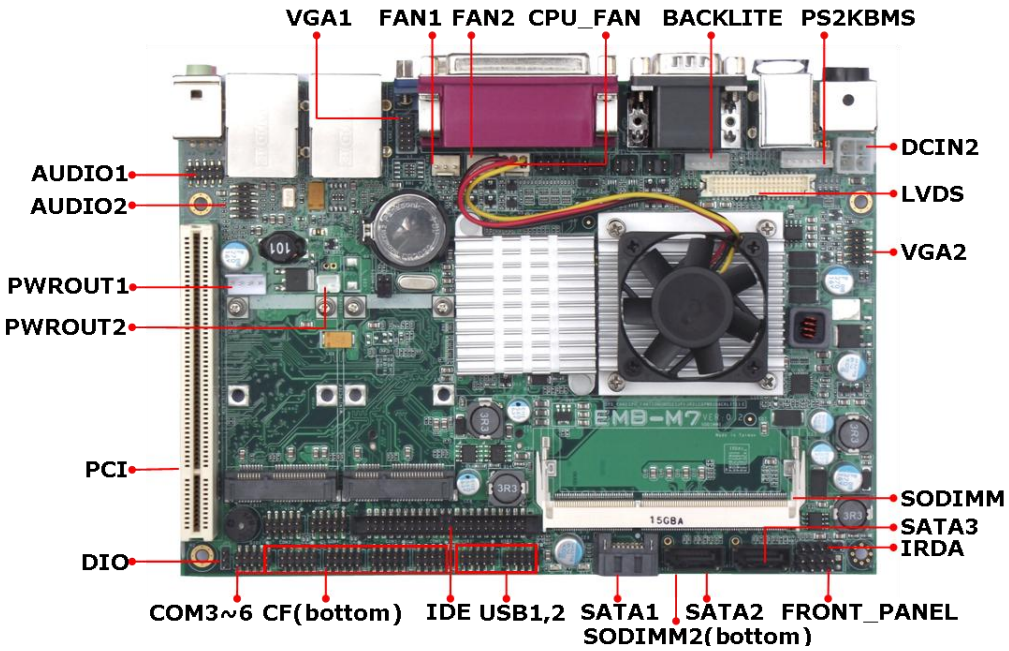
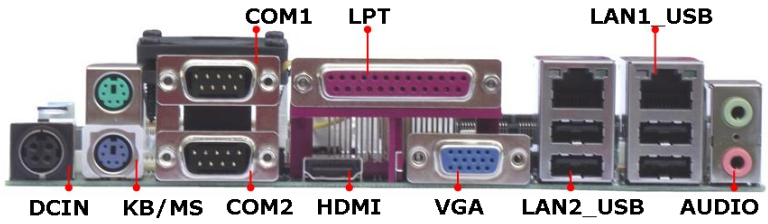
CF-II Connector 32

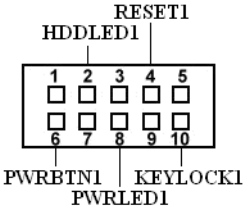
Connector Locations on the TR-5197





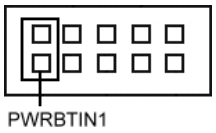
Front Panel Connector

The front panel of the case has a control panel, which provides light indication of the computer activities and switches to change the computer status.



- **ATX Power ON/OFF Button**

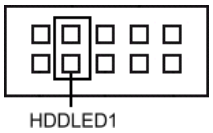
This 2-pin connector acts as the "Power Supply On/Off Switch" on the TR-5197 main board. When pressed the, switch will force the Main board to power on. When pressed again, it will force the main board to power off.



PWR BTN Pin #	Signal Name
1	PWR-BTN
6	GND

- **HDD LED Connector**

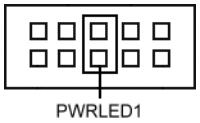
This connector connects to the hard drive activity LED on control panel. This LED will flash when the HDD is being accessed.



HDD LED Pin #	Signal Name
2	VCC
7	HDDLED

- **Power-On LED**

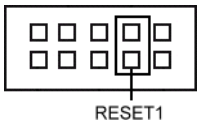
This connector allows users to connect to Front Panel Power indicator.



Power-On Pin #	Signal Name
3	VCC
8	GND

➢ **RESET Switch**

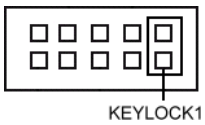
The reset switch allows the user to reset the system without turning the main power switch off and then on. Orientation is not required when making a connection to this header.



RESET Pin #	Signal Name
4	Reset
9	GND

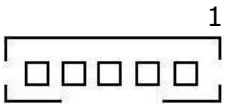
➢ **KEYLOCK Switch**

The keylock switch, when closed, will disable the keyboard function.



KEYLOCK Pin #	Signal Name
5	KEYLOCK
10	GND

BACKLIGHT Connector



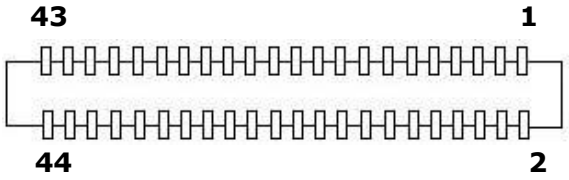
Pin #	Signal Name
1	+12V
2	GND
3	Brightness
4	ON/OFF
5	GND

IRDA Connector

This connector is used for an IRDA connector for wireless communication.

IrDA Pin #	Signal Name
1	+5V
2	FIR
3	IR-TX
4	GND
5	IR-RX

IDE Connectors

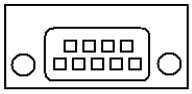


Primary IDE Connector

Signal Name	Pin #	Pin #	Signal Name
Reset IDE	1	2	Ground
Host data 7	3	4	Host data 8
Host data 6	5	6	Host data 9
Host data 5	7	8	Host data 10
Host data 4	9	10	Host data 11
Host data 3	11	12	Host data 12
Host data 2	13	14	Host data 13
Host data 1	15	16	Host data 14
Host data 0	17	18	Host data 15
Ground	19	20	Key
DRQ	21	22	Ground
Host IOW	23	24	Ground
Host IOR	25	26	Ground
IOCHRDY	27	28	Host PU 0
DACK	29	30	Ground
IRQ14	31	32	No connect
Address 1	33	34	P66DET
Address 0	35	36	Address 2
Chip select 1	37	38	Chip select 3
Activity LED	39	40	GND
VCC	41	42	VCC
GND	43	44	NC

COM1 Serial Port

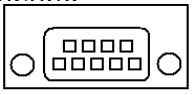
COM1, a 9-pin D-Sub male connector, is the onboard COM1 serial port of the TR-5197. The following table shows its pin assignments.



Pin #	Signal Name
1	DCD, Data carrier detect
2	RXD, Receive data
3	TXD, Transmit data
4	DTR, Data terminal ready
5	GND, ground
6	DSR, Data set ready
7	RTS, Request to send
8	CTS, Clear to send
9	+5V,Ring-IN or +12V

COM2 Serial Port

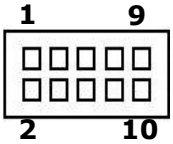
COM2, a 9-pin D-Sub male connector, is the onboard COM2 serial port of the TR-5197. The following table shows its pin assignments.



Pin #	RS232 Mode Signal Name	RS422/RS485 Mode Signal Name
1	DCD, Data carrier detect	TX- (422/485)
2	RXD, Receive data	TX+ (422/485)
3	TXD, Transmit data	RX+ (422)
4	DTR, Data terminal ready	RX- (422)
5	GND, ground	GND
6	DSR, Data set ready	N.C.
7	RTS, Request to send	N.C.
8	CTS, Clear to send	N.C.
9	+5V,Ring-IN or +12V	N.C.

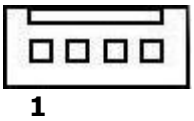
COM3, COM4, COM5,COM6 Serial Ports

COM3, COM4, COM5, COM6 a 10-pin header connector, is the onboard COM3, COM4, COM5, COM6 serial port of the TR-5197. The following table shows its pin assignments.



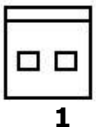
Pin #	RS232 Mode Signal Name
1	DCD, Data carrier detect
2	RXD, Receive data
3	TXD, Transmit data
4	DTR, Data terminal ready
5	GND, ground
6	DSR, Data set ready
7	RTS, Request to send
8	CTS, Clear to send
9	Ring-IN
10	NC

PWROUT1 Connector



Pin #	Signal Name
1	VCC
2	GND
3	GND
4	+12V

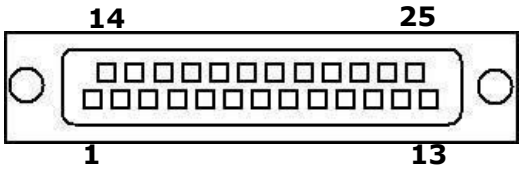
PWROUT2 Connector



Pin #	Signal Name
1	VCC
2	GND

LPT Port

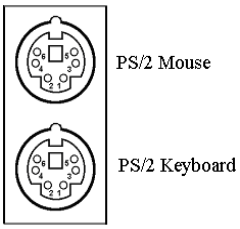
The LPT parallel port is a standard DSUB 25-pins Female connector. It can be configured as EPP or ECP or SPP mode.



Signal Name	Pin #	Pin #	Signal Name
Strobe	1	14	AUTOFD
DATA0	2	15	ERROR
DATA1	3	16	INIT
DATA2	4	17	SLIN
DATA3	5	18	GND
DATA4	6	19	GND
DATA5	7	20	GND
DATA6	8	21	GND
DATA7	9	22	GND
ACK	10	23	GND
BUSY	11	24	GND
PE	12	25	GND
SLCT	13		

PS/2 Keyboard & Mouse Connector

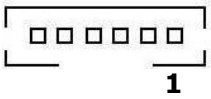
The following table describes the pin assignment of PS/2 Keyboard and Mouse connector.



Pin #	Signal Name
1	Keyboard/Mouse data
2	NC
3	GND
4	5V
5	Keyboard/Mouse clock
6	GND

PS2KBMS Connector

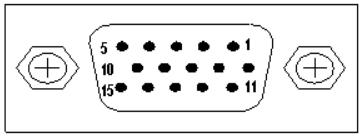
The following table describes the pin assignment of PS/2 Keyboard and Mouse connector with 6-pins wafer for internal or external access.



Pin #	Signal Name
1	RKBCLK
2	RKBDAT
3	RMSCLK
4	RMSDAT
5	RKBVCC
6	KBGND

VGA Connector

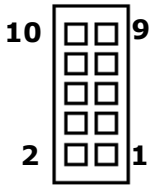
The pin assignments of VGA CRT connector are as follows:



Signal Name	Pin #	Pin #	Signal Name
Red	1	2	Green
Blue	3	4	N.C.
GND	5	6	GND
GND	7	8	GND
N.C.	9	10	GND
N.C.	11	12	DDC_DATA
HSYNC	13	14	VSYNC
DDC_CLK	15		

VGA1 Connector

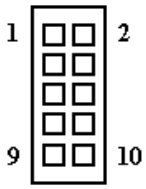
INT_VGA is for internal Video A/D board connection. The pin out is listed as below:



Signal Name	Pin #	Pin #	Signal Name
RED	1	2	GND
GREEN	3	4	GND
BLUE	5	6	GND
HSYNC	7	8	DDC_DATA
VSYNC	9	10	DDC_CLK

VGA2 Connector

INT_VGA is for internal Video A/D board connection. The pin out is listed as below:



Signal Name	Pin #	Pin #	Signal Name
RED	1	2	GND
GREEN	3	4	GND
BLUE	5	6	GND
HSYNC	7	8	DDC_DATA
VSYNC	9	10	DDC_CLK

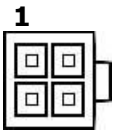
DCIN Connector

DC_IN1 is for external power input connection to supply system power. It needs to be +12V input from AC/DC adapter within 5% tolerance.
Users should calculate the total system power required and use sufficient rating adapter.

Signal Name	Pin #	Pin #	Signal Name
+12V	1	2	+12V
GND	3	4	GND

DCIN2 Power Connector

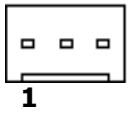
The CD_IN2 power connector is for internal connection to +12V input power. If you already have external +12V power input connected on DC_IN1, please leave DC_IN2 unconnected.



Pin #	Signal Name
1	GND
2	GND
3	+12V
4	+12V

CPU Fan Power Connector

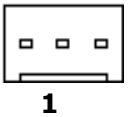
This is a 3-pin header for the CPU fan.



Pin #	Signal Name
1	Ground
2	+12V
3	CPUPWM

FAN1 Power Connector

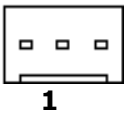
This is a 3-pin header for the system fan.



Pin #	Signal Name
1	Ground
2	+12V
3	SYSPWM

FAN2 Power Connector

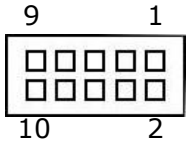
This is a 3-pin header for the system fan.



Pin #	Signal Name
1	Ground
2	+12V
3	SYSPWM

USB12 USB34 Connectors

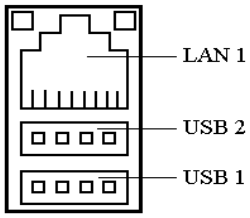
The following table shows the pin outs of the USB56 USB78 connectors.

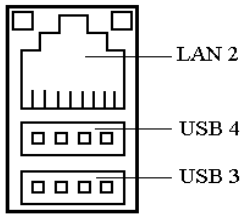


USB5,USB6 USB7,USB8 Pin#		Signal Name
10	1	N.C.
2	9	+5V
8	3	Ground
4	7	USB-
6	5	USB+

LANGbE+USBx2 Connectors

Below pictures show the location of LAN GbE ports and USB Type-A ports on the Combo GbE + USB connector.

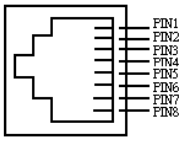




Before you connect your device(s) into USB connector(s), please make sure your device(s) such as USB keyboard, mouse, scanner, zip, speaker and etc., Have a standard USB interface. Also make sure your OS supports USB controller.
If you're OS does not support USB controller, please contact OS vendor for possible patch or driver upgrade. For more information please contact your OS or device(s) vendors.

LAN- GBE Connectors

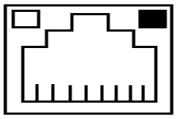
This connector is for the 10/100/1000Mbps Ethernet capability. The figure below shows the pin out assignments of this connector and its corresponding input jack.



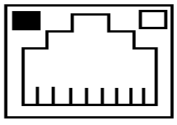
Pin #	Signal Name
1	MDI0+
2	MDI0-
3	MDI1+
4	MDI1-
5	MDI2+
6	MDI2-
7	MDI3+
8	MDI3-

LAN RJ45 LED1, 2

The LAN_LEDs on top of RJ45 are to display the current network connection status. The green color LED on the right-hand side shows the link status and TX/RX activity. The Orange/Green Dual color LED on the left-hand side indicates the operation mode, i.e. 10Base-T, 100Base-T or 1000Base-T.



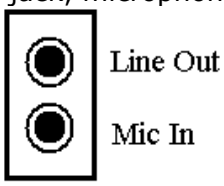
LNK/ACT	STATUS
YELLOW	Link
OFF	Disconnected
FLASH	Packets TX/RX



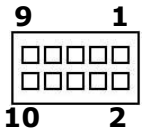
SPEED	MODE
ORANGE	1000 Mbps
GREEN	100 Mbps
OFF	10 Mbps

Audio Connectors

After install onboard audio driver, you may connect speaker to Line Out jack, microphone to MIC In jack.

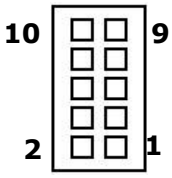


Audio1Pin Headers



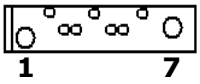
Signal Name	Pin #	Pin #	Signal Name
JD0	1	2	NC
MIC1-IN-L	3	4	MIC1-IN-R
GND	5	6	GND
LINEOUT-L	7	8	LINE-IN-L
LINEOUT-R	9	10	LINE-IN-R

Audio 2 Pin Headers



Signal Name	Pin #	Pin #	Signal Name
SPDIF_IN_RCA	1	2	SPDIF_IN_OPT
SPDIF_OUT_RCA	3	4	SPDIF_OUT_OPT
GND	5	6	GND
SURR_L	7	8	SURR_R
CENT	9	10	VCC

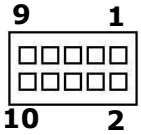
SATA1, SATA2, SATA3 Connectors



Pin #	Signal Name
1	GND
2	SATATX+
3	SATATX-
4	GND
5	SATARX-
6	SATARX+
7	GND

DIO Pin Header

DIO port supports 8 digital I/O bits. Each bit can be configured as Input or output individually. All bits are 5V tolerant.



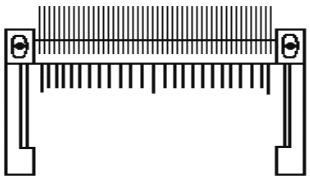
Signal Name	Pin #	Pin #	Signal Name
GND	1	2	+5V
DIO_0	3	4	DIO_4
DIO_1	5	6	DIO_5
DIO_2	7	8	DIO_6
DIO_3	9	10	DIO_7

LVDS Connector

The LCD panel, inverter for LCD LAMP, Touch-screen Serial Interface must be connected to this LVDS header, using the below described connector:

Signal Name	Pin #	Pin #	Signal Name
+12V	2	1	+12V
GND	4	3	GND
LCDVDD 5V/3.3V	6	5	LCDVDD 5V/3.3V
GND	8	7	GND
BCKLITE_ON	10	9	BRIGHTNES
LVDS_GND	12	11	LVDS_GND
-	14	13	CHA_TX0+
-	16	15	CHA_TX0-
-	18	17	LVDS_GND
-	20	19	CHA_TX1+
-	22	21	CHA_TX1-
-	24	23	LVDS_GND
-	26	25	CHA_TX2+
-	28	27	CHA_TX2-
-	30	29	LVDS_GND
-	32	31	CHA_TXC+
-	34	33	CHA_TXC-
-	36	35	LVDS_GND
-	38	37	CHA_TX3+
-	40	39	CHA_TX3-

CF-II Connector



Signal Name	Pin #	Pin #	Signal Name
GND	1	2	PDD3
PDD4	3	4	PDD5
PDD6	5	6	PDD7
PCS1-	7	8	GND
GND	9	10	GND
GND	11	12	GND
VCC	13	14	GND
GND	15	16	GND
GND	17	18	PDA2
PDA1	19	20	PDA0
PDD0	21	22	PDD1
PDD2	23	24	N.C.
N.C.	25	26	N.C.
PDD11	27	28	PDD12
PDD13	29	30	PDD14
PDD15	31	32	PCS3-
N.C.	33	34	PDIOR-
PDIOW-	35	36	VCC
IRQ14	37	38	VCC
MST#_SLV	39	40	N.C.
PST1-	41	42	PIORDY
PDDREQ	43	44	PDDACK-
CF_LED-	45	46	N.C.
PDD8	47	48	PDD9
PDD10	49	50	GND

2 Section 3

BIOS Setup

This section describes the different settings available in the Award BIOS that comes with the TR-5197 SBC.The topics covered in this chapter are as follows:

Main Menu 38
Standard CMOS Features 41
Advanced BIOS Features 46
Advanced Chipset Features 51
Integrated Peripherals 54
Power Managment Setup 66
PnP/PCI Configurations 68
PC Health Status 72
Load Fail-Safe Defaults 74
Load Optimized Defaults 74
Set Supervisor/User Password 75
Save & Exit Setup 77
Exit Without Saving 77

BIOS Introduction

This section discusses Award™ Setup program built into the TR-5197 BIOS. The Setup program allows users to modify the basic system configuration. This special information is then stored in battery-backed RAM so that it retains the Setup information when the power is turned off.

The AwardBIOS™ installed in TR-5197 is a custom version of an industry standard BIOS. This means that it supports Intel Dual Atom in a standard IBM-AT compatible input/output system. The BIOS provides critical low-level support for standard devices such as disk drives and serial and parallel ports.
It also adds non-standard, features such as virus and password protection as well as special support for detailed fine-tuning of the chipset controlling the entire system.
The rest of this chapter is intended to guide you through the process of configuring your system using Setup.

Starting Setup

The AwardBIOS™ is immediately activated when you first power on the computer. The BIOS reads the system information contained in the CMOS and begins the process of checking out the system and configuring it. When it finishes, the BIOS will seek an operating system on one of the disks and then launch and turn control over to the operating system.

While the BIOS is in control, the Setup program can be activated in one of two ways:

1. By pressing <Del> immediately after switching the system on, or
2. By pressing the <Del> key when the following message appears briefly at the bottom of the screen during the POST (Power On Self-Test).

Press DEL to enter SETUP.

If the message disappears before you respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the "RESET" button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys. If you
do not press the keys at the correct time and the system does not boot, an error message will be displayed and you will again be asked to...

PRESS F1 TO CONTINUE, DEL TO ENTER SETUP

Using Setup

In general, you use the arrow keys to highlight items, press <Enter> to select, use the PageUp and PageDown keys to change entries, press <F1> for help and press <Esc> to quit. The following table provides more detail about how to navigate in the Setup program using the keyboard.

Key	Function
Up Arrow	Move to the previous item
Down Arrow	Move to the next item
Left Arrow	Move to the item on the left (menu bar)
Right Arrow	Move to the item on the right (menu bar)
Esc	Main Menu: Quit without saving changes Submenus: Exit Current page to the next higher level menu
Move Enter	Move to the item you desired
PgUp key	Increase the numeric value or make changes
PgDn key	Decrease the numeric value or make changes
+ key	Increase the numeric value or make changes
- key	Decrease the numeric value or make changes
Esc key	Main Menu -- Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
F1 key	General help on Setup navigation keys
F5 key	Load previous values from CMOS
F6 key	Load the fail-safe defaults from BIOS default table
F7 key	Load the optimized defaults
F10 key	Save all the CMOS changes and exit

Navigating through the menu bar
Use the left and right arrow keys to choose the menu you want to be in.

To display a sub menu
Use the arrow keys to move the cursor to the sub menu you want. Then press <Enter>. A "➢" pointer marks all sub menus.

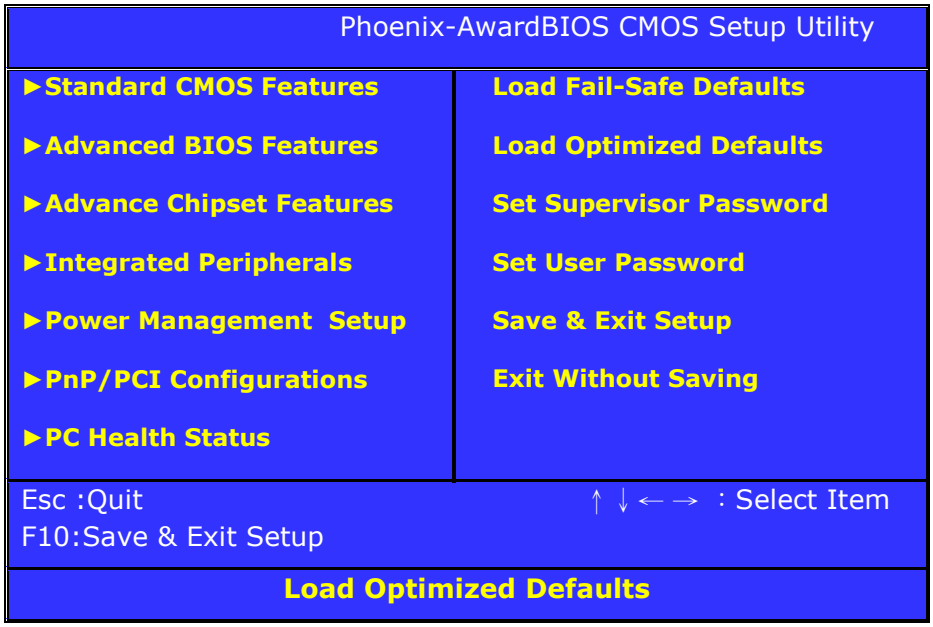
Getting Help

Press F1 to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window press <Esc> or the F1 key again.

In Case of Problems

If, after making and saving system changes with Setup, you discover that your computer no longer is able to boot, the AwardBIOS™ supports an override to the CMOS settings which resets your system to its defaults.
The best advice is to only alter settings that you thoroughly understand. To this end, we strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both Award and TR-LCD1500-ITX-7 manufacturer to provide the absolute maximum performance and reliability. Even a seemingly small change to the chipset setup has the potential for causing you to use the override.

3.1 Main Menu



(Figure 1)

Note that a brief description of each highlighted selection appears at the bottom of the screen.

Setup Items

The main menu includes the following main setup categories.

➢Standard CMOS Features

Use this menu for basic system configuration.

➢ Advanced BIOS Features

Use this menu to set the Advanced Features available on your system.

➢ Advance Chipset Features

Use this menu to change the values in the chipset registers and optimize your system's performance.

➢ Integrated Peripherals

Use this menu to specify your settings for integrated peripherals.

➢ Power Management Setup

Use this menu to specify your settings for power management.

➢ PnP/PCI Configurations

Use this menu to set up the PnP/PCI configuration.

➢ PC Health Status

Use this menu to display the CPU temperature, FAN speed and voltages.

➢ Load Fail-Safe Defaults

Use this menu to load the BIOS default values for the minimal/stable performance for your system to operate.

➢ Load Optimized Defaults

Use this menu to load the BIOS default values that are factory settings for optimal performance system operations. While Award has designed the custom BIOS to maximize performance, the factory has the right to change these defaults to meet their needs.

➢ Set Supervisor/ User Password

Use this menu to set User and Supervisor Passwords.

➢ Save & Exit Setup

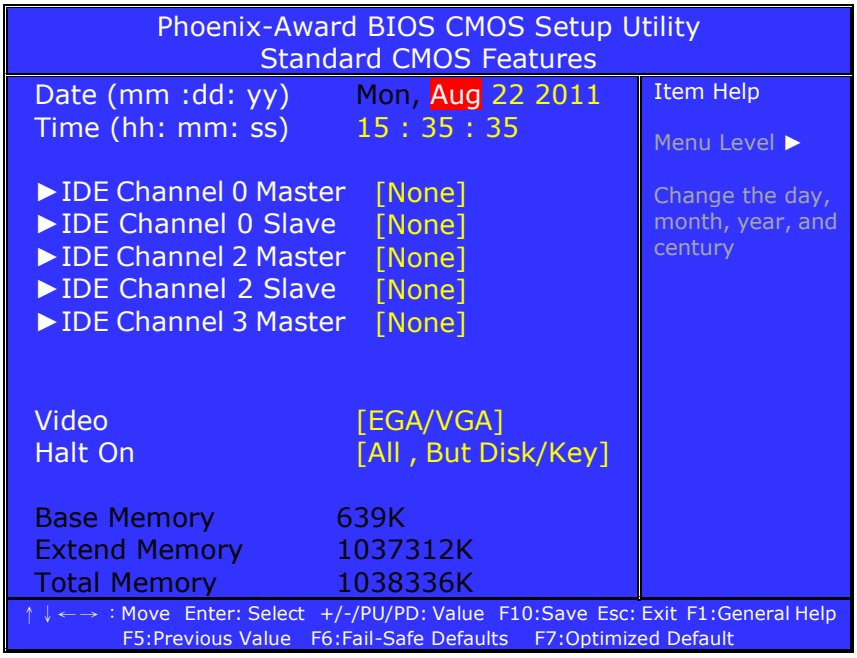
Save CMOS value changes to CMOS and exit setup.

➢ Exit Without Saving

Abandon all CMOS value changes and exit setup.

3.2 Standard CMOS Features

The items in Standard CMOS Setup Menu are divided into 10 categories. Each category includes no, one or more than one setup items. Use the arrow keys to highlight the item and then use the <PgUp> or <Pg Dn> keys to select the value you want in each item.



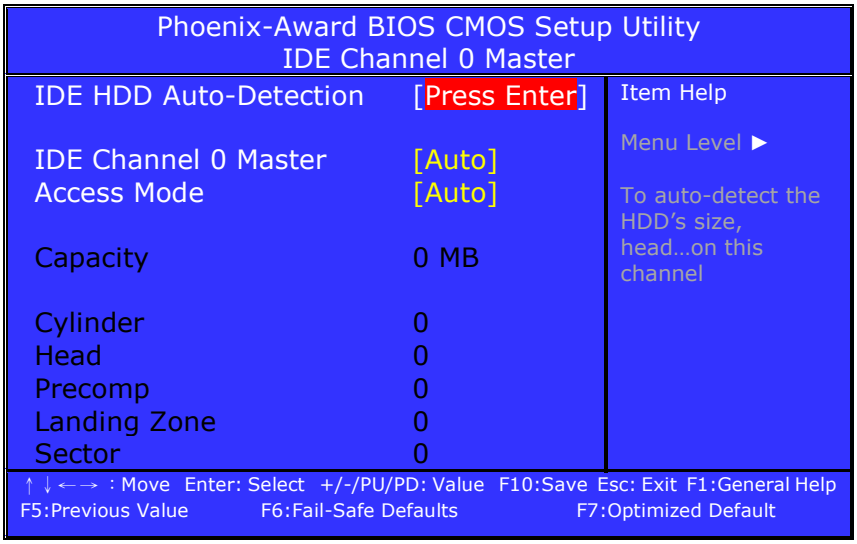
(Figure 2)

This table shows the selections that you can make on the Standard CMOS Menu

Item	Options	Description
Date	Month DD YYYY	Set the system date. Note that the 'Day' automatically changes when you set the date
Time	HH : MM : SS	Set the system time
IDE Channel 0 Master	Options are in its sub menu	Press <Enter> to enter the sub menu of detailed options
IDE Channel 0 Slave	Options are in its sub menu	Press <Enter> to enter the sub menu of detailed options
Drive A Drive B	None 360K, 5.25 in 1.2M, 5.25 in 720K, 3.5 in 1.44M, 3.5 in 2.88M, 3.5 in	Select the type of floppy disk drive installed in your system
Video	EGA/VGA CGA 40 CGA 80 MONO	Select the default video device
Halt On	All Errors No Errors All, but Keyboard All, but Diskette All, but Disk/Key	Select the situation in which you want the BIOS to stop the POST process and notify you
Base Memory	N/A	Displays the amount of conventional memory detected during boot up
Extended Memory	N/A	Displays the amount of extended memory detected during boot up
Total Memory	N/A	Displays the total memory available in the system

IDE Channel 0, 1 Master/ Slave

The IDE adapters control the hard disk drive. Use a separate sub menu to configure each hard disk drive. Figure 3 shows the IDE Channel 0 / Channel 1 master sub menu.



(Figure 3)

Use the legend keys to navigate through this menu and exit to the main menu. Use the Table listed below to configure the hard disk**.**

Item	Options	Description
IDE HDD Auto-detection	Press Enter	Press Enter to auto-detect the HDD on this channel. If detection is successful, it fills the remaining fields on this menu.
IDE Channel 0 Master	None Auto Manual	Selecting 'manual' lets you set the remaining fields on this screen. Selects the type of fixed disk. "User Type" will let you select the number of cylinders, heads, etc. Note: PRECOMP=65535 means NONE!
Access Mode	CHS LBA Large Auto	Choose the access mode for this hard disk
Capacity	Auto Display your disk drive size	Disk drive capacity (Approximated). Note that this size is usually slightly greater than the size of a formatted disk given by a disk checking program.
The following options are selectable only if the 'IDE Channel 0 Master' item is set to 'Manual'		
Cylinder	Min = 0 Max = 65535	Set the number of cylinders for this hard disk.
Head	Min = 0 Max = 255	Set the number of read/write heads
Precomp	Min = 0 Max = 65535	**** Warning: Setting a value of 65535 means no hard disk
Landing zone	Min = 0 Max = 65535	****
Sector	Min = 0 Max = 255	Number of sectors per track

Video

This field selects the type of video display card installed in your system. You can choose the following video display cards:

EGA/VGA: For EGA, VGA, SEGA, SVGA or PGA monitor adapters **(default).**

CGA 40: Power up in 40 column mode.

CGA 80: Power up in 80 column mode.

MONO: For Hercules or MDA adapters.

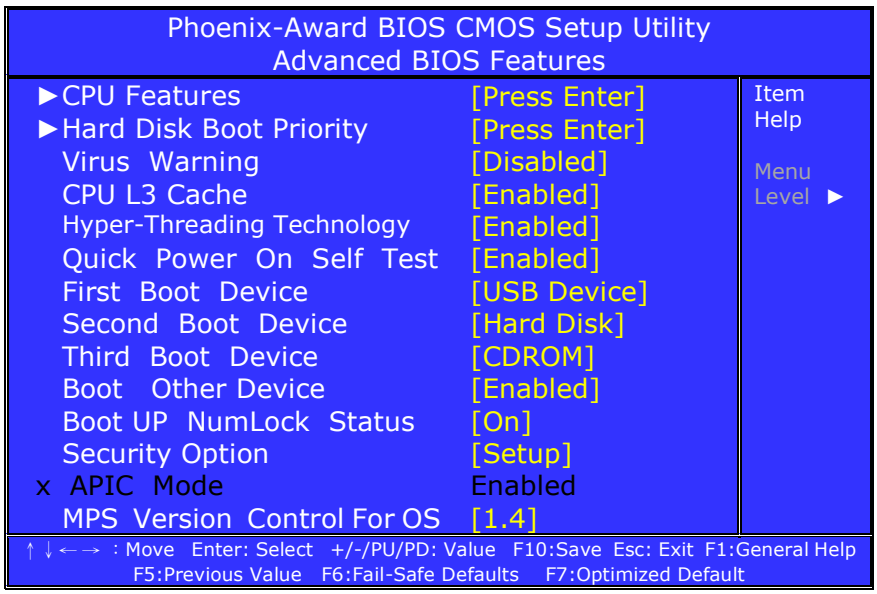
Halt On

This field determines whether the system will halt if an error is detected during power up.

All errors	Whenever the BIOS detect a non-fatal error, the system will stop and you will be prompted.
No errors	The system boot will not be halted for any error that may be detected.
All, But Keyboard	The system boot will not be halted for a keyboard error; it will stop for all other errors **(default).**
All, But Diskette	The system boot will not be halted for a disk error; it will stop for all other errors.
All, But Disk/Key	The system boot will not be halted for a key- board or disk error; it will stop for all others.

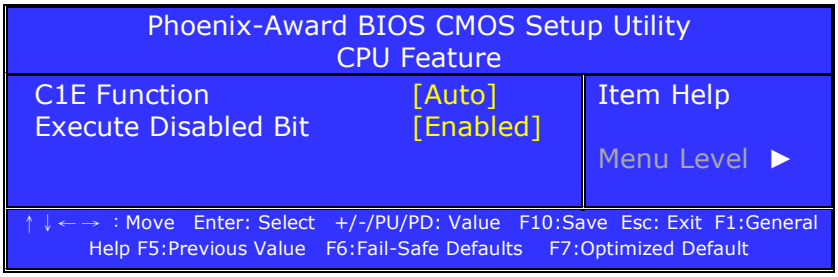
3.3 Advanced BIOS Features

This section allows you to configure your system for basic operation. You have the opportunity to select the system's default speed, boot-up sequence, keyboard operation, shadowing and security.



(Figure 4)

➢CPU Feature



(Figure 5)

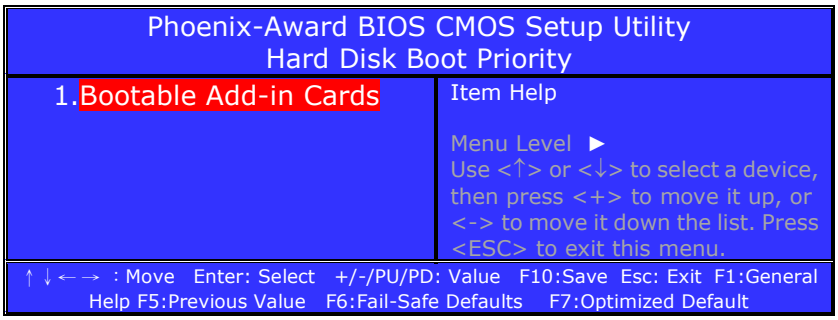
C1E Function

The choice: Auto **(default)**, Disabled

Execute Disabled Bit

The choice: Enabled **(default)**, Disabled

➢Hard Disk Boot Priority



(Figure 6)

Bootable Add-in Cards

This is for setting the priority of the hard disk boot order when the
"Hard Disk" option is selected in the "[First/Second/Third] Boot Device "menu item.

Virus Warning

Allow you to choose the VIRUS Warning feature for IDE Hard Disk boot sector protection.
If this function is enabled and someone attempt to write data into this area, BIOS will show a warning message on screen and alarm beep.

Enabled	Activates automatically when the system boots up causing a warning message to appear when anything attempts to access the boot sector or hard disk partition table.
Disabled	No warning message will appear when anything attempts to access the boot sector or hard disk partition table **(default).**

CPU L3 Cache

This field is used to enable or disable the CPU's L3 cache.
The choice: Enabled **(default)**, Disabled.

Hyper-Threading Technology

The choice: Enabled **(default)**, Disabled.

Quick Power On Self Test

Allow the system to skip certain tests while booting. This will decrease the time needed to boot the system.

Enabled	Enable quick POST **(default).**
Disabled	Normal POST

First/Second/Third Boot Device

The BIOS attempts to load the operating system from the devices in the sequence selected in these items.
The Choice: Floppy, LS120, Hard-Disk, ZIP100, CDROM, Disabled, USB-FDD, USB-ZIP, USB-CDROM, Legacy LAN.

Item	Default
First Boot Device	USB Device
Second Boot Device	Hard Disk
Third Boot Device	CDROM

Boot Other Device

When enabled, BIOS will try to load the operating system from other device when it failed to load from the three devices above.
The choice: Enabled **(default)**, Disabled.

Boot Up NumLock Status

Selects power on state for Num Lock.
The choice: On **(default)**, Off.

Typematic Rate Setting

Keystrokes repeat at a rate determined by the keyboard controller. When enabled, the typematic rate and typematic delay can be selected.
The choice: Enabled, Disabled **(default)**.

If Typematic Rate setting is [Enabled]
Can choice Rate and Delay:

Security Option

Select whether the password is required every time the system boots or only when you enter setup.

System	The system will not boot and access to Setup will be denied if the correct password is not entered at the prompt.
Setup	The system will boot, but access to Setup will be denied if the correct password is not entered at the prompt **(default).**

Note: To disable security, select PASSWORD SETTING at Main Menu and then you will be asked to enter password. Do not type anything and just press <Enter>, it will disable security. Once the security is disabled, the system will boot and you can enter Setup freely.

APIC Mode

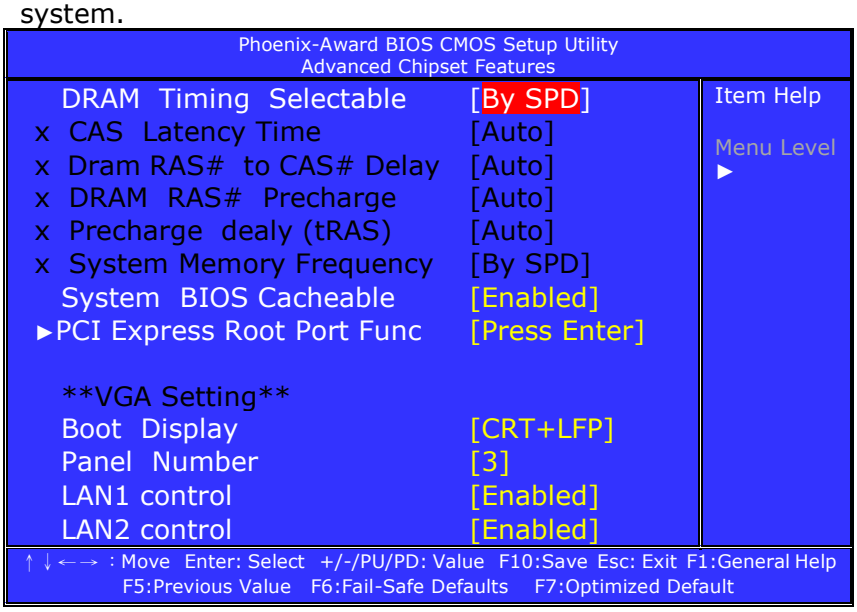
This setting allows to enable the APIC mode.
The choice: Enabled **(default)**, Disabled.

MPS Version Control For OS

The BIOS supports version 1.1 and 1.4 of the Intel multiprocessor specification.
Select version supported by the operation system running on this computer.
The choice: 1.1, 1.4 **(default)**.

3.4 Advanced Chipset Features

This section allows you to configure the system based on the specific features of the installed chipset. This chipset manages bus speeds and access to system memory resources, such as DRAM and the external cache. It also coordinates communications between the conventional ISA bus and the PCI bus. It must be stated that these items should never need to be altered. The default settings have been chosen because they provide the best operating conditions for your system. The only time you might consider making any changes would be if you discovered that data was being lost while using your system.



(Figure 7)

DRAM Timing Selectable

The choice: Manual, By SPD **(default)**.

If DRAM Timing Selectable is [Manual], can choice these Items:

►CAS Latency Time
►Dram RAS# to CAS# Delay
►DRAM RAS# Precharge
►Precharge dealy (tRAS)
►System Memory Frequency

CAS Latency Time

This controls the latency between DDR RAM read command and the time that the data actually becomes available.
Leave this on the default setting.
The choice: 5, 4, 3, 6, Auto **(default)**.

DRAM RAS# to CAS# Delay

In order to improve performance, certain space in memory is reserved for PISA cards.
This memory must be mapped into the memory space below 16MB.
The choice: 2, 3, 4, 5, 6, Auto **(default)**.

DRAM RAS# Precharge

This controls the idle clocks after issuing a precharge command to DRAM.
Leave this on the default setting.
The choice: Auto **(default)**, 2, 3,4,5,6.

Precharge dealy (tRAS)

The choice: Auto **(default)**,
4,5,6,7,8,9,10,11,12,13,14,15.

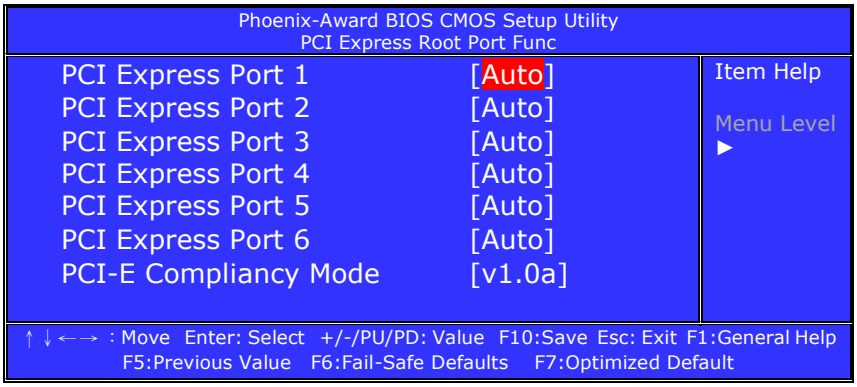
System Memory Frequency

The choice: By SPD **(default)**, 667MHz, 800MHz

System BIOS Cacheable

Selecting the "Enabled" option allows caching of the system BIOS ROM at F0000h-FFFFFh, which is able to improve the system performance. However, any programs that attempts to write to this memory block will cause conflicts and result in system errors.
The choice: Enabled (**default)**, Disabled.

▸PCI Express Root Port Func



PCI Express Port 1~6

The choice: Enabled, Disabled, Auto **(default).**

PCI-E Compliancy Mode

The choice: v1.0a, v1.0 **(default).**

Boot Display

This field is used to select the type of display to use when the system boots.
The choice:

Auto	CRT	TV	EFP
LFP	CRT+LFP **(default)**	EFP+LFP	

Panel Number

The choice: 1,2,3 **(default)**,4,5,6,7,8,9,10,11,12,13,14,15,16.

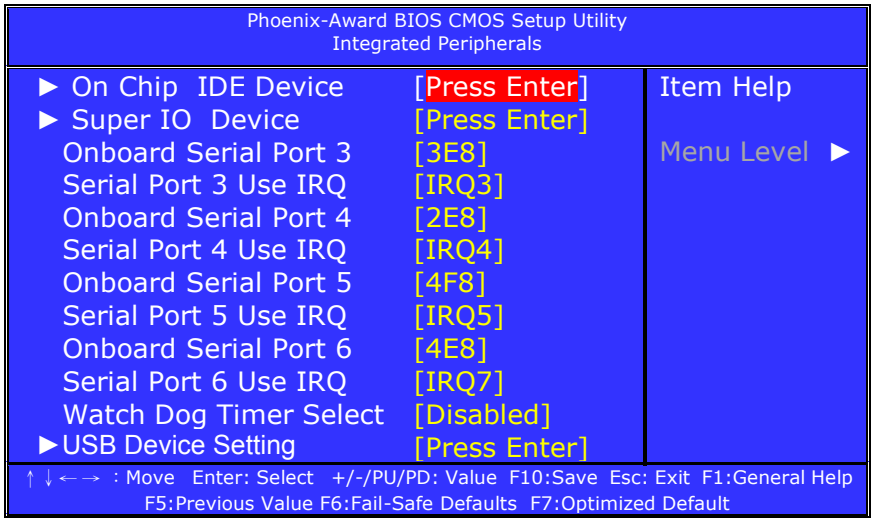
Lan1 Chip Control

The choice: Enabled **(default)**, Disabled.

Lan2 Chip Control

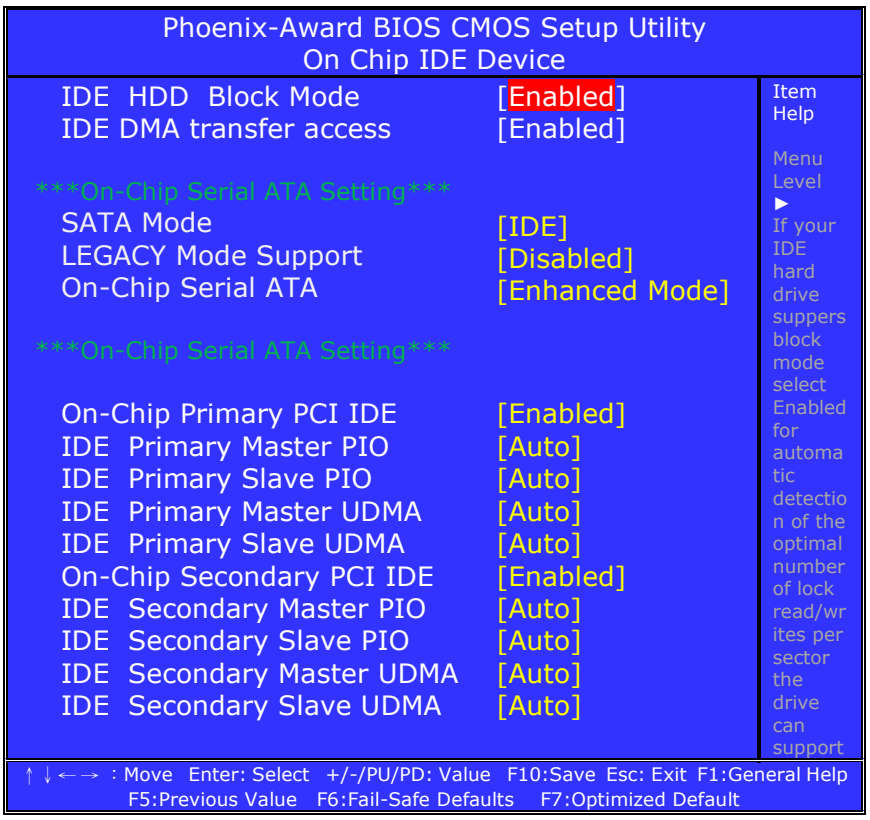
The choice: Enabled **(default)**, Disabled.

3.5 Integrated Peripherals



(Figure 8)

➢On Chip IDE Device



(Figure 9)

IDE HDD Block Mode

Block mode is also called block transfer, multiple commands, or multiple sectors read / write.

If you're IDE hard drive supports block mode (most new drives do), select Enabled for automatic detection of the optimal number of block mode (most new drives do), select.

Enabled for automatic detection of the optimal number of block read /write per sector where the drive can support.

The choice: Enabled **(default)**, Disabled.

IDE DMA transfer access

The choice: Enabled **(default)**, Disabled.

SATA Mode

The choice: IDE **(default)**, RAID, AHCI.

LEGACY Mode Support

The choice: Enabled, Disabled **(default)**.

On-Chip Serial ATA

The choice: Disabled, Combined Mode, Enhanced Mode **(default)**, and SATA Only.

On-Chip Primary PCI IDE

This field allows you to enable or disable the primary and secondary IDE controller.
Select disabled if you want to add a different hard drive controller.
The choice: Enabled **(default)**, Disabled.

IDE Primary/Secondary, Master/Slave PIO

The choice: Auto **(default)**, Mode0, Mode1, Mode2, Mode3, Mode4.

Caution: Do not use the wrong setting or you will have drive errors.

PIO means Programmed Input/output.
Rather than have the BIOS issue a series of commands to affect a transfer to or from the disk drive, PIO allows the BIOS to tell the controller what it wants and then let the controller and the CPU perform the complete task by them.

Your system supports five modes, 0 (default) to 4, which primarily differ in timing.
When Auto is selected, the BIOS will select the best available mode after checking your drive.

Auto	The BIOS will automatically set the system according to your hard disk drive's timing **(default)**.
Mode 0-4	You can select a mode that matches your hard disk drive's timing.

IDE Primary/Secondary, Master/ Slave UDMA

The choice: Disabled, Auto **(default).**

On-Chip Secondary PCI IDE

These fields allow you to enable or disable the primary and secondary IDE controller.
Select disabled if you want to add a different hard drive controller.
The choice: Enabled **(default)**, Disabled.

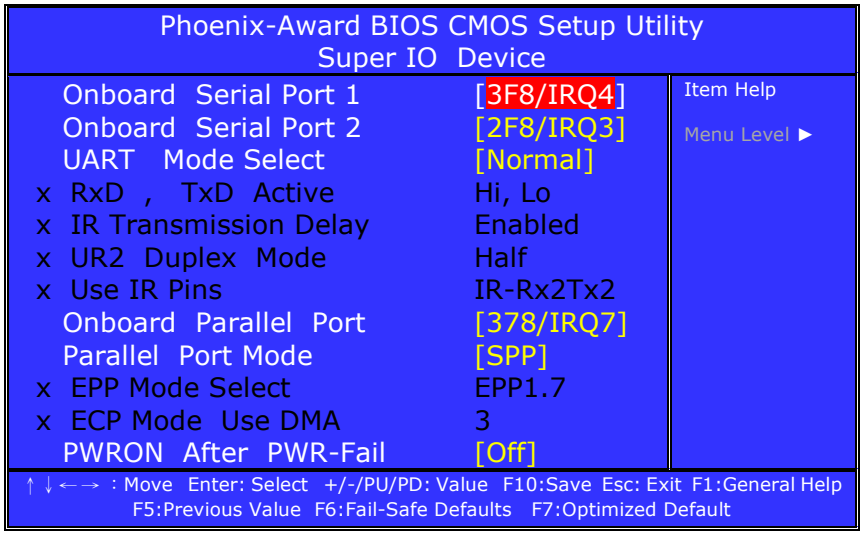
IDE Secondary Master/Slave PIO

The choice: Auto **(default)**, Mode0, Mode1, Mode2, Mode3, Mode4.

IDE Secondary Master/Slave UDMA

The choice: Auto **(default)**, Mode0, Mode1, Mode2, Mode3, Mode4.

➢Super IO Device



Onboard Serial Port 1

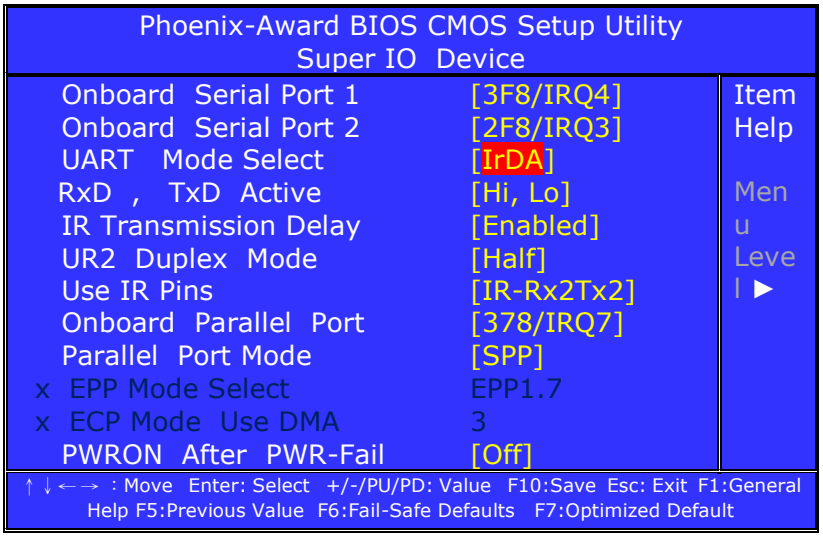
Select an address and corresponding interrupt for the first serial ports.
The choice: Disable, 3F8/IRQ4 **(default)**, 2F8/IRQ3, 3E8/IRQ4, 2E8/IRQ3, Auto.

Onboard Serial Port 2

Select an address and corresponding interrupt for the second serial ports.
The choice: Disable, 3F8/IRQ4, 2F8/IRQ3 **(default)**, 3E8/IRQ4, 2E8/IRQ3, Auto.

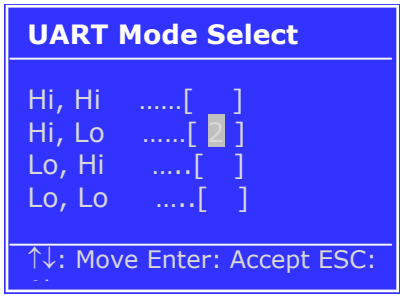
UART Mode Select

This item allows you to select which mode for the Onboard Serial Port 2.
The choice: IrDA, ASKIR, Normal **(default).**
If UART Mode Select is [IrDA] and [ASKIR] will show:



RxD, TxD Active

The choice:



IR Transmission Delay

The choice: Disabled, Enabled **(default)**.

UR2 Duplex Mode

The choice: Full, Half **(default)**.

Onboard Parallel Port

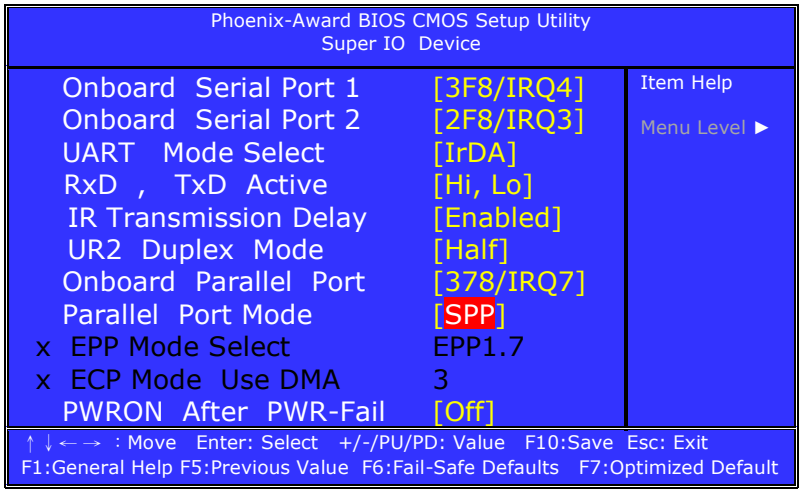
This item allows you to determine onboard parallel port controller I/O address setting.
The choice: 378/IRQ7 **(default)**, 278/IRQ5, 3BC/IRQ7, Disabled.

Parallel Port Mode

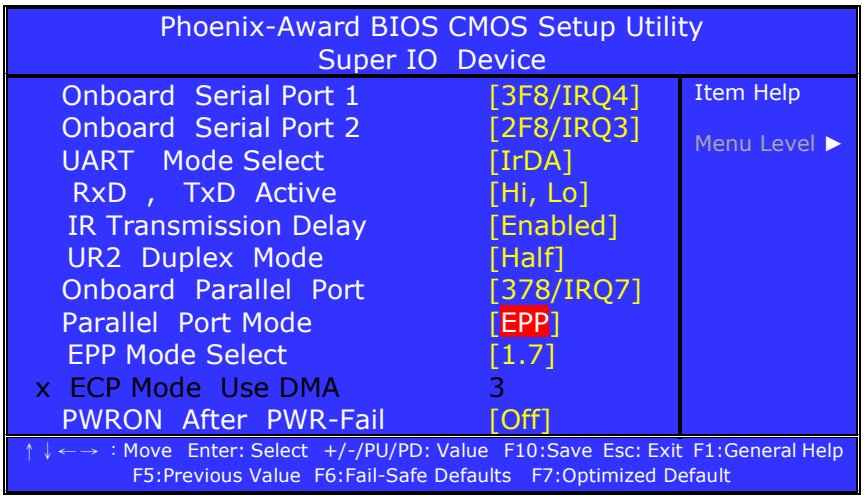
The choice: SPP **(default)**, EPP, ECP, ECP+EPP, Normal.

SPP	Sets the parallel port to function as a Standard Parallel Port. This is the default (and slowest) option.
EPP	Sets the parallel port to Enhanced Parallel Port mode. Sometimes also called "Bi-directional"
ECP	Sets the parallel port up as an Enhanced Capabilities Port. This setting requires the use of a DMA channel

If Parallel Port Mode Select is[SPP] and [Normal] will show:



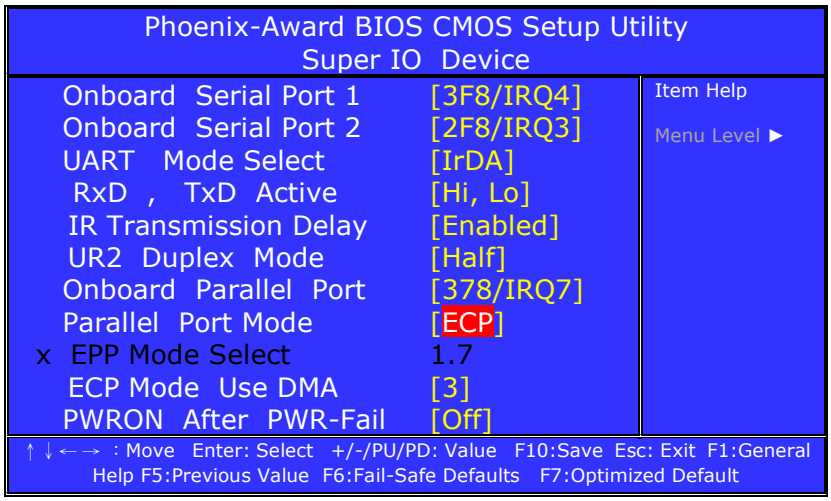
If Parallel Port Mode Select is [EPP] will show:



EPP Mode Select

Select EPP port type 1.7 or 1.9.
The choice: EPP1.7 **(default)**, EPP1.9.

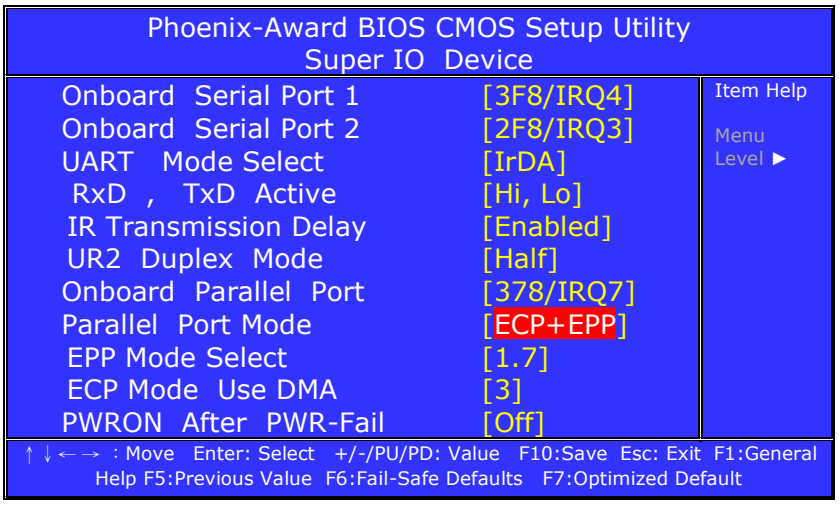
If Parallel Port Mode Select is [ECP] will show:



ECP Mode Use DMA

If your system supports ECP parallel port mode and you have the port set to use ECP, you must use this setting to assign a DMA channel for use by the port.
The choice: 1, 3 **(default)**.

If Parallel Port Mode Select is [ECP+EPP] will show:



EPP Mode Select

Select EPP port type 1.7 or 1.9.
The choice: 1.7 **(default)**, 1.9.

ECP Mode Use DMA

If your system supports ECP parallel port mode and you have the port set to use ECP, you must use this setting to assign a DMA channel for use by the port.
The choice: DMA1, DMA3 **(default)**.

PWRON After PWR-Fail

When power fails, you can select power ON or Off or Former status.
The choice: Off **(default)**, On, Former-Sts.

Onboard Serial Port 3

This is used to select an I/O address for the onboard serial port 3.
The choice: Disabled, 3F8, 2F8, 3E8 **(default)**, 2E8.

Serial Port 3 Use IRQ

This is used to select an IRQ for the onboard serial port 3.
The choice: IRQ3, IRQ4, IRQ5 **(default),** IRQ6, IRQ7, IRQ10, IRQ11.

Onboard Serial Port 4

This is used to select an I/O address for the onboard serial port 4.
The choice: Disabled, 3F8, 2F8, 3E8, 2E8 **(default).**

Serial Port 4 Use IRQ

This is used to select an IRQ for the onboard serial port 4.
The choice: IRQ3, IRQ4, IRQ5, IRQ6 **(default)**, IRQ7, IRQ10, IRQ11.

Onboard Serial Port 5

This is used to select an I/O address for the onboard serial port 5
The choice: Disabled, 4F8 **(default)**, 4E8**.**

Serial Port 5 Use IRQ

This is used to select an IRQ for the onboard serial port 5.
The choice: IRQ3, IRQ4, IRQ5, IRQ6, IRQ7 **(default)**, IRQ10, IRQ11.

Onboard Serial Port 6

This is used to select an I/O address for the onboard serial port 6.
The choice: Disabled, 4F8, 4E8 **(default).**

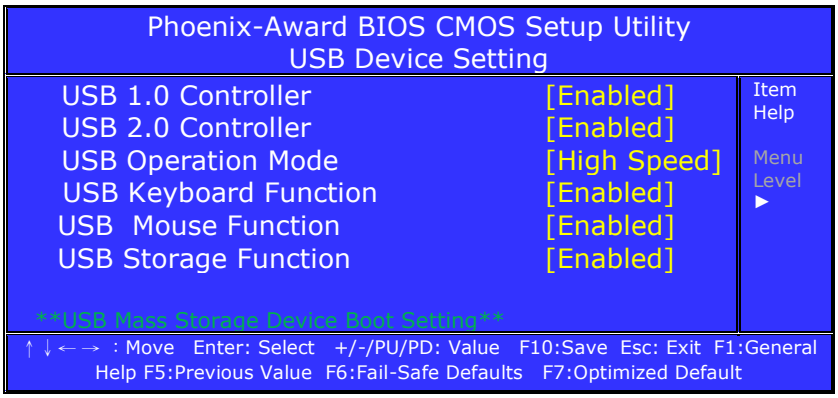
Serial Port 6 Use IRQ

This is used to select an IRQ for the onboard serial port 6. The choice: IRQ3, IRQ4, IRQ5, IRQ6, IRQ7, IRQ10 **(default)**, IRQ11.

Watch Dog Timer Select

The choice: Disabled **(default)**, Enable.

►USB Device Setting



USB 1.0 Controller

The choice: Disabled, Enable **(default).**

USB 2.0 Controller

The choice: Disabled, Enable **(default).**

USB Operation Mode

The choice: Full/Low Speed, High Speed **(default).**

USB Keyboard Function

The choice: Disabled, Enable **(default).**

USB Mouse Function

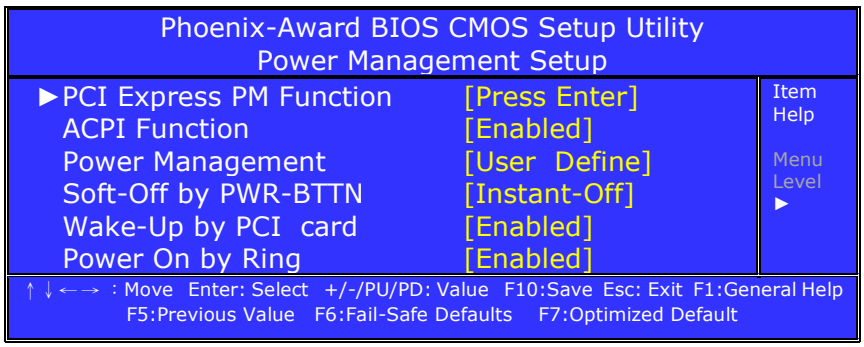
The choice: Disabled, Enable **(default).**

USB Storage Function

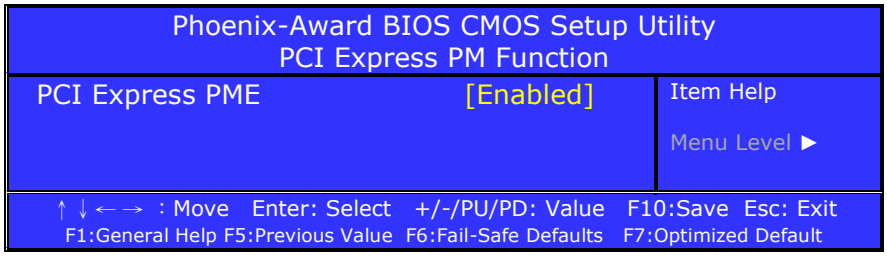
The choice: Disabled, Enable **(default).**

3.6 Power Management Setup

The Power Management Setup allows you to configure you system to most effectively save energy while operating in a manner consistent with your own style of computer use.



►PCI Express PM Function



PCI Express PME

The choice: Enabled **(default)**, Disabled.

ACPI Function

This item allows you to enable/disable the Advanced Configuration and Power Management (ACPI).
The choice: Enabled **(default)**, Disabled.

Power Management

The choice: User Define **(default)**, Min Saving, Max Saving.

Max Saving	Maximum power savings. Only Available for SL CPUs. Inactivity period is 1 minute in each mode.
User Define	Set each mode individually. Select time-out periods in the section for each mode, below.
Min Saving	Minimum power savings. Inactivity period is 1 hour in each mode (except the hard drive).

8Min, 9Min, 10Min, 11Min, 12Min, 13Min, 14Min, 15Min, Disable **(default)**.

Soft-Off by PWR-BTTN

This field defines the power off mode when using an ATX power supply.
The choice: Instant-Off, Delay 4 Sec.

Instant-Off	Press power button then Power off instantly **(default).**
Delay 4 Sec	Press power button 4 sec. to Power off. Enter suspend if button is pressed less than 4 sec.

Wake-Up by PCI card

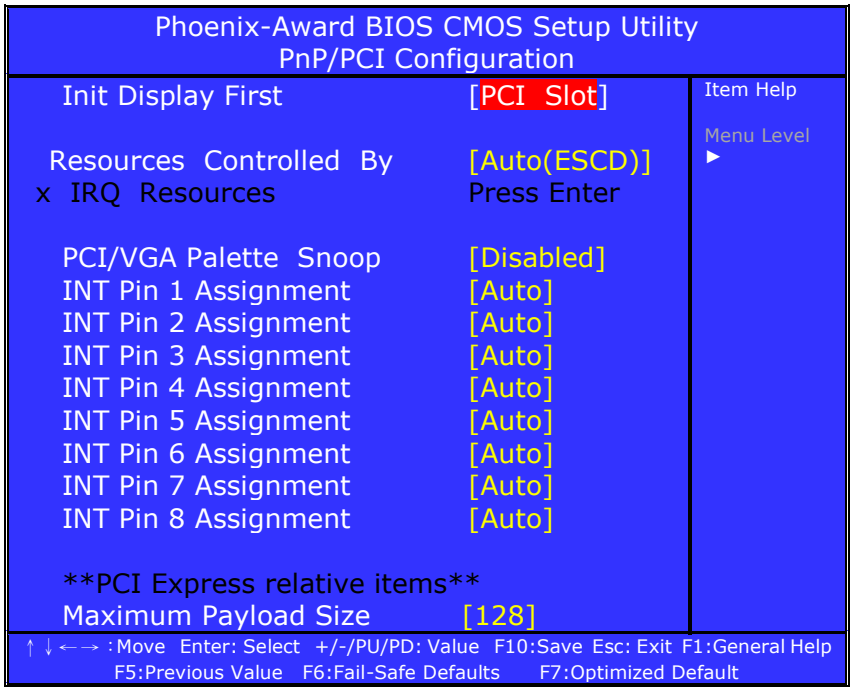
Enable/Disable PCI PME wakes up function.
The choice: Enabled **(default)**, Disabled.

Power On by Ring

Enable/Disable Power On By Ring function.
The choice: Enabled, Disabled **(default)**.

3.7 PnP/PCI Configuration

This section describes configuring the PCI bus system. PCI, or Personal Computer Interconnect, is a system which allows I/O devices to operate at speeds nearing the speed the CPU itself uses when communicating with its own special components. This section covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.



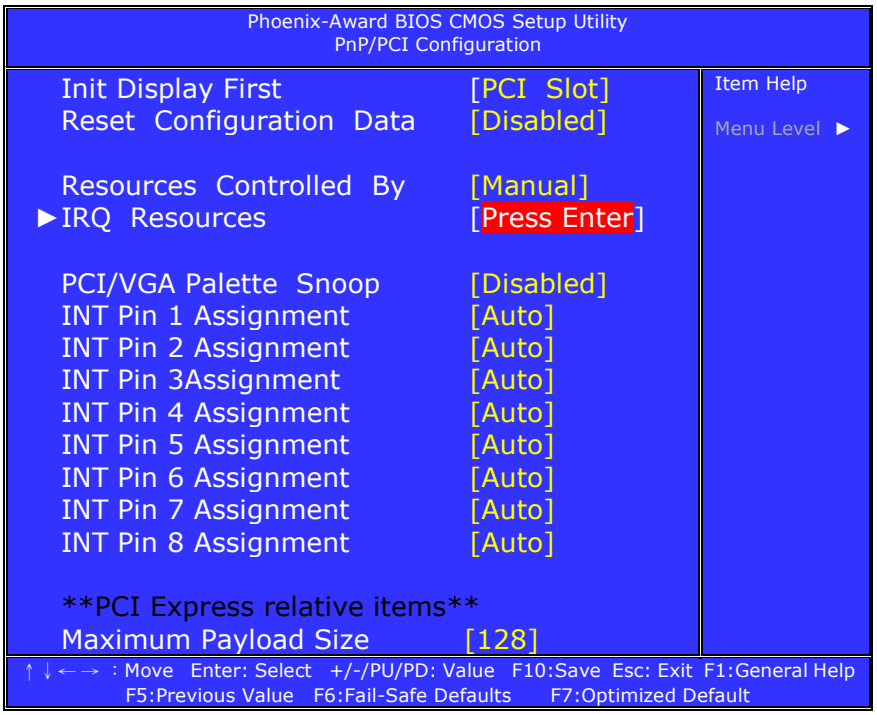
Init Display First

This item allows you to choose which one to activate first, PCI Slot or onchip VGA.
The choice: PCI Slot **(default)**, Onboard, PCIEx.

Resources Controlled By

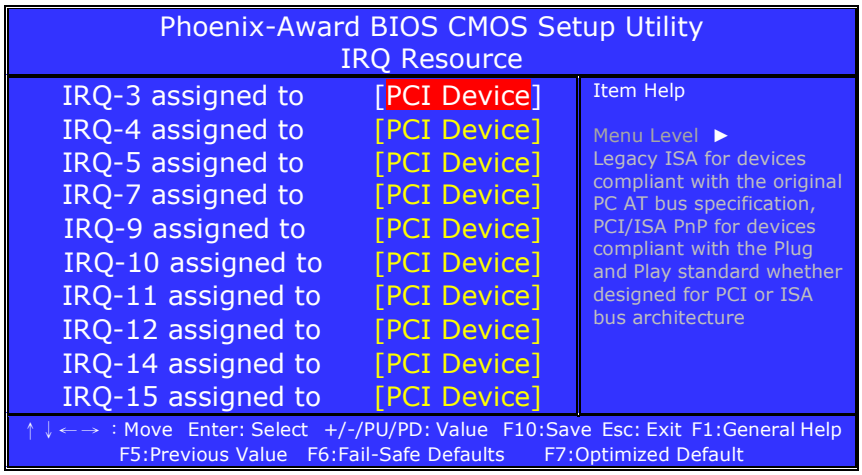
BIOS can automatically configure all the boot and Plug and Play compatible devices. If you choose Auto, you cannot select IRQ DMA and memory base address fields, since BIOS automatically assigns them.
The choice: Auto (ESCD) **(default)**, Manual.

If Resources Controlled By is [Manual], can choice IRQ Resource:

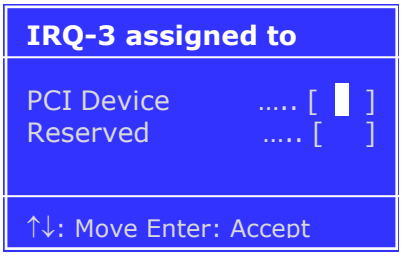


►IRQ Resource

When resources are controlled manually, assign each system interrupt a type, depending on the type of device using the interrupt. This item allows you to determine the IRQ assigned to the ISA bus and is not available to any PCI slot.



IRQ-3,4,5,7,9,10,11,12,14,15 assigned to



The choice: PCI Device **(default)**, Reserved.

PCI/VGA Palette Snoop

This BIOS feature determines if your graphics card should allow VGA palette snooping by a fixed function display card.
The choice: Enabled, Disabled **(default).**

INT Pin 1/2/3/4/5/6/7/8 Assignment

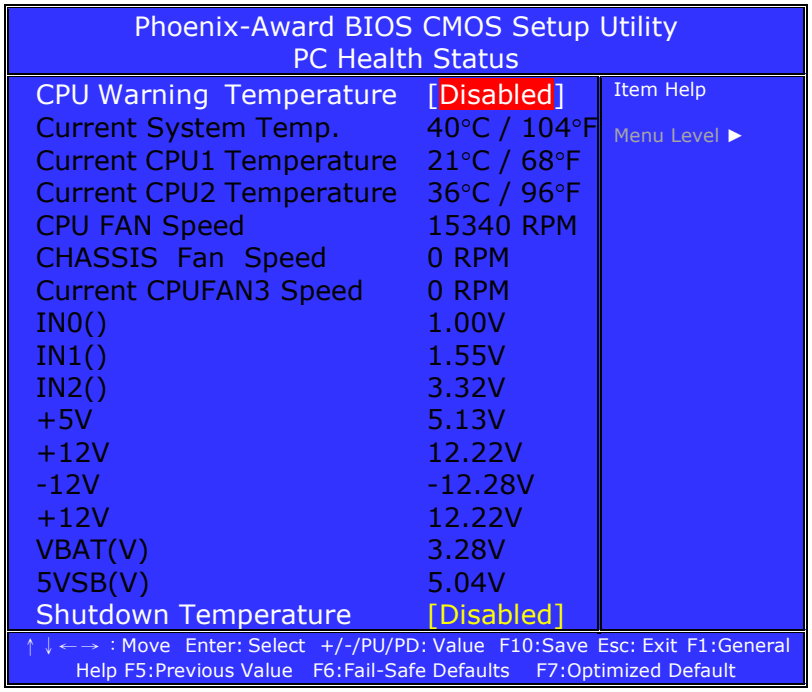
The choice: Auto **(default)**,3,4,5,7,9,10,11,12,14,15.

Maximum Payload Size

The choice: 128 (**default)**.

3.8 PC Health Status

This section helps you to get more information about your system including CPU temperature, FAN speed and voltages. It is recommended that you contact with your motherboard supplier to get proper value about your setting of the CPU temperature.



CPU Warning Temperature

Select the CPU over-heated warning temperature.
The choice: Disabled **(default)**, 50°C/122°F, 53°C/127°F, 56°C/133°F, 60°C/140°F, 63°C/145°F, 66°C/151°F, 70°C/158°F.

Current System Temp

Show System Temperature.

Current CPU1/2 Temperature

Shows Board Temperature

CPU FAN Speed

Shows CPU Fan speed.

CHASSIS Fan Speed

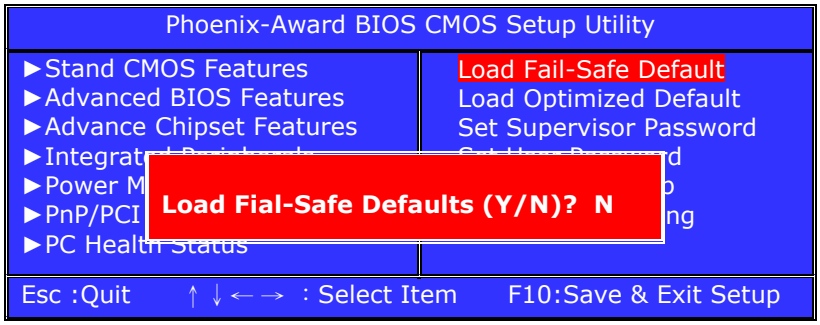
Shows CHASSIS Fan speed

Shutdown Temperature

Select the CPU over-heated shutdown temperature.
The choice: Disabled **(default)**, 60°C/140°F, 65°C/149°F, 70°C/158°F, 75°C/167°F

3.9 Load Fail-Safe Defaults

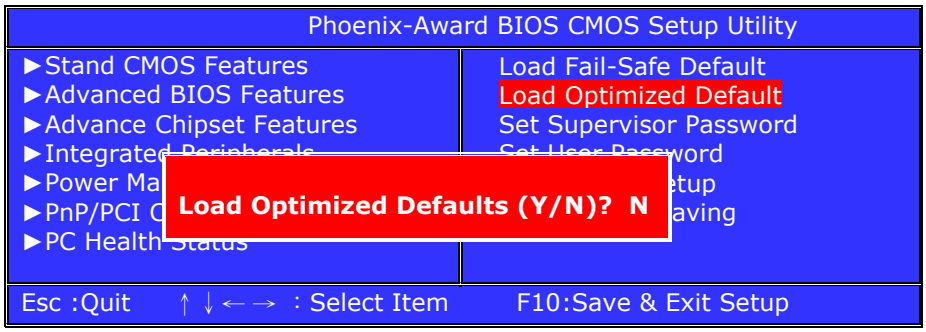
When you press <Enter> on this item you get a confirmation dialog box with a message similar to:



Pressing '**Y**' loads the BIOS default values for the most stable, minimal-performance system operations.

3.10 Load Optimized Defaults

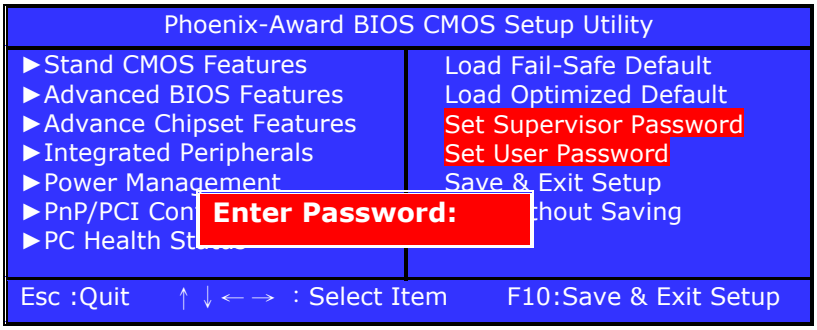
When you press <Enter> on this item you get a confirmation dialog box with a message similar to:



Pressing '**Y**' loads the default values that are factory settings for optimal performance system operations.

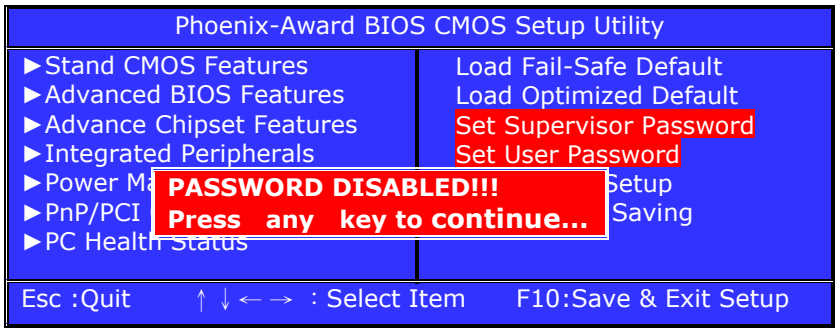
3.11 Set Supervisor/User Password

You can set either supervisor or user password, or both of them. The differences between are:
Supervisor password: can enter and change the options of the setup menus.
User password: just can only enter but do not have the right to change the options of the setup menus. When you select this function, the following message will appear at the center of the screen to assist you in creating a password.



ENTER PASSWORD:
Type the password, up to eight characters in length, and press <Enter>. The password typed now will clear any previously entered password from CMOS memory. You will be asked to confirm the password. Type the password again and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

To disable a password, just press <Enter> when you are prompted to enter the password. A message will confirm the password will be disabled. Once the password is disabled, the system will boot and you can enter Setup freely.



PASSWORD DISABLED:

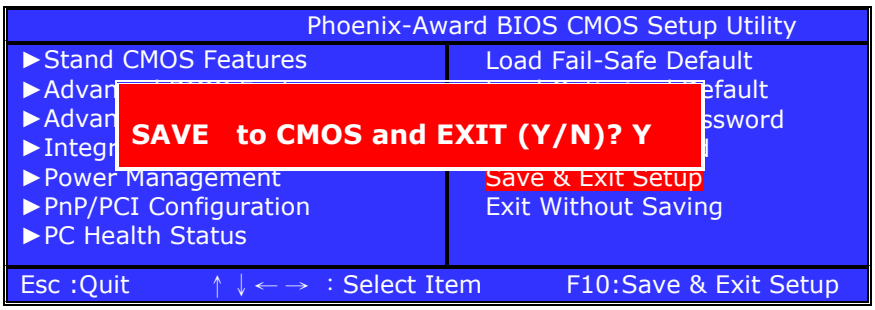
When a password has been enabled, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

Additionally, when a password is enabled, you can also require the BIOS to request a password every time your system is rebooted. This would prevent unauthorized use of your computer.

You determine when the password is required within the BIOS Features Setup Menu and its Security option. If the Security option is set to "System", the password will be required both at boot and at entry to Setup. If set to "Setup", prompting only occurs when trying to enter Setup.

3.12 Save & Exit Setup

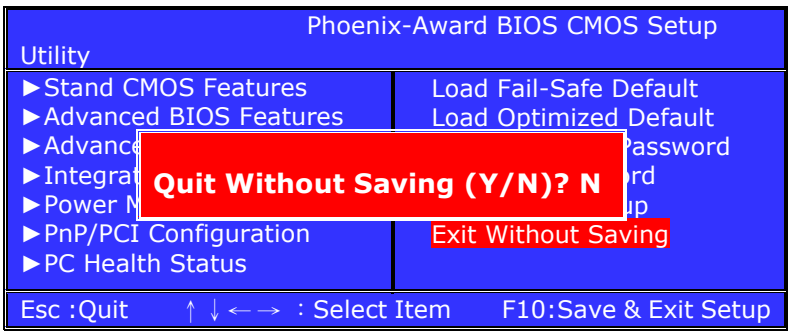
Pressing <Enter> on this item asks for confirmation:



Pressing "**Y**" stores the selections made in the menus in CMOS – a special section of memory that stays on after you turn your system off. The next time you boot your computer, the BIOS configures your system according to the Setup selections stored in CMOS. After saving the values the system is restarted again.

3.13 Exit Without Saving

Pressing <Enter> on this item asks for confirmation:



This allows you to exit Setup without storing in CMOS any change. The previous selections remain in effect. This exits the Setup utility and restarts your computer.

3

Power Supply

This chapter provides information on the power supply used on the TR-5197 computer. The topics covered are:

TR-DCW100-12VDC Description 79
TR-DCW100-12VDC Specifications..... 80
TR-MIW100-12VDC Description 81
TR-MIW100-12VDC Specifications 82

TR-DCW100-12VDC Description

The TR-DCW100-12VDC industrial DC/DC converter uses a field proven topology to generate 100W output power with input range of 20 ~ 60VDC. This chassis-mount design is optimized for reliability and cost efficiency. The use of components with established reliability results in a high demonstrated MTBF. The TR-DCW100-12VDC is rated for operation over a temperatuer range of 0 ~ 50°C, without derating. It is cooled by conduction via baseplate to a heatsinking surface and by natural convection.

For more information on the TR-DCW100-12VDC, please call the Transduction sales team.

Figure 1: TR-DCW100-12VDC

TR-DCW100-12VDC Specifications

Model	TR-DCW100-12VDC DC/DC converter
Input Voltage	20 ~ 60VDC
Input Protection	Inrush current limiting Varistor Reverse polarity protection Internal safety fuse Lower voltage than the specified minimum input will not damage the unit
Isolation	1500VDC input to chassis 1500VDC input to output 500VDC output to chassis
Frequency	Switchable, 47KHz ±2KHz
Output Voltage/Current	12V/8A
Line/Load Regulation	±1% combined from no load to full load
Dynamic Response	Max 5% voltage deviation for 10 ~ 50% load step, with better than 1msec recovery time
Output Ripple/Noise	Better than 1% of output voltage peak to peak or 0.2% RMS of the output voltage (20MHz BW)
Output Overload Protection	Current limiting with short circuit protection (hiccup mode)
Output Overvoltage Protection	Double regulator loop and transzorb clamp
Cooling	Conduction to customer heatsink or chassis and natural convection
Efficiency	80% at full load
Operating Temperature	0 ~ 50ºC (32º ~ 122ºF)
Temperature Drift	0 .03% per ºC over operating temperature range
MTBF	> 150,000 hours
Standards	EN 60950 and corresponding UL and CSA standards
EMI	EN 55022 Class A
RoHS Compliant	Fully compliant
Warranty	5 years

TR-MIW100-12VDC Description

The TR-MIW100-12VDC industrial AC/DC converter uses a field proven topology to generate 100W output power with input range of 95 ~ 264V AC or 105 ~ 350VDC. This chassis-mount design is optimized for reliability and cost ef ficiency. The use of components with established reliability results in a high demonstrated MTBF. The TR-MIW100-12VDC is rated for operation over a temperature range of 0 ~ 50°C, without derating. It is cooled by conduction via baseplate to a heatsinking surface and by natural convection.

For more information on the TR-MIW100-12VDC, please call the Transduction sales team.

Figure 1: TR-MIW100-12VDC

TR-MIW100-12VDC Specifications

Model	TR-MIW100-12VDC AC/DC power supply
Input Voltage	Universal 95 ~ 264VAC, 47 ~ 63Hz 105 ~ 350VDC available option
Input Protection	Inrush current limiting Varistor Internal safety fuse Lower voltage than the specified minimum input will not damage the unit
Isolation	2250VDC input to chassis 4300VDC input to output, 8mm spacing 500VDC output to chassis
Frequency	Switchable, 47KHz ±2KHz
Hold Up Time	Minimum 10ms at full load for 5% drop of output voltage at > 120VAC input
Output Voltage/Current	12VDC/8A
Line/Load Regulation	±1% combined from no load to full load
Dynamic Response	Max 5% voltage deviation for 10 ~ 50% load step, with better than 1msec recovery time
Output Ripple/Noise	Better than 1% of output voltage peak to peak or 0.2% RMS of the output voltage (20MHz BW)
Output Overload Protection	Current limiting with short circuit protection on both outputs Thermal shutdown in case of insufficient cooling (self-resetting)
Output Overvoltage Protection	Double regulator loop on both outputs
Cooling	Conduction to customer heatsink or chassis and natural convection
Efficiency	80% at full load
Operating Temperature	0 ~ 50ºC (32º ~ 122ºF)
Temperature Drift	0 .03% per ºC over operating temperature range
MTBF	> 150,000 hours
Standards	EN 60950 and corresponding UL and CSA standards
EMI	EN 55022 Class B
RoHS Compliant	Fully compliant
Warranty	5 years

4

Isolated Serial Adapters

This chapter provides information on the isolated serial adapters option on the TR-5197 computer. The topics covered are:

TR-USB-COM-SI-M Description 84
TR-USB-COM-SI-M Specifications 85
TR-USB-COMi-SI-M Description 86
TR-USB-COMi-SI-M Specifications 87
Windows Driver Installation 88
RS-422/485 Mode Configuration 89

TR-USB-COM-SI-M Description

The TR-USB-COM-SI-M is designed to make industrial communication RS-232 isolated serial port expansion quick and simple, with easy plug-and-play features. Two high speed RS-232 isolated serial ports can be added via USB connection.

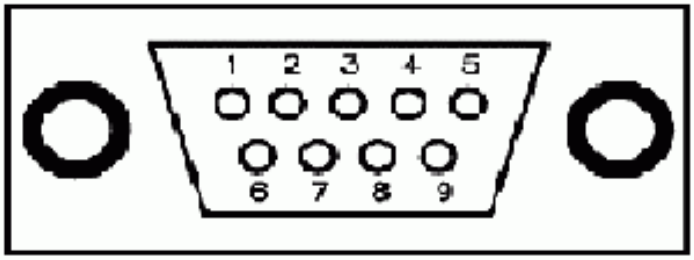
There is no IRQ and COM port conflict, since the port does not require any additional IRQ, DMA or memory on the system. The RS-232 isolated serial port functions as a native Windows COM port and is compatible with Windows serial communication applications. Each port is individually configurable.

TR-USB-COM-SI-M provides instant connectivity to RS-232 communication devices for industrial automation, multi-drop data collection devices, barcode readers, time clocks, scales, data entry terminals, and PC to PC long distance communication in harsh environments if needed.

TR-USB-COM-SI-M Specifications

Model	TR-USB-COM-SI-M RS-232 Isolated Serial Port
Connector	Serial DB-9 male connector
Buffer Speed	Transmit - 128-byte Receive - 385-byte
Port Speed	Up to 230K bps
Isolation	2KV DC optical isolation protection
Surge Protection	25KV ESD surge protection
LED's	Power, TxD and RxD indicating power and port status
Serial Communication Parameters	Parity - none, even, odd Data bits - 7, 8 Flow control - RTS/CTS
COM Port	COM1 ~ COM4 can be changed to support HyperTerminal, or any other COM port number
Power Requirements	USB 1.1 or USB 2.0 port
Warranty	5 years
	Compatible with all versions of Windows XP, 2003, 2000, ME and 9x

TR-USB-COM-SI-M Connector Pin Drawing



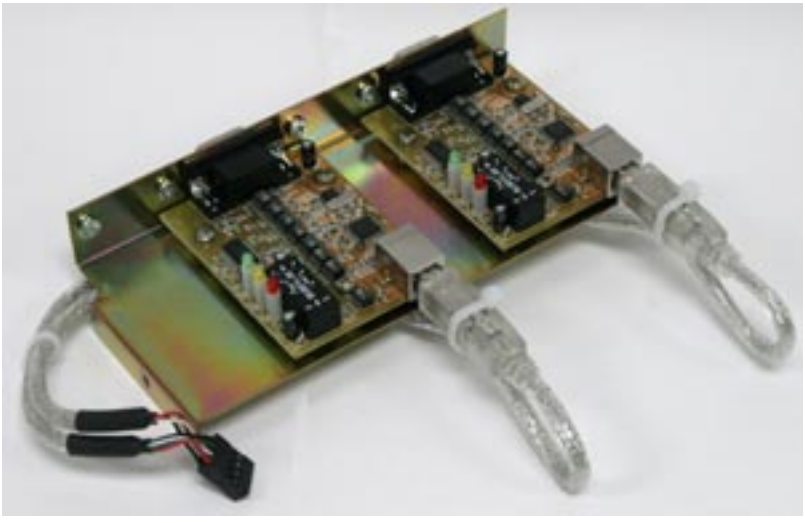
Pin 1	**DCD**
Pin 2	**RxD**
Pin 3	**TxD**
Pin 4	**DTR**
Pin 5	**GND**
Pin 6	**DSR**
Pin 7	**RTS**
Pin 8	**CTS**
Pin 9	**RI**

TR-USB-COMi-SI-M Description

The TR-USB-COMi-SI-M is designed to make industrial communication RS-422/485 port expansion quick and simple, with easy plug-and-play features.

Plugging the TR-USB-COMi-SI-M Serial Adapter into the USB port, the adapter is automatically detected and installed. There is no IRQ and COM port conflict, since the port does not require any additional IRQ, DMA or memory on the system. The RS-422/485 port functions as a native Windows COM port and it is compatible with Windows serial communication applications. Each port is individually configurable.

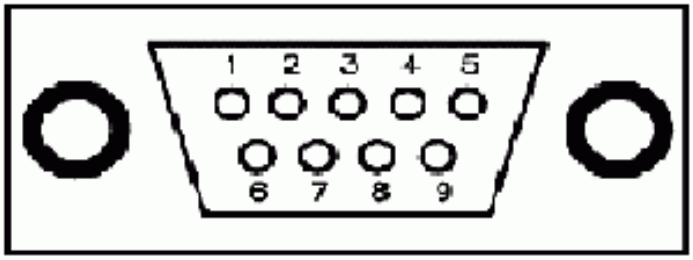
TR-USB-COMi-SI-M provides instant connectivity to RS-422/485 communication devices for industrial automation, multi-drop data collection devices, barcode readers, time clocks, scales, data entry terminals, and PC to PC long distance communication in harsh environments if needed.



TR-USB-COMi-SI-M Specifications

Model	TR-USB-COMi-SI-M RS-422/485 Isolated Serial Port
Connector	Serial DB-9 male connector
Buffer Speed	Transmit - 128-byte Receive - 385-byte
Buffer Control	Automatic transmit buffer control for 2-wire RS-485 half-duplex operation
Port Speed	Up to 230K bps
Isolation	2KV DC optical isolation protection
Surge Protection	25KV ESD surge protection
LED's	Power, TxD and RxD indicating power and port status
RS-422/485 Mode Setting	1 x external DIP switch for easy RS-422, RS-485 mode setting RS-422 mode - 4-wire with handshaking ON, ON, OFF, OFF RS-485 mode - 4-wire full duplex ON, OFF, OFF, OFF, OFF RS-485 mode - 2-wire half duplex with echo OFF, OFF, OFF, ON RS-485 mode - 2-wire half duplex without echo OFF, OFF, ON, ON
Serial Communication Parameters	Parity - none, even, odd Data bits - 7, 8 Flow control - RTS/CTS
Resistance	Built-in 120 Ohm termination resistors for Tx/Rx/CTS termination Built-in 750 Ohm biasing resistor for Tx/Rx biasing
COM Port	COM1 ~ COM4 can be changed to support HyperTerminal, or any other COM port number
Power Requirements	USB 1.1 or USB 2.0 port
Warranty	5 years
	Compatible with all versions of Windows XP, 2003, 2000, ME and 9x

TR-USB-COMi-SI-M Connector Pin Drawing



Pin 1	**TxD-(A)**
Pin 2	**TxD+(B)**
Pin 3	**RxD+(B)**
Pin 4	**RxD-(A)**
Pin 5	**GND**
Pin 6	**RTS-(A)**
Pin 7	**RTS+(B)**
Pin 8	**CTS+(B)**
Pin 9	**CTS-(A)**

Windows Drivers Installation

You need to have administrator privileges to inst all any new drivers under W indows Vista/2003/XP/ 2000. To install the driver or update the configuration, log on Windows as “Administrator” or ask the system administrator to install the TR-USB-COM driver.

NOTE: Prior to hardware installation, the driver must first be installed. Do not connect the USB Isolated Serial Adapter to the computer USB port, before the driver inst allation is completed.

Please proceed with the following steps to install the driver:

1. Insert the **USB to Serial Driver and Utility** CD in the CD-ROM.
2. The **USB to Serial Driver and Utility CD** dialog box appears.
3. Under **Driver Installation**, double click **Windows Vista, 2003, XP, 2000 driver** to inst all the device driver.
4. If using Windows (64-bit), select **Windows (64-bit) Vista, 2003, XP driver** for driver installation.
5. After the message **FTDI CDM drivers have been successfully installed** appears, click **finish** to complete the driver installation.
6. Plug in the USB Isolated Serial Adapter to the USB port and Windows will finish installing the driver files.

Verify the installation has been completed successfully by looking under Device Manager of the System Properties screen. **(Click on Start-Settings-Control Panel-System Properties-Hardware-Device Manager)**.
The device should have installed as a **USB Serial Port (COMx)** attached to **USB Serial Converter (A/B)**.

COM Port Properties and Port Number

This feature is particularly useful for programs, such as HyperTerminal, which only work with COM1 through COM4. Please ensure to leave the COM port number setting already in use.

To change the virtual COM port properties:

- Select the **USB Serial Port**
- Click **Properties**
- Select **Port Setting** and **Advanced**
- Click the drop down arrow on COM port number and scroll to the required COM port.

  Select **OK**.
- Return to the Device Manager screen. You will see that the USB Serial Port installation has been changed to the new COM port number.

Uninstalling Windows Driver

To uninstall Windows Vista/2003/XP/2K driver:

- Remove the USB serial device from the USB port or hub.
- Go to the **Control Panel**
- Open **Add or Remove Program**
- Select **FTDI USB Serial Converter Driver**
- Click **Change/Remove**
- Select **Continue** to delete the drivers
- Select **Finish**
- Reboot the computer to complete the driver uninstall

RS-422/485 Mode Configuration of USB to RS-422/485 Adapter

Jumper Settings for RS-422 or RS-485

Inside the unit, there is a 2 x 10 (20-pin) header block which is jumpered to select the mode of operation. The plastic or metal cover needs to be opened to set the jumper setting to RS-422 or RS-485 mode as per the requirements of the application. After setting the jumpers and connecting the power supply to the adapter, plug the adapter to the USB port to start driver installation.
The RS-422 and RS-485 Mode Block Configuration Settings are listed as follows.

RS-422 Mode Block Configuration

Jumper	Function
1-2	TxD / RxD Termination of 120 Ohm. This jumper should be always populated for RS-422 mode.
3-4	CTS / RTS Termination of 120 Ohm. This jumper should be always populated for RS-422 mode.
9-10	TxD Driver Always ON. As RS-422 is full duplex point to point, the transmitter should always be enabled.
13-14	RxD Driver Always ON. As RS-422 is full duplex point to point, the receiver should always be enabled.
17-18	Enable CTS Handshaking. This setting allows the data flow to be controlled using CTS/RTS handshaking if required by the application.

Note : all other positions = no jumper populated.

RS-485 Mode Block Configuration

Jumper	Function
1-2	TxD / RxD Termination of 120 Ohm. This jumper should only be populated at each end of the cable to meet RS-485 termination requirements.
5-6 7-8	TxD / RxD Single pair (half duplex for RS-485). Populate both these jumpers.
11-12	Enable TxD Driver only when transmitting. This is required by the RS-485 as multiple devices can transmit over the same twisted pair. When a RS-485 is not transmitting, it's transmitter must be turned off to allow other devices to communicate over the same wire.
13-14 (Echo) OR 15-16 (No Echo)	RxD Always Enabled. In this RS-485 mode characters transmitted by the RS-485 device will also be received by the same device. These echoed characters are usually stripped out by the application software. Transmit Data Echo Suppression Mode. In this mode characters transmitted by the RS-485 device will NOT be received by the same device. In this mode there is no need for the application software to strip out the transmitted data from the received data as it is handled by the hardware.
19-20	CTS Always Enabled. As there is no hardware handshaking in RS-485, CTS should be permanently enabled to allow unrestricted flow of data. If handshaking is required for RS-485 it can be done using X-On / X-Off handshaking protocol.

Note : all other positions = no jumper populated.

Sometimes, when operating in RS-422 or RS-485 mode, it is necessary to configure 120 Ohm termination of the data transmission lines. Generally this must be done in the cabling, since this depends on the installation of connections. Before applying the option, check the cable specifications for proper impedance matching.

Optical Isolation and Surge Protection

Each RS-422/485 port is individually optically isolated with 2000 VDC optical isolation. The optical isolation protects the PC from spikes and surges on the RS-422/485 network, by converting the electrical pulse into an optical signal and then changing it back into an electrical pulse. The computer is well protected, since the surges and spikes cannot cross the optical link.

Each RS-422/485 port is individually protected by surge protector to withstand electrostatic discharge and power surges up to 25KV ESD. Surge suppression on all signals prevent from damages caused by lighting or high voltage.

RS-232 Signal Pin-outs of DB-9 Male

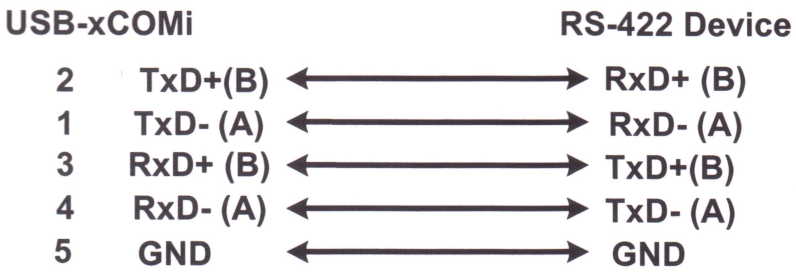
Pin 1	DCD
Pin 2	RxD
Pin 3	TxD
Pin 4	DTR
Pin 5	GND
Pin 6	DSR
Pin 7	RTS
Pin 8	CTS
Pin 9	RI

RS-422 Signal Pin-outs of DB-9 Male

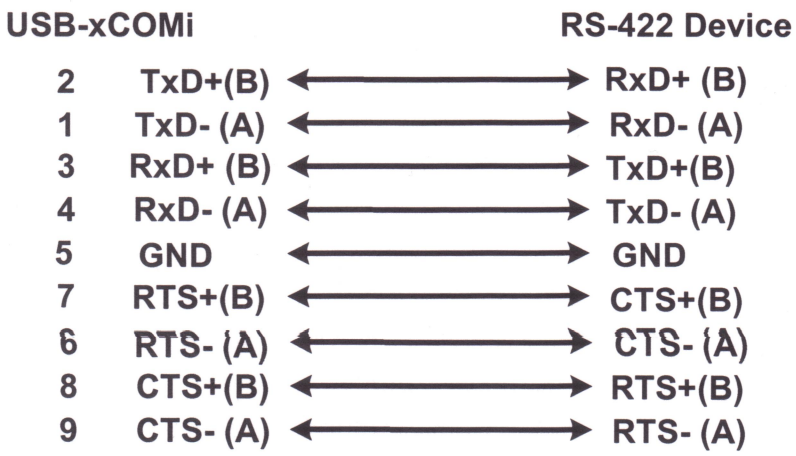
Pin 1	TxD- (A)
Pin 2	TxD+(B)
Pin 3	RxD+(B)
Pin 4	RxD-(A)
Pin 5	GND
Pin 6	RTS- (A)
Pin 7	RTS+(B)
Pin 8	CTS+(B)
Pin 9	CTS- (A)

RS-422 Signal Wiring

- **Point-to-Point 4 Wire Full Duplex**



- **RS-422 with Handshaking**

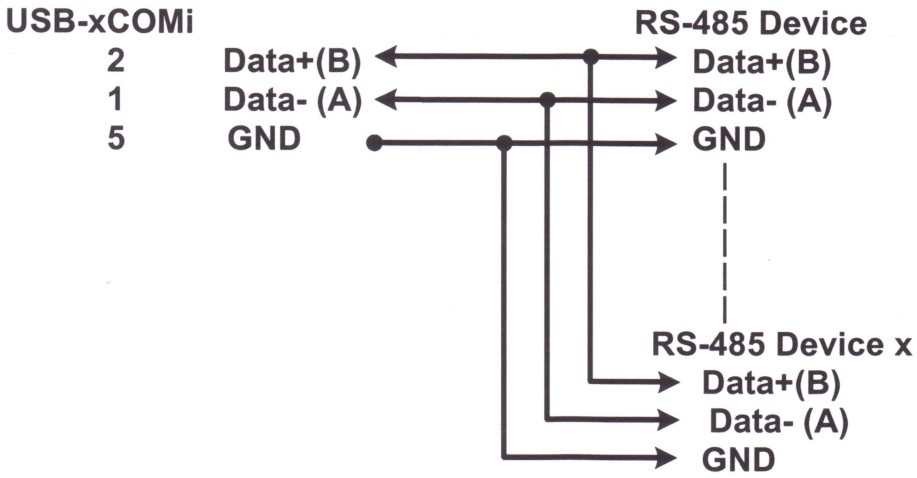


RS-485 2-Wire (Half Duplex) Signal Pin-outs of DB-9 Male

Pin 1	Data- (A)
Pin 2	Data+(B)
Pin 5	GND

RS-485 Signal Wiring

- **Multidrop RS-485 2-Wire Half-duplex**



5

TR-IRIG-A/B Time Sync

This chapter provides information on the time synchronization option for the TR-5197 computer. The topics covered are:

TR-IRIG-A/B Time Synchronization Option Description 95
TR-IRIG-A/B Specifications..... 96

TR-IRIG-A/B Time Synchronization Option Description

The TR-IRIG-A/B was developed for Transduction panel and rack mount computer systems with USB connection. It provides a professional solution for synchronization requirements in mobile applications like field data acquisition and can be deployed whenever to synchronize a PC, laptop or server when no PCI or serial port is available.

The TR-IRIG-A/B time code reader shows the receiver status via integrated LED's and uses a buffered real time clock to maintain the time while powered off. The driver software supplied with the board maintains the computer system time synchronous to the board time.

TR-IRIG-A/B Specifications

Model	TR-IRIG-A/B Time Code Reader
Receiver Input	AM-input (external BNC, internal SMB) Isolated by a transformer Impedance settable 50 ohms Input signal - 600mV ~ 8V (Mark) *other ranges on request* DC Level Shift input (external BNC, internal SMB) Isolated by photocoupler Internal series resistance - 220 ohms Maximum forward current - 50mA Diode forward voltage - 1.0V ~ 1.3V
Decoding Time Standards	IRIG-A133/A132/A003/A002 IRIG-B123/B122/B003/B002
Accuracy of Time Base	±5 usec compared to IRIG reference marker
Accuracy of Time Code Source	±100ppm
Holdover Mode	Automatic switching to crystal time base Accuracy approximately 1E-6 if decoder has been synchronous for more than 1 hour
Backup Battery	If power supply fails, onboard realtime clock keeps time and date information. Realtime clock can work with backup battery for approximately 5 days. Important system parameters are stored in the RAM of system.
Reliability of Operation	Microprocessor supervisory circuit provides watchdog timer, power supply monitoring and backup battery switchover Software watchdog monitors correct program flow and generates a reset in case of error detection
Initialization	Software and realtime clock can be set by USB monitor program
Interface	USB connection
Power Requirements	±5V @ 80mA
Dimensions	2.87” (L) x 4.61” (W) x 0.94” (H)
Operating Temperature	0 ~ 70ºC (32ºF ~
Humidity	Max. 85%
Warranty	3 year

6

Regulatory & Safety Compliance

This chapter provides information on the TR-5197 computer regulatory and safety compliance. The topics covered are:

TR-5197 Regulatory and Safety Compliance 98

Regulatory and Safety Compliance

The TR-5197 fanless panel/rack mount PC complies with the following safety and regulation standards:

- NEMA 4 Front Panel and Seal
- UL, C-UL or equivalent electrical safety approval
- FCC Class A or B depending on final configuration
- CE including EMC and Low Voltage Directive
- RoHS
- Shock and Vibration 25G, 5G 10 ~ 300Hz
- IEEE 1613 Class 2 Standard for substation computers
- NV Marine compliant but not certified

Appendix

I/O Port Address Map 100
Interrupt Request Lines (IRQ) 101
POST Beep 102
Your Configuration Sheet 105
TR-5197 Mechanical Drawings 106

I/O Port Address Map

Each peripheral device in the system is assigned a set of I/O port addresses which also becomes the identity of the device. There is a total of 1K port address space available. The following table lists the I/O port addresses used on the Industrial PC.

Address	Device Description
000h - 01Fh	DMA Controller #1
020h - 03Fh	Interrupt Controller #1
040h - 05Fh	Timer
060h - 06Fh	Keyboard Controller
070h - 07Fh	Real Time Clock, NMI
080h - 09Fh	DMA Page Register
0A0h - 0BFh	Interrupt Controller #2
0C0h - 0DFh	DMA Controller #2
0F0h	Clear Math Coprocessor Busy Signal
0F1h	Reset Math Coprocessor
1F0h - 1F7h	IDE Interface
278 - 27F	Parallel Port #2(LPT2)
2F8h - 2FFh	Serial Port #2(COM2)
2B0 - 2DF	Graphics adapter Controller
378h - 3FFh	Parallel Port #1(LPT1)
360 - 36F	Network Ports
3B0 - 3BF	Monochrome & Printer adapter
3C0 - 3CF	EGA adapter
3D0 - 3DF	CGA adapter
3F0h - 3F7h	Floppy Disk Controller
3F8h - 3FFh	Serial Port #1(COM1)

Interrupt Request Lines (IRQ)

There are a total of 15 IRQ lines available on the Industrial PC. Peripheral devices use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on the Industrial PC.

Level	Function
IRQ0	System Timer Output
IRQ1	Keyboard
IRQ2	Interrupt Cascade
IRQ3	Serial Port #2
IRQ4	Serial Port #1
IRQ5	Reserved
IRQ6	Floppy Disk Controller
IRQ7	Parallel Port #1
IRQ8	Real Time Clock
IRQ9	Software Redirected to Int 0Ah
IRQ10	Reserved
IRQ11	Reserved
IRQ12	PS/2 Mouse
IRQ13	80287
IRQ14	Primary IDE
IRQ15	Secondary IDE

POST Beep

Currently there are two kinds of beep codes in BIOS.
This code indicates that a **video error** has occurred and the BIOS cannot initialize the video screen to display any additional information.

This beep code consists of a single long beep followed by two short beeps.

The other code indicates that your **DRAM error** has occurred.
This beep code consists of a single long beep repeatedly.

NOTE:

The following discussion applies to DOS environment. For other operating systems e.g. Windows, LINUX, etc., please contact Transduction technical support for assistance.

The Watchdog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMI or a software bug. When the CPU stops working correctly, Watchdog Timer either performs a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

A BIOS function call (INT 15H) is used to control the Watchdog Timer:

INT 15H:

AH – 6FH Sub-function:	
AL – 2:	Sets the Watchdog Timer's period.
BL:	Time-out value (Its unit-second is dependent on the item "Watchdog Timer unit select" in CMOS setup).

Table 1: AH-6FH Sub-function

Call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer starts counting down. While the timer value reaches zero, the system resets. To ensure that this reset condition does not occur, calling sub-function 2 must periodically refresh the Watchdog Timer. However, the Watchdog timer is disabled if the time-out value is set to zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.

NOTE:

When exiting a program it is necessary to disable the Watchdog Timer, otherwise the system resets.

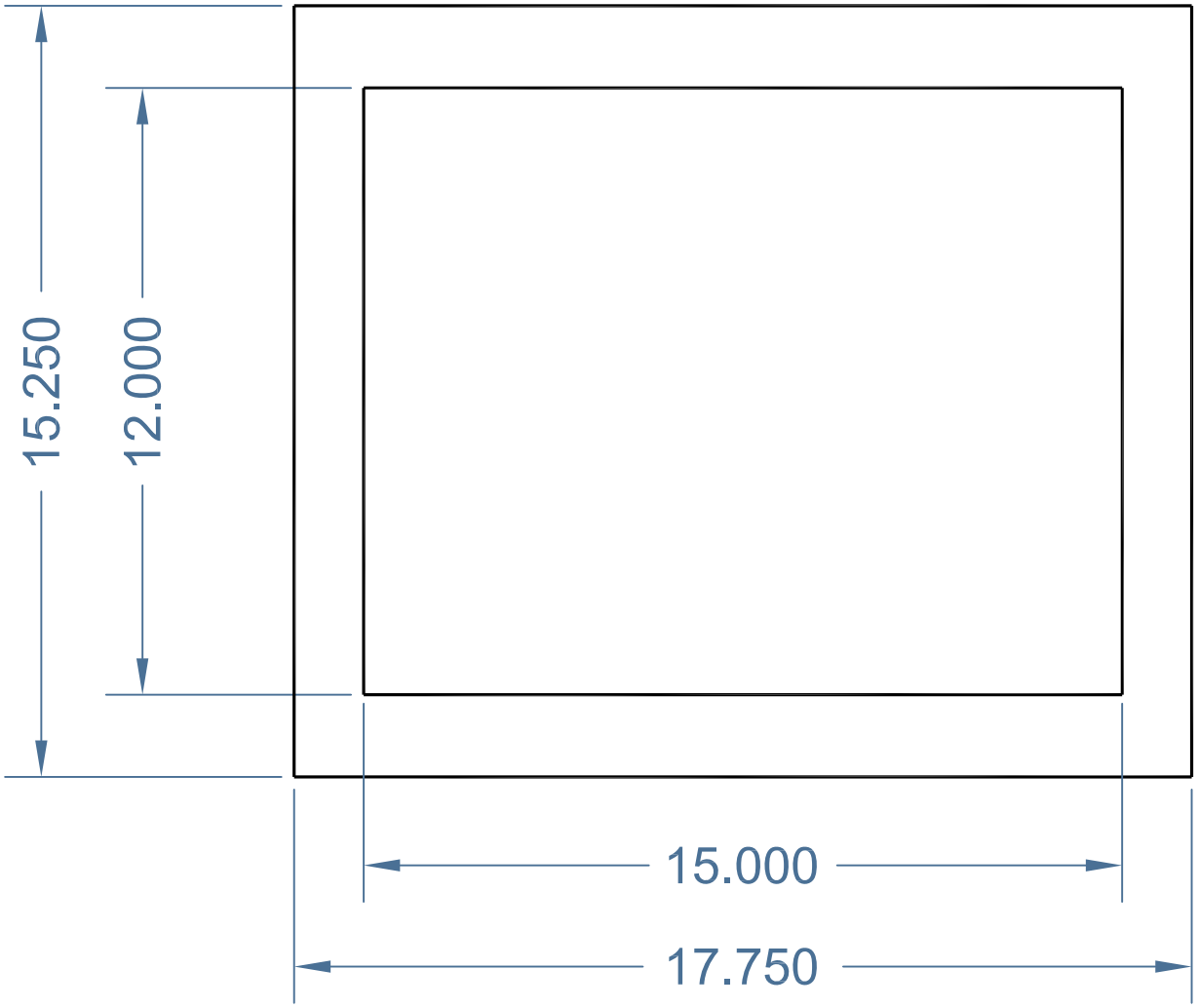
Example program:

```
; INITIAL TIMER PERIOD COUNTER
;
W_LOOP:

        MOV     AX, 6F02H       ;setting the time-out value
        MOV     BL, 30              ;time-out value is 48 seconds
        INT      15H
 ;
; ADD THE APPLICATION PROGRAM HERE
;
        CMP      EXIT_AP, 1         ;is the application over?
        JNE      W_LOOP     ;No, restart the application

        MOV     AX, 6F02H       ;disable Watchdog Timer
        MOV     BL, 0           ;
        INT      15H
;
; EXIT ;
```

Your Configuration Sheet

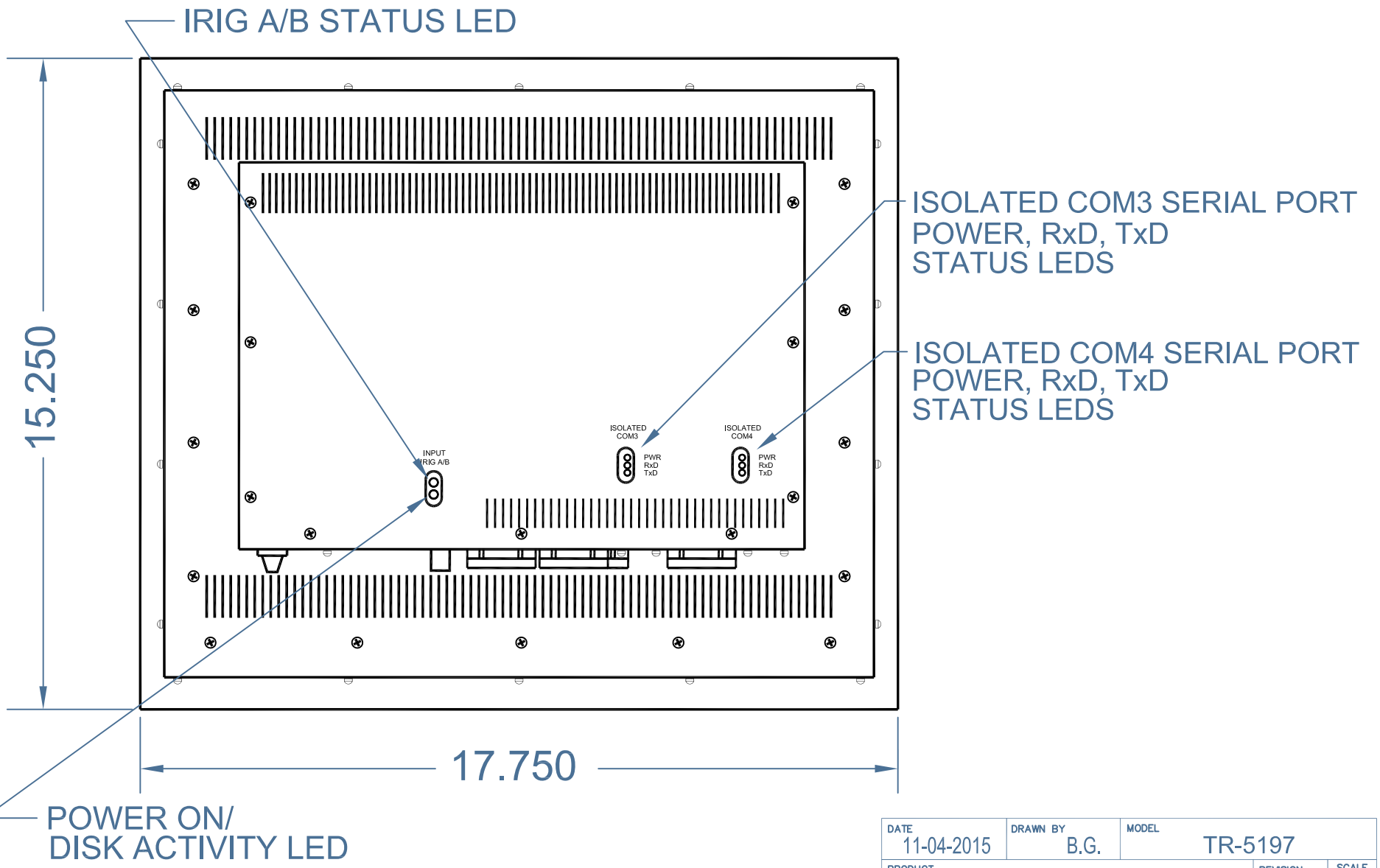
The TR-5197 fanless panel/rack mount PC configuration sheet will help you decide on the configuration of the system:

- Rack mount?
- Panel mount?
- Touch screen?
- Notouch screen - safety glass?
- Wide viewing angle - no touch screen, no safety glass?
- High brightness LCD for outdoor use?
- Universal AC power supply 50/60Hz?
- DC input power supply 24, 48, 125, 250VDC?
- How much memory 2GB or 3GB?
- How big solid state flash drive 128 or 256GB?
- Which operating system to be installed?
- How many RS-232 isolated serial ports?
- How many RS-422/485 isolated serial ports?
- IRIG-A/B time sync option?
- Heat chamber test and for how long?
- Is CE certificate needed?



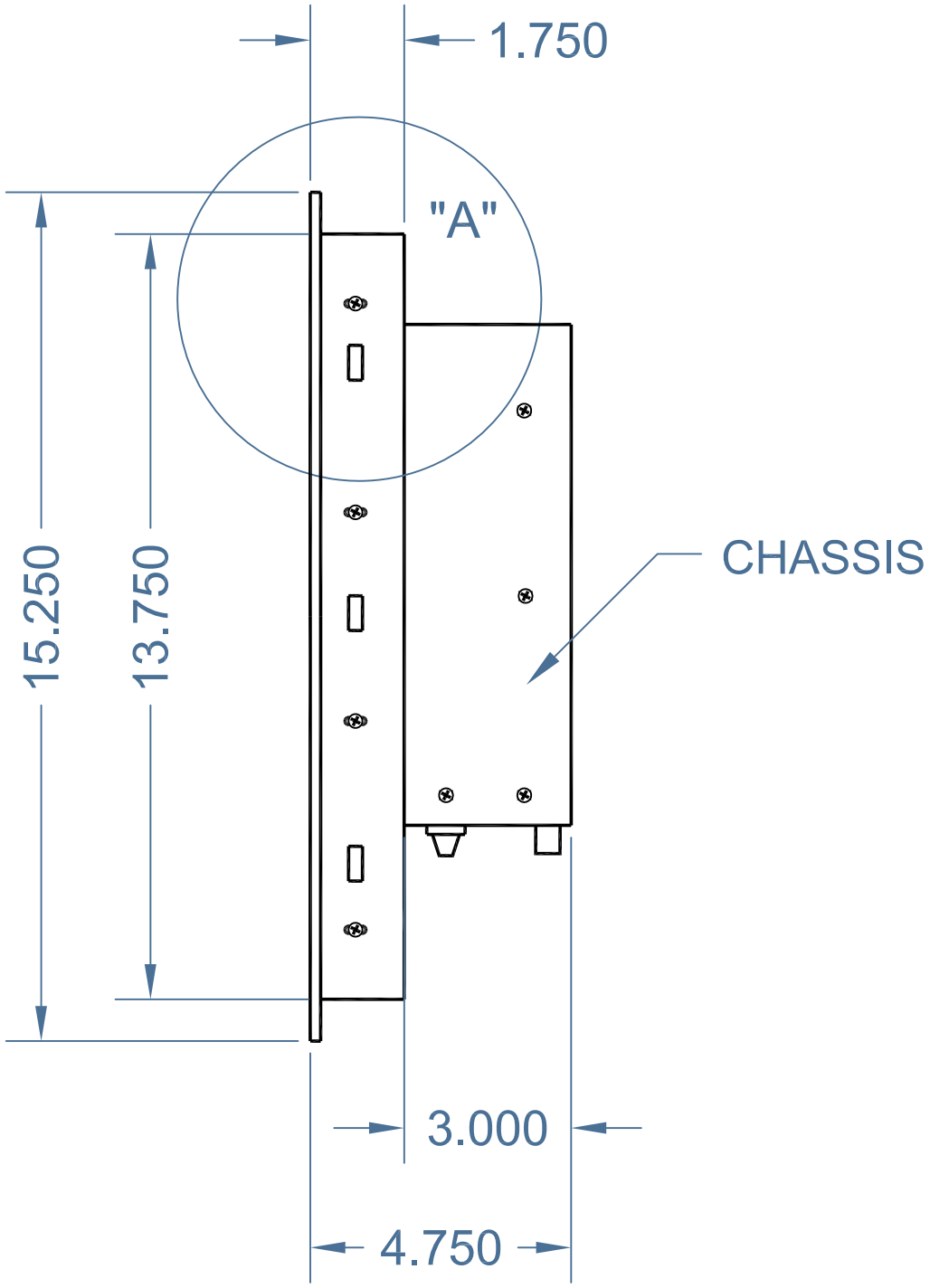
FRONT VIEW

DATE 11-04-2015	DRAWN BY B.G.	MODEL TR-5197	
PRODUCT PANEL MOUNT VERSION		REVISION 0	SCALE NTS
FINISH CRINKLE BLACK POWDER PAINT	Transducton	CHECKED BY	
TITLE LAYOUT		DRAWING No B-646	



REAR VIEW

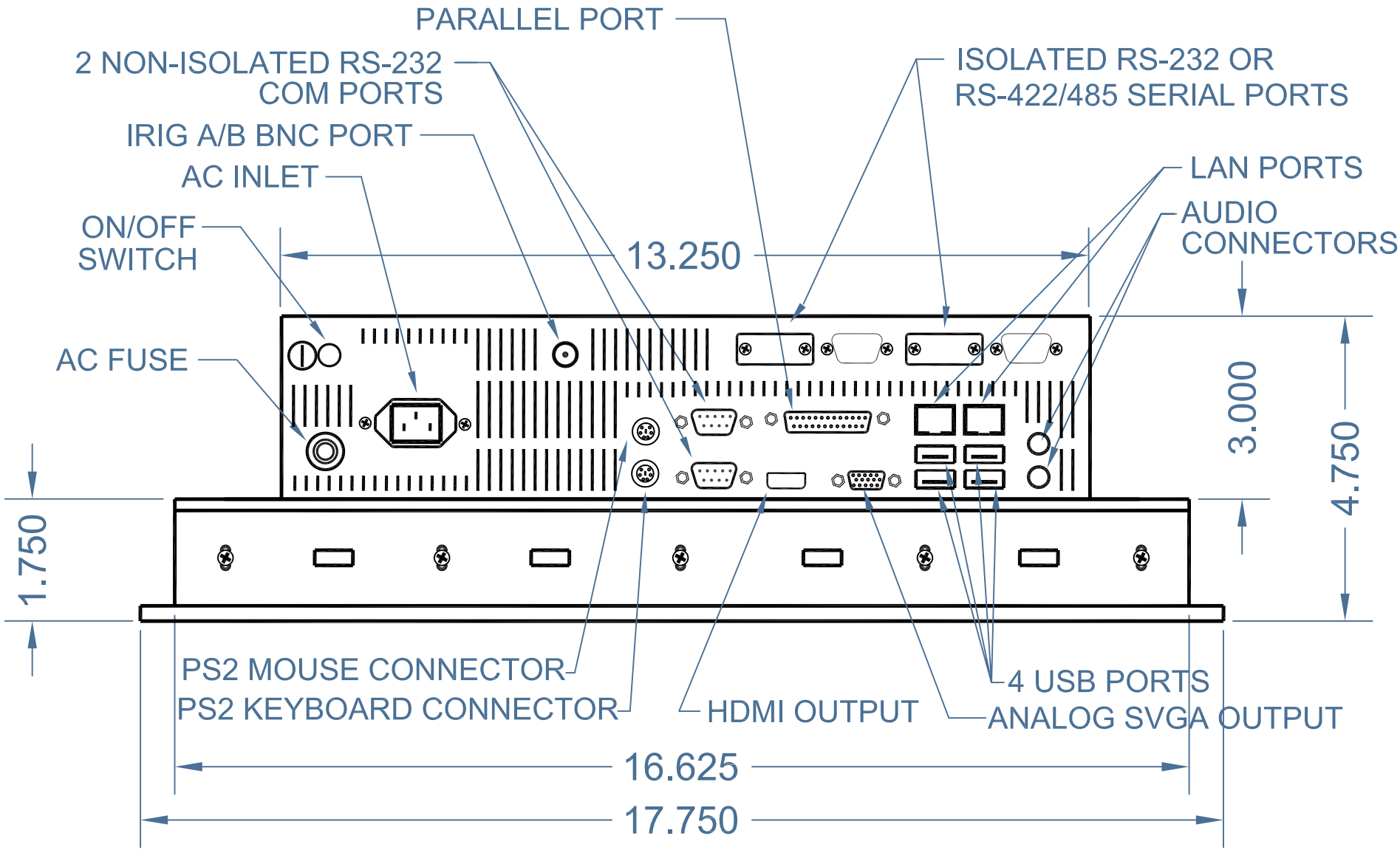
DATE 11-04-2015	DRAWN BY B.G.	MODEL TR-5197	
PRODUCT PANEL MOUNT VERSION		REVISION 0	SCALE NTS
FINISH CRINKLE BLACK POWDER PAINT	Transduction	CHECKED BY	
TITLE LAYOUT		DRAWING No B-647	



RIGHT SIDE VIEW

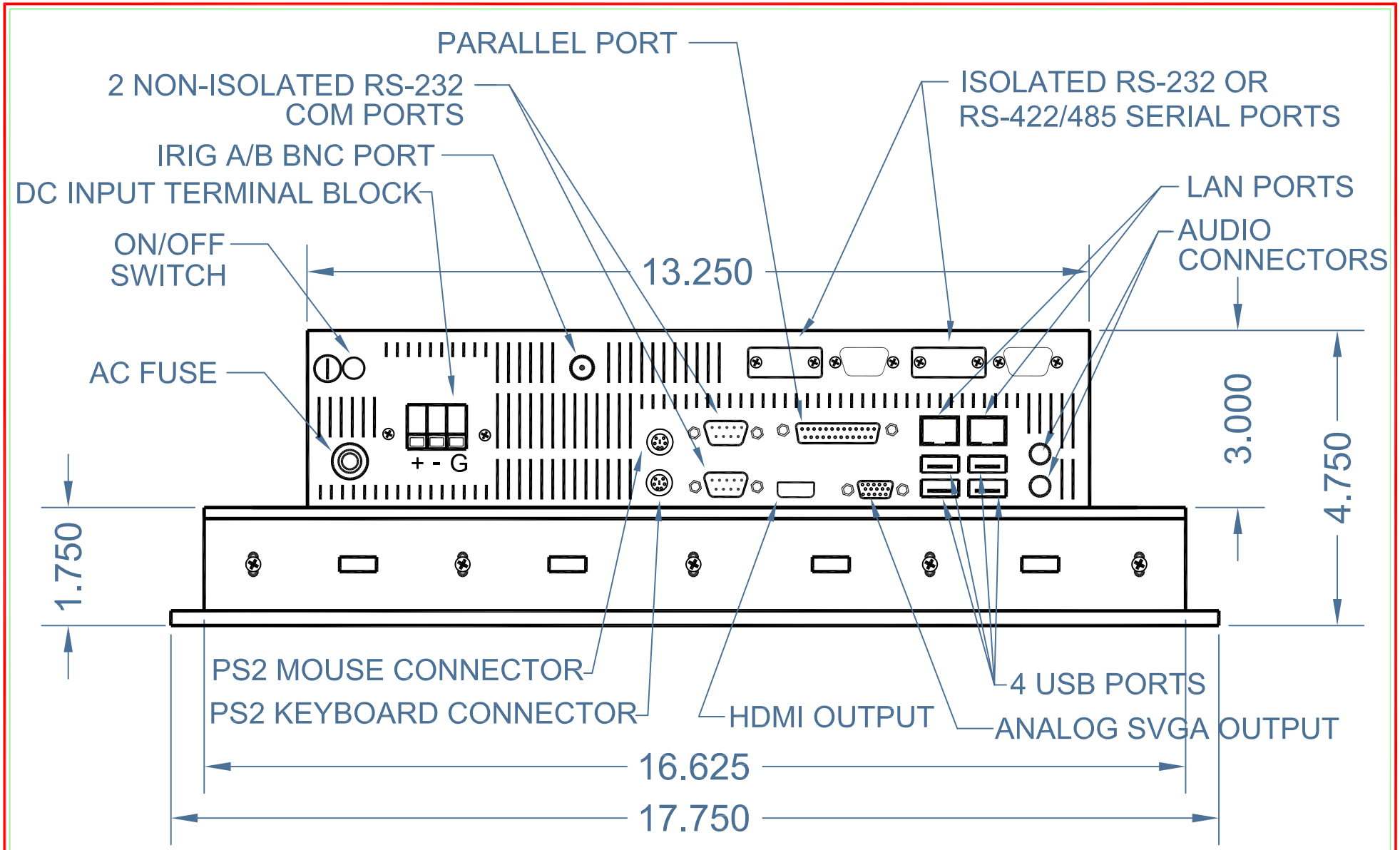
NOTE: FOR DETAIL "A" LOOK DRAWING B-652

DATE 11-04-2015	DRAWN BY B.G.	MODEL TR-5197	
PRODUCT PANEL MOUNT VERSION		REVISION 0	SCALE NTS
FINISH CRINKLE BLACK POWDER PAINT	Transduction	CHECKED BY	
TITLE LAYOUT		DRAWING No B-648	



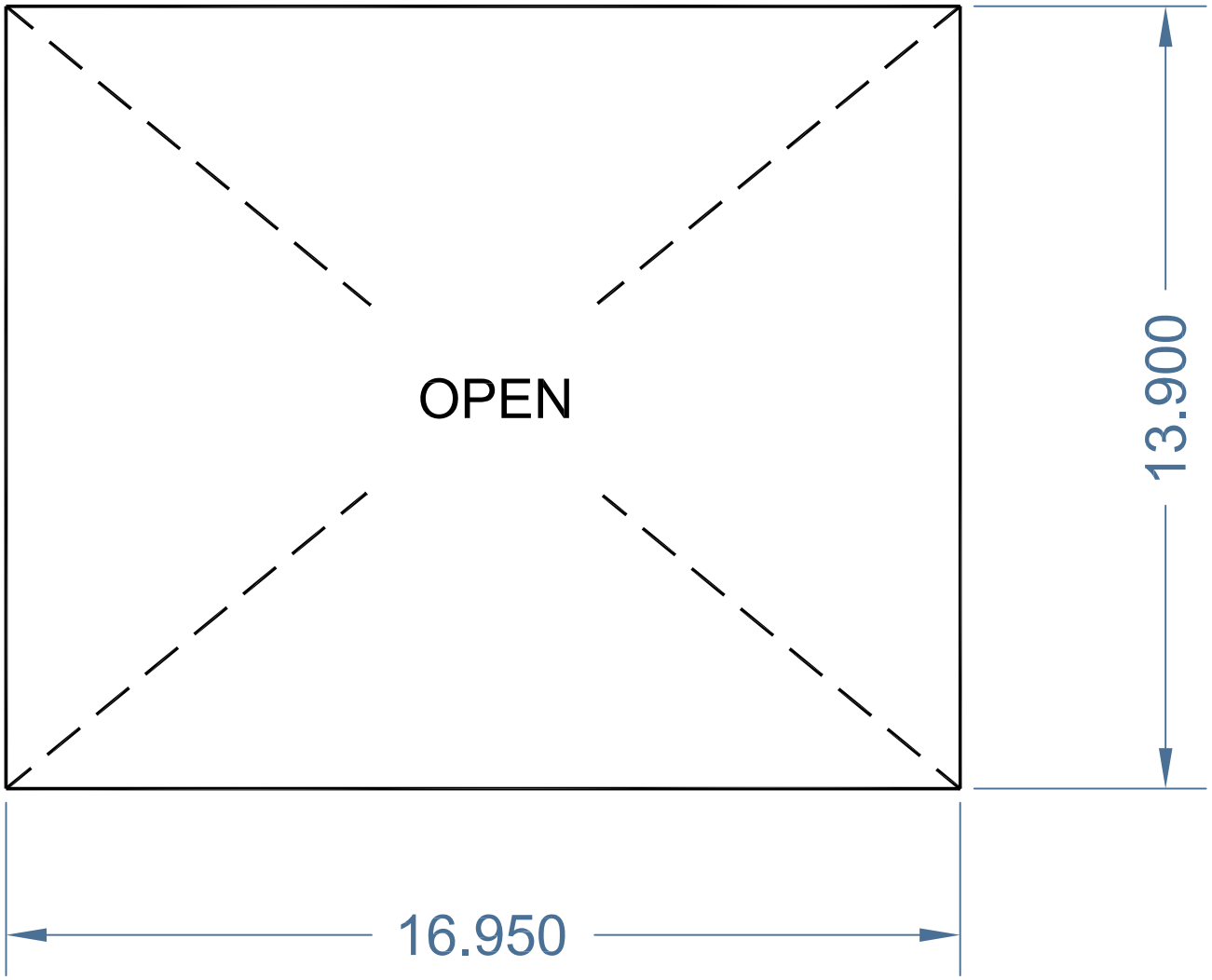
BOTTOM VIEW

DATE 11-04-2015	DRAWN BY B.G.	MODEL TR-5197	
PRODUCT PANEL MOUNT VERSION		REVISION 0	SCALE NTS
FINISH CRINKLE BLACK POWDER PAINT	Transducion	CHECKED BY	
TITLE LAYOUT		DRAWING No B-649	

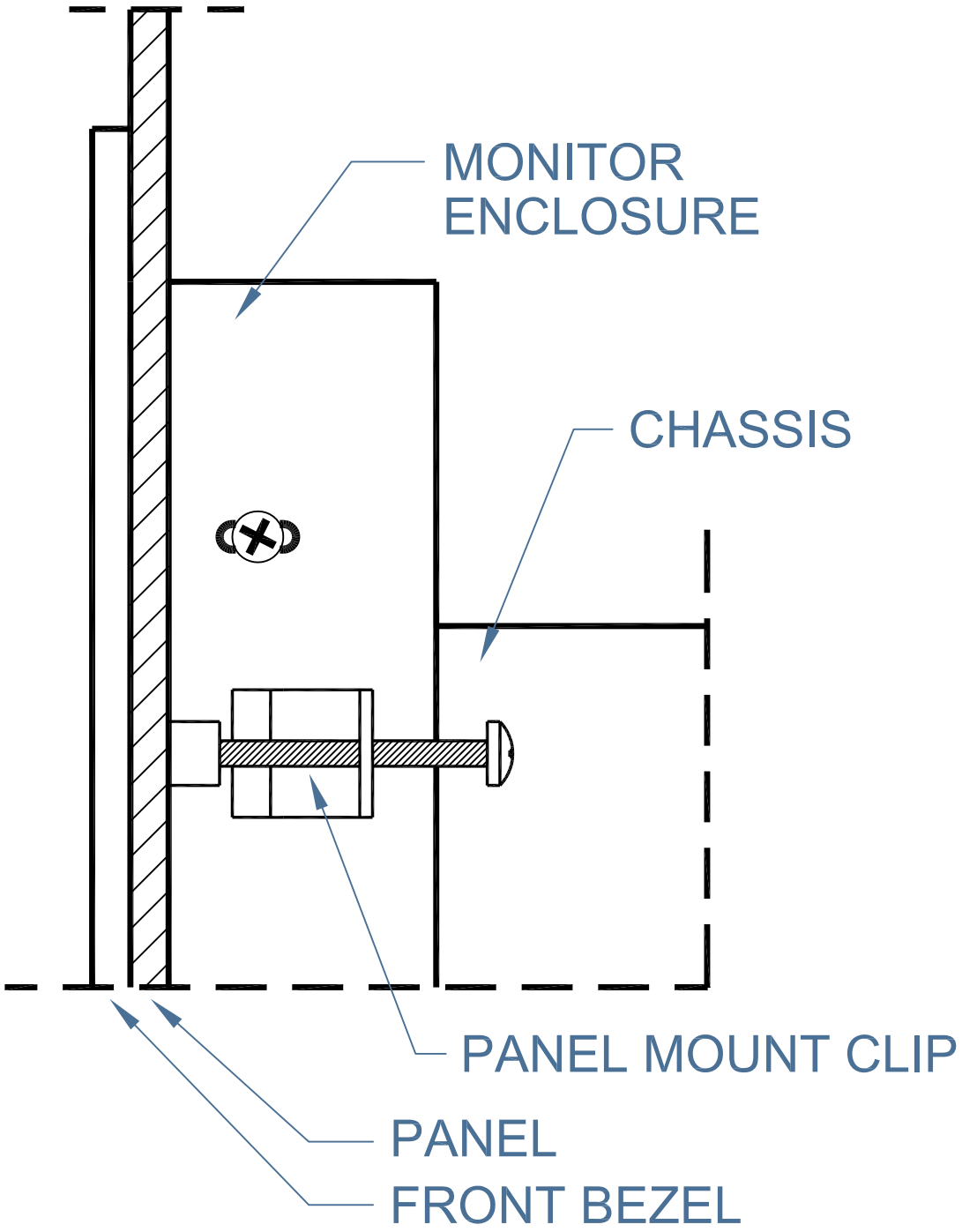


BOTTOM VIEW

DATE 11-04-2015	DRAWN BY B.G.	MODEL TR-5197	
PRODUCT PANEL MOUNT VERSION		REVISION 0	SCALE NTS
FINISH CRINKLE BLACK POWDER PAINT	Transducton	CHECKED BY	
TITLE LAYOUT DC INPUT OPTION		DRAWING No B-650	

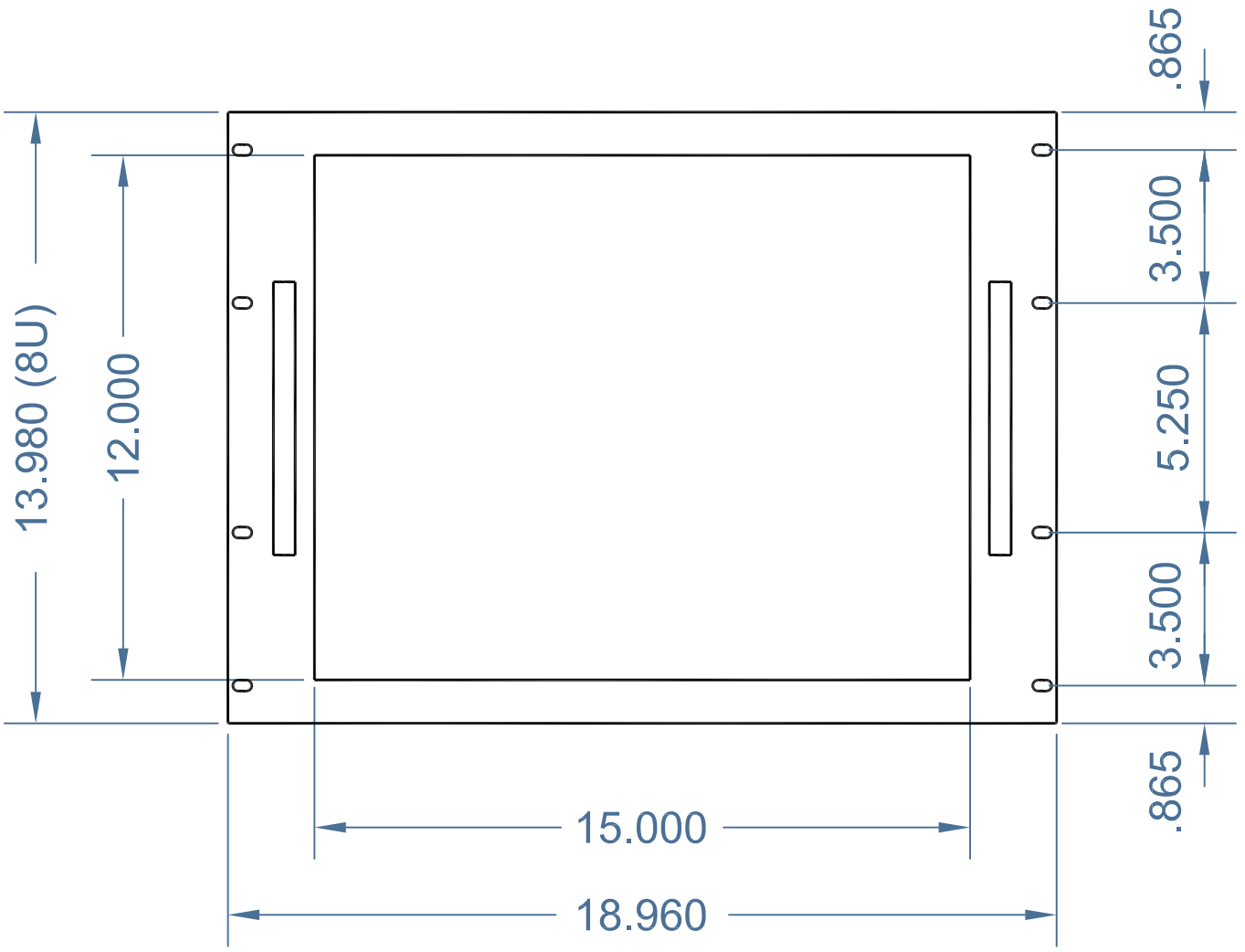


DATE 11-04-2015	DRAWN BY B.G.	MODEL TR-5197		
PRODUCT PANEL MOUNT VERSION			REVISION 0	SCALE NTS
FINISH CRINKLE BLACK POWDER PAINT	Transduction		CHECKED BY	
TITLE CUTOUT		DRAWING No B-651		



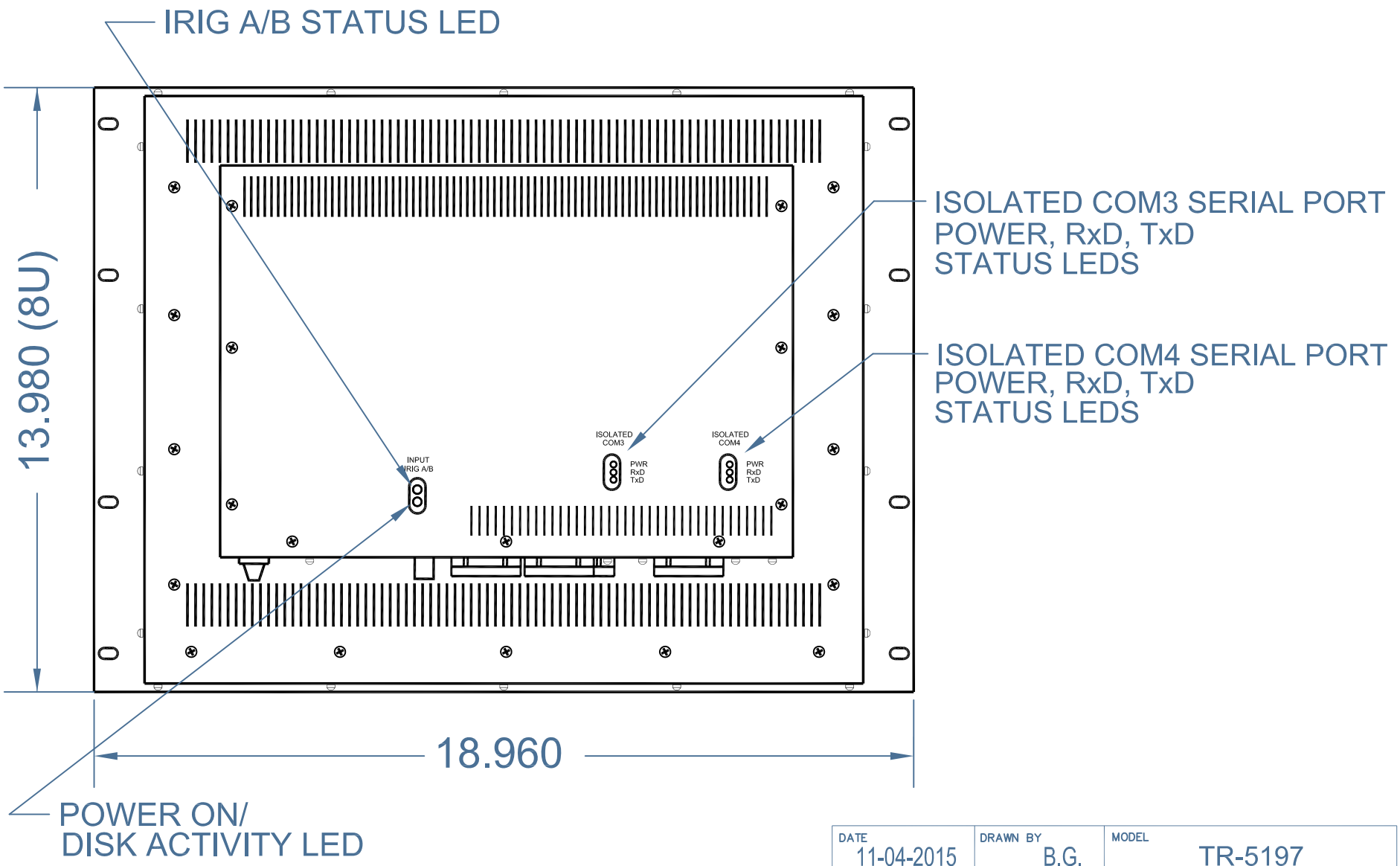
NOTE: CLIP ATTACHED FROM BEHIND AFTER CHASSIS PLACEMENT IN THE PANEL OPENING

DATE 11-04-2015	DRAWN BY B.G.	MODEL TR-5197	
PRODUCT PANEL MOUNT VERSION		REVISION 0	SCALE NTS
FINISH CRINKLE BLACK POWDER PAINT	Transduction	CHECKED BY	
TITLE DETAIL "A"		DRAWING No B-652	



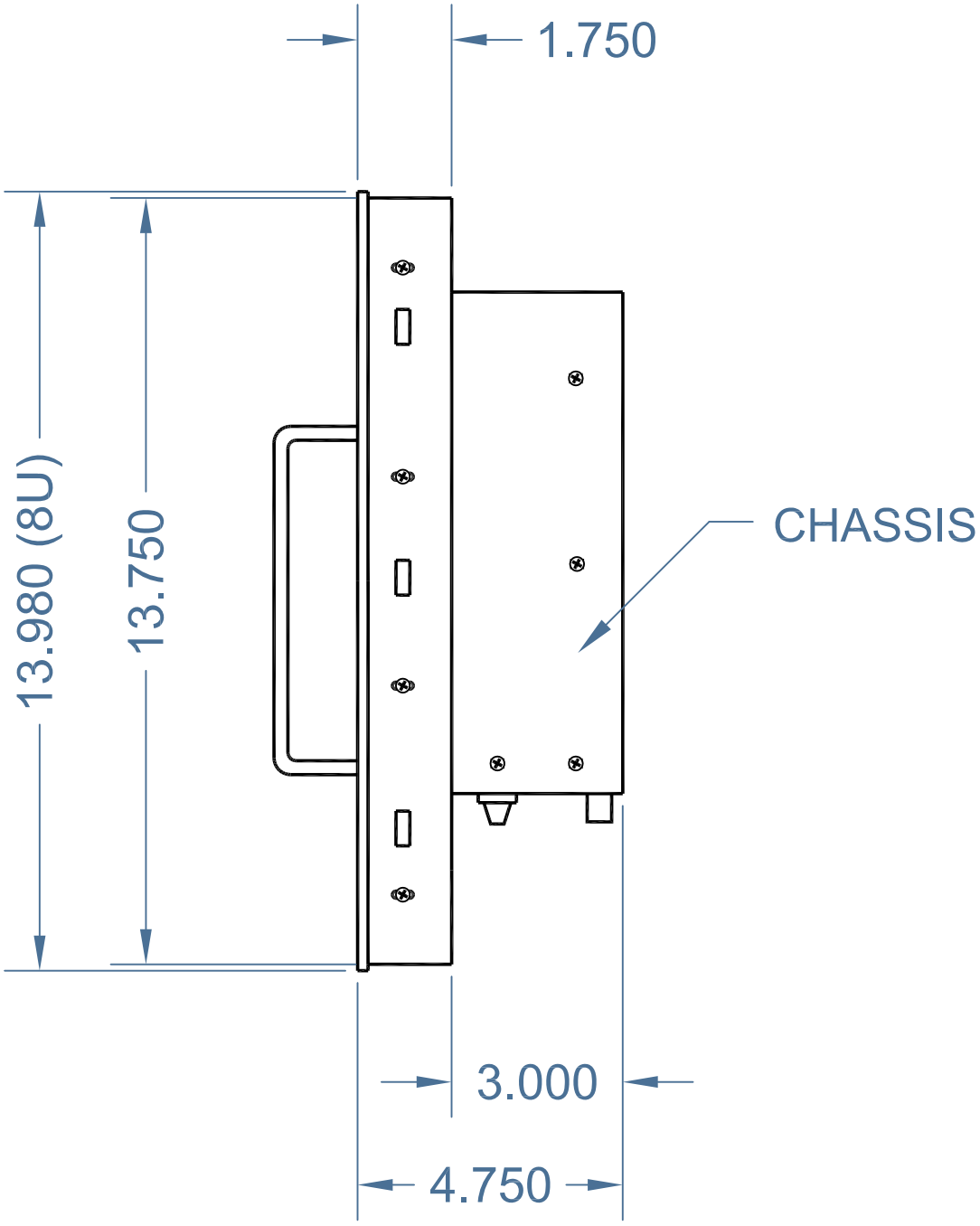
FRONT VIEW

DATE 11-04-2015	DRAWN BY B.G.	MODEL TR-5197	
PRODUCT RACK MOUNT VERSION		REVISION 0	SCALE NTS
FINISH CRINKLE BLACK POWDER PAINT	Transduction	CHECKED BY	
TITLE LAYOUT		DRAWING No B-653	



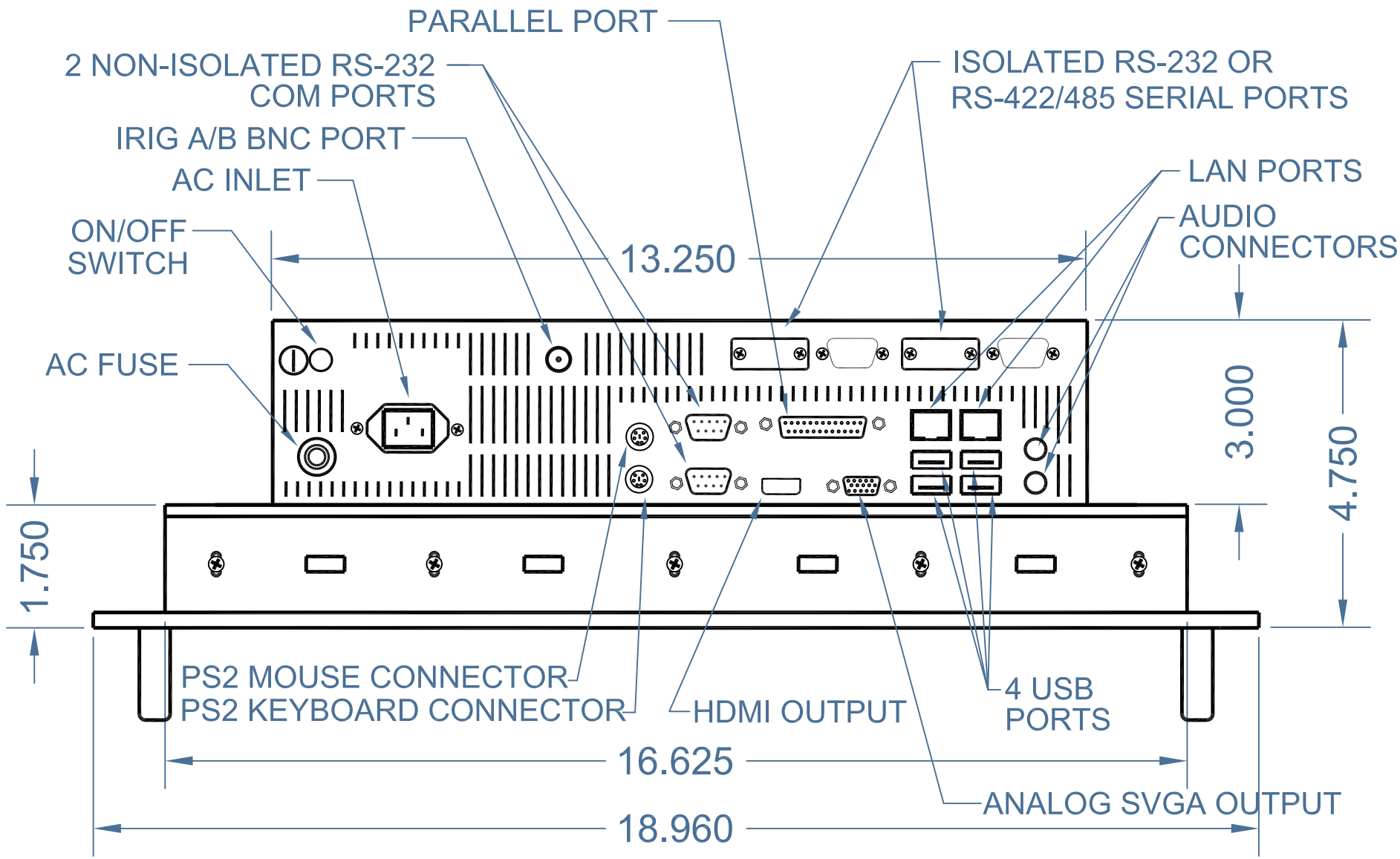
REAR VIEW

DATE 11-04-2015	DRAWN BY B.G.	MODEL TR-5197	
PRODUCT RACK MOUNT VERSION		REVISION 0	SCALE NTS
FINISH CRINKLE BLACK POWDER PAINT	Transduction	CHECKED BY	
TITLE LAYOUT		DRAWING No B-654	



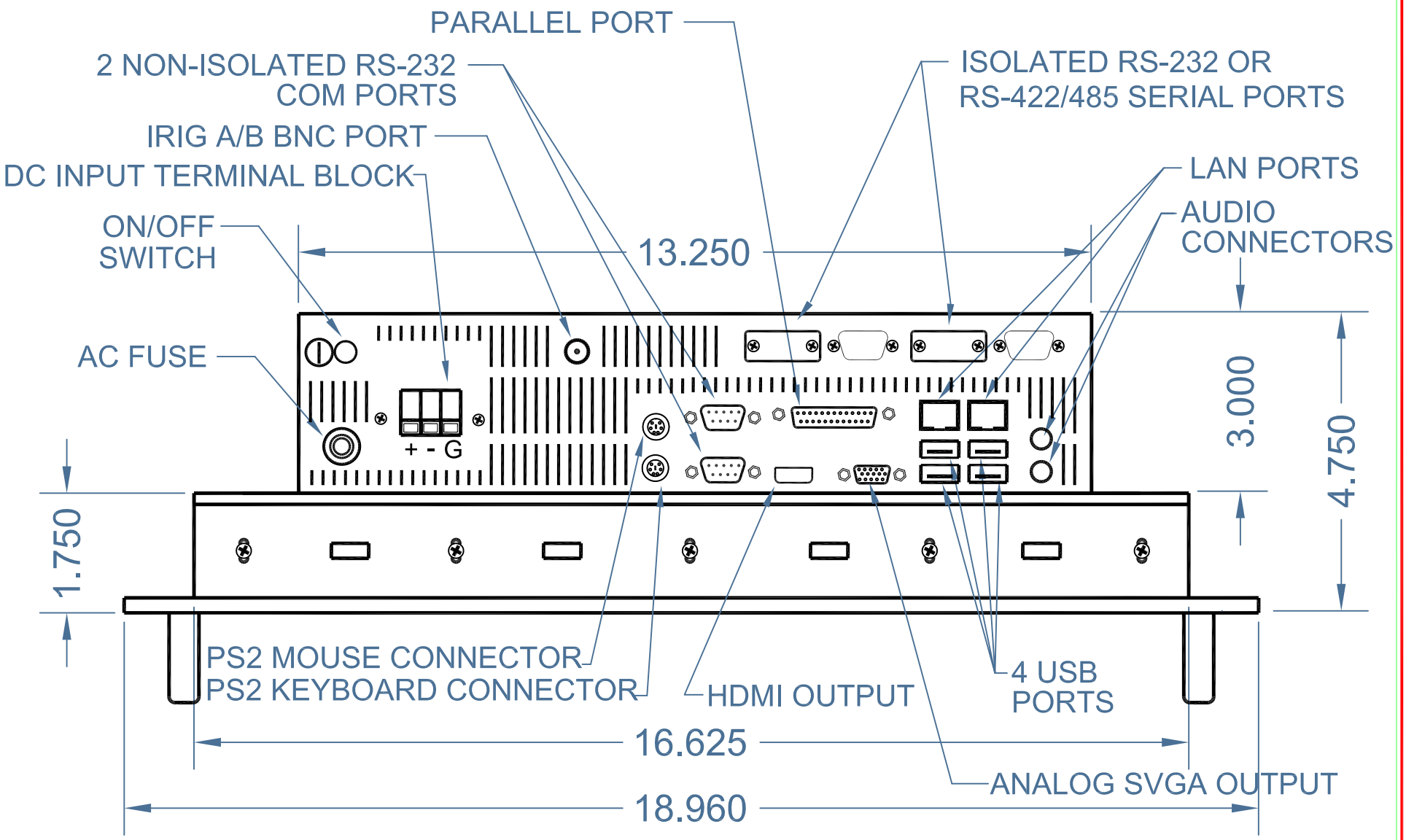
RIGHT SIDE VIEW

DATE 11-04-2015	DRAWN BY B.G.	MODEL TR-5197	
PRODUCT RACK MOUNT VERSION		REVISION 0	SCALE NTS
FINISH CRINKLE BLACK POWDER PAINT	Transduction	CHECKED BY	
TITLE LAYOUT		DRAWING No B-655	



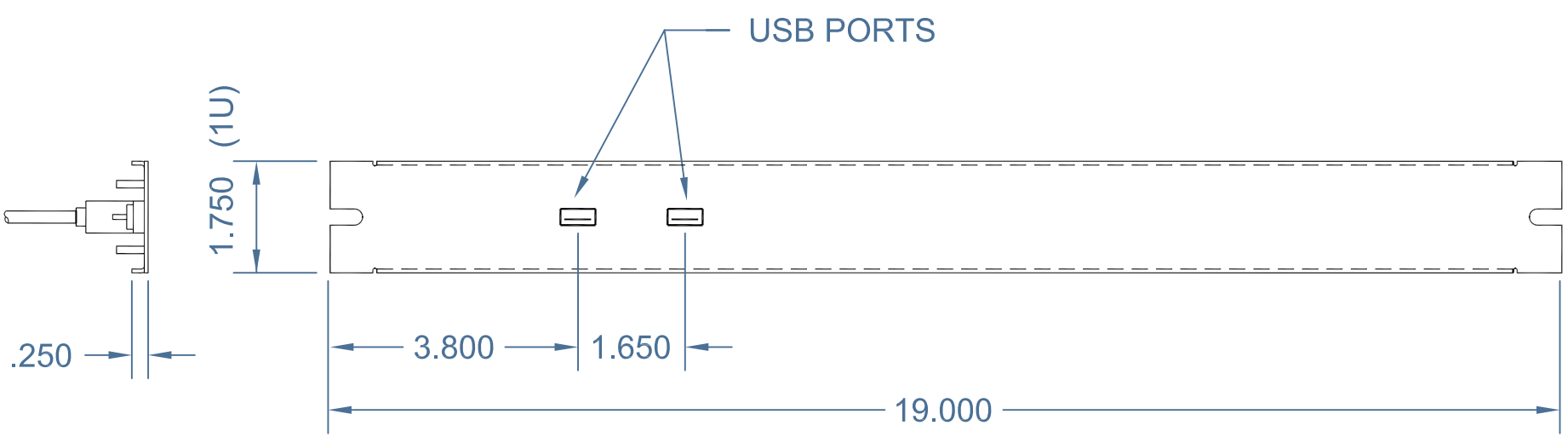
BOTTOM VIEW

DATE 11-04-2015	DRAWN BY B.G.	MODEL TR-5197	
PRODUCT RACK MOUNT VERSION		REVISION 0	SCALE NTS
FINISH CRINKLE BLACK POWDER PAINT	Transduction	CHECKED BY	
TITLE LAYOUT		DRAWING No B-656	



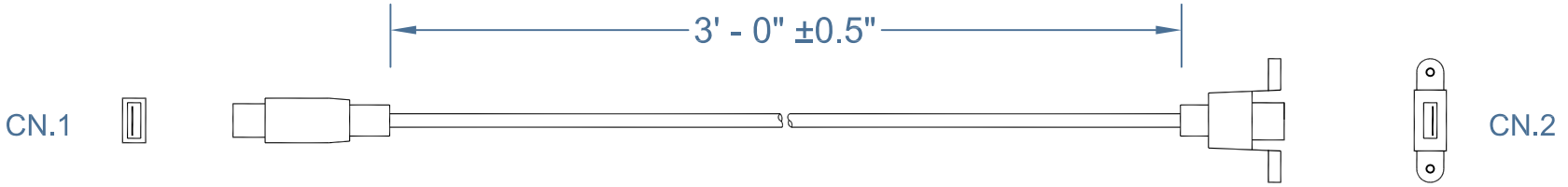
BOTTOM VIEW

DATE 11-04-2015	DRAWN BY B.G.	MODEL TR-5197	
PRODUCT RACK MOUNT VERSION		REVISION 0	SCALE NTS
FINISH CRINKLE BLACK POWDER PAINT	Transduction	CHECKED BY	
TITLE LAYOUT DC INPUT OPTION		DRAWING No B-657	



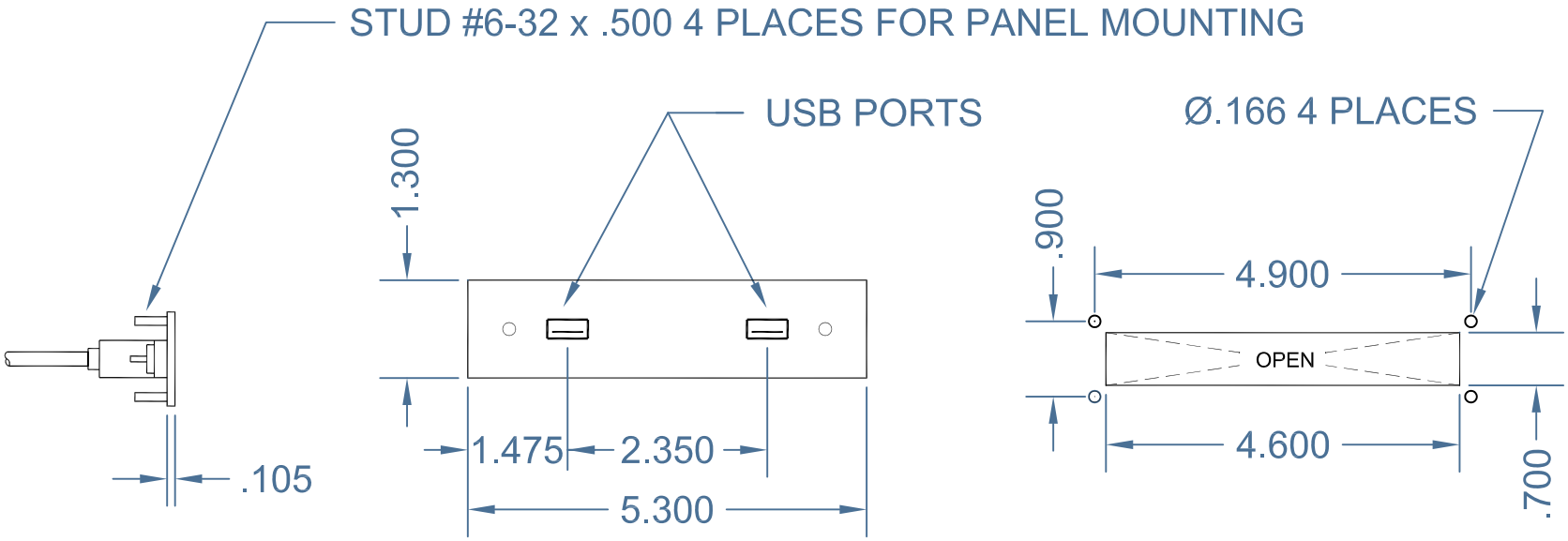
SIDE VIEW

FRONT VIEW



TWO USB CABLES
MOUNTED ON THE PLATE

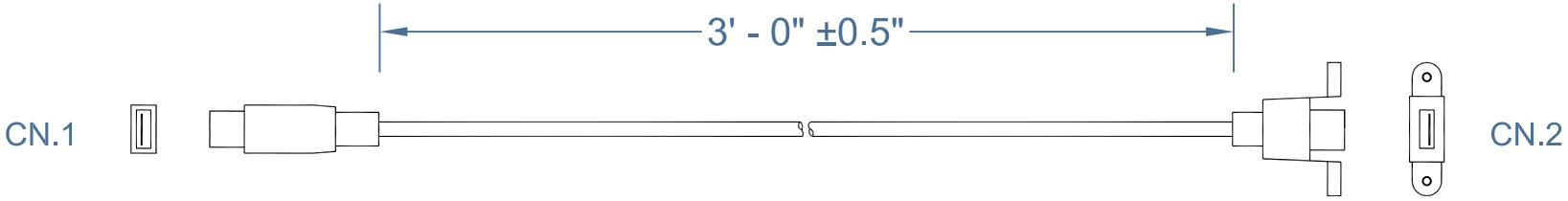
DATE 02-01-2010	DRAWN BY B.G.	MODEL 1U USB FILLER	
TR-RM-USB PLATE		REVISION 0	SCALE NTS
FINISH SANDTEX BLACK PAINT	Transduction	CHECKED BY	
TITLE LAYOUT		DRAWING No B-436A	



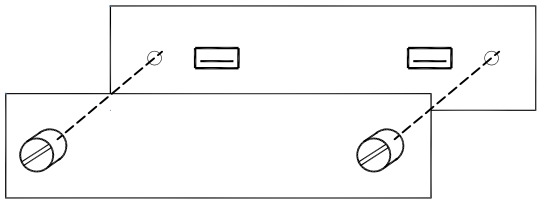
SIDE VIEW

FRONT VIEW

PANEL CUTOUT



TWO USB CABLES
MOUNTED ON THE PLATE



COVER PLATE

DATE 02-01-2010	DRAWN BY B.G.	MODEL FILLER PLATE	
TR-PM-USB PLATE		REVISION 0	SCALE NTS
FINISH SANDTEX BLACK PAINT	Transduction	CHECKED BY	
TITLE LAYOUT		DRAWING No B-476A	