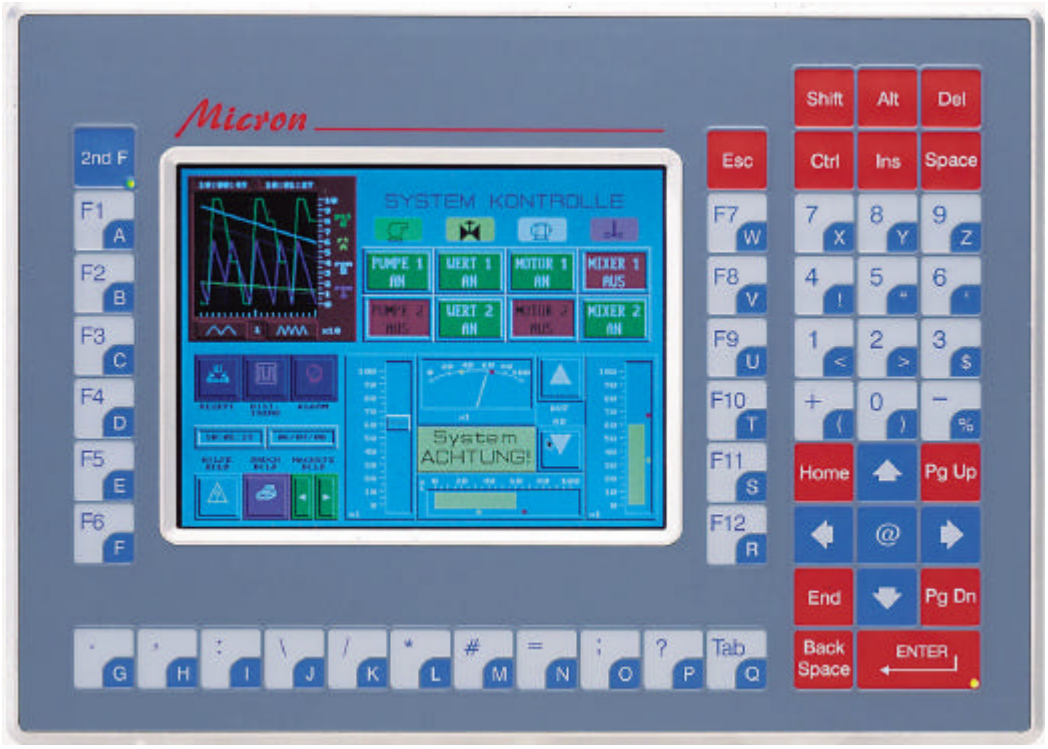

# N.C.S. COMPUTER GROUP since 1975




# industrial and marine system

# Micron-II

# INDUSTRIAL PC PII/III p/n: Micron-*II*
## *from 6.4" up to 18"TFT*

***MANUFACTURER***

**N.C.S. COMPUTER GROUP**

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**N.C.S. COMPUTER GROUP IS A COMPANY THAT HAS BEEN WORKING ON THE INDUSTRIAL, MILITARY AND MARINE MARKET SINCE 1975 (29 YEARS), DESIGNING AND PRODUCING SYSTEMS WITH A VERY HIGH DEGREE OF RELIABILITY.**

***AT THE END OF LAST YEAR 2003, NCS COMPUTER GROUP HAS COMPLETED SOME IMPORTANT DESIGNS REFERRED TO RELEVANT HARDWARE AND SOFTWARE SYSTEMS FOR THE FUTURE OF THE GROUP.***

**MICRON-II/FANLESS Manual Rev 1.12 29th January 2005**

**N.C.S. Computer Italia, based near Milano (Italy), have been leaders in Industrial Automation and Electronics since 1975, and have designed and manufactured INDUSTRIAL PC's since 1985.**

company profile

**N.C.S Computer Italia fondata nel lontano 1975** è una società che opera a livello mondiale nei settori **industriale, militare (non armamenti) e marino.** Nei suoi primi 10 anni ha operato esclusivamente come fornitore di soluzioni complete (Hardware/Software/meccanico/pneumatico/oleodinamico) garantendo un completo supporto sistemistico ed impiantistico anche sulla parte del cliente fino alla installazione e completa messa in funzione dell'impianto stesso. Questo modo di operare ha permesso alla N.C.S di acquisire una preziosissima ed unica nel suo genere esperienza nell'impiantistica generale. Esperienza trasferita successivamente su prodotti standard o dedicati.

E' così che a partire dal 1985 è stato possibile realizzare affidabilissimi **PC Industriali e Marini, TFT MONITORS e REMOTE CONSOLE** anche ad alta luminosità (fino a **1600 cd/m² per il settore marino**).

N.C.S può vantare migliaia di impianti ancora oggi funzionanti dopo oltre 20 anni di continua operatività, installati in diversi settori dell'industria sia italiana che mondiale.

N.C.S si distingue non solo per la qualità dei suoi prodotti e per la sua competenza, ma anche per il prezioso (non solo a parole) servizio di assistenza e supporto tecnico pre-post vendita che garantisce a tutti indistintamente, garantendo inoltre, come costruttore, continuità nel tempo sui prodotti. I prodotti N.C.S, inoltre, sono reperibili in America presso la filiale americana - **N.C.S NA** - e presso gli oltre venti distributori presenti nell'Unione Europea e sul mercato mondiale.

## PRODOTTI e SERVIZI:

- Ricerca e sviluppo
- Sviluppo software di base
- Sviluppo di drivers o routine sw speciali
- Sviluppo software applicativi su capitolato
- Porting del S.O. **WINDOWS XPe™**
- Progettazione hardware su capitolato
- PC Industriali e Marini per rack 19"
- Panel PC anche **FANLESS**
- Remote display da 6.4" a 22" TFT
- Remote Console (KVM) fino a 150 m. dal PC
- Schede di I/O
- Sistemi di sicurezza
- Sistemi di videosorveglianza su WEB

***N.C.S Computer Italia was founded in 1975*** *and is a Company that has always been working in the* ***Industrial, Military (not Weapons) and Marine Markets Worldwide.***

*In its initial 10 years of activity, it has worked solely as a Supplier of Complete Solutions (Hardware / Software / mechanics / pneumatic / oil-pressure) guaranteeing a complete support - also on the Customer's purchases - up to the installaton and complete start up of the Plant itself. This methodology enabled* ***NCS Italia*** *to acquire a very precious and exclusive experience in setting up Plants. An experience that has been subsequently transferred on its Standard and Customized Products. It has been therefore possible, since 1985, to manufacture very reliable* ***Industrial and Marine PC's, TFT MONITORS and REMOTE CONSOLES,*** *even with high briteness (up to* ***1600 cd/m² for marine sector****). N.C.S. can boast thousands of Plants in-the-field, that have been constantly working in the past twenty years, installed in several sectors of the Industry, both Italian and in the World. N.C.S is proud of the quality of its Products, of its competence and of the precious (facts not words) technical support and assistance provided before and after the sale, which are guaranteed to each and every Customer, along with – being the Manufacturer – a continuity of the Products.*

*NCS' Products are also available in North America via its American Branch -* ***N.C.S North America*** *– and via over twenty Distributors in the European Union and Worldwide.*

## PRODUCTS AND SERVICES:

- *Research and Development*
- *Development of basic Software*
- *Development of Drivers or special software Routines*
- *Development of Application Software upon Client's specs*
- *Porting of the O.S.* ***WINDOWS XPe™***
- *Design of dedicated Hardware*
- *19" Industrial and Marine PC's*
- *Panel PC's – also* ***FANLESS***
- *Remote displays from 6.4" up to 22"*
- *Remote Consoles (KVM) up to 150m from the PC*
- *I/O boards*
- *Security systems*
- *Video-surveillance systems via PC*

NCS COMPUTER GROUP ...since 1975

# CHAPTER 00 : HARDWARE CONFIGURATION

## CHAPTER 01

# PREFACE

The **Micron-II** is the ultimate cost-effective solution for limited space applications. It offers all the functions of an AT-compatible industrial computer on a single board and only occupies the space of a 3 ½" hard drive. The **MICRON-II** comes with an embedded high-performance Pentium III-733 MHz compatible processor and video-on board. For maximum performance, the Micron-II also supports a single 144-Pin SO-DIMM socket for up to 256 MB PC133 SDRAM.
On board features include an Ethernet interface, support for a VL-Bus Enhanced IDE interface with up to Mode 3 transfer protocol, one parallel port, four serial ports (RS-232 and RS-232/422/485) with DB-9 connector as COM1/2, 2 USB, CF connector and a mini-DIN PS/2 keyboard/mouse interface. **AGP-4X LCD/ LVDS/ CRT controller for** LCD screen resolution up to 1600 x 1200.

The **MICRON-II** complies with the "Green Functions" standard and supports three types of power saving features: Normal, Doze and Sleep modes.

The display type configuration is done through software. A single Flash chip holds the AWARD system BIOS and the VGA BIOS. This minimizes the number of chips and eases configuration. You can change the display BIOS simply by programming the Flash chip.
If you need any additional functions, the Micron-II has a PC/104 connector for future upgrades.

It is mechanically structured with four essential parts:
1) IP65 anodized aluminium front panel (6 mm thickness) with integrated resistive touch screen
2) Steel module to host display
3) Steel module to host SBC and P.S
4) Steel cover to close point (s)
5) Used steel has a high magnetic permeability .

Cover is fixed to the module board with 6 steel cross-head screws. Subsequently a label with all system configuration data and serial number i sticked. The display module is fixed to the module board with 4 screws.

## ***OPERATING SYSTEM XP Embedded***

***NEW FAMILY OF COMPUTERS BASED ON THE OPERATING SYSTEM XP embedded OF WHICH WE ARE IN POSSESSION OF THE EXPERIENCE, THE TECHNOLOGY AND THE CAPABILITY TO CUSTOMIZE EACH AND EVERY PORTING OPERATION. WE HAVE CREATED SOME COMPACT VERSIONS OF XPE (64Mb-200Mb) ENABLING, WITHOUT PROBLEMS, TO USE - ON OUR SYSTEMS - APPLICATION SOFTWARE DESIGNED ON THE XP PROFESSIONAL AND XP HOME PLATFORMS.***

***THE PORTING OPERATION WE PERFORMED ALLOWED TO CREATE SOME VERY COMPACT AND VERY RELIABLE VERSIONS OF THE OPERATING SYSTEM XPE. THESE CAN ALSO BE LOADED ON SOLID STATE DISKS (FLASH DISKS) THAT GUARANTEE A VERY HIGH DEGREE OF RELIABILITY AGAINST HIGH AND LOW TEMPERATURES, MECHANICAL SHOCKS, VIBRATIONS AND DUST.***

***FOR THE MARINE MARKET, OUR SYSTEMS ARE PROPOSED WITH TFT DISPLAYS UP TO 1600cd/m².***

## CHAPTER 02

# PREFACE (Cont'd)

Outside connectors are:

**1.** Connector DB15HD/F video output for CRT
**2.** Connector DB25/F standard printer port
**3.** Connector DB9/M COM1/RS232C
**4.** Connector DB9/M COM2/RS232C (RS422/485 - see notes for selection)
**5.** Connector DB37/F for external FDD
6. Mini-Din 6P/F PS/2 Mouse/Keyboard
7. Phoenix 3 P/Male connector for power supply
8. RJ45 connector for LAN
9. Connecotors USB

On the right of Mini-Din/6 pin keyboard connector there is a small hole ( 3 mm diameter ) for reset button access.

The **SBC Micron-II** has been designed for direct interface with 5 Vdc and 3,3 Vdc TFT display.

***The SBC is based on a multilayer PCB with components mounted on both sides and foresees ferrites, capacitors, limitation resistors, buffers and all what it is necessary to be CE compliant, reliable and immune from disturbancies.***

On board module there are two 12Vdc fans.

NOTE : **in case of presence of ventilation fans (included CPU COOLER for non-fanless SBC NCS-679) it is <u>mandatory to conduct an adequate cleaning operation</u> of these fans at least once a month. This maintenance allows to avoid random FANS HALTS and prevent accidental system halts.**

Among Micron-II external accessories (optional)*:*

- Floppy disk driver (max. length external FDD cable: 50 cm.)
- Mouse and Touch screen
- Touch-pad
- Trackball
- Many types of Industrial Keyboards
- Industrial FLASH DISK up to 6 Gb

## CHAPTER 03

# PREFACE (Cont'd)

**On connector side there are four LEDs :**

- 2 LEDs/LAN near RJ45 connector
- 2 LEDs/ at righ hand side of DB15/F – HD (VGA) connector
  1 Green Power-on LED - 1 Red HDD LED (see page 10)

**SETUP BIOS:**

To access BIOS setup it is sufficient to press DEL key during memory test.
N.C.S. systems are delivered already configurated in accordance with customer's request.
However to modify or vary setup it is very easy thank to various menu given by AWARD BIOS.

**SAFETY PRECAUTIONS**

Follow the messages below to avoid your system from damage.

1. Keep your system from static electric power on all occasions.
2. Stay safe from the electric shock. Don't touch any components of this card when the power is ON. Always disconnect power when the system is not in use.
3. Remove power when you change any hardware devices. For instance, when you connect a jumper or install any cards, a surge of power may damage the electronic components or the whole system.

***Standard front panels have following dimensions :***

Standard front panel has following dimensions: **(L) 280 mm x (H) 204 mm x (D) 75 mm (with display TFT 6.4" VGA)**

***mm 280 x 204 x 75 (display TFT 6.4" 250 cd/m²) ( 640x480 VGA ) with IP65 complete membrane keyboard***
***mm 300 x 240 x 80 (display TFT10.4" 250 cd/m²) ( 640x480 VGA ) special mini bezel***
***mm 330 x 270 x 80 (display TFT10.4" 250 cd/m²) ( 640x480 VGA )***
***mm 330 x 270 x 80 (display TFT10.4" 250 cd/m²) ( 800x600 SVGA)***
***mm 350 x 270 x 80 (display TFT 12" 250 cd/m²) ( 800x600 SVGA)***
***mm 420 x 311 x 80 (display TFT 15" 250 cd/m² ) ( 1024x768 XGA )***
***mm 380 x 270 x 80 (display TFT 12" 250 cd/m²) ( 800x600 SVGA) with IP65 complete membrane keyboard***

***all models are available with touch screen***

Customizations and Stainless Steel Bezels are also available
Board Specs are following on "Main Board Reference Guide"

## CHAPTER 04

# Micron-II SPECIFICATIONS

- **CPU: P-III class VIA Eden ESP** **733 MHz low-power fanless CPU**, 8W, 128K L1 cache & 64K L2 cache, 100/133 FSB
- System chip: VIA VT8606 (PN133T Twister-T) & VT82C686A/B.
- Cache memory: 128K L1 Cache & 64K L2 Cache built in CPU.
- BIOS: Award/AMI BIOS, 256KB (Flash) EPROM **Boot From USB FDD/HDD/CD-ROM**
- AGP-4X LCD/ LVDS/ CRT: AGP-4X Savage4 3D/2D LVDS/TFT/DSTN LCD/CRT W/ 8M~32M SMA memory (share system memory as display memory), support 1600x1200 TFT/DSTN/LVDS (2-channel 110MHz) LCD & 1920x1440 2D/3D CRT. *Also support* 16:9 display(resolution 848x480 and 1280x768)
- DVD: Hardware-Assisted MPEG-2 architecture for DVD full-screen video playback
- 100/10M Ethernet: Realtek 8139C LAN x 1, or, Intel 82559 LAN x 1
- Optional AC97 audio: AC97 audio daughter board.
- CMOS Backup: CMOS Backup by Li battery.
- IrDA and USBx2: USB and IrDA pin header on board
- Temperature /fan monitoring: 686B on-chip function
- CompactFlash II socket: Support CF I / II type IDE Flash Disk or IBM 340MB/1GB MicroDrive HDD. (optional)
- Keyboard & Mouse connector: 6-pin Mini-Din connector
- BUS TYPE: PC/104 socket.
- Speaker: Buzzer on Board.
- **Digital I/O: 4-bit DI and 4-bit DO, TTL level**
- WATCHDOG: Programmable 0 ~ 256 sec.
- ATA100/66/33 IDE Port x 1: Up to 2 x IDE devices.
- FDD: Two 3.5" or 5.25" FDD or LS120
- Serial Port x 4: RS-232 x 3 + RS-232/422/485 x 1(+5v/+12v Power Output in Pin1 or Pin9 via jumper setting, TTL-level Reserved in COM2)
- PARALLEL PORT: Bi-directional SPP/EPP/ECP port
- Power Requirement: +5V & +12V or Single +5V by 4-pin power connector; ATX power control pin.
- DMA CHANNELS: 7, INTERRUPT CONTROLLERS: 82C59 X 2 INTERRUPT LEVELS: 15
- OPERATING TEMPERATURE: 0 to 60~ (140~) and 0~85~ CPU support fanless application..
- BOARD DIMENSION: 145mm x 102mm
- BOARD WEIGHT: 0.34Kg.

***Solid State Disk*** : from 16 Megabytes up to 6 Gb Flash Disk Hard drive

| PARAMETERS | OPERATING | NON OPERATING |
|---|---|---|
| TEMPERATURE | 0-50°C (IEC 68-2-1) | -10 to 80°C |
| HUMIDITY n.c. at 30°C | 5 % to 90% (IEC 68-2-2) | 0% to 95% RH |
| ALTITUDE | 0 m t. to 3 km (2 miles) | -100 m t. 10 km |
| SHOCK ½ sine wave-11mS duration | 10G (IEC 68-2-27) | 30G |
| VIBRATION | 1G (IEC 68-2-6) | 2G 5 to 100 Hz sine wave (peak to peak) |

| | |
|---|---|
| MTBF (mean time between failures) 4 | 0000 H. at 25 C estimated (MIL - HDBK - 217F) |
| MTTR (mean time to repair) | 20 minutes |
| Warranty | 3 Years (1 year for display-HDD-Touch Screen) |
| Certifications EMC | **1.** IEC 801-2 ELECTROSTATIC DISCHARGE<br>**2.** IEC 801-3/ENV 50140 RADIATED ELECTROMAGNETIC SUSCEPTIBILITY<br>**3.** IEC 801-4 LEVEL 3 FAST TRANSIENT/BURST<br>**4.** ENV 50141 LEVEL 3 CONDUCED IMMUNITY<br>**5.** EN 55022 ELECTROMAGNETIC EMISSION |
| Safety Compliances | EC 950, EN 60950 Prepared for : UL CSA-C-C22.2 |

# CHAPTER 05

## GENERAL INSTRUCTIONS

- **Power supply nominal data:**

  Mod. (C) DC/DC 24 Input 16÷32Vdc (external power min. 5A)

- **Storage and transport conditions:**

  Non operating temperature: -10÷80º C.

  R.H. 0÷95%

- **Operating conditions when system is placed into a conditioned enclosure or with forced ventilation:**

  0÷50º C. - R.H 5%÷80%

**IMPORTANT: When the system is placed into an IP65 enclosure it is absolutely mandatory to foresee an appropriate ventilation system or air conditioning in order to avoid to create hot air bubbles inside the Micron-II.**

**INSTALL INSTRUCTIONS :**

Mandatory to install inside a console with max. 3 mm dimensions openings.

Mandatory to install inside a console for technical assistence staff access only using key or tool .

Mandatory to connect with bipolar switch previously approved on PC.

Mandatory conductors connection (phase/neutral) in accordance with M1 connector indications

**Mandatory PC connection to other compliant CEI EN 60950 systems only**

**MAINTENANCE INSTRUCTIONS :**

Mandatory to operate on PC with open bipolar switch only.

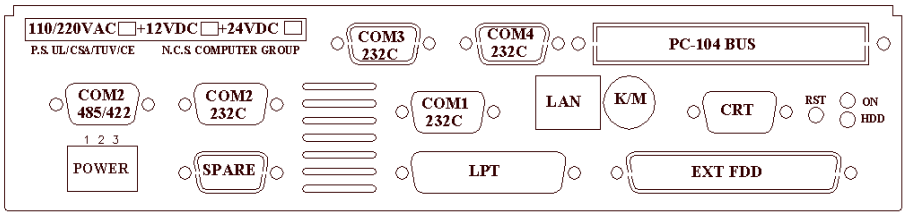
Attention to power supply connector (open-frame parts at 240 V) during connections or reset operations.

**OUTSIDE CLEANING INSTRUCTIONS :**

Alcohol only is suggested for outside cleaning

## CHAPTER 06

**MICRON-II FANLESS SYSTEM**
**side connectors**




### EXTERNAL CONNECTIONS COM1 – COM2 - DB/9 D-SUB SHELL CONNECTORS (MALE)

| COM1/RS232C | | COM2/RS232C | | COM2/RS422-485 | |
|---|---|---|---|---|---|
| ***PIN No.*** | ***SIGNAL*** | ***PIN No.*** | ***SIGNAL*** | ***PIN No.*** | ***SIGNAL*** |
| ***1*** | ***RLSD1 (DCD1)*** | ***1*** | ***RLSD2 (DCD 2)*** | ***1*** | ***TXD-(DATA-485)*** |
| ***2*** | ***RXD1*** | ***2*** | ***RXD2*** | ***2*** | ***TXD+(DATA+485)*** |
| ***3*** | ***TX1*** | ***3*** | ***TX2*** | ***3*** | ***RXD+*** |
| ***4*** | ***DTR1*** | ***4*** | ***DTR2*** | ***4*** | ***RXD-*** |
| ***5*** | ***GND*** | ***5*** | ***GND*** | ***5*** | |
| ***6*** | ***DSR1*** | ***6*** | ***DSR2*** | ***6*** | |
| ***7*** | ***RTS1*** | ***7*** | ***RTS2*** | ***7*** | |
| ***8*** | ***CTS1*** | ***8*** | ***CTS2*** | ***8*** | |
| ***9*** | ***RI1*** | ***9*** | ***RI2*** | ***9*** | |

### EXTERNAL ETHERNET 10BASE-T CONNECTOR

| ***ETHERNET 10BASE-T CONNECTOR*** | |
|---|---|
| ***PIN No.*** | ***SIGNAL*** |
| ***1*** | ***XMT+*** |
| ***2*** | ***XMT-*** |
| ***3*** | ***RCV+*** |
| ***4*** | ***NC*** |
| ***5*** | ***NC*** |
| ***6*** | ***RCV-*** |
| ***7*** | ***NC*** |
| ***8*** | ***NC*** |

## CHAPTER 07

### INTERNAL/EXTERNAL FDD CABLE - Pinout FDD connector (optional)

| DB/37 CONNECTOR | | | FLAT CABLE 34P CONNNECTOR | |
|---|---|---|---|---|
| | SIGNAL | | | |
| 1 | GND | | | 1 |
| 20 | DENSEL | | | 2 |
| 2 | GND | | | 3 |
| 21 | NC | | | 4 |
| 3 | GND | | | 5 |
| 22 | PIN 2 SW4 | | | 6 |
| 4 | GND | | | 7 |
| 23 | INDEX | | | 8 |
| 5 | GND | | | 9 |
| 24 | MTR0 | | | 10 |
| 6 | GND | | | 11 |
| 25 | DRV1 | | | 12 |
| 7 | GND | | | 13 |
| 26 | DRV0 | | | 14 |
| 8 | GND | | | 15 |
| 27 | MTR1 | | | 16 |
| 9 | GND | | | 17 |
| 28 | DIR | | | 18 |
| 10 | GND | | | 19 |
| 29 | STEP | | | 20 |
| 11 | GND | | | 21 |
| 30 | WDATA | | | 22 |
| 12 | GND | | | 23 |
| 31 | WGATE | | | 24 |
| 13 | GND | | | 25 |
| 32 | TRKO | | | 26 |
| 14 | GND | | | 27 |
| 33 | WRPRT | | | 28 |
| 15 | GND | | | 29 |
| 34 | RDATA | | | 30 |
| 16 | GND | | | 31 |
| 35 | HDSEL | | | 32 |
| 17 | GND | | | 33 |
| 36 | DSKCHG | | | 34 |
| 18 | GND | 2 - 3 | | |
| 19 | +5V | 1 | | |
| 37 | +5V | 1 | | |

**CONNECTOR P.S FDD AMP 171822-4 OR EQUIVALENT**

## CHAPTER 08

**JP-21 EXTERNAL PINTER PORT CONNECTION**

**One 25 pin D-Sub shell connector (female)**

| *EXTERNAL PRINTER CONNECTOR EPP-ECP - JP21* | | | |
|---|---|---|---|
| *PIN No.* | *SIGNAL* | *Pin No.* | *SIGNAL* |
| *10* | *ACK* | *18* | *GND* |
| *11* | *BUSY* | *19* | *GND* |
| *12* | *PE* | *20* | *GND* |
| *13* | *SLCT* | *21* | *GND* |
| *15* | *ERR* | *22* | *GND* |
| *9* | *PRD7* | *23* | *GND* |
| *8* | *PRD6* | *24* | *GND* |
| *7* | *PRD5* | *25* | *GND* |
| *6* | *PRD4* | | |
| *5* | *PRD3* | | |
| *4* | *PRD2* | | |
| *3* | *PRD1* | | |
| *2* | *PRD0* | | |
| *1* | *STROBE* | | |
| *14* | *AUTOF* | | |
| *16* | *INIT* | | |
| *17* | *INSEL* | | |

## CHAPTER 09

### JP28 – EXTERNAL SVGA VIDEO CONNECTOR (CN14)

**One 15 Pin D-Sub shell connector (female simultaneous SVGA external connection)**

| *SVGA CONNECTOR – JP28* | |
|---|---|
| ***Pin No.*** | ***SIGNAL*** |
| ***1*** | ***RED*** |
| ***2*** | ***GREEN*** |
| ***3*** | ***BLU*** |
| ***4*** | ***N.C*** |
| ***5*** | ***GND*** |
| ***6*** | ***GND*** |
| ***7*** | ***GND*** |
| ***8*** | ***GND*** |
| ***9*** | ***N.C*** |
| ***10*** | ***GND*** |
| ***11*** | ***N.C*** |
| ***12*** | ***N.C*** |
| ***13*** | ***HSYNC*** |
| ***14*** | ***VSYNG*** |
| ***15*** | ***N.C*** |

### EXTERNAL KEYBOARD, MOUSE PS/2 CONNECTIONS (CN13)

**Mini-Din 6 Pin connector (female)**

| ***EXTERNAL KEYBOARD, MOUSE PS/2 CONNECTOR*** | |
|---|---|
| ***PIN No.*** | ***SIGNAL*** |
| ***1*** | ***KB-DATA*** |
| ***2*** | ***MS DATA*** |
| ***3*** | ***GND*** |
| ***4*** | ***VCC*** |
| ***5*** | ***KB-CLOCK*** |
| ***6*** | ***MS CLOCK*** |

## CHAPTER 0A

### POWER SUPPLY

| M1/PS1-AC 85V÷265Vac/47-440HZ/55W | | M1/PS2-DC12 9.5V÷18VDC/45W | | M1/PS3-DC24 16V÷32VDC/55W | |
|---|---|---|---|---|---|
| **PIN No.** | **SIGNAL** | **PIN No.** | **SIGNAL** | **PIN No.** | **SIGNAL** |
| 1 | VAC | 1 | +12V | 1 | +24VDC |
| 2 | SHIELD | 2 | GND | 2 | GND |
| 3 | VAC | 3 | NC | 3 | NC |
| Inrush current: 30A/115 Vac or 60A/230Vac | | Max input current: 10A at 9.5Vdc | | Max input current: 9A at 16Vdc | |
| Max input current: 2A/115Vac or 1A/230Vac | | | | | |

| DC OUTPUT PIN ASSIGNMENT FOR ALL THREE POWER SUPPLIES | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| + 12V | GND | GND | GND | GND | +5V | +5V | +5V |

| *MODEL P.S.* | *RATED LOAD AT 50°C* *+ 5V* | *+ 12V* | *MAX. LOAD AT 50°C* *+5V* | *+12V* | *MTBF HOURS* |
|---|---|---|---|---|---|
| *PS1-AC 55W* | *8A* | *1.2A* | *10A* | *4A* | *335.800 HRS* |
| *PS2-DC12 45W* | *6A* | *1.1A* | *8A* | *2A* | *327.400 HRS* |
| *PS3-DC24 55W* | *8A* | *1.2A* | *10A* | *4A* | *335.800 HRS* |

**Operating temperature of Power Supply : -20° C to +70° C**
**Safety P.S. : Meets UL1950 - CSA 22.2 n. 234 VDE EN 60950**

## IMPORTANT :

**For power-supplies PS2-DC12 and PS3-DC24 mandatorily use wires with a minimum section of 1,5 mm².**

**CURRENT INPUT : +24Vdc/5A (min.), +12Vdc/8A (min.) .**

**For power-supply PS1-AC mandatorily use wires with a minimum section of 0,75 mm².**

## CHAPTER 0B

**IRQ Assignments**

| IRQ | ASSIGNMENT |
|---|---|
| 0 | System TIMER interrupt from TIMER-0 |
| 1 | Keyboard output buffer full |
| 2 | Cascade for IRQ 8-15 |
| 3 | Serial port 2 |
| 4 | Serial port 1 |
| 5 | Parallel port 2 |
| 6 | Floppy Disk adapter |
| 7 | Parallel port 1 |
| 8 | RTC clock |
| 9 | Available |
| 10 | Available |
| 11 | Available |
| 12 | Available |
| 13 | Math coprocessor |
| 14 | Hard Disk adapter |
| 15 | Available |

**TIMER & DMA CHANNELS MAP**

| Timer Channel | Assignment |
|---|---|
| 0 | System timer interrupt |
| 1 | DRAM Refresh request |
| 2 | Speaker tone generator |

## CHAPTER 0C

**DMA Channel Map**

| DMA Channel | Assignment |
|---|---|
| 0 | Available |
| 1 | IBM SDLC |
| 2 | Floppy Disk adapter |
| 3 | Channel-3 Available |
| 4 | Cascade for DMA controller 1 |
| 5 | Available |
| 6 | Available |
| 7 | Available |

## CHAPTER 0D

| CODE | ASSIGNMENT |
|---|---|
| 00 | Seconds |
| 01 | Second alarm |
| 02 | Minutes |
| 03 | Minutes alarm |
| 04 | Hours |
| 05 | Hours alarm |
| 06 | Day of week |
| 07 | Day of month |
| 08 | Month |
| 09 | Year |
| 0A | Status register A |
| 0B | Status register B |
| 0C | Status register C |
| 0D | Status register D |
| 0E | Diagnostic status byte |
| 0F | Shutdown byte |
| 10 | Floppy Disk drive type byte |
| 11 | Reserve |
| 12 | Hard Disk type byte |
| 13 | Reserve |
| 14 | Equipment byte |
| 15 | Base memory low byte |
| 16 | Base memory high byte |
| 17 | Extension memory low byte |
| 18 | Extension memory high byte |
| 30 | Reserved for extension memory low byte |
| 31 | Reserved for extension memory high byte |
| 32 | Date Century byte |
| 33 | Information Flag |
| 34-3F | Reserve |
| 40-7F | Reserved for Chipset Setting Data |

## CHAPTER 0E

| MEMORY MAP | ASSIGNMENT |
|---|---|
| 0000000-009FFFF | System memory used by DOS and application |

| I/O & MEMORY MAP | |
|---|---|
| 00A0000-00BFFFF | Display buffer memory for VGA/EGA/CGA/MONO Adapter |
| 00C0000-00DFFFF | Reserved for I/O device BIOS ROM or RAM buffer. |
| 00E0000-00EFFFF | Reserved for PCI device ROM |
| 00F0000-00FFFFF | System BIOS ROM |
| 0100000-BFFFFF | System extension memory |

| I/O MAP | ASSIGNMENT |
|---|---|
| 000-01F | DMA controller (Master) |
| 020-021 | Interrupt controller (Master) |
| 022-023 | Chipset controller registers I/O ports. |
| 040-05F | Timer control registers. |
| 060-06F | Keyboard interface controller (8042) |
| 070-07F | RTC ports & CMOS I/O ports |
| 080-09F | DMA register |
| 0A0-0BF | Interrupt controller (Slave) |
| 0C0-0DF | DMA controller (Slave) |
| 0F0-0FF | Math coprocessor |
| 1F0-1F8 | Hard Disk controller |
| 278-27F | Parallel port-2 |
| 2B0-2DF | Graphics adapter controller |
| 2F8-2FF | Serial port-2 |
| 360-36F | Net work ports |
| 378-37F | Parallel port-1 |
| 3B0-3BF | Monochrome & Printer adapter |
| 3C0-3CF | EGA adapter |
| 3D0-3DF | CGA adapter |
| 3F0-3F7 | Floppy disk controller |
| 3F8-3FF | Serial port-1 |

## CHAPTER 0F

### WATCHDOG TIMER FUNCTION

The watchdog timer can reset the system or generate a IRQ11 signal automatically. It is defined at I/O port 0443H. When you want to enable the watchdog timer, please write code to I/O port 0443H, then the system will generate a reset or IRQ11 signal. When you want to disable the function, write I/O port 043H (1043H ~ D043H), the system will stop the WDT function.

This CPU board watchdog functions: write I/O port address 0443 to enable watchdog and write I/O port address 043 (1043, 2043, 3043,…D043) to disable watchdog. The following program shows you how to program the watchdog timer in your program.
WatchDog Enable program: For Example

```
MOV AX, 000FH          (choose the values you need; start from 0 to FF )
MOV DX, 0443H
OUT DX, AX
```

Watchdog Disable program:

```
MOV AX, 000FH (please ignore this value.)
MOV DX, x043H “x= 2,3,4,5,6,7,8,9,a,b,c,d”
OUT DX, AX
```

Please find the time you need and the corresponding value from the following Watchdog Timer Cl Table on the next page:

**TIME BASE IS LIST BELOW**
**VA Mean is Value for counter**
**Time Mean is WDT Signal response time**

**: Unit Hexdecimal**

**: Unit Decimal (second)**

| Va | time | Va | time | va | time | Va | time | va | time | va time | va time | va | time |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00 | 1024 | 10 | 64 | 20 | 128 | 30 | 192 | 40 | 256 | 50 320 | 60 384 | 70 | 448 |
| 01 | 4 | 11 | 68 | 21 | 132 | 31 | 196 | 41 | 260 | 51 324 | 61 388 | 71 | 452 |
| 02 | 8 | 12 | 72 | 22 | 136 | 32 | 200 | 42 | 264 | 52 328 | 62 392 | 72 | 456 |
| 03 | 12 | 13 | 76 | 23 | 140 | 33 | 204 | 43 | 268 | 53 332 | 63 396 | 73 | 460 |
| 04 | 16 | 14 | 80 | 24 | 144 | 34 | 208 | 44 | 272 | 54 336 | 64 400 | 74 | 464 |
| 05 | 20 | 15 | 84 | 25 | 148 | 35 | 212 | 45 | 276 | 55 340 | 65 404 | 75 | 468 |
| 06 | 24 | 16 | 88 | 26 | 152 | 36 | 216 | 46 | 280 | 56 344 | 66 408 | 76 | 472 |
| 07 | 28 | 17 | 92 | 27 | 156 | 37 | 220 | 47 | 284 | 57 348 | 67 412 | 77 | 476 |
| 08 | 32 | 18 | 96 | 28 | 160 | 38 | 224 | 48 | 288 | 58 352 | 68 416 | 78 | 480 |
| 09 | 36 | 19 | 100 | 29 | 164 | 39 | 228 | 49 | 292 | 59 356 | 69 420 | 79 | 484 |
| 0a | 40 | 1a | 104 | 2a | 168 | 3a | 232 | 4a | 296 | 5a 360 | 6a 424 | 7a | 488 |
| 0b | 44 | 1b | 108 | 2b | 172 | 3b | 236 | 4b | 300 | 5b 364 | 6b 428 | 7b | 492 |
| Oc | 48 | 1c | 112 | 2c | 176 | 3c | 240 | 4c | 304 | 5c 368 | 6c 432 | 7c | 496 |
| 0d | 52 | 1d | 116 | 2d | 180 | 3d | 244 | 4d | 308 | 5d 372 | 6d 436 | 7d | 500 |
| 0e | 56 | 1e | 120 | 2e | 184 | 3e | 248 | 4e | 312 | 5e 376 | 6e 440 | 7e | 504 |
| 0f | 60 | 1f | 124 | 2f | 188 | 3f | 252 | 4f | 316 | 5f 380 | 6f 444 | 7f | 508 |

| Va | time | Va | time | va | time | Va | time | va | time | va time | va time | va | time |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 80 | 512 | 90 | 576 | a0 | 640 | b0 | 704 | c0 | 768 | d0 832 | e0 896 | f0 | 960 |
| 81 | 516 | 91 | 580 | a1 | 644 | b1 | 708 | c1 | 772 | d1 836 | e1 900 | f1 | 964 |
| 82 | 520 | 92 | 584 | a2 | 648 | b2 | 712 | c2 | 776 | d2 840 | e2 904 | f2 | 968 |
| 83 | 524 | 93 | 588 | a3 | 652 | b3 | 716 | c3 | 780 | d3 844 | e3 908 | f3 | 972 |
| 84 | 528 | 94 | 592 | a4 | 656 | b4 | 720 | c4 | 784 | d4 848 | e4 912 | f4 | 976 |
| 85 | 532 | 95 | 596 | a5 | 660 | b5 | 724 | c5 | 788 | d5 852 | e5 916 | f5 | 980 |
| 86 | 536 | 96 | 600 | a6 | 664 | b6 | 728 | c6 | 792 | d6 856 | e6 920 | f6 | 984 |
| 87 | 540 | 97 | 604 | a7 | 668 | b7 | 732 | c7 | 796 | d7 860 | e7 924 | f7 | 988 |
| 88 | 544 | 98 | 608 | a8 | 672 | b8 | 736 | c8 | 800 | d8 864 | e8 928 | f8 | 992 |
| 89 | 548 | 99 | 612 | a9 | 676 | b9 | 740 | c9 | 804 | d9 868 | e9 932 | f9 | 996 |
| 8a | 552 | 9a | 616 | aa | 680 | Ba | 744 | ca | 808 | da 872 | ea 936 | fa | 1000 |
| 8b | 556 | 9b | 620 | ab | 684 | Bb | 748 | cb | 812 | db 876 | eb 940 | fb | 1004 |
| 8c | 560 | 9c | 624 | ac | 688 | Bc | 752 | cc | 816 | dc 880 | ec 944 | fc | 1008 |
| 8d | 564 | 9d | 628 | ad | 692 | Bd | 756 | cd | 820 | dd 884 | ed 948 | fd | 1012 |
| 8e | 568 | 9e | 632 | ae | 696 | Be | 760 | ce | 824 | de 888 | ee 952 | fe | 1016 |
| 8f | 572 | 9f | 636 | af | 700 | Bf | 764 | cf | 828 | df 892 | ef 956 | ff | 1020 |
| | | | | | | | | | | | | | |

**User can use WDT function by following way:**

**1.Direct start WDT function as procedure which described on Sec. 5-1. FOR EXAMPLE:**

```
MOV AL, 44
OUT 70, AL
IN AL, 71
MOV DX, 0443
OUT DX, AL
RET
```

**The above simple software was written under DOS DEBUG. It shows you how to get the SETUP VALUE from CMOS location 44H.**

**If you want to read the data correctly, you must put the data 44 value on register AL first.**

**Then you must put the register value (44) on port 70H (this mean you need to addressing the port 70H)**

**Whenever you need, you can send the data to I/O port 0443H to trigger the WDT timer and for your application.**

## CHAPTER 10

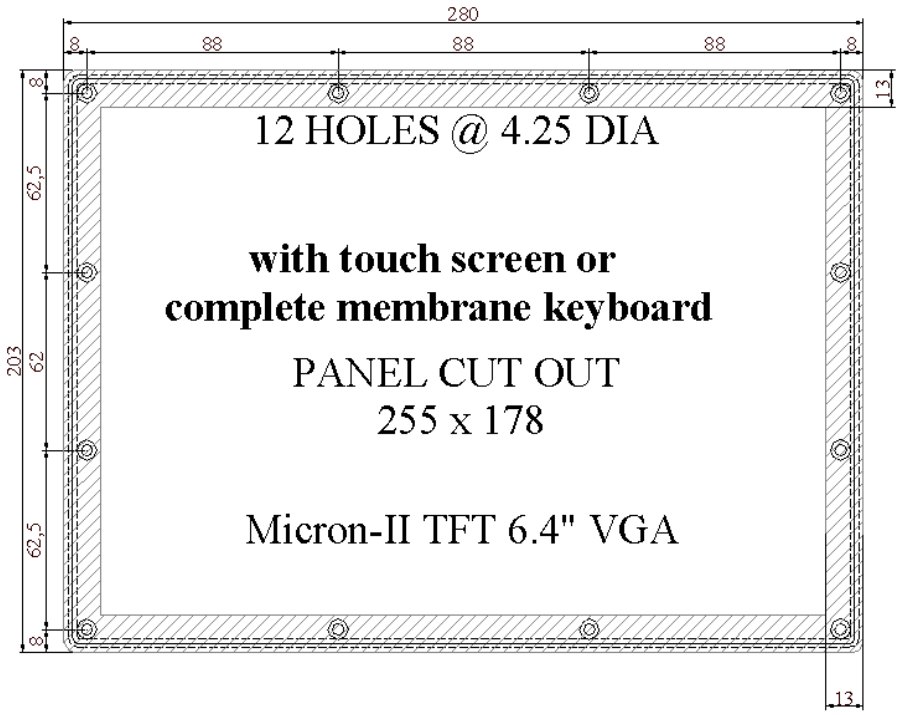
| PC/104 CONNECTORS (CN3,CN5) | | | | |
|---|---|---|---|---|
| *PIN No.* | *SIGNAL (CN3) Row A* | *Row B* | *SIGNAL (CN5) Row C* | *Row D* |
| ***0*** | ***-*** | ***-*** | ***0 V*** | ***0 V*** |
| ***1*** | ***IOCHCHK**** | ***0V*** | ***SBHE**** | ***MEMCS 16**** |
| ***2*** | ***SD7*** | ***RESETDRV*** | ***LA23*** | ***IOCS16**** |
| ***3*** | ***SD6*** | ***+5V*** | ***LA22*** | ***IRQ10*** |
| ***4*** | ***SD5*** | ***IRQ9*** | ***LA21*** | ***IRQ11*** |
| ***5*** | ***SD4*** | ***-5V*** | ***LA20*** | ***IRQ12*** |
| ***6*** | ***SD3*** | ***DRQ2*** | ***LA19*** | ***IRQ15*** |
| ***7*** | ***SD2*** | ***-12V*** | ***LA18*** | ***IRQ14*** |
| ***8*** | ***SD01*** | ***ENDXFR**** | ***LA17*** | ***DACK0**** |
| ***9*** | ***SD0*** | ***+12V*** | ***MEMR**** | ***DRQ0*** |
| ***10*** | ***IOCHRDY*** | ***NC*** | ***MEMW**** | ***DACK5**** |
| ***11*** | ***AEN*** | ***SMEMW**** | ***SD8*** | ***DRQ5*** |
| ***12*** | ***SA19*** | ***SMEMR**** | ***SD9*** | ***DACK6**** |
| ***13*** | ***SA18*** | ***IOW**** | ***SD10*** | ***DRQ6*** |
| ***14*** | ***SA17*** | ***IOR**** | ***SD11*** | ***DACK7**** |
| ***15*** | ***SA16*** | ***DACK3**** | ***SD12*** | ***DRQ7*** |
| ***16*** | ***SA15*** | ***DRQ3*** | ***SD13*** | ***+5V*** |
| ***17*** | ***SA14*** | ***DACK1**** | ***SD14*** | ***MASTER**** |
| ***18*** | ***SA13*** | ***DRQ1*** | ***SD15*** | ***0V*** |
| ***19*** | ***SA12*** | ***REFRESH**** | ***KEY*** | ***0V*** |
| ***20*** | ***SA11*** | ***SYSCLK*** | | |
| ***21*** | ***SA10*** | ***IRQ7*** | | |
| ***22*** | ***SA9*** | ***IRQ6*** | | |
| ***23*** | ***SA8*** | ***IRQ5*** | | |
| ***24*** | ***SA7*** | ***IRQ4*** | | |
| ***25*** | ***SA6*** | ***IRQ3*** | | |
| ***26*** | ***SA5*** | ***DACK2**** | | |
| ***27*** | ***SA4*** | ***TC*** | | |
| ***28*** | ***SA3*** | ***BALE*** | | |
| ***29*** | ***SA2*** | ***+5V*** | | |
| ***30*** | ***SA1*** | ***OSC*** | | |
| ***31*** | ***SA0*** | ***OV*** | | |
| ***32*** | ***OV*** | ***OV*** | | |

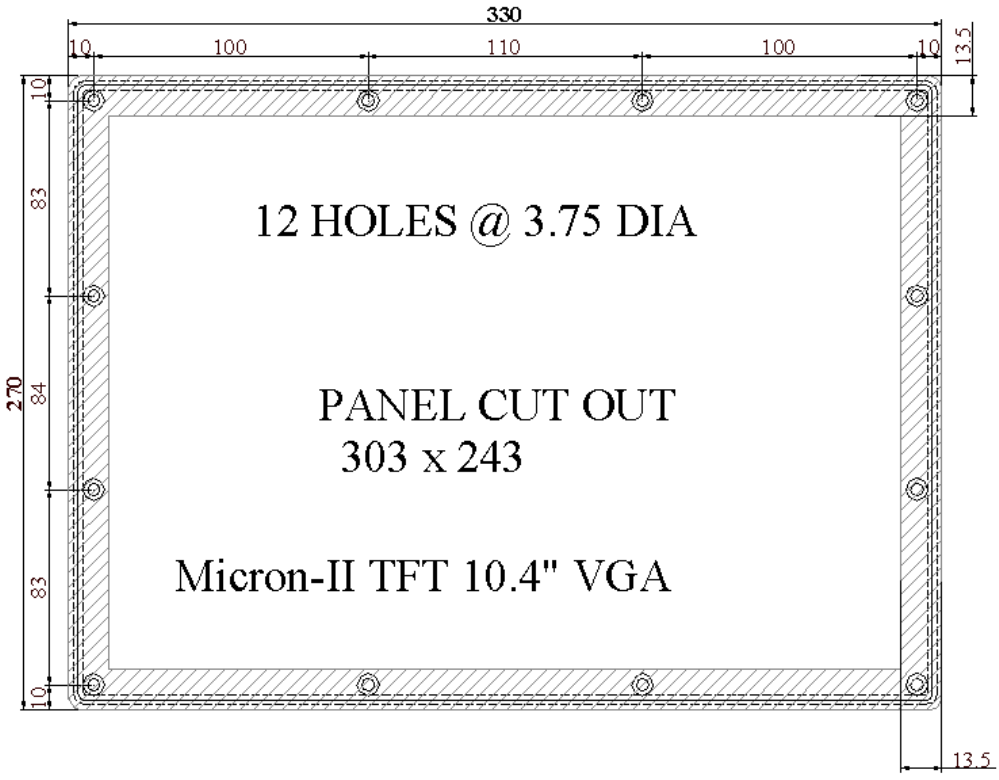
- **active low**

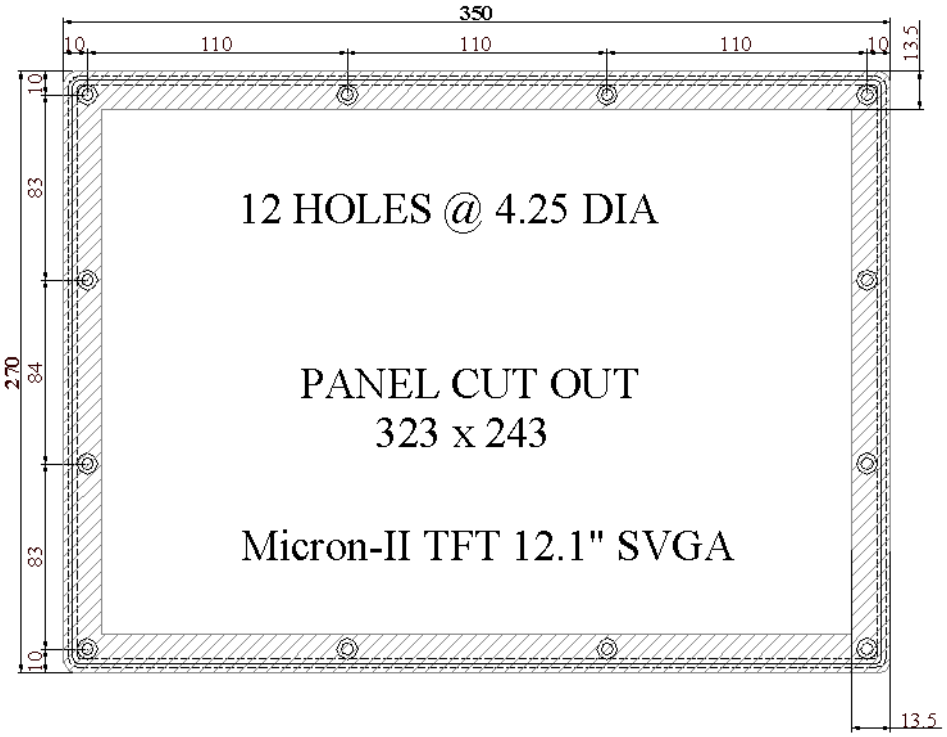
## CHAPTER 11

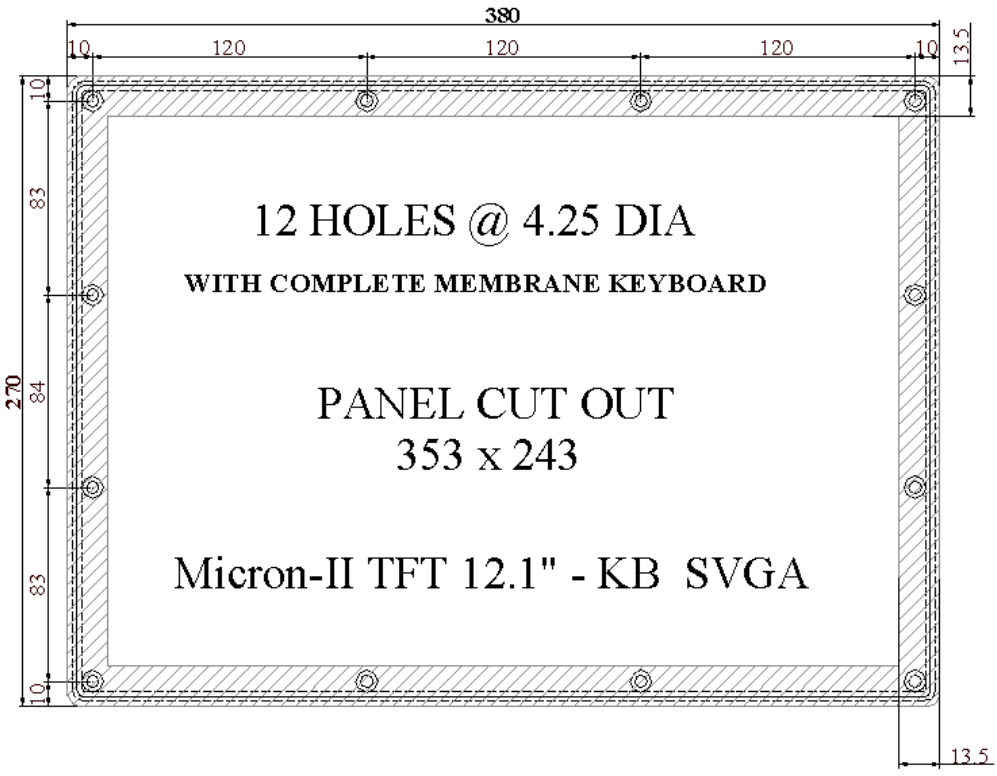
**Example : DISPLAY TFT 10,4" PINOUT**

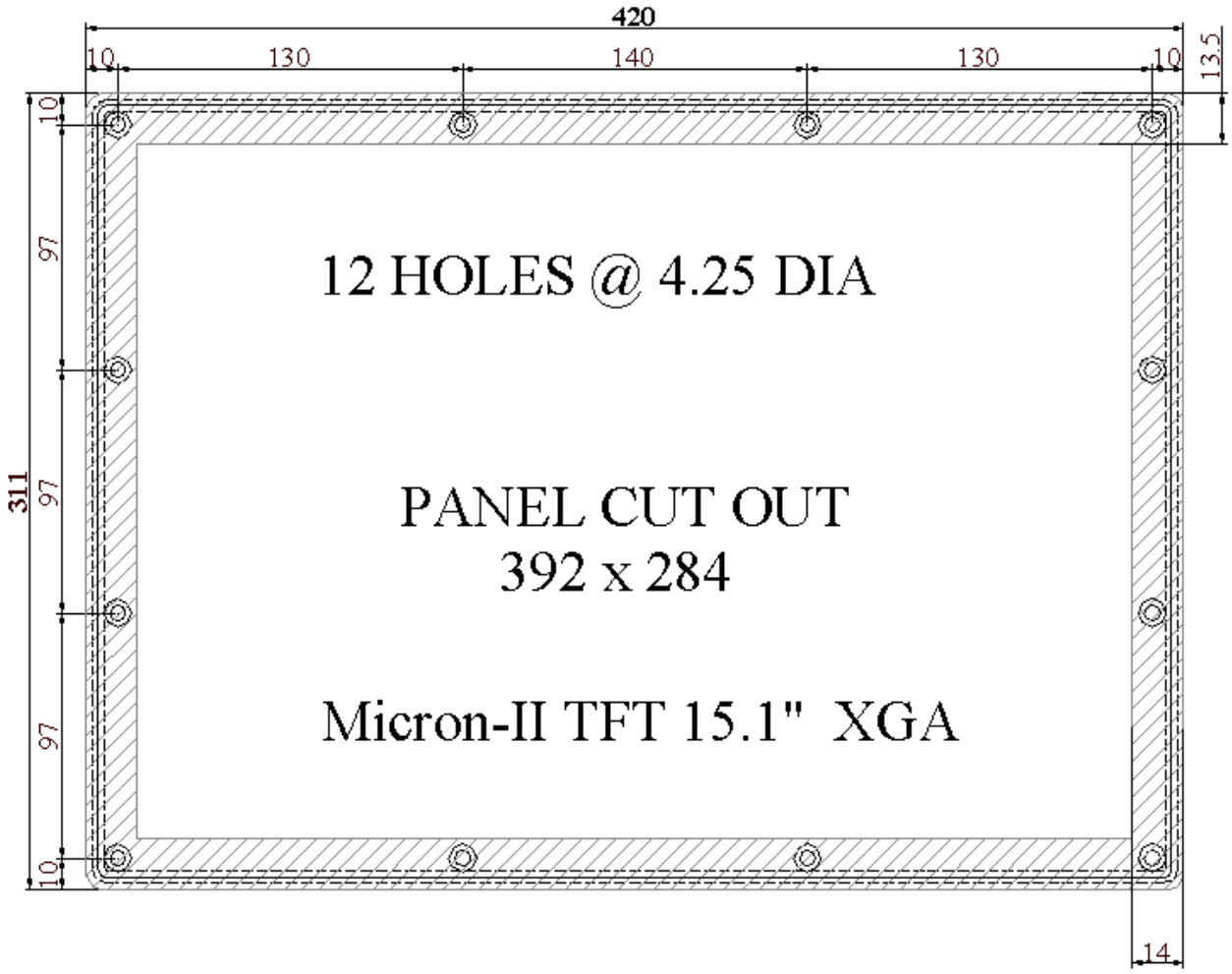
| ***LTM 10C209A and LTM10C042 DF-9-M-315-1V*** | | ***CPU BOARD INSIDE OF MICRON SYSTEM*** | |
|---|---|---|---|
| *PIN No.* | *FUNCTION* | *PIN No.* | *FUNCION* |
| ***1*** | ***GND*** | *3* | ***GND*** |
| ***2*** | ***CLK*** | ***35*** | ***SHFCLK*** |
| ***3*** | ***GND*** | ***4*** | ***GND*** |
| ***4*** | ***R0*** | ***27*** | ***PD18*** |
| ***5*** | ***R1*** | ***28*** | ***PD19*** |
| ***6*** | ***R2*** | ***29*** | ***PD20*** |
| ***7*** | ***GND*** | ***8*** | ***GND*** |
| ***8*** | ***R3*** | ***30*** | ***PD21*** |
| ***9*** | ***R4*** | ***31*** | ***PD22*** |
| ***10*** | ***R5*** | ***32*** | ***PD23*** |
| ***11*** | ***GND*** | | |
| ***12*** | ***G0*** | ***19*** | ***PD10*** |
| ***13*** | ***G1*** | ***20*** | ***PD11*** |
| ***14*** | ***G2*** | ***21*** | ***PD12*** |
| ***15*** | ***GND*** | | |
| ***16*** | ***G3*** | ***22*** | ***PD13*** |
| ***17*** | ***G4*** | ***23*** | ***PD14*** |
| ***18*** | ***G5*** | ***24*** | ***PD15*** |
| ***19*** | ***GND*** | ***34*** | |
| ***20*** | ***ENAB*** | ***37*** | ***M (DE)*** |
| ***21*** | ***GND*** | | |
| ***22*** | ***B0*** | ***11*** | ***PD2*** |
| ***23*** | ***B1*** | ***12*** | ***PD3*** |
| ***24*** | ***B2*** | ***13*** | ***PD4*** |
| ***25*** | ***GND*** | ***39*** | ***GND*** |
| ***26*** | ***B3*** | ***14*** | ***PD5*** |
| ***27*** | ***B4*** | ***15*** | ***PD5*** |
| ***28*** | ***B5*** | ***16*** | ***PD7*** |
| ***29*** | ***GND*** | ***39*** | ***GND*** |
| ***30*** | *+5* | ***5*** | ***+5VDC*** |
| ***31*** | ***+5*** | ***6*** | ***+5VDC*** |
| | | ***1*** | ***+12VDC*** |
| | | ***2*** | ***+12VDC*** |

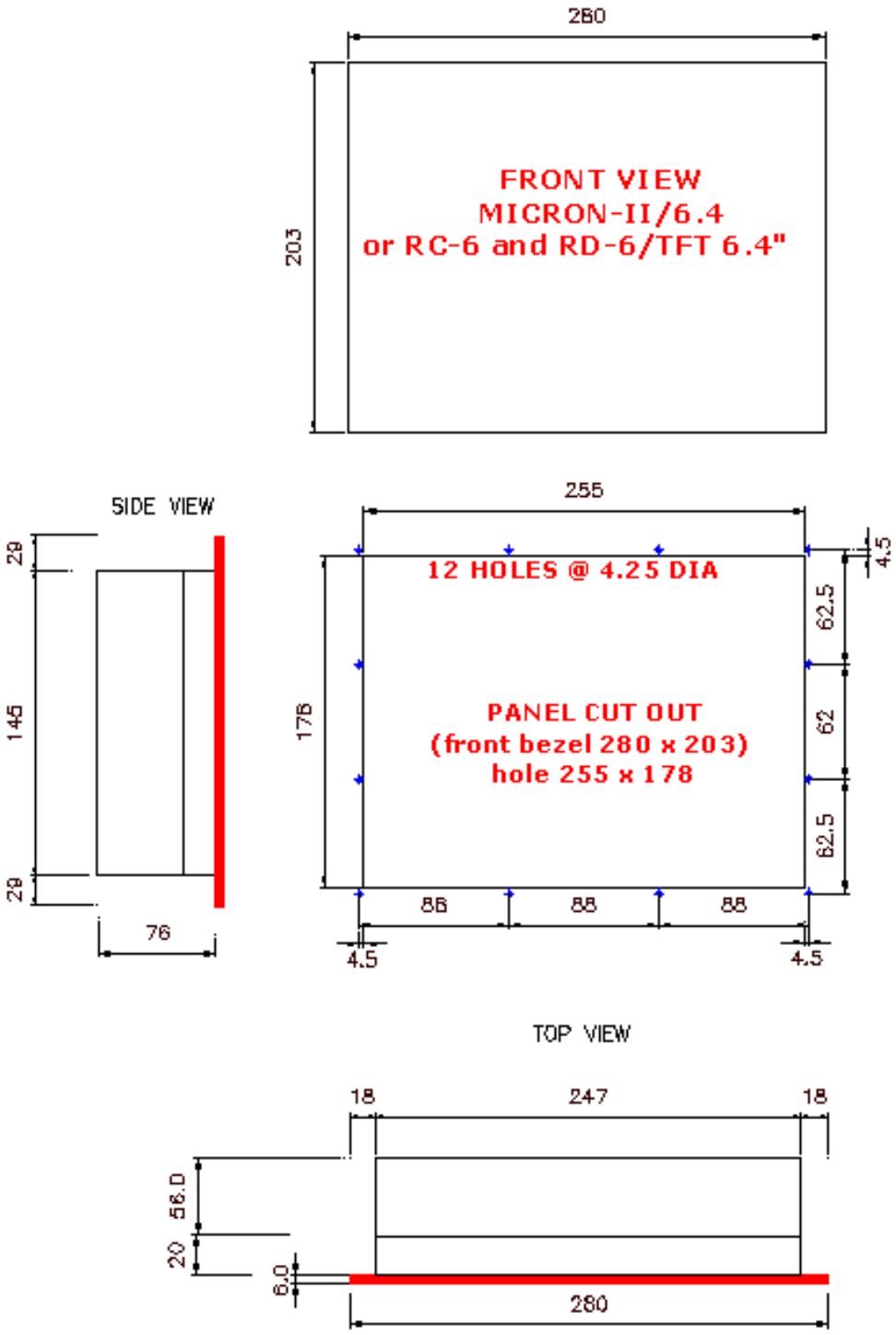

280
8
88
88
88
8
8
13
62,5
62
62,5
203
8
12 HOLES @ 4.25 DIA
with touch screen or
complete membrane keyboard
PANEL CUT OUT
255 x 178
Micron-II TFT 6.4" VGA
13

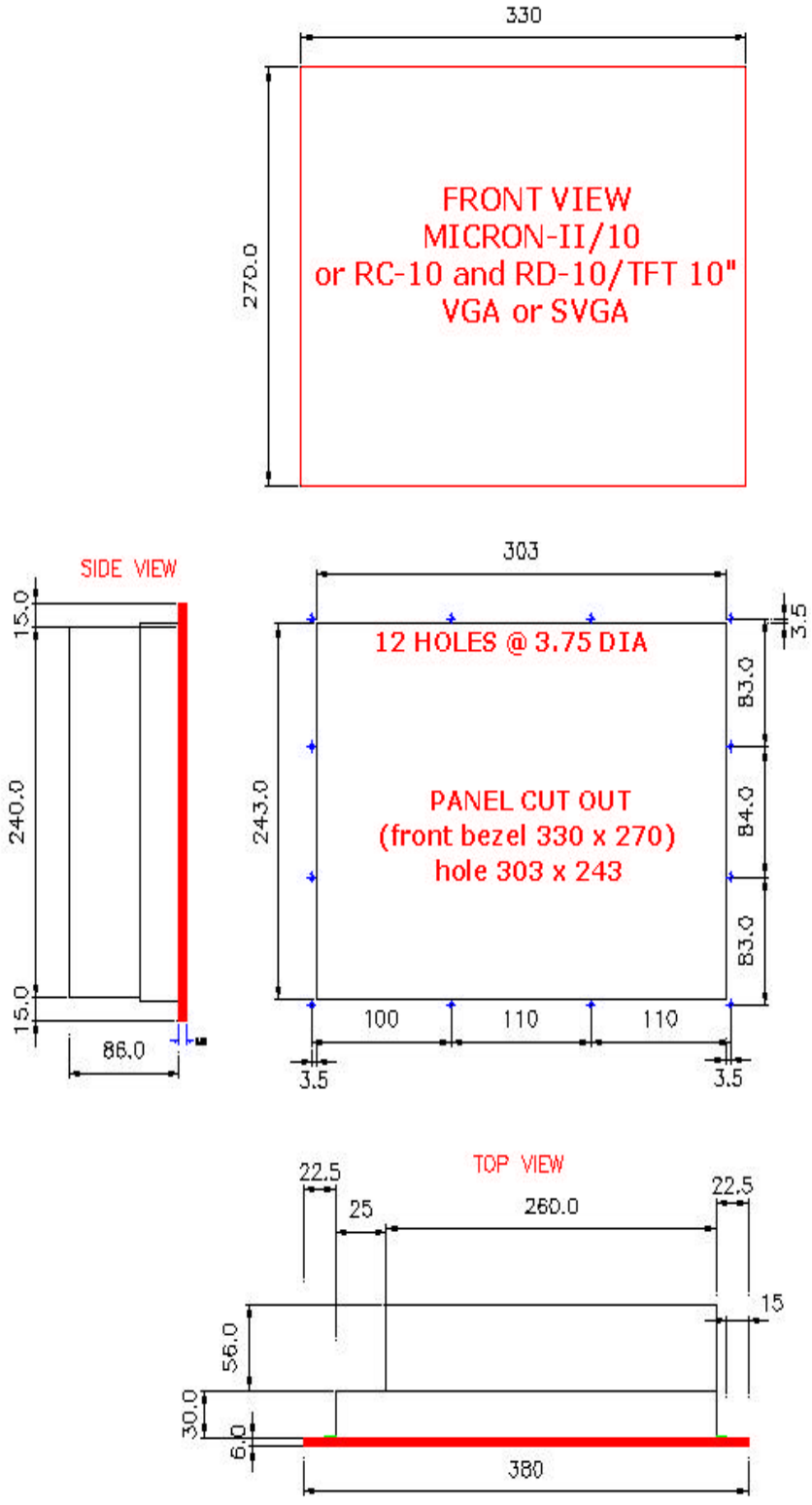

330
10
100
110
100
10
13.5
10
83
84
83
10
270
12 HOLES @ 3.75 DIA
PANEL CUT OUT
303 x 243
Micron-II TFT 10.4" VGA
13.5


350
10
110
110
110
10
13.5
10
83
84
83
10
270
12 HOLES @ 4.25 DIA
PANEL CUT OUT
323 x 243
Micron-II TFT 12.1" SVGA
13.5


380
10
120
120
120
10
13.5
10
83
84
83
10
270
12 HOLES @ 4.25 DIA
WITH COMPLETE MEMBRANE KEYBOARD
PANEL CUT OUT
353 x 243
Micron-II TFT 12.1" - KB SVGA
13.5


420
10
130
140
130
10
13.5
10
97
97
97
10
311
12 HOLES @ 4.25 DIA
PANEL CUT OUT
392 x 284
Micron-II TFT 15.1" XGA
14


280
203
FRONT VIEW
MICRON-II/6.4
or RC-6 and RD-6/TFT 6.4"
SIDE VIEW
29
145
29
76
255
12 HOLES @ 4.25 DIA
4.5
62.5
62
62.5
176
PANEL CUT OUT
(front bezel 280 x 203)
hole 255 x 178
86
88
88
4.5
4.5
TOP VIEW
18
247
18
56.0
20
6.0
280


330
270.0
FRONT VIEW
MICRON-II/10
or RC-10 and RD-10/TFT 10"
VGA or SVGA
SIDE VIEW
15.0
240.0
15.0
86.0
303
12 HOLES @ 3.75 DIA
3.5
83.0
84.0
83.0
243.0
PANEL CUT OUT
(front bezel 330 x 270)
hole 303 x 243
100
110
110
3.5
3.5
TOP VIEW
22.5
25
260.0
22.5
15
56.0
30.0
6.0
380

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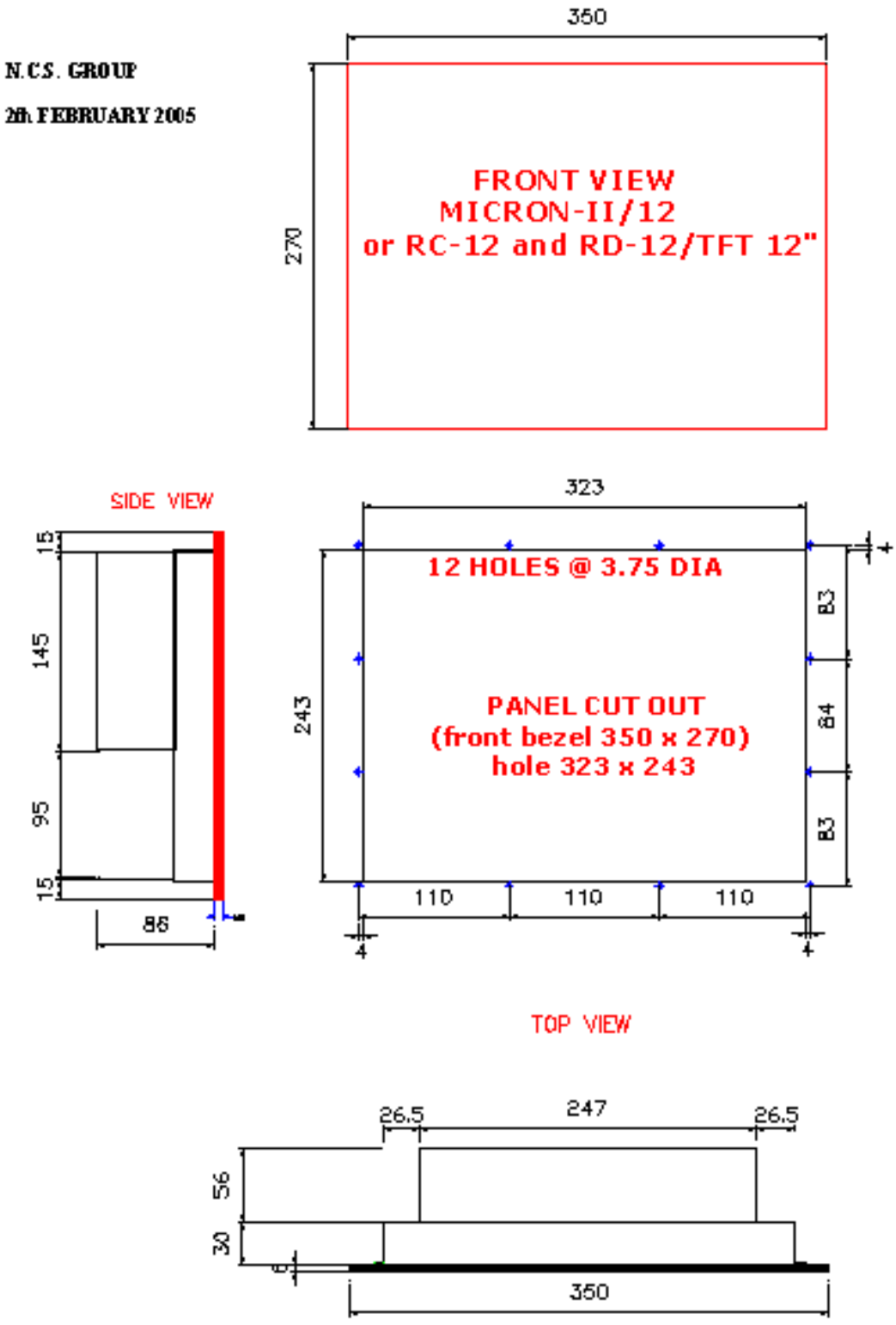
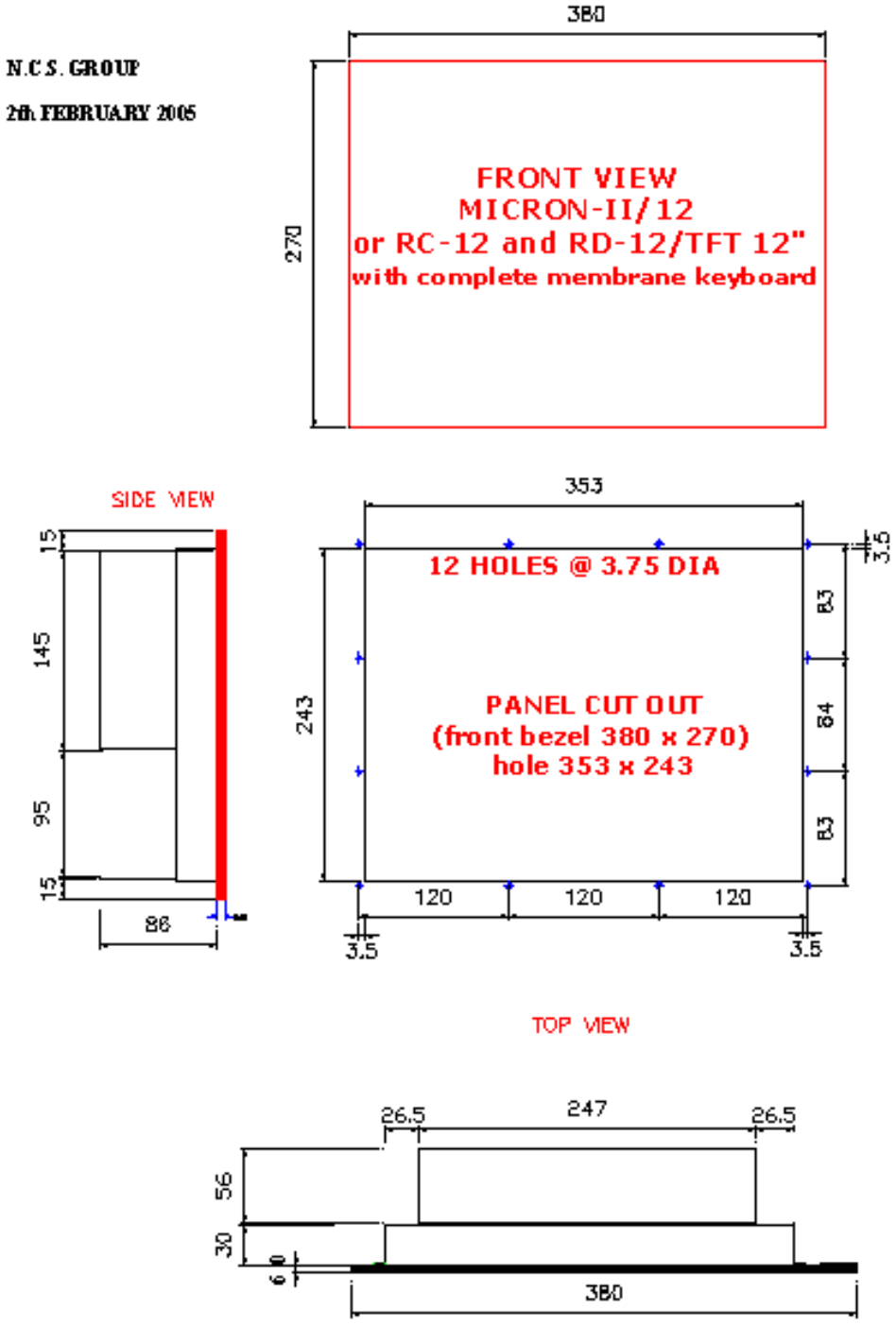
**26th FEBRUARY 2005**

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26th FEBRUARY 2005
380
270
FRONT VIEW
MICRON-II/12
or RC-12 and RD-12/TFT 12"
with complete membrane keyboard
SIDE VIEW
15
145
95
15
86
353
12 HOLES @ 3.75 DIA
3.5
83
84
83
243
PANEL CUT OUT
(front bezel 380 x 270)
hole 353 x 243
120
120
120
3.5
3.5
TOP VIEW
26.5
247
26.5
56
30
6
380

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Micron-II/15