# User Manual

Version 3.0 March 2017

# Breeze All-in-one

TOUCH DYNAMIC

Manual Version 3.0



# TRADEMARK

# Safety

## IMPORTANT SAFETY INSTRUCTIONS

1. To disconnect the machine from the electrical Power Supply, turn off the power switch and remove the power cord plug from the wall socket. The wall socket must be easily accessible and in close proximity to the machine.
2. Read these instructions carefully. Save these instructions for future reference.
3. Follow all warnings and instructions marked on the product.
4. Do not use this product near water.
5. Do not place this product on an unstable cart, stand, or table. The product may fall, causing serious damage to the product.
6. Slots and openings in the cabinet and the back or bottom are provided for ventilation; to ensure reliable operation of the product and to protect it from overheating. These openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug, or other similar surface. This product should never be placed near or over a radiator or heat register, or in a built-in installation unless proper ventilation is provided.
7. This product should be operated from the type of power indicated on the marking label. If you are not sure of the type of power available, consult your dealer or local power company.
8. Do not allow anything to rest on the power cord. Do not locate this product where persons will walk on the cord.
9. Never push objects of any kind into this product through cabinet slots as they may touch dangerous voltage points or short out parts that could result in a fire or electric shock. Never spill liquid of any kind on the product.

## CE MARK

CE

This device complies with the requirements of the EEC directive 2004/108/EC with regard to “Electromagnetic compatibility” and 2006/95/EC “Low Voltage Directive”.

## FCC

FC

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference.

(2) This device must accept any interference received, including interference that may cause undesired operation

## CAUTION ON LITHIUM BATTERIES

There is a danger of explosion if the battery is replaced incorrectly. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

### ⚠ Battery Caution

Risk of explosion if battery is replaced by an incorrectly type.
Dispose of used battery according to the local disposal instructions.

### ⚠ Safety Caution

Note: To comply with IEC60950-1 Clause 2.5 (limited power sources, L.P.S) related legislation, peripherals shall be 4.7.3.2 "Materials for fire enclosure" compliant.

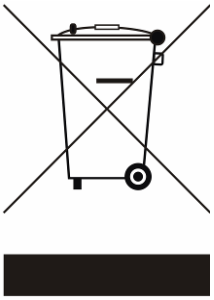
**4.7.3.2 Materials for fire enclosures**

For MOVABLE EQUIPMENT having a total mass not exceeding 18kg.the material of a FIRE ENCLOSURE, in the thinnest significant wall thickness used, shall be of V-1 CLASS MATERIAL or shall pass the test of Clause A.2.

For MOVABLE EQUIPMENT having a total mass exceeding 18kg and for all STATIONARY EQUIPMENT, the material of a FIRE ENCLOSURE, in the thinnest significant wall thickness used, shall be of 5VB CLASS MATERIAL or shall pass the test of Clause A.1

## LEGISLATION AND WEEE SYMBOL

2012/19/EU Waste Electrical and Electronic Equipment Directive on the treatment, collection, recycling and disposal of electric and electronic devices and their components.



The crossed dustbin symbol on the device means that it should not be disposed of with other household wastes at the end of its working life. Instead, the device should be taken to the waste collection centers for activation of the treatment, collection, recycling and disposal procedure.
To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate this from other types of wastes and recycle it responsibly to promote the sustainable reuse of material resources.

Household users should contact either the retailer where they purchased this product, or their local government office, for details of where and how they can take this item for environmentally safe recycling.

Business users should contact their supplier and check the terms and conditions of the purchase contract.

This product should not be mixed with other commercial wastes for disposal.

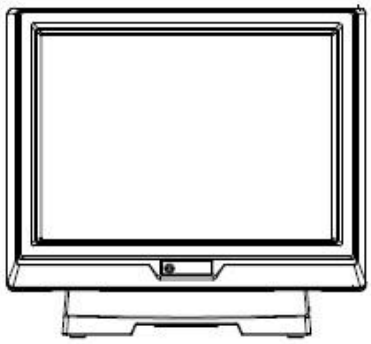
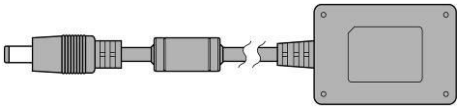
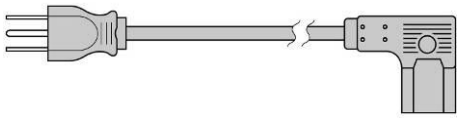
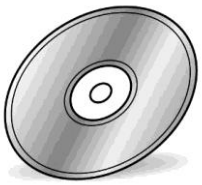
# Revision History

| Version | Date | Description |
|---|---|---|
| 1.0 | July 2008 | • Initial release |
| 1.1 | February 2009 | • B78 M/B Upgraded from v2.1 to v2.2<br>• B98 V1.0 M/B information added<br>• Second display installation added<br>• 2nd FAN of B98 MB added<br>• Drivers list and installation upgraded<br>• Jumper setting upgraded<br>• VGA version upgraded<br>• Specification upgraded<br>• 2-in-1 MSR + iButton / Fingerprint module installation added |
| 1.2 | November 2009 | • 17" TFT LCD added<br>• Drivers installation removed<br>• BIOS setup removed<br>• B68 motherboard version added |
| 1.3 | June 2010 | • C48 motherboard version added<br>• New system stand phased in<br>• B68, B78 Jumper updated |
| 1.4 | January 2011 | • C48 motherboard updated to v2.1<br>• B78 motherboard updated to v2.4<br>• B98 motherboard updated to v1.1<br>• 8.4" 2nd display phased in<br>• SSD module added<br>• OSD functions for 2nd display added |
| 2.0 | January 2013 | • C58 motherboard added |
| 2.1 | December 2013 | • C78 motherboard added |
| 3.0 | March 2017 | • Skylake motherboard added |

# Table of Contents

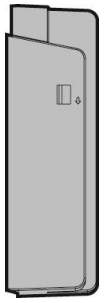
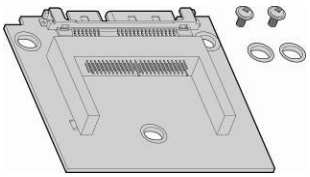
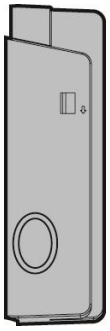
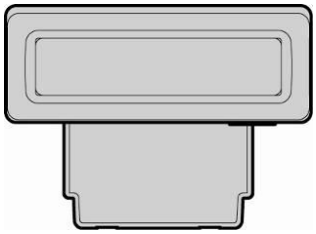
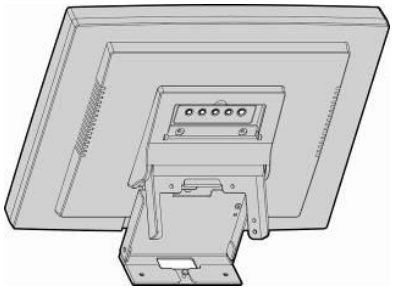
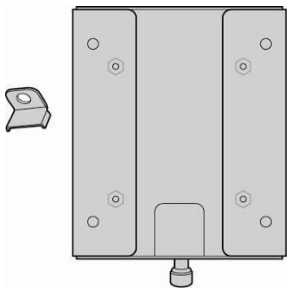
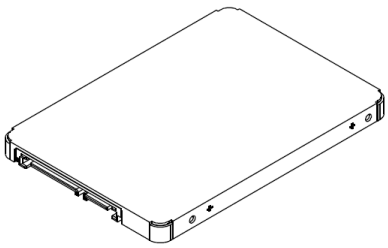
# 1 Item Checklist

## 1-1 Standard Item

| | |
|---|---|
|  |  |
| a. System | b. Power adapter |
|  |  |
| c. Power cord | d. RJ45-DB9 cable (x2) |
|  | |
| e. Driver CD | |

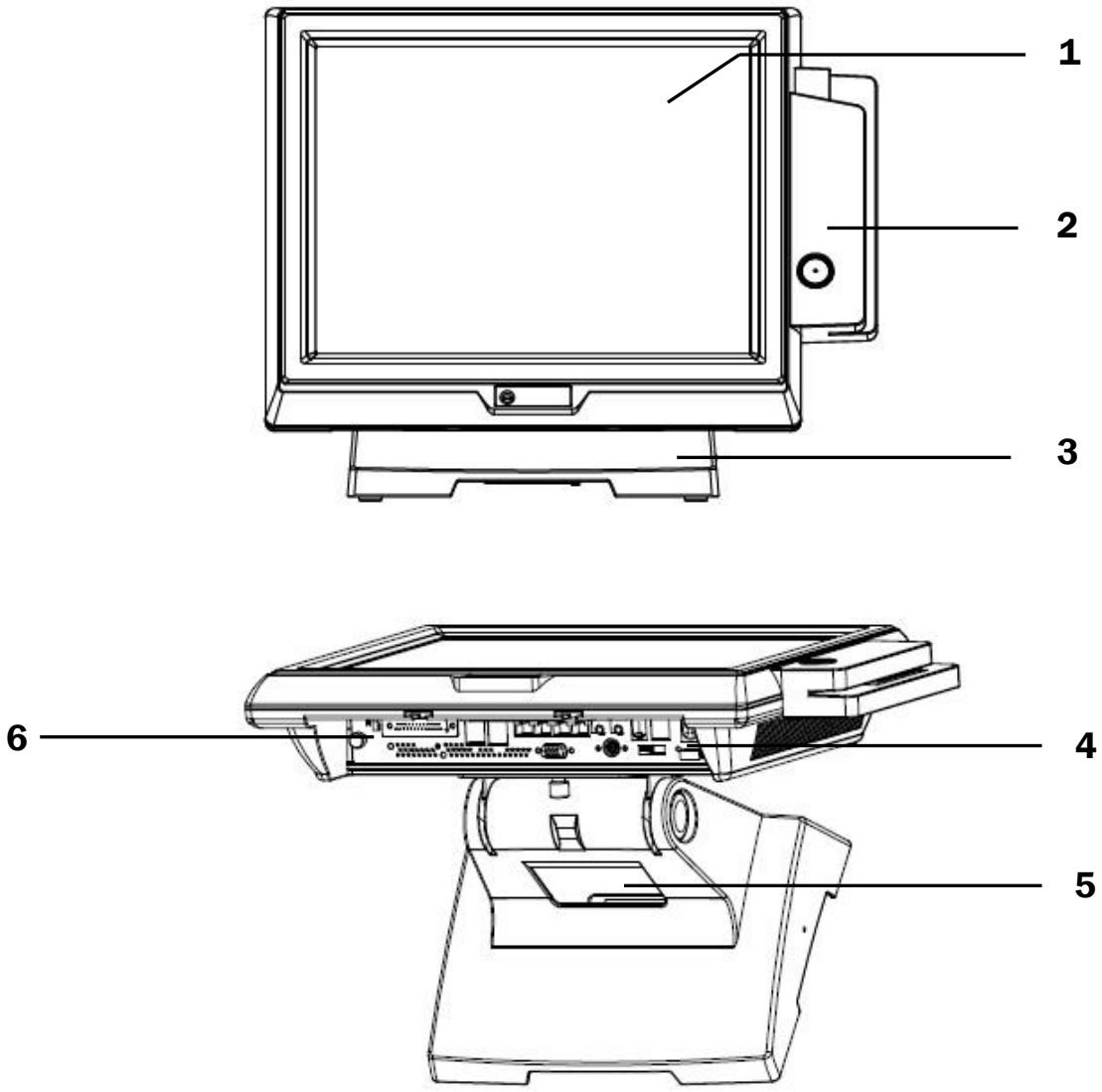
# 1-2 Optional Item

The touch terminal device provides various peripheral options for your selection. Please refer to your local sales representative or distributor for further information.

| | |
|---|---|
|  |  |
| a. MSR module (PS2 or USB) | b. CF Card adapter |
|  |  |
| c. MSR (PS/2 or USB) + Fingerprint module (USB) | d. VFD customer display (with RJ45 cable, Serial Interface) |
|  |  |
| e. Second display with the optional touch | f. Wall mount kit |
|  | |
| g. 2.5” SSD module | |

# 2 System View

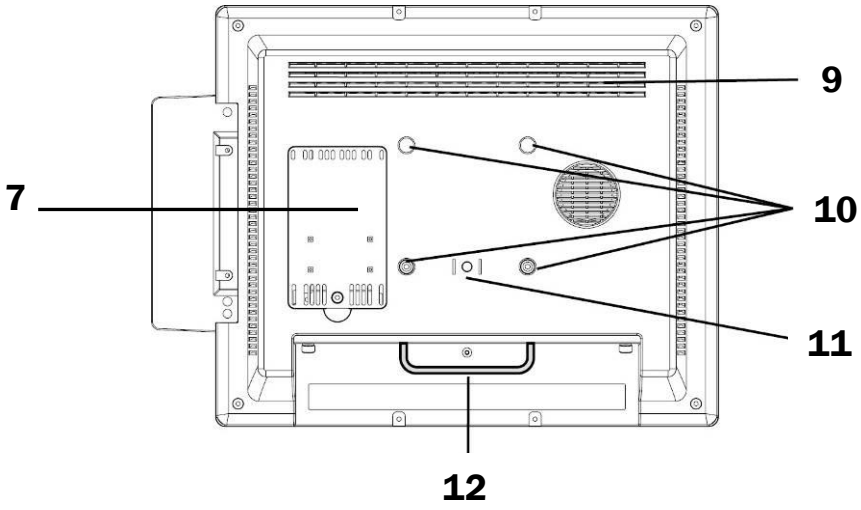
## 2-1 Front View




| No. | Description |
|---|---|
| 1 | Touch Glass |
| 2 | MSR (optional) |
| 3 | Stand (with power supply ) |
| 4 | Ventilation Holes |
| 5 | Stand cable management opening |
| 6 | I/O ports |

## 2-2 Rear View with stand


## 2-3 Rear View without stand

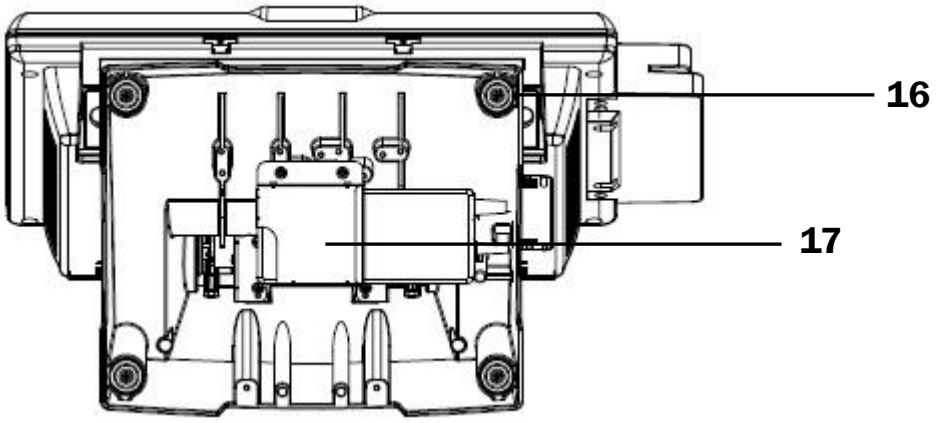



| No. | Description |
|---|---|
| 6 | 2nd Display (optional, 8” shown) |
| 7 | HDD Door |
| 8 | MSR dummy cover |
| 9 | Ventilation Holes |
| 10 | VESA holes (100x100mm) |
| 11 | Thumbscrew hole for stand |
| 12 | Motherboard handle |

## 2-4 Side View


| No. | Description |
|---|---|
| 14 | Vent holes, speaker location |
| 15 | Stand hinge cover |

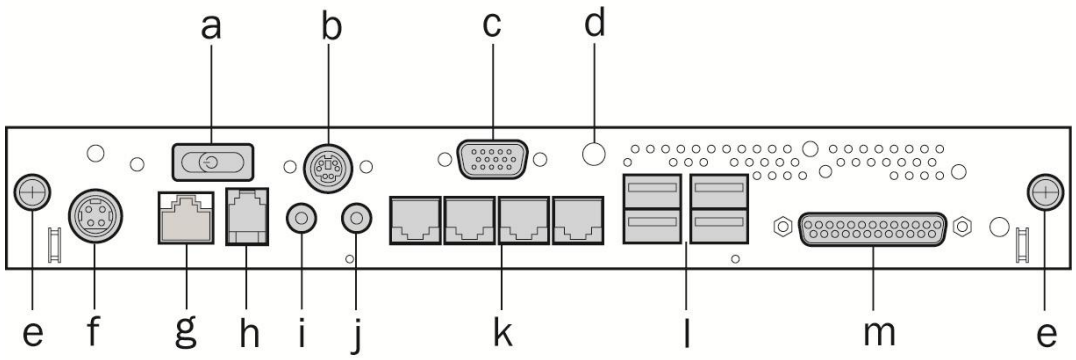
## 2-5 Bottom View




| No. | Description |
|---|---|
| 16 | Rubber foot (x4) |
| 17 | Holder bracket for power supply |

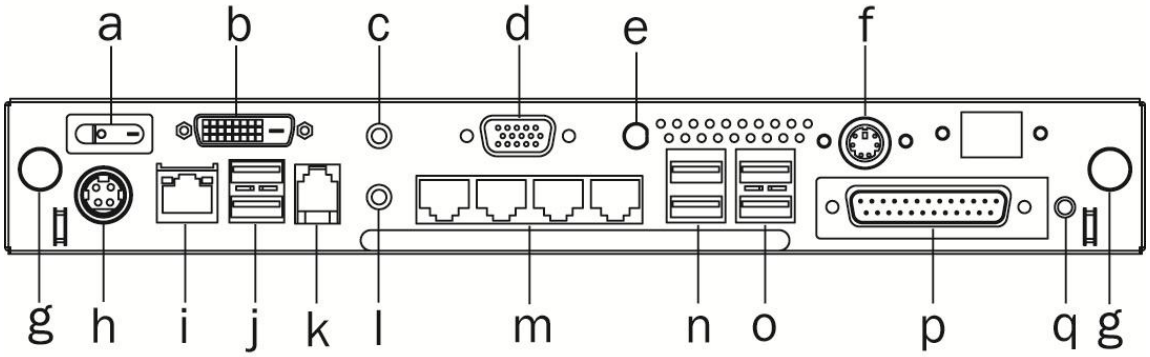
# 2-6 I/O View

### B78/B68/B98/C48/C58 Motherboard



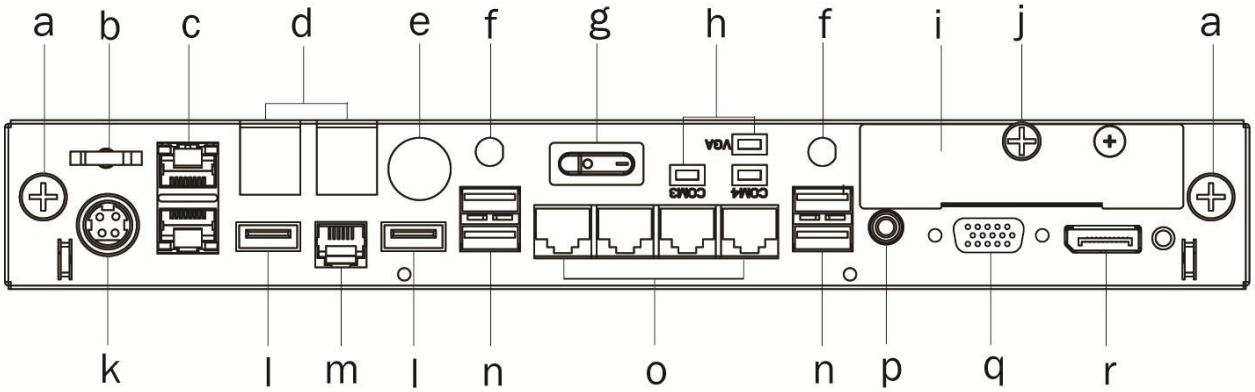

| No. | Description |
|---|---|
| a | Power switch (rocker type) |
| b | PS/2 |
| c | 2nd VGA (female for standard, male for powered) |
| d | Antenna hole (blind hole) |
| e | Thumbscrews for fixing the motherboard |
| f | DC-IN (19V) |
| g | LAN |
| h | Cash drawer |
| i | MIC-in |
| J | Line-out |
| k | COM 1, 2, 3, 4 (from left to right) |
| l | USB 2.0 (x4) |
| m | Parallel |

## C78 Motherboard




| No. | Description |
|---|---|
| a | Power switch (rocker type) |
| b | DVI-D |
| c | MIC-in |
| d | 2nd VGA (female for standard, male for powered) |
| e | Antenna hole (blind hole) |
| f | PS/2 |
| g | Thumbscrews for fixing the motherboard |
| h | DC-IN (19V) |
| i | LAN |
| J | USB 2.0 (x2) |
| k | Cash drawer |
| l | Line-out |
| m | COM 1, 2, 3, 4 (from left to right) |
| n | USB 3.0 (x2) |
| o | USB 2.0 (x2) |
| p | Parallel |
| q | Power button |

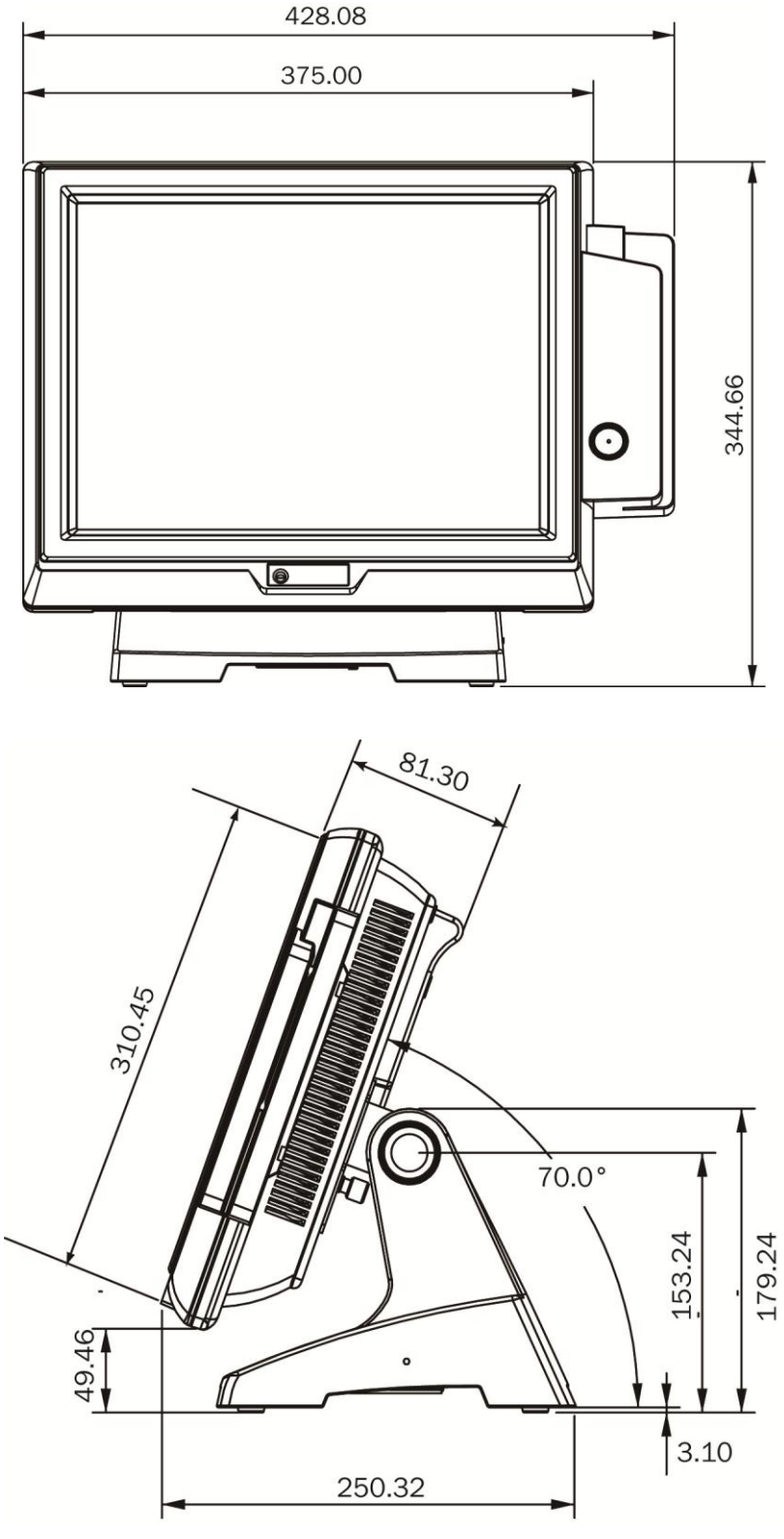
**Skylake Motherboard**



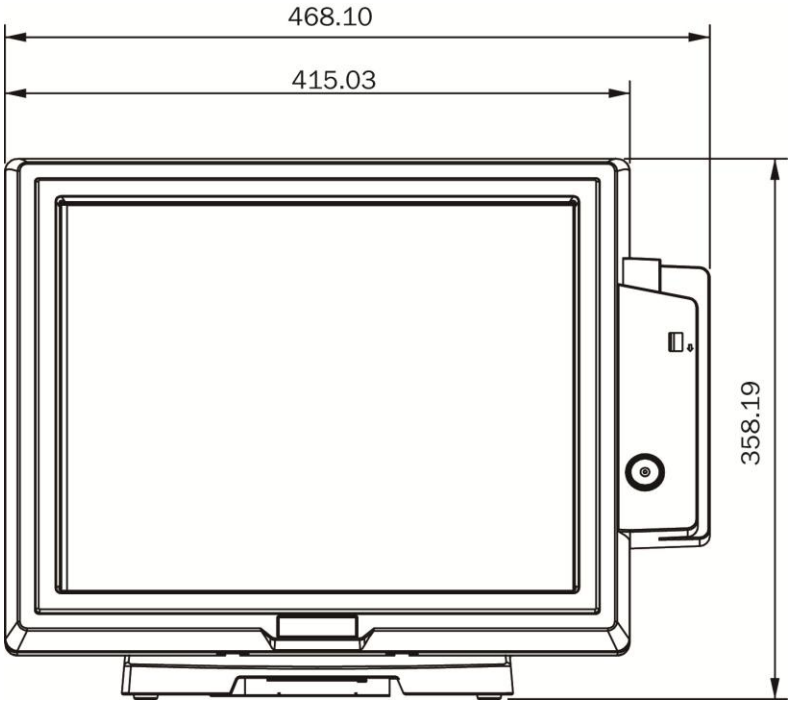

| No. | Description |
|---|---|
| a | Thumbscrews for fixing the motherboard |
| b | Cable clip |
| c | LAN x 2 |
| d | Power USB x2 (24V & 12V) (blind hole) |
| e | DC 24V out (blind hole) |
| f | Antenna hole (blind hole) |
| g | Power switch (rocker type) |
| h | Indicator LED |
| i | HDD slot |
| J | Thumbscrews for fixing the HDD door |
| k | DC-IN (19V) |
| l | USB 2.0 (x2) |
| m | Cash drawer |
| n | USB 3.0 (x4) |
| o | COM 1, 2, 3, 4 (from right to left) |
| p | Line-out |
| q | VGA |
| r | Display port |

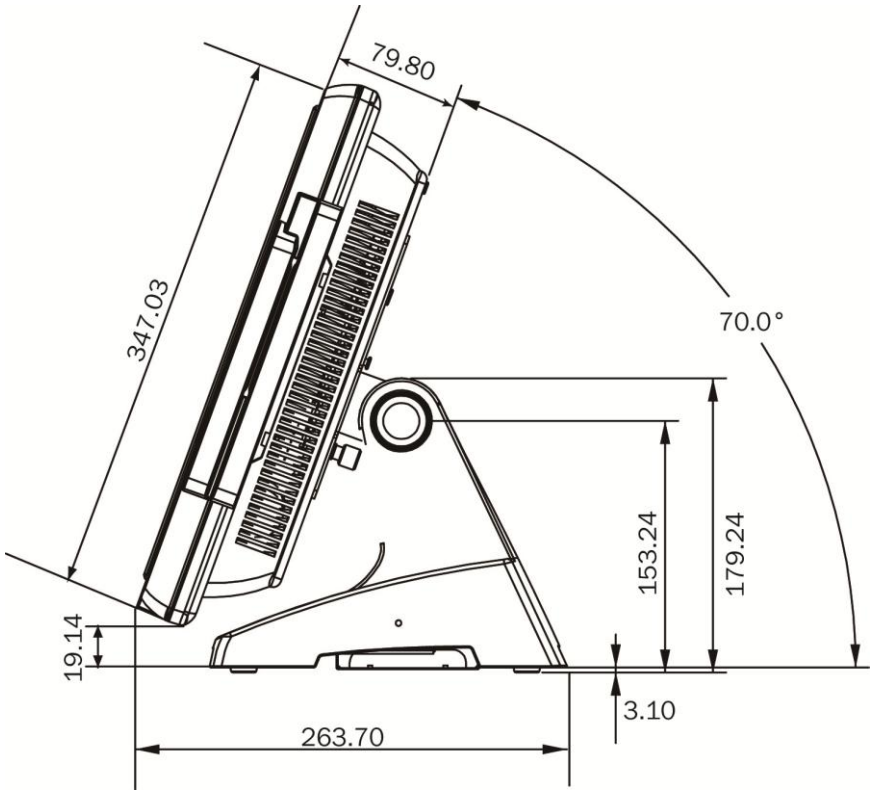
# 3 System Dimensions

## 3-1 15” System Dimensions



## 3-2 17” System Dimensions



# 4 Peripheral Installation

## 4-1 VFD (Customer Display) Installation

The VFD requires 12V power and must be connected to a powered COM port (COM3 or COM4). Please refer to Chapter7 for correct jumper setting.

### ■ VFD Module View

### ■ VFD Installation Procedure

1. Slide the VFD module to the VESA bracket on the stand and tighten it with thumb screw.
2. Connect the VFD cable to the COM port on the system.

# 4-2 Second Display Installation

## 4-2-1 8.4" Second Display Installation

- **Accessories:**

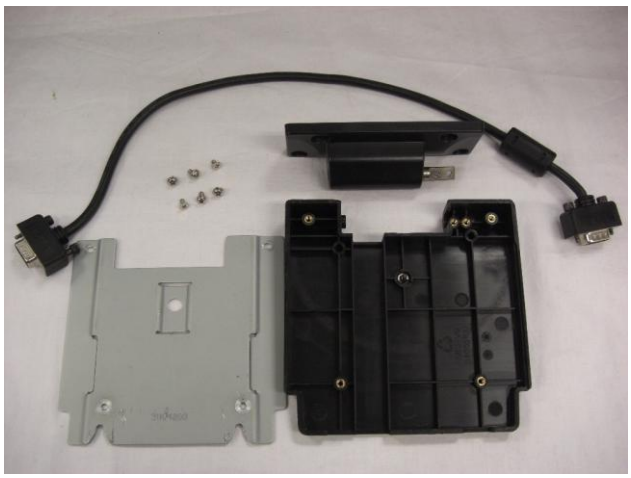
System Stand

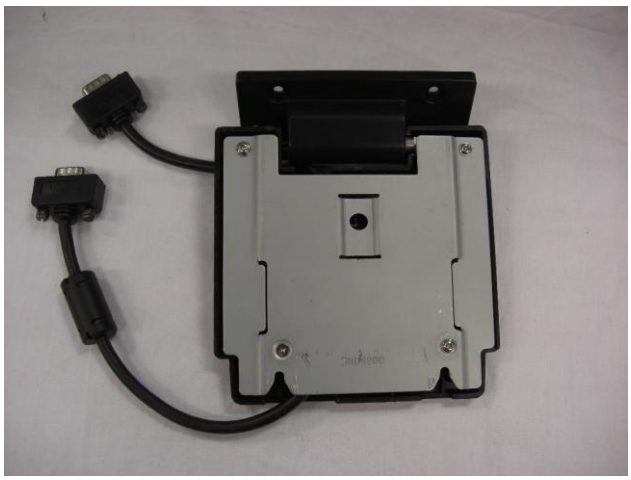
8.4” 2nd Display

VGA Cable x 1

Screw x 6

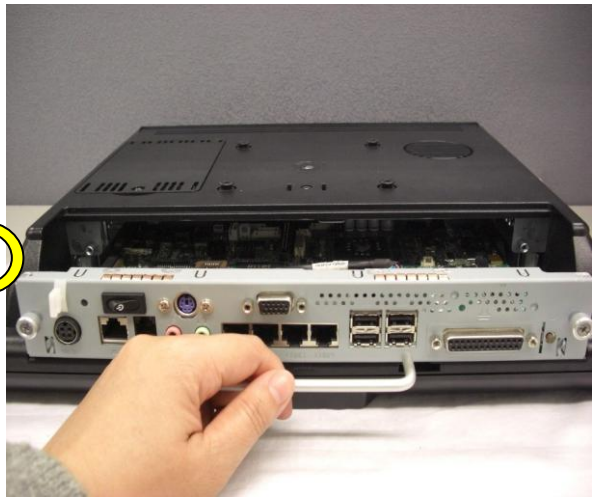
2nd Display Bracket



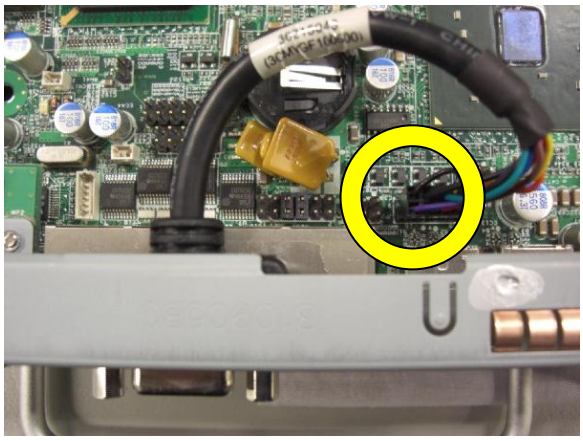


■ **Installation Procedure:**

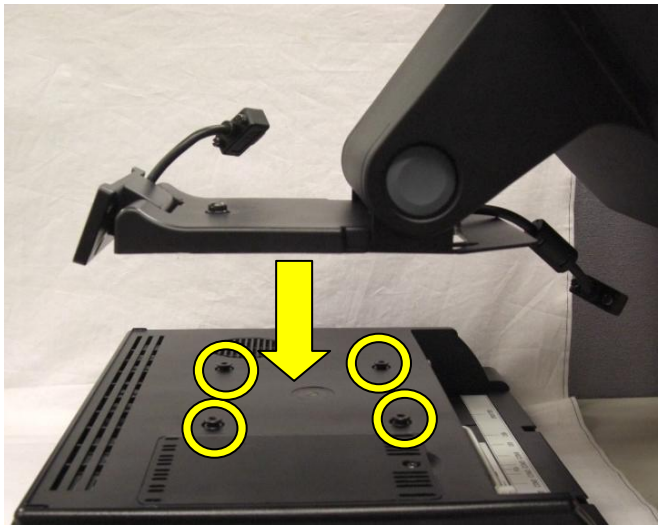
1. Attach the 2nd display bracket to the stand system and fasten the thumb screw (x1).

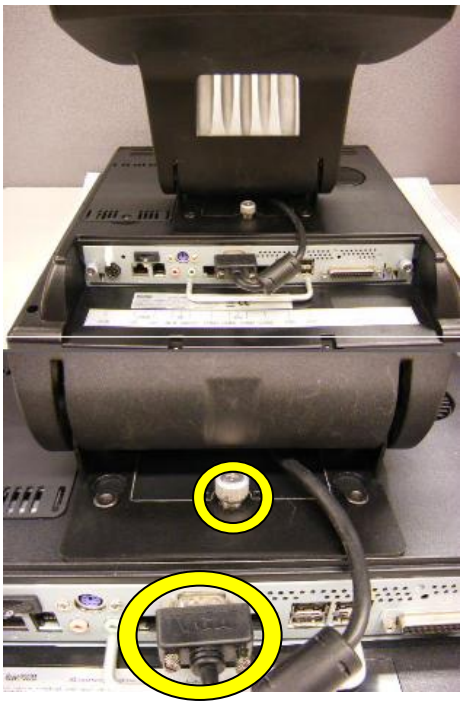


2. Loosen the thumb screw (x2) and the screw (x2) of the female VGA cable.
3. Pull the I/O panel towards you by the handle



4. Replace the VGA cable to male type.
5. Connect the other end of the VGA cable to the connector on the motherboard.
   The locations of the VGA power connector and the jumper are as following:
   B78: JP1 and JP2
   B98: JP9 and JP13
   B68: JP4
   C48: JP18
   Please see chapter 7 for different motherboards.





6. Attach the stand with 2nd display bracket to the LCD touch panel. Fix the stand with 2nd display bracket on the VESA holes (x4) until it snaps in place.
7. Fasten the thumb screw (x1) and connect the VGA cable to the LCD touch panel.

8. Attached the 2nd display and connect the other end of cable to the system port.

## 4-2-2 10.4" / 12.1" Second Display Installation

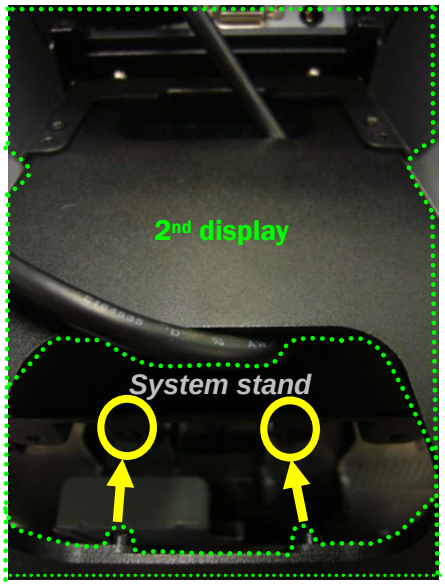
- **Accessories:**

2nd display

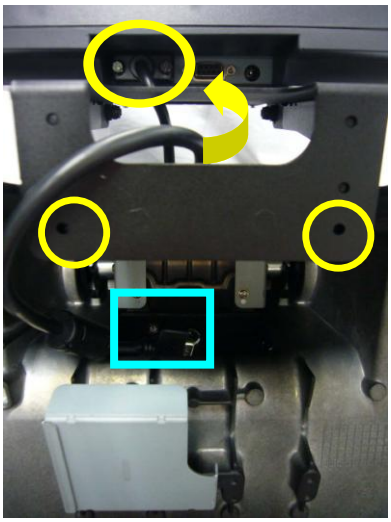
VGA Cable x 1

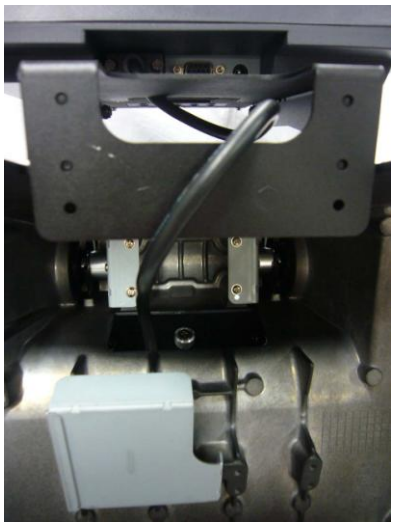
Screw x 2

## ■ Installation Procedure:

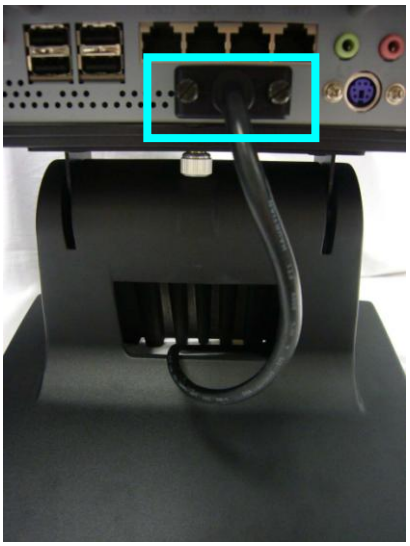



1. Thread two ends of the cable respectively through the upper and the lower gap on the 2nd display on the bracket.
2. Align the boss on 2nd display to the holes on the bottom of the system stand. Attach 2nd display to the stand.





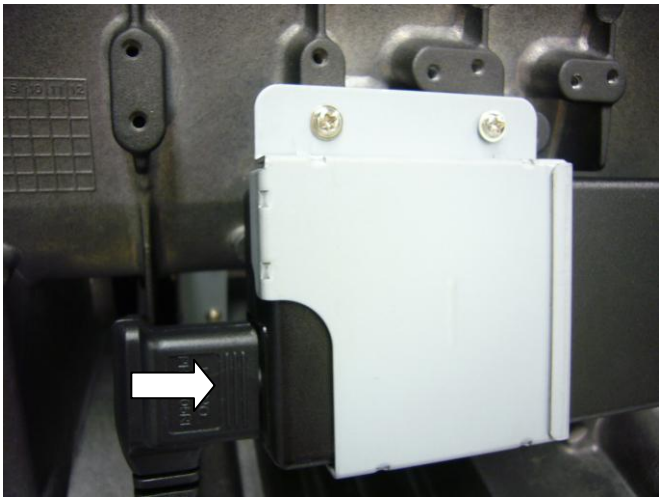
3. Fasten the 2nd display stand with the screws (x2), and connect cable to 2nd display.



4. Route VGA cable through stand gap and connect the other end of the cable to the system port.

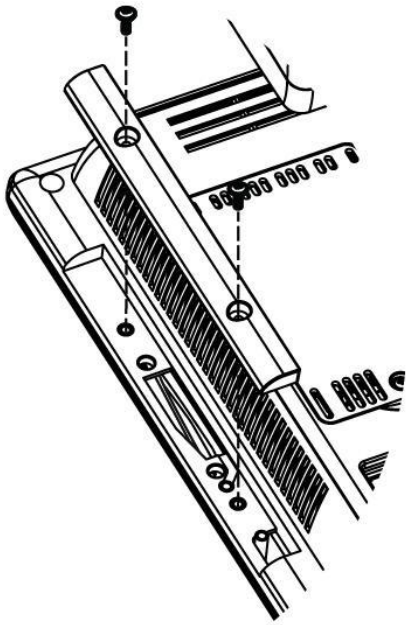
## 4-3 Power Cord Installation

The Power supply is installed in the base and secured with the PSU bracket

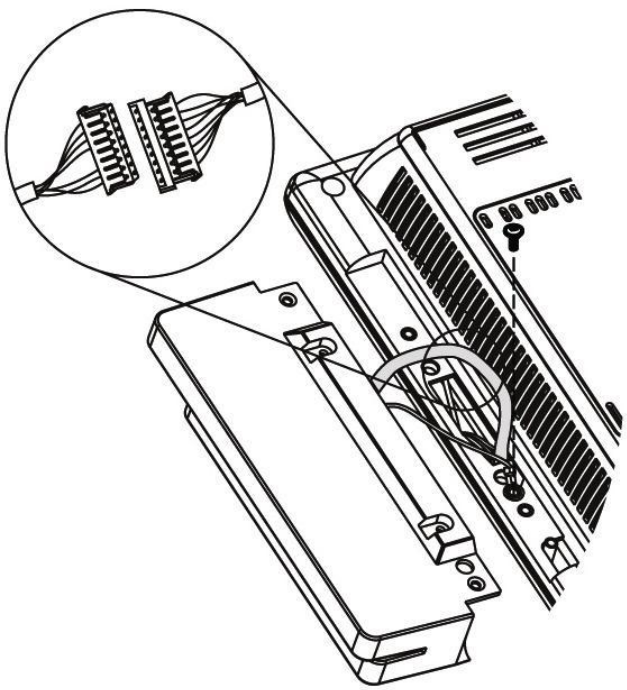


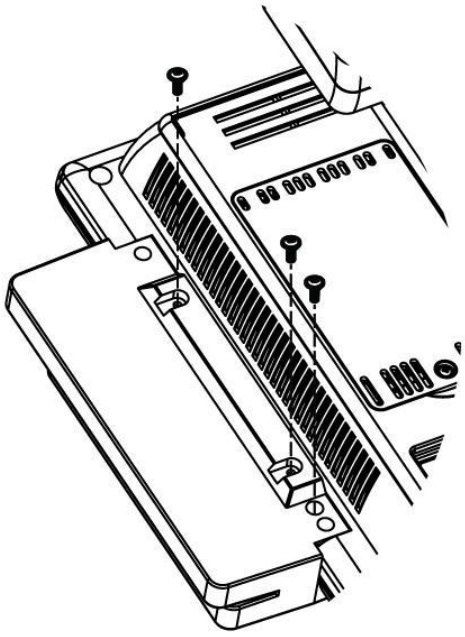
Connect the Power cord to the power adapter.

# 4-4 MSR / 2-in-1 MSR Installation



1. Loosen the screws (x2) to remove the MSR dummy cover.



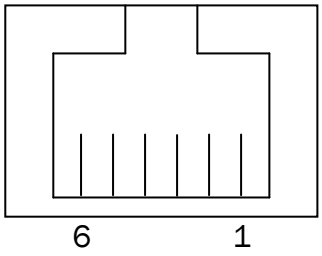


2. Connect the MSR or 2-in-1 MSR cable to the connector on the system side. After the cable is connected, attach the grounding cable and fasten the screw (x1).
3. Finally fasten the screws (x3) on the back to fix the MSR or 2-in-1 MSR module to the system.

# 4-5 Cash Drawer Installation for B78 Motherboard

You can install a cash drawer through the cash drawer port. Please verify the pin assignment before installation.

**Cash Drawer Pin Assignment**




| Pin | Signal |
|---|---|
| 1 | GND |
| 2 | DOUT bit0 |
| 3 | DIN bit0 |
| 4 | 12V / 19V |
| 5 | DOUT bit1 |
| 6 | GND |

**Cash Drawer Controller Register**

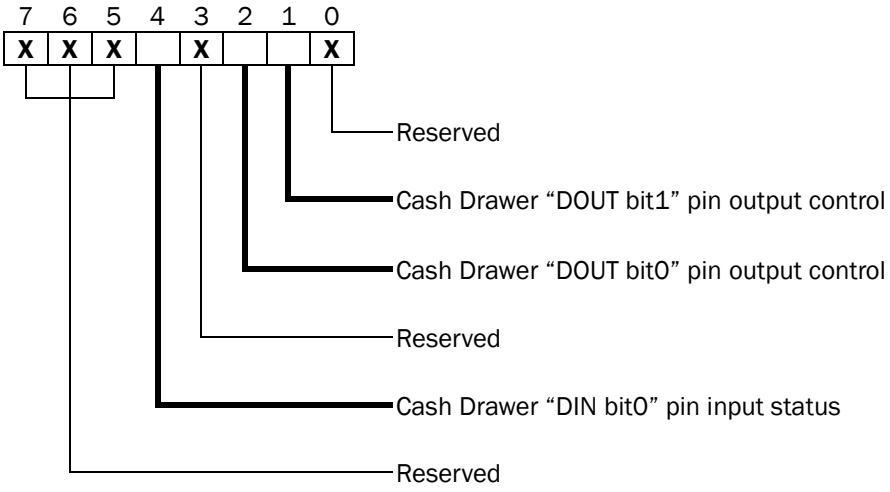
The Cash Drawer Controller use one I/O addresses to control the Cash Drawer.

**Register Location:** 48Ch

**Attribute:** Read / Write

**Size:** 8bit

| BIT | BIT7 | BIT6 | BIT5 | BIT4 | BIT3 | BIT2 | BIT1 | BIT0 |
|---|---|---|---|---|---|---|---|---|
| Attribute | Reserved | | | Read | Reserved | Write | | Reserved |



Bit 7: Reserved

Bit 6: Cash Drawer “DIN bit0” pin input status.

= 1: the Cash Drawer closed or no Cash Drawer

= 0: the Cash Drawer opened

Bit 5: Reserved

Bit 4: Reserved

Bit 3: Cash Drawer “DOUT bit1” pin output control.

= 1: Opening the Cash Drawer

= 0: Allow close the Cash Drawer

Bit 2: Cash Drawer “DOUT bit0” pin output control.

= 1: Opening the Cash Drawer

= 0: Allow close the Cash Drawer

Bit 1: Reserved

Bit 0: Reserved

Note: Please follow the Cash Drawer control signal design to control the Cash Drawer.

**Cash Drawer Control Command Example**

Use Debug.EXE program under DOS or Windows98

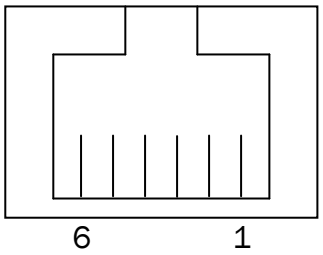
| **Command** | **Cash Drawer** |
|---|---|
| O 48C 04 | Opening |
| O 48C 00 | Allow to close |
| ➢ Set the I/O address 48Ch bit2 =1 for opening Cash Drawer by “DOUT bit0” pin control.<br>➢ Set the I/O address 48Ch bit2 = 0 for allow close Cash Drawer. | |

| **Command** | **Cash Drawer** |
|---|---|
| I 48C | Check status |
| ➢ The I/O address 48Ch bit6 =1 mean the Cash Drawer is closed or not exist.<br>➢ The I/O address 48Ch bit6 =0 mean the Cash Drawer is opened. | |

# 4-6 Cash Drawer Installation for B68/B98/C48/C58/C78 Motherboard

You can install a cash drawer through the cash drawer port. Please verify the pin assignment before installation.

**Cash Drawer Pin Assignment**



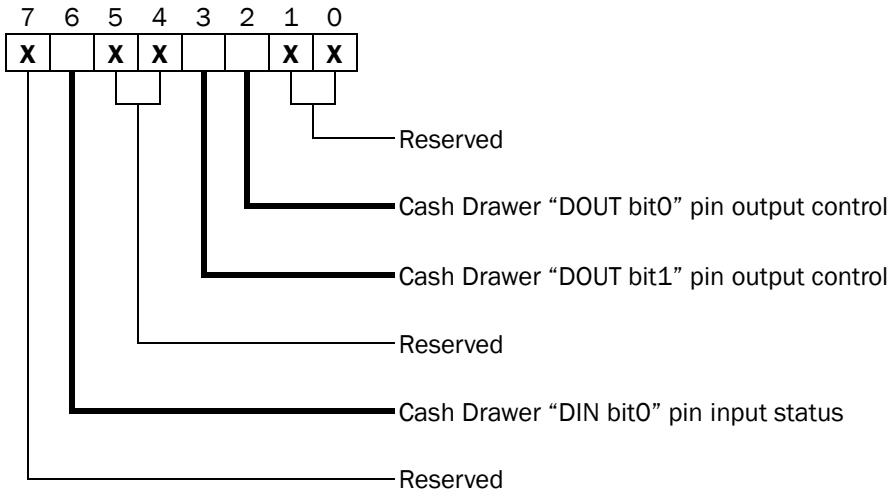

| Pin | Signal |
|---|---|
| 1 | GND |
| 2 | DOUT bit0 |
| 3 | DIN bit0 |
| 4 | 12V / 19V |
| 5 | DOUT bit1 |
| 6 | GND |

**Cash Drawer Controller Register**

The Cash Drawer Controller use one I/O addresses to control the Cash Drawer.

**Register Location:** 48Ch
**Attribute:** Read / Write
**Size:** 8bit

| BIT | BIT7 | BIT6 | BIT5 | BIT4 | BIT3 | BIT2 | BIT1 | BIT0 |
|---|---|---|---|---|---|---|---|---|
| Attribute | Reserved | Read | Reserved | | Write | | Reserved | |



Bit 7: Reserved

Bit 6: Cash Drawer “DIN bit0” pin input status.

= 1: the Cash Drawer closed or no Cash Drawer

= 0: the Cash Drawer opened

Bit 5: Reserved

Bit 4: Reserved

Bit 3: Cash Drawer “DOUT bit1” pin output control.

= 1: Opening the Cash Drawer

= 0: Allow close the Cash Drawer

Bit 2: Cash Drawer “DOUT bit0” pin output control.

= 1: Opening the Cash Drawer

= 0: Allow close the Cash Drawer

Bit 1: Reserved

Bit 0: Reserved

Note: Please follow the Cash Drawer control signal design to control the Cash Drawer.

**Cash Drawer Control Command Example**

Use Debug.EXE program under DOS or Windows98

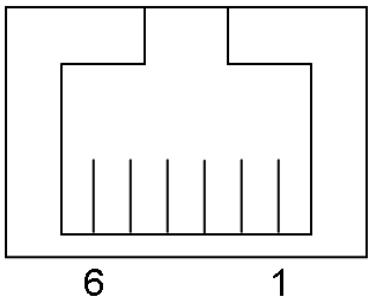
| **Command** | **Cash Drawer** |
|---|---|
| O 48C 04 | Opening |
| O 48C 00 | Allow to close |
| ➢ Set the I/O address 48Ch bit2 =1 for opening Cash Drawer by “DOUT bit0” pin control.<br>➢ Set the I/O address 48Ch bit2 = 0 for allow close Cash Drawer. | |

| **Command** | **Cash Drawer** |
|---|---|
| I 48C | Check status |
| ➢ The I/O address 48Ch bit6 =1 mean the Cash Drawer is closed or not exist.<br>➢ The I/O address 48Ch bit6 =0 mean the Cash Drawer is opened. | |

# 4-7 Cash Drawer Installation for Skylake Motherboard

You can install a cash drawer through the cash drawer port. Please verify the pin assignment before installation.

**Cash Drawer Pin Assignment**



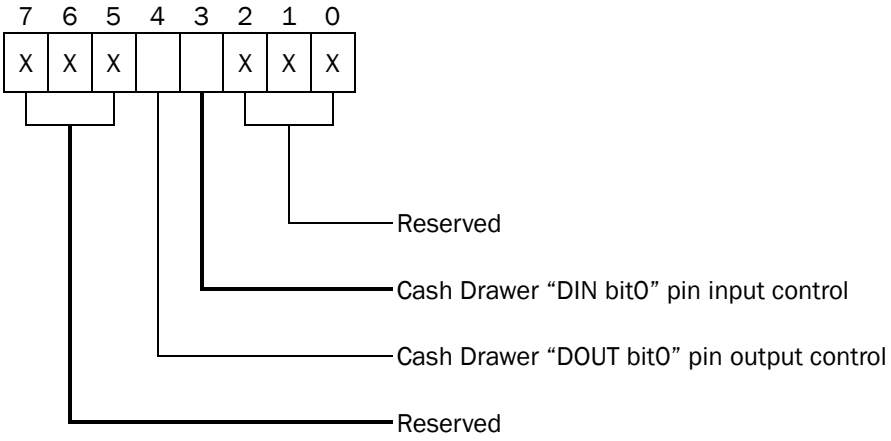

| Pin | Signal |
|---|---|
| 1 | GND |
| 2 | DOUT bit0 |
| 3 | DIN bit0 |
| 4 | 12V / 19V |
| 5 | DOUT bit1 |
| 6 | GND |

**Cash Drawer Controller Register**

The Cash Drawer Controller use one I/O addresses to control the Cash Drawer.

**Register Location:** 482h
**Attribute:** Read / Write
**Size:** 8bit

| BIT | BIT7 | BIT6 | BIT5 | BIT4 | BIT3 | BIT2 | BIT1 | BIT0 |
|---|---|---|---|---|---|---|---|---|
| Attribute | Reserved | | | Write | Read | Reserved | | |



Bit 7: Reserved
Bit 6: Reserved
Bit 5: Reserved
Bit 4: Cash Drawer "DOUT bit0" pin output control.
= 1: Opening the Cash Drawer
= 0: Allow close the Cash Drawer
Bit 3: Cash Drawer "DIN bit0" pin input control.
= 1: the Cash Drawer closed or no Cash Drawer
= 0: the Cash Drawer opened
Bit 2: Reserved
Bit 1: Reserved
Bit 0: Reserved

Note: Please follow the Cash Drawer control signal design to control the Cash Drawer.

**Cash Drawer Control Command Example**

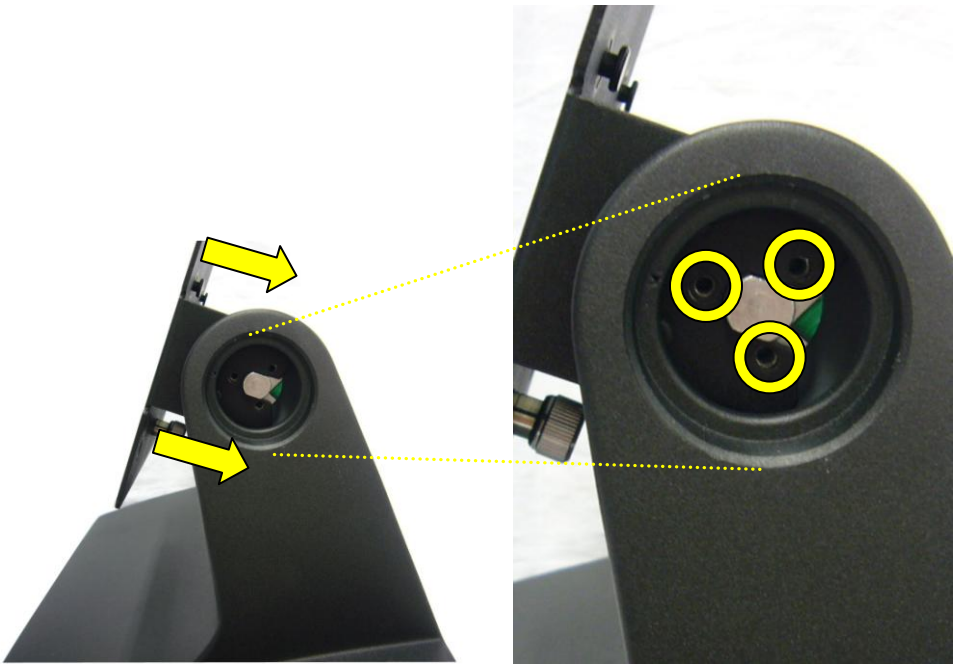
Use Debug.EXE program under DOS or Windows98

| **Command** | **Cash Drawer** |
|---|---|
| O 482 04 | Opening |
| O 482 00 | Allow to close |
| ➢ Set the I/O address 482h bit4 =1 for opening Cash Drawer by "DOUT bit0" pin control.<br>➢ Set the I/O address 482h bit4 = 0 for allow close Cash Drawer. | |

| **Command** | **Cash Drawer** |
|---|---|
| I 482 | Check status |
| ➢ The I/O address 482h bit3 =1 mean the Cash Drawer is opened or not exist.<br>➢ The I/O address 482h bit3 =0 mean the Cash Drawer is closed. | |

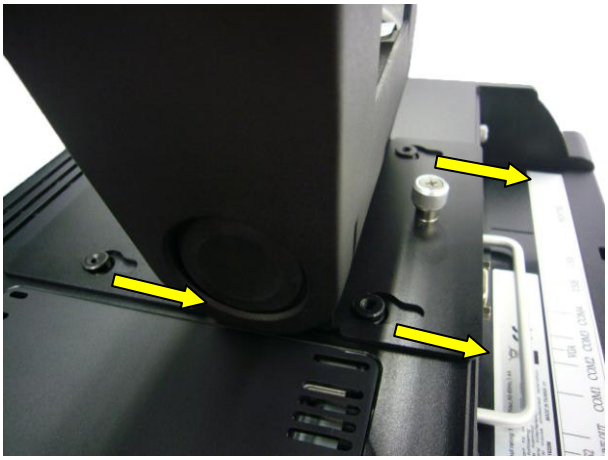
# 4-8 Stand Assembly & Disassembly

## Stand Assembly



1. Slide the VESA hinge bracket into the metal hinge shaft on the stand.
2. Fasten the screws (x6) ( 3 on both sides) to fix the VESA hinge bracket onto the stand.

3. Use rubber hinge cover to plug the holes on both sides.



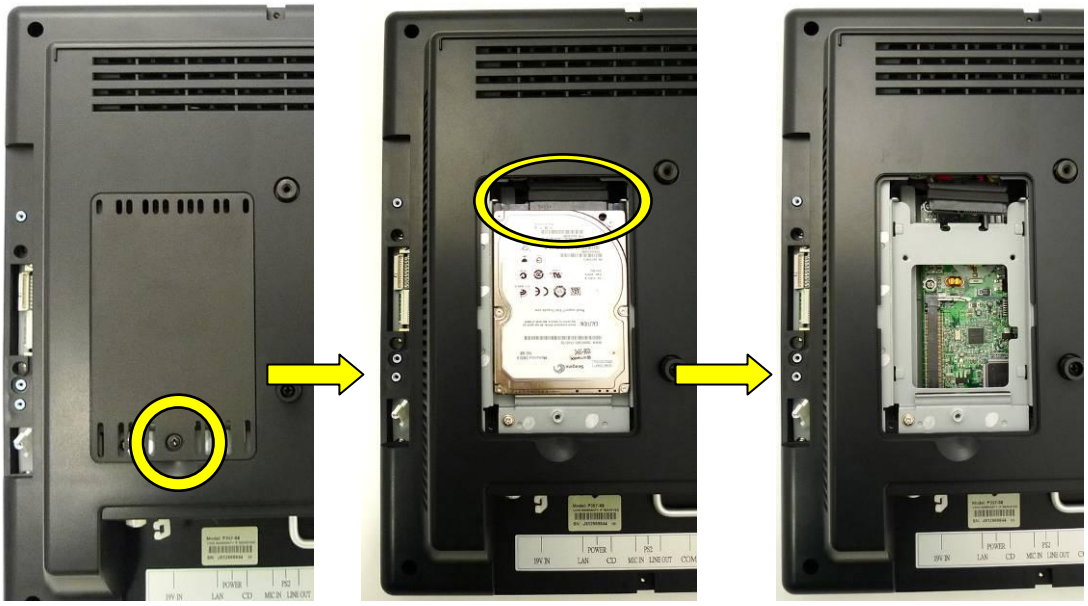
4. Align larger end of the teardrop mounting holes on the VESA hinge bracket with fixing screws (x4) on the rear cover of the system. Slide to narrow end of the mounting holes, and stick the bracket to the system.
5. Push and fasten the thumb screw to fix it to the system.

## Stand Disassembly

1. Loosen the thumb screw.
2. Slide the system upward to separate from the stand.

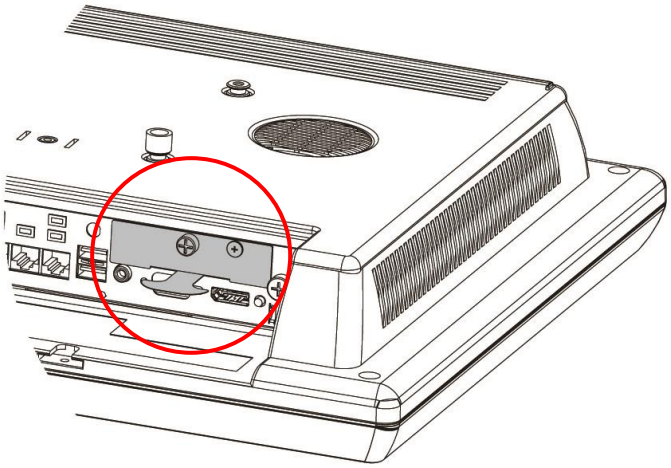
# 5 System Assembly & Disassembly

## 5-1 HDD Replacement

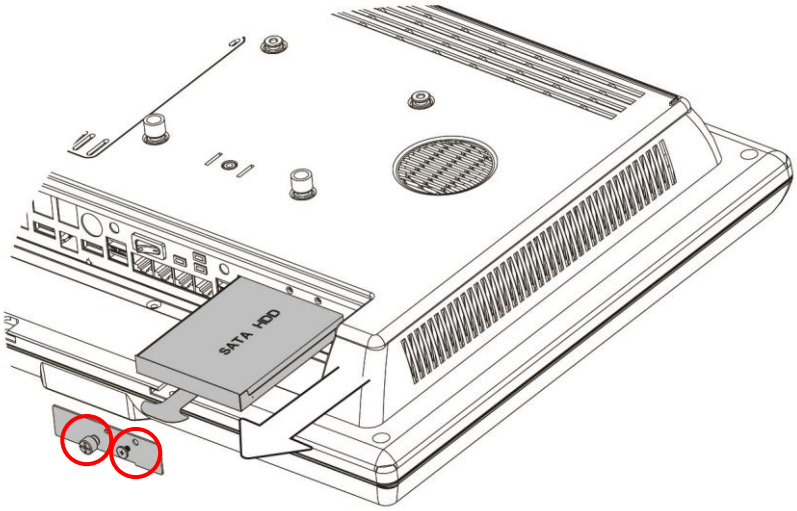


1. Remove the screw (x1) to open the HDD door.
2. Disconnect the HDD cable from the HDD (x1).
3. Replace the HDD.

## 5-1-1 HDD Replacement for Skylake motherboard



1. Turn off the system. Place the system face down and make sure not to scratch the screen.
2. Find the HDD located at the right side of the IO bracket.



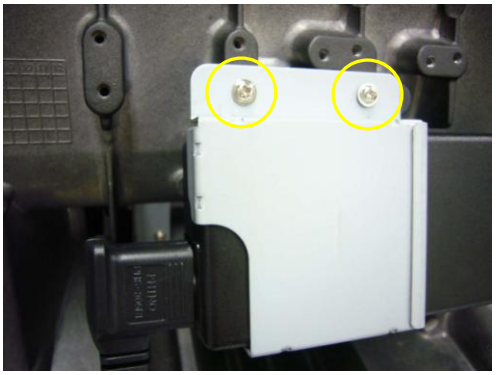

3. Loosen the thumb screw(x1) and another screw(x1) to open the HDD door.
4. Pull the HDD tray from the system. For easier removal pull the plastic tab (see picture) at the same time.

## 5-2 Compact Flash Card Replacement

If the system is equipped with CF (Compact Flash) slot as storage device, please follow the following steps to replace CF card.

1. Loosen the screw (x1) to open the HDD door, and replace the CF card..

## 5-3 Power supply Replacement



1. Loosen the screws (x2) to remove the PSU bracket and remove the Power supply.
2. Replace the Power supply and reinstall the PSU bracket securing it with 2 screws.

# 6 Specification

## 6-1 B78 Motherboard

| Motherboard | B78 | |
|---|---|---|
| **Model/System** | **15" System** | **17" System** |
| CPU | Fanless: Intel Celeron M ULV 1.0GHz (BGA)<br>With cooler: Intel Celeron M 1.5GHz / Pentium M 1.8GHz | Fanless: Intel Celeron M ULV 1.0GHz (BGA)<br>Fan: Intel Celeron M 1.5GHz |
| Chipset | Intel 852GM + ICH4 FSB 400MHz | |
| System Memory | 2 x DDR SO-DIMM Slot support up to 2GB | |
| Graphic Memory | Shared system memory up to 64MB | |
| **LCD Touch Panel** | | |
| LCD Size | 15" TFT LCD | 17" TFT LCD |
| Brightness | 250nits | 250-400nits |
| Maximal Resolution | 1024 x 768 | 1280 x 1024 |
| Touch Screen Type | Resistive | Resistive/SAW |
| Tilt Angle | 0° ~ 70° | 0° ~ 70° |
| **Storage** | | |
| HDD | one 2.5" SATA HDD bay | |
| Flash Memory | by optional SSD without HDD | |
| **Expansion** | | |
| Mini-PCI Slot | 1 | |
| **External I/O Ports** | | |
| USB | 4 ports (V2.0) | |
| PS/2 | 1 | |
| Serial / COM | 4 x RJ-45 COM connectors<br>(COM1 & COM2 standard RS-232; COM3 & COM4 pin9 with 5V /12V power by jumper) | |
| Parallel | 1 | |
| LAN (10 /100 / 1000) | 1 x RJ45 | |
| DC Jack | 1 | |
| 2nd VGA | 1 | |
| Audio Jack | 1 x Line-out, 1 x MIC-in | |
| **Audio** | | |
| Built in Speaker | 2 x 2W speakers | |
| **Power** | | |
| Power Adapter | 19V/90W | |

| **Motherboard** | **B78** |
|---|---|
| **Control / Indicator** | |
| Power Button | 2 |
| Indicator LED | 1 |
| **Peripheral** | |
| MSR | 3 Tracks MSR ( PS/2 , USB) |
| 2-in-1 MSR | MSR (PS/2, USB) / Fingerprint (USB)<br>MSR (PS/2, USB) / iButton (PS/2) |
| Second Display | 8.4" / 10.4" / 12.1" 2nd display (optional touch) |
| Customer Display | Flush mount VFD display 2 x 20 characters (COM) |
| **Communication** | |
| Wireless LAN | 802.11 b/g/n wireless LAN card & antenna |
| **Environment** | |
| EMC & Safety | FCC, Class A, CE, LVD |
| Operating Temperature | 0°C ~ 35°C (32°F~ 95°F) |
| Storage Temperature | -20°C ~ 60°C (4°F ~ 140°F) |
| Humidity | 20% ~ 80% RH non condensing |
| Dust & Water Proof | IP 54 (Front bezel) |
| **Dimension (W x D x H)** | 15'' LCD 70 degree : 250 x 250.99 x 347 mm / 9.84 x 9.88 x 13.78 inches<br>17'' LCD 70 degree : 415 x 264 x 348 mm / 16.34 x 10.4 x 13.7 inches |
| **Weight (N.W./G.W.)** | 15'' : 8.1kgs / 9.1kgs (17.8 / 20 lb)<br>17'' : 9.1kgs / 10.1kgs (20 / 22.25 lb) |
| **Mounting** | 100mm x100mm VESA Standard holes |
| **OS Support** | Windows XP Pro, POSReady 2009, Linux |

# 6-2 B68 / B98 / C48 Motherboard

| Motherboard | B68 | B98 | C48 |
|---|---|---|---|
| CPU Supports | Intel Atom N270 processors 1.6G (BGA) | Intel Celeron M 1.86G/ Core duo 2.0G/ Core 2 duo 1.66G (socket) | Intel Pineview D525 dual core 1.8G (BGA) |
| Chipset | Intel 945GSE + ICH7M, FSB 533MHz | Intel 945GME + ICH7M, FSB 533 / 667MHz | CPU with Graphic built-in + ICH 8M, FSB 800MHz |
| System Memory | 2 x DDR2 DIMM up to 2GB, FSB 533 MHz | 2 x DDR2 DIMM up to 4GB, FSB 533 / 667MHz | 2 x DDR3 DIMM up to 4GB, FSB 800MHz |
| Graphic Memory | Share system memory up to 224MB | | Intel GMA 3150, share system memory up to 256MB |
| **LCD Panel** | | | |
| LCD Size | 15" / 17" | | 15” |
| Brightness | 15” 250nits<br>17” 300nits | | 250nits |
| Maximal Resolution | 15” 1024 x 768<br>17” 1280 x 1024 | | 1024 x 768 |
| Touch Screen Type | 15” Resistive<br>17” Resistive / SAW | | Resistive |
| Tilt Angle (Degree) | 15” 0° ~70°<br>17” 0° ~ 70° | | 0° ~70° |
| **Storage** | | | |
| HDD | one slim HDD bay support SATA HDD | | |
| Flash Memory | by optional compact SSD (without HDD) | | |
| **Expansion** | | | |
| Mini-PCI Slot | N/A | 1 | N/A |
| Mini-PCI-E Slot | 1 | N/A | 1 |
| **External I/O Ports** | | | |
| USB | 4 ports (V2.0) | | |
| PS/2 | 1 | | |
| Serial / COM | 4 x RJ-45 COM connector (COM1 & COM2 standard RS-232; COM3 & COM4 pin10 with 5V /12V power by jumper ) | | 4 x RJ-45 COM connector (COM1/COM2 standard RS-232 without power, COM3 /COM4 powered COM with power enable /disable by BIOS setting and +5V/+12V by MB setting. COM3 default +5V/ COM4 default +12V ) |
| Parallel | 1 | | |

| **Motherboard** | **B68** | **B98** | **C48** |
|---|---|---|---|
| LAN (10 /100 / 1000) | 1 x RJ-45 | | |
| DC Jack | 1 | | |
| 2nd VGA | 1 (Female) | | |
| Cash Drawer Port | 1 x RJ-11 (for +24V Cash Drawer) | | |
| Audio Jack | 1 x Line-out, 1 x MIC-in | | |
| **Audio** | | | |
| Built in Speaker | 15": 2 x 2W speakers<br>17": 2 x 3W speakers | | 2 x 2W speakers |
| **Power** | | | |
| Power Adapter | 19V/90W | | |
| **Control / Indicator** | | | |
| Power Button | 2 | | |
| Indicator LED | 1 | | |
| **Peripheral** | | | |
| MSR | 3 Tracks MSR ( PS/2, USB ) | | |
| 2-in-1 MSR | MSR (PS/2, USB) + Fingerprint (USB) / MSR (PS/2, USB) + iButton (PS/2) | | |
| Second Display | 8.4" / 10.4" / 12.1" / 15" 2nd display (optional touch) | | |
| Customer Display | Flush mount VFD display 2 x 20 characters (COM) | | |
| **Communication** | | | |
| Wireless LAN | 802.11 b/g/n wireless LAN card & antenna | | |
| **Environment** | | | |
| EMC & Safety | FCC, Class A, CE, LVD | | |
| Operating Temperature | 0°C ~ 35°C (32°F~ 95°F) | | |
| Storage Temperature | -20°C ~ 60°C (4°F ~ 140°F) | | |
| Humidity | 20% ~ 80% RH non condensing | | |
| Dust & Water Proof | IP 54 (Front bezel) | | |
| **Dimension (W x D x H)** | 15'' LCD 70 degree : 250 x 250.99 x 347 mm / 9.84 x 9.88 x 13.78 inches<br>17'' LCD 70 degree : 415 x 264 x 348 mm / 16.34 x 10.4 x 13.7 inches | | |
| **Weight (N.W/G.W)** | 15'' : 8.1kgs / 9.1kgs (17.8 / 20 lb)<br>17'' : 9.1kgs / 10.1kgs (20 / 22.25 lb) | | 15'' : 8.1kgs / 9.1kgs<br>17.8 / 20 lb) |
| **Mounting** | 100mm x100mm VESA Standard holes | | |
| **OS Support** | Windows XP Pro, POSREADY2009, Windows7 Pro, POSREADY7, Linux | | |

# 6-3 C58 Motherboard

| Motherboard | C58 |
|---|---|
| CPU Supports | Intel CedarView D2550 dual core 1.86GHz, L2 1M, 10W |
| Chipset | Intel NM10 Express Chipset |
| System Memory | 2x DDR3 DIMM up to 4GB 1067MHz |
| Graphic Memory | DX9, Graphic core speed at 640MHz |
| **LCD Panel** | |
| LCD Size | 15” |
| LCD type | LED |
| Brightness (cd/m²) | 300 nits |
| Maximal Resolution | 1024 x 768 |
| Touch Screen Type | True Flat Resistive or True Flat Capacitive (USB Interface) |
| Tilt Angle (Degree) | 0~70° |
| **Storage** | |
| HDD | 2.5 HDD |
| Flash Memory | Optional CF Reader (replaces HDD) |
| **Expansion** | |
| Mini-PCI-E Slot | 1 |
| **External I/O Ports** | |
| USB | 4 ports (V2.0) |
| PS/2 | 1 |
| Serial / COM | 4 x RJ45 COM connector<br>(COM1 w/o power; COM2/COM3/COM4 powered COM with power enabled by BIOS setting; COM2 is 0V/5V; COM3 is 0V/5V/12V; COM4 is 0V/5V/12V; COM2 voltage 0V/5V by jumper; COM3/COM4 voltage 5V/12V by jumper; default BIOS setting 0V) |
| Parallel | 1 |
| LAN (10 /100 / 1000) | 1 x RJ-45 |
| DC Jack | 1 |
| 2nd VGA | 1 (Female) |
| Cash Drawer Port | 1 x RJ-11 (for +24V Cash Drawer) |
| Audio Jack | 1 x Line-out, 1 x MIC-in |
| **Audio** | |
| Built in Speaker | 2 x 2W speakers |
| **Power** | |
| Power Adapter | 19V/90W |
| **Control / Indicator** | |
| Power Button | 1 |

| **Motherboard** | **C58** |
|---|---|
| Power Indicator LED | 1 |
| **Peripheral** | |
| MSR | 3 Tracks MSR ( PS/2, USB ) (encrypted option) |
| 2-in-1 MSR | MSR (PS/2, USB) + Fingerprint (USB) / MSR (PS/2, USB) |
| Second Display | 8.4" / 12.1" / 15" 2nd display (optional touch) |
| Customer Display | Flush mount VFD display 2 x 20 characters (Serial interface) |
| **Communication** | |
| Wireless LAN | 802.11 b/g/n wireless LAN card & antenna |
| **Environment** | |
| EMC & Safety | FCC, Class A, CE, LVD |
| Operating Temperature | 0°C ~ 35°C (32°F~ 95°F) |
| Storage Temperature | -20°C ~ 60°C (4°F ~ 140°F) |
| Humidity | 20% ~ 80% RH non condensing |
| Dust & Water Proof | IP 54 (Front bezel) |
| **Dimension( W x D x H)** | 15'' LCD 70 degree : 250 x 250.99 x 347 mm / 9.84 x 9.88 x 13.78 inches |
| **Weight (N.W/G.W)** | 8.1kgs / 9.1kgs (17.8 / 20 lb) |
| **Mounting** | 100mm x100mm VESA Standard holes |
| **OS Support** | Windows XP Pro**, PosReady2009**, Windows 7 Pro***, PosReady7***,<br>** Embedded support only, ***32bit only |

* This specification is subject to change without prior notice.

# 6-4 C78 Motherboard

| Motherboard | C78 |
|---|---|
| CPU Supports | Intel Ivy Bridge Mobile CPU (BGA)<br>i3-3217U 1.8G, LLC 3M, 17W;<br>Celeron 1037U, 1.8G LLC 2M, 17W |
| Chipset | CPU with Graphic built-in + HM76 |
| System Memory | 2 x DDR3 SO-DIMM up to 8GB, FSB 1333MHz |
| Graphic Memory | Intel HD Graphics (Gfx frequency up to 1GHz), DX10.1 / 11 |
| BIOS | Phoenix UEFI |
| **LCD Panel** | |
| LCD Size | 15” |
| Brightness (cd/m²) | 300 nits |
| Maximal Resolution | 1024 x 768 |
| Touch Screen Type | ELO Resistive TF (USB), P-Cap touch |
| Tilt Angle (Degree) | 0~70° |
| **Storage** | |
| HDD | one 2.5" SATA HDD (SATA 2.0) |
| Flash Memory | Compact Flash or SATA SSD (same location as HDD, Option) |
| **Expansion** | |
| Mini-PCI-E Slot | 1 |
| **External I/O Ports** | |
| USB | 6 ( USB 2.0 x 4; USB 3.0/2.0 x 2) |
| PS/2 | 1 |
| Serial / COM | 4 x RJ45 COM connector<br>(COM1/2/3/4 0V/5V/12V supported; COM1/COM2 default 0V, COM3/COM4 default 12V/5V by BIOS setting) |
| Parallel | 1 (DB25 Female) |
| LAN (10 /100 / 1000) | 1 x RJ-45 |
| DC Jack | 1 |
| Secondary Video | VGA Port (DB15 Female) or DVI-D (optional) |
| Cash Drawer Port | 1 x RJ-11 (for +24V Cash Drawer) |
| Audio Jack | 1 x Line-out; 1 x Mic-in(option) |
| 2nd LAN | 2nd LAN daughter board_miniPCI-E RTL8111E-VL-CG (either one w/ WLAN card) (option) |
| DVI-D | DVI-D fly-wire connector (option) |
| **Power** | |
| Power Adapter | 19V/90W |
| **Audio** | |
| Built in Speaker | 2 x 2W speakers |

| **Motherboard** | **C78** |
|---|---|
| **Control / Indicator** | |
| Power Button | 1 |
| Power Indicator LED | 1 |
| **Peripheral** | |
| MSR | 3 Tracks MSR ( PS/2, USB ) |
| 2-in-1 MSR | MSR (PS/2, USB) + Fingerprint (USB) / MSR (PS/2, USB) |
| Second Display | 8.4" / 12.1" / 15" 2nd display (optional touch) |
| Customer Display | Flush mount VFD display 2 x 20 characters (Serial interface) |
| **Communication** | |
| Wireless LAN | 802.11 b/g/n wireless LAN card & antenna |
| **Environment** | |
| EMC & Safety | FCC, Class A, CE, LVD |
| Operating Temperature | 0°C ~ 35°C (32°F~ 95°F) |
| Storage Temperature | -20°C ~ 60°C (4°F ~ 140°F) |
| Humidity | 20% ~ 80% RH non condensing |
| Dust & Water Proof | IP 54 (Front bezel) |
| **Dimension( W x D x H)** | 15'' LCD 70 degree : 250 x 250.99 x 347 mm / 9.84 x 9.88 x 13.78 inches |
| **Weight (N.W/G.W)** | 8.1kgs / 9.1kgs (17.8 / 20 lb) |
| **Mounting** | 100mm x100mm VESA Standard holes |
| **OS Support** | Windows XP Pro, PosReady2009, Windows 7 Pro (32/64bit), PosReady7 (32/64bit), Linux |

# 6-5 Skylake Motherboard

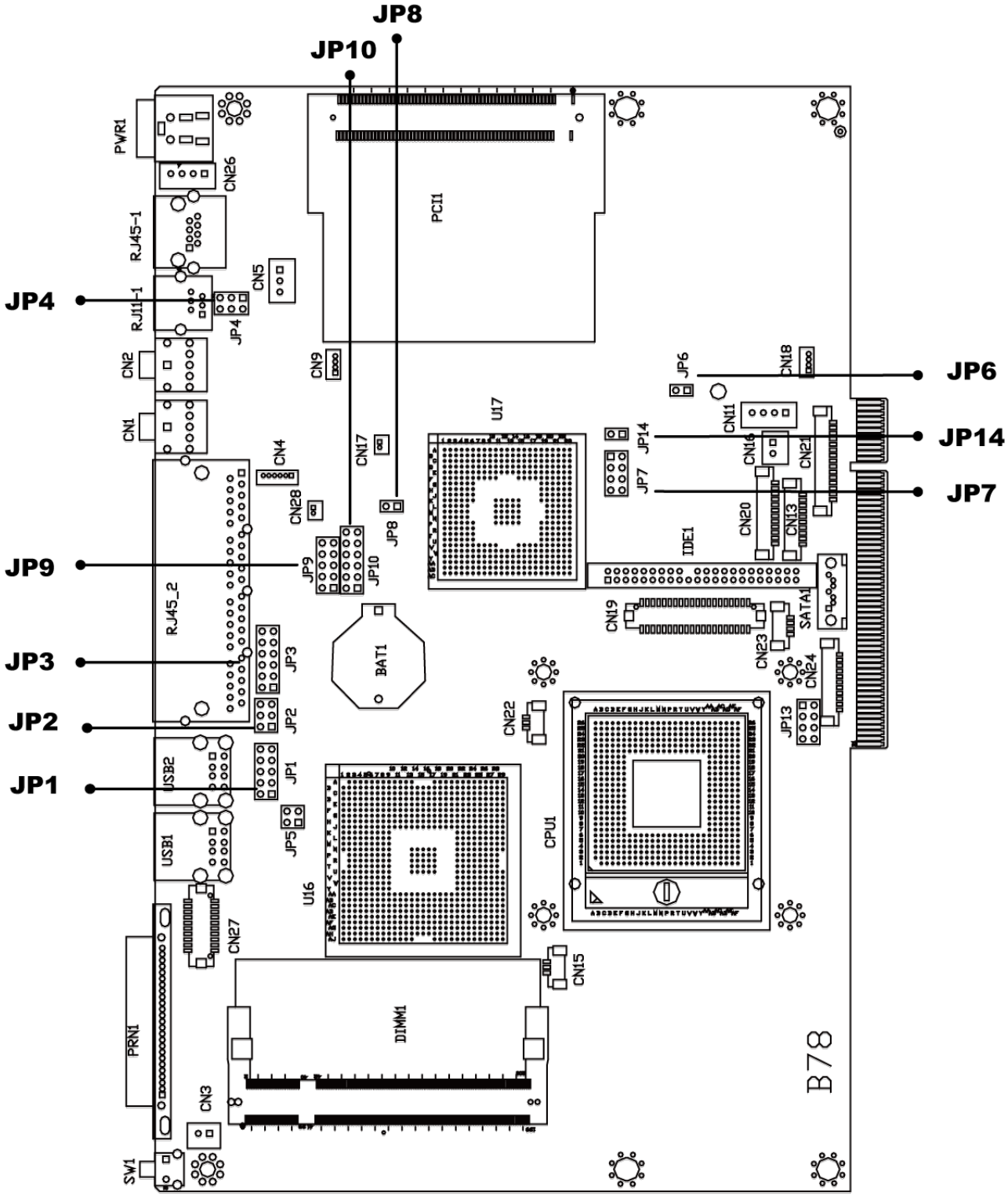
| Motherboard | Skylake |
|---|---|
| CPU Supports | Intel SKYLAKE CPU LGA-1356 14nm<br>i3-6100U 2.3GHz, LLC 3M (15W, EIA)<br>Celeron 3955U 2G, LLC 2M (15W, IA) |
| System Memory | 2 x DDR3L SO-DIMM1600MHz, up to 16GB, FSB 1600MHz. dual Channel |
| Graphic Memory | Intel HD Graphic DX 11.1 |
| **LCD Panel** | |
| LCD Size | 15 and 17” |
| Brightness (cd/m²) | 350 nits |
| Maximal Resolution | 1024 x 768 for 15” and 1280x1024 for 17” |
| Touch Screen Type | True flat (resistive & P-CAP, 17” P-CAP only) |
| Tilt Angle (Degree) | 0~70° |
| **Storage** | |
| HDD | one 2.5" SATA HDD (SATA 2.0) |
| Flash Memory | Compact Flash or SATA SSD (same location as HDD, Option) |
| **Expansion** | |
| Mini-PCI-E Slot | 1 |
| **External I/O Ports** | |
| USB | 6 ( USB 2.0 x 2 USB 3.0/2.0 x 4) |
| VGA | 1 |
| Serial / COM | 4 x RJ45 COM connector<br>(COM1/COM2/COM3/COM4 0V/5V/12V power enabled by BIOS, BIOS default is 0V) |
| Display Port | 1 |
| LAN (10 /100 / 1000) | 2 x RJ-45 |
| DC Jack | 1 |
| Power USB | 1 x 24V (option) / 1 x 12V (option) |
| DC 24V Out | 1 (option) |
| Cash Drawer Port | 1 x RJ-11 (for +24V Cash Drawer) |
| Audio Jack | 1 x Line-out |
| **Power** | |
| Power Adapter | 19V/90W power adapter or 19V/180W for power USB & DC-24V out by option |
| **Control / Indicator** | |
| Power Button | 1 |
| Power Indicator LED | 1 (blue power LED) / 1 (VGA W/powered LED) / 2 (COM3 & 4 W/powered LED) |
| **Peripherals** | |
| POS Peripherals (3 in 1) | MSR (IDTECH Slim, USB, 5 pin ) / Finger Print Reader (USB) |
| Second Display | 8.4" / 12.1" / 15" 2nd display (optional touch) |

| **Motherboard** | **Skylake** |
|---|---|
| Customer Display | Flush mount VFD display 2 x 20 characters (Serial interface) |
| Printer Stand | Printer base with EPSON (TM-T70) & TD T25 printer |
| **Communication** | |
| Wireless LAN | 802.11 b/g/n/ac wireless LAN card & antenna |
| **Environment** | |
| EMC & Safety | FCC, Class A, CE, LVD |
| Operating Temperature | 0°C ~ 35°C (32°F~ 95°F) |
| Storage Temperature | -20°C ~ 60°C (4°F ~ 140°F) |
| Humidity | 20% ~ 80% RH non condensing |
| Dust & Water Proof | IP 54 (Front bezel) |
| **Dimension( W x D x H)** | 15'' LCD 70 degree : 250 x 250.99 x 347 mm / 9.84 x 9.88 x 13.78 inches |
| **Weight (N.W/G.W)** | 8.1kgs / 9.1kgs (17.8 / 20 lb) |
| **Mounting** | 100mm x100mm VESA Standard holes |
| **OS Support** | POSReady 7 (64-bit only), Windows Embedded Industry Retail Pro 8.1 (64-bit only)<br>Windows 10 IOT 10(64-bit only), Windows 10 Pro (64-bit only), Linux |

# 7 Jumper Setting

## 7-1 B78 Motherboard

### 7-1-1 Motherboard Layout

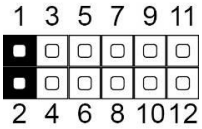
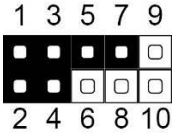
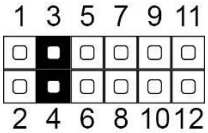
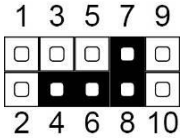
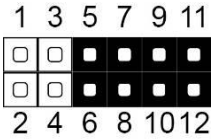
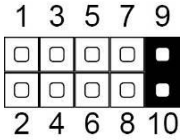


## 7-1-2 Connectors & Functions

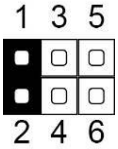
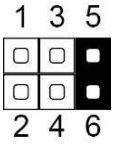
| Connector | Function |
|---|---|
| BAT1 | CMOS Battery Base ( Use CR2023) |
| CN1 | Audio Line Out |
| CN2 | Audio MIC In |
| CN3 | Internal Power Switch |
| CN4 | Speaker & MIC Connector |
| CN9 | CD-IN Connect |
| CN11 | Power Connector For 3.5" HDD |
| CN13 | COM5 for Touch |
| CN15 | CPU FAN Connector |
| CN16 | Hardware Reset |
| CN18 | USB2 |
| CN19 | LCD Interface Connector |
| CN20 | Inverter Connector |
| CN21 | Card Reader Connector |
| CN22 | System FAN Connector |
| CN23 | IrDA Connector |
| CN26 | Internal Power In Connector |
| CN27 | Internal LPT Connector |
| IED1 | Secondary IDE Connector (Pitch = 2.0mm) |
| PRN1 | Parallel Port |
| PWR1 | +19V Power Adaptor |
| RJ11_1 | Cash Drawer Connector |
| RJ45_1 | LAN (On Board) |
| RJ45_2 | COM1, COM2, COM3, COM4 |
| SATA1 | SATA Connector |
| USB1 | USB3, USB4 |
| USB2 | USB5, USB6 |
| JP1 | VGA Port |
| JP2 | VGA Power |
| JP3 | COM3/COM4 Power Setting |
| JP4 | Cash Drawer Power Setting |
| JP6 | Power Mode Setting |
| JP7 | LCD ID Setting |
| JP8 | CMOS Operation Mode |
| JP9 / 10 | COM2 RS232/485/422 Setting |
| JP13 | System Indicator |
| JP14 | USB Path Setting |

## 7-1-3 Jumper Setting

**COM2 RS232/485/422 Setting**

| Function | JP10<br>(1-2) (3-4) (5-6) (7-8) (9-10) (11-12) | JP9<br>(1-2) (3-4) (4-6) (5-7) (7-8) (9-10) |
|---|---|---|
| ▲RS232 |  |  |
| RS485 |  |  |
| RS422 |  |  |

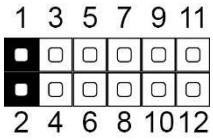
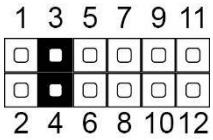
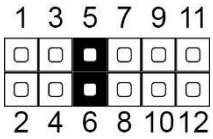
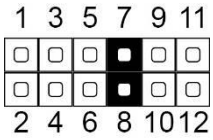
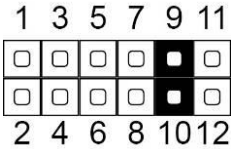
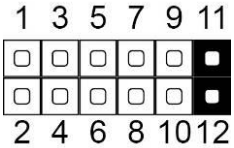
**Cash Drawer Power Setting**

| Function | JP4<br>(1-2) (3-4) (5-6) |
|---|---|
| +12V |  |
| ▲+19V<br>(for +24V Cash Drawer) |  |

**Power Mode Setting**

| Function | JP6<br>(1-2) |
|---|---|
| ▲ATX Power |  |
| AT Power |  |

**COM3 & COM4 Power Setting**

| Function | | JP3<br>(1-2) (3-4) (5-6) (7-8) (9-10) (11-12) |
|---|---|---|
| COM3 Pin10 | ▲RI |  |
| | +5V |  |
| | +12V |  |
| COM4 Pin10 | ▲RI |  |
| | +5V |  |
| | +12V |  |

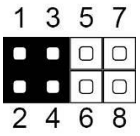
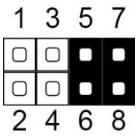
**CMOS Operation Mode**

| Function | JP8<br>(1-2) |
|---|---|
| ▲CMOS Normal |  |
| CMOS Reset |  |

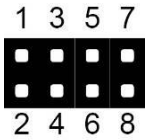
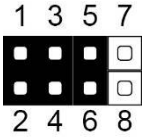
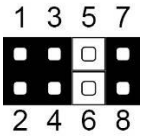
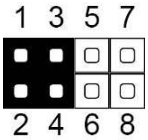
**USB Path Setting**

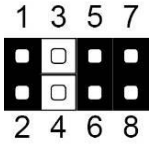
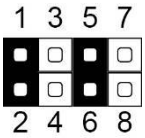
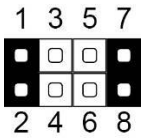
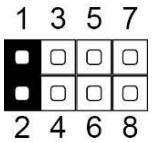
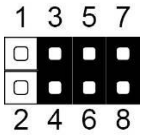
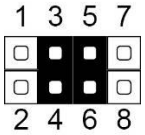
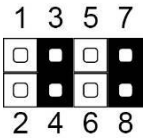
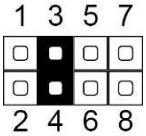
| Function | JP14 (1-2) |
|---|---|
| ▲To Docking |  |
| To MB |  |

**System Indicator**

| Function | JP13 (1-2) (3-4) (5-6) (7-8) |
|---|---|
| ▲Disable |  |
| Enable |  |

**LCD ID Setting**

| Panel # | Resolution | LVDS | | JP7 (1-2) (3-4) (5-6) (7-8) |
|---|---|---|---|---|
| | | Bits | Channel | |
| 1 | 640 x 480 | 18 | Single |  |
| 2 | 800 x 600 | 18 | Single |  |
| 3 | 1024 x 768 | 18 | Single |  |
| 4 | 1280 x 1024 | 24 | Dual |  |

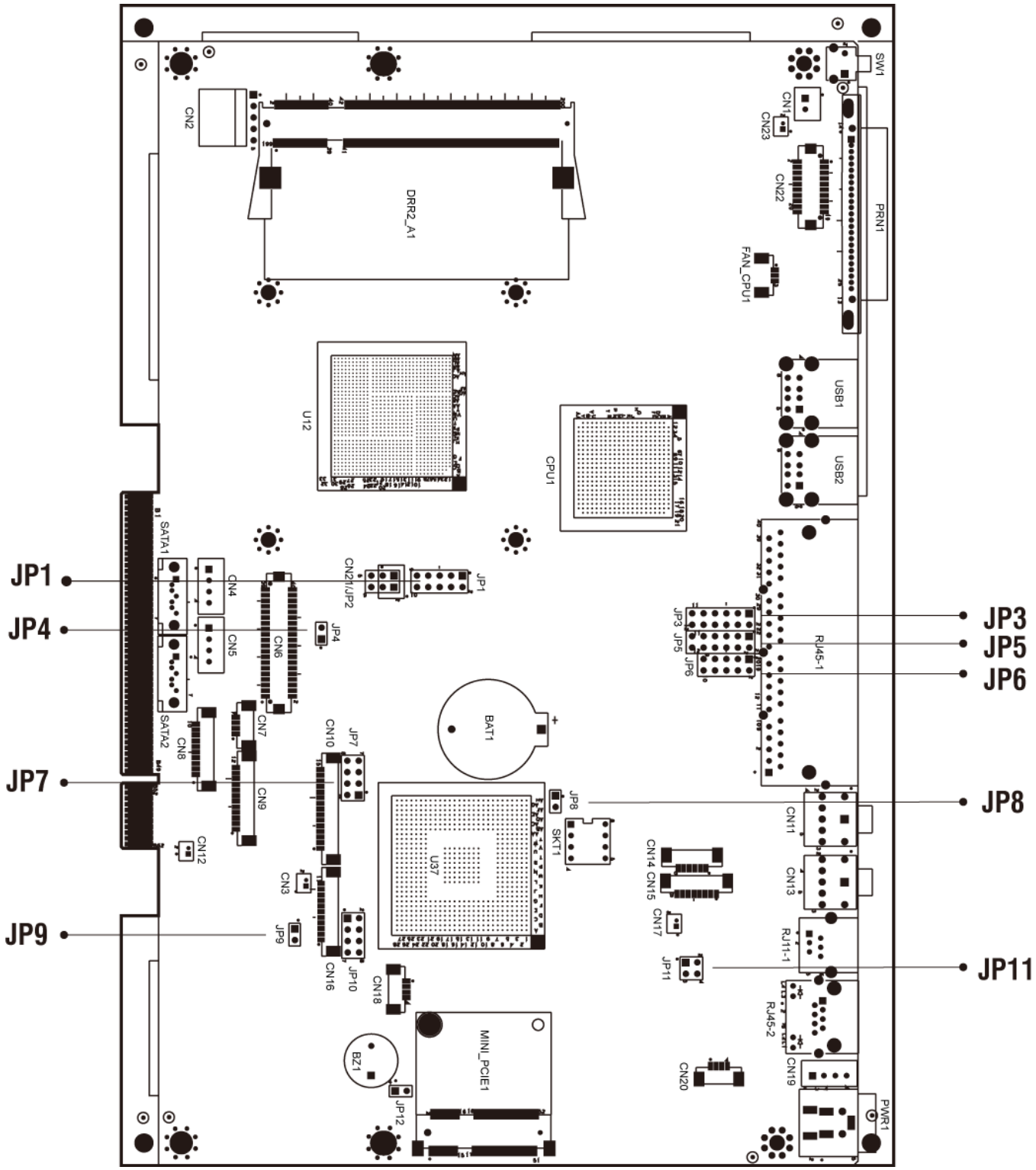
| | | | | |
|---|---|---|---|---|
| 5 | 1024 x 768 | 24 | Single |   |
| 6 | 800 x 600 | 24 | Single |   |
| 7 | 800 x 600 | 18 | Single |   |
| 8 | 800 x 600 | 18 | Single |   |
| 9 | 1024 x 768 | 24 | Single |   |
| 10 | 1440 x 900 | 24 | Dual |   |
| 11 | 1280 x 1024 | 24 | Dual |   |
| 12 | 1440 x 900 | 18 | Dual |   |

***** Panel ID #8 is only applied for Sharp 12” LQ121S1LG41 / LQ121S1LG42 panel.

▲ = Manufacturer Default Setting  OPEN  SHORT

# 7-2 B68 Motherboard

## 7-2-1 Motherboard Layout

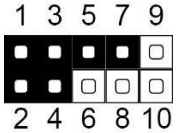
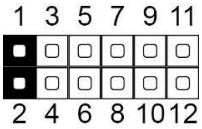
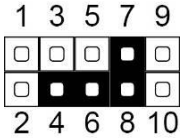
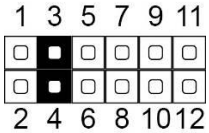
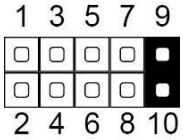
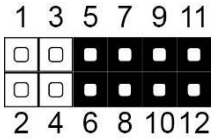


## 7-2-2 Connectors & Functions

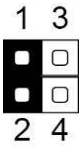
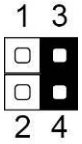
| Connector | Function |
|---|---|
| BAT1 | CMOS Battery Base ( Use CR2023) |
| CN1 | Power On Button |
| CN2 | Touch Sensor |
| CN3 | Power LED |
| CN4 | SATA1 HDD Power Connector |
| CN5 | SATA2 HDD Power Connector |
| CN6 | LCD Interface Connector |
| CN7 | IrDA Connector |
| CN8 | For External Touch Connector |
| CN9 | Inverter Connector |
| CN10 | Card Reader Connector |
| CN11 | Line Out |
| CN12 | LED Power |
| CN13 | MIC In |
| CN14 | Speaker & MIC CONN |
| CN15 | CD-IN CONN |
| CN17 | LAN LED |
| CN18 | USB5 |
| CN19 | DC-Jack |
| CN20 | PS2 KEYBOARD |
| DDR2_A1 | DDR2 SO-DIMM1 |
| DDR2_A2 | DDR2 SO-DIMM2 |
| PRN1 | Parallel Port |
| PWR1 | +19V Power Adaptor |
| RJ11_1 | Cash Drawer Connector |
| RJ45_1 | COM1, COM2, COM3, COM4 |
| RJ45_2 | LAN (on Board) |
| SATA1 | SATA Connector |
| SATA2 | SATA Connector |
| SKT1 | SPI ROM |
| USB1 | USB1, USB2 |
| USB2 | USB3, USB4 |
| SW1 | Power On Bottom |
| JP1 | CRT Connector |
| JP3 | COM3/COM4 Power Setting |
| JP4 | VGA Power Setting |
| JP5 / 6 | COM2 RS232/485/422 Setting |
| JP7 | LCD ID Setting |
| JP8 | RTC Reset |
| JP9 | Power Mode Setting |
| JP11 | Cash Drawer Power Setting |

## 7-2-3 Jumper Setting

**COM2 RS232/485/422 Setting**

| Function | JP6<br>(1-2) (3-4) (4-6) (5-7) (7-8) (9-10) | JP5<br>(1-2) (3-4) (5-6) (7-8) (9-10) (11-12) |
|---|---|---|
| ▲RS232 |  |  |
| RS485 |  |  |
| RS422 |  |  |

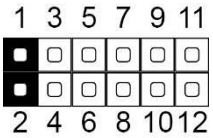
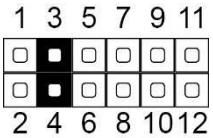
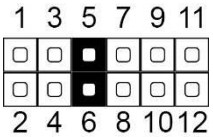
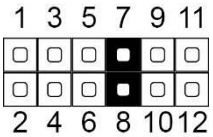
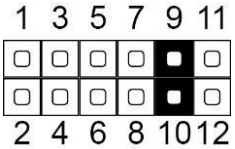
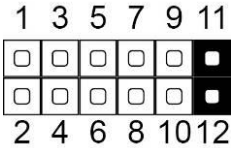
**Cash Drawer Power Setting**

| Function | JP11<br>(1-2, 3-4) |
|---|---|
| +12V |  |
| ▲+19V<br>(for +24V Cash Drawer) |  |

**Power Mode Setting**

| Function | JP9<br>(1-2) |
|---|---|
| ▲ATX Power |  |
| AT Power |  |

**COM3 & COM4 Power Setting**

| Function | | JP3<br>(1-2) (3-4) (5-6) (7-8) (9-10) (11-12) |
|---|---|---|
| COM3 Pin30 | ▲RI |  |
| | +5V |  |
| | +12V |  |
| COM4 Pin40 | ▲RI |  |
| | +5V |  |
| | +12V |  |

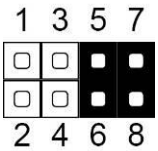
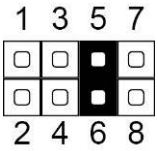
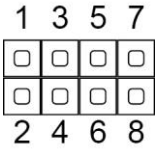
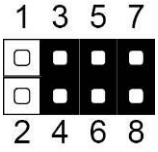
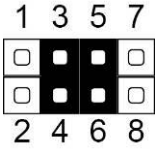
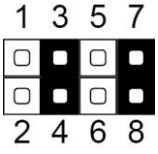
**CMOS Operation Mode**

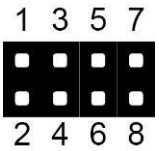
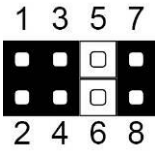
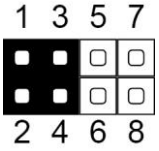
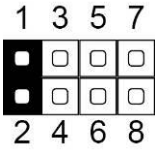
| Function | JP8<br>(1-2) |
|---|---|
| ▲CMOS Normal |  |
| CMOS Reset |  |

**VGA Power Setting**

| Function | JP4 (1-2) |
|---|---|
| ▲No Power |  |
| +12V |  |

**LCD ID Setting**

| Panel # | Resolution | LVDS | | Output Interface | JP7 (1-2) (3-4) (5-6) (7-8) |
|---|---|---|---|---|---|
| | | Bits | Channel | | |
| 1 | 1366 x 768 | 24 | Single | LVDS |  |
| 2 | 1440 x 900 | 24 | Dual | LVDS |  |
| 4 | 1920 x 1080 | 24 | Dual | LVDS |  |
| 5 | 1024 x 768 | 24 | Single | LVDS |  |
| 6 | 1280 x 1024 | 24 | Dual | LVDS |  |
| 7 | 800 x 600 | 24 | Single | LVDS |  |

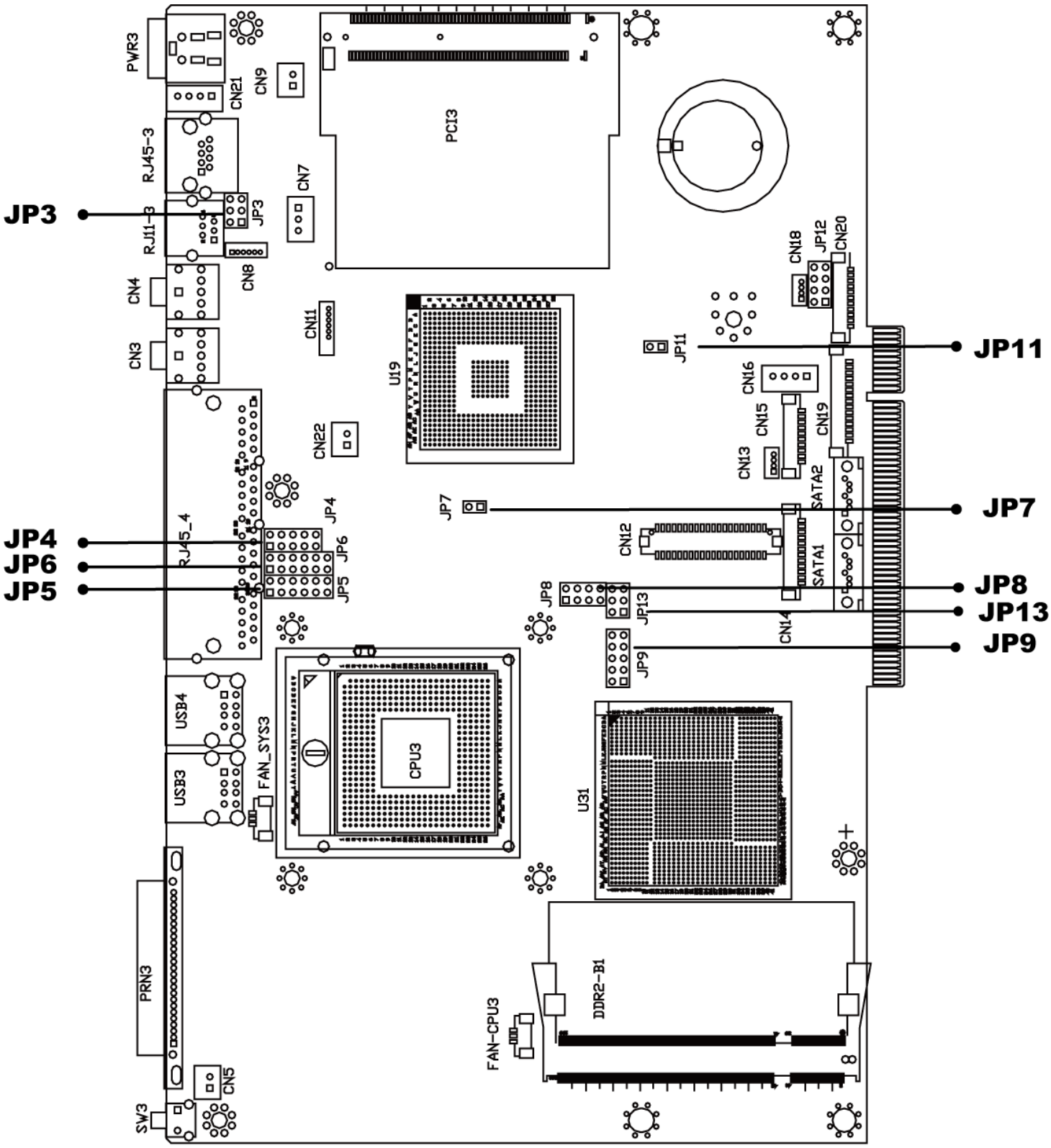
| | | | | | |
|---|---|---|---|---|---|
| 9 | 1024 x 768 | 18 | Single | LVDS |  |
| 11 | 800 x 600 | 18 | Single | LVDS |  |
| 12 | 800 x 600 | 18 | Single | LVDS |  |
| | | | | CRT |  |

*Panel ID #12 is only applied for Sharp 12” LQ121S1LG41 / LQ121S1LG42 panel.

▲ = Manufacturer Default Setting  OPEN  SHORT

# 7-3 B98 Motherboard

## 7-3-1 Motherboard layout

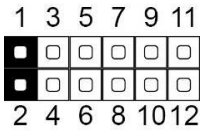
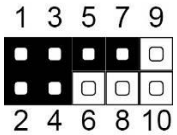
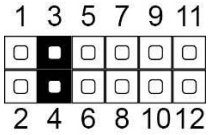
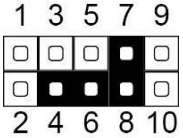
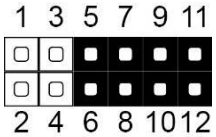
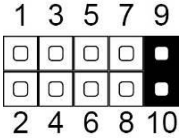


## 7-3-2 Connectors & Functions

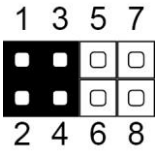
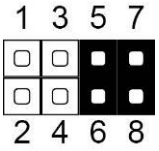
| Connector | Function |
|---|---|
| BAT3 | CMOS Battery Base (Use CR2023) |
| CN3 | Audio Line Out |
| CN4 | MIC In |
| CN5 | Internal Power On Switch Connector |
| CN8 | Speaker & MIC Connector |
| CN11 | CD-IN / Line-In Connector |
| CN12 | LCD Interface Connector |
| CN14 | Inverter Connector |
| CN15 | COM5 for Touch |
| CN16 | Power Connector For HDD |
| CN18 | USB5 |
| CN19 | Card Reader Connector |
| CN21 | Internal Input Power Connector |
| CN22 | Hardware Reset |
| DDR2_A1 | DDR2 SO-DIMM |
| DDR2_B1 | DDR2 SO-DIMM |
| FAN_CPU3 | CPU FAN Connector |
| FAN_SYS3 | System FAN Connector |
| MINI_PCIE3 | Mini PCI-E Socket |
| PCI3 | Mini PCI Socket |
| PRN3 | Parallel Port |
| PWR3 | +19V Power Adaptor |
| RJ45_3 | LAN (On Board) |
| RJ45_4 | COM1, COM2, COM3, COM4 |
| SATA1 | SATA Connector |
| SATA2 | SATA Connector |
| SKT1 | SPI ROM |
| SW3 | Power On Button |
| USB3 | USB1, USB2 |
| USB4 | USB3, USB4 |
| JP3 | Cash Drawer Power Setting |
| JP4 / 6 | COM2 RS232/485/422 Setting |
| JP5 | COM3/COM4 Power Setting |
| JP7 | CMOS Operation Mode |
| JP8 | LCD ID Setting |
| JP9 | VGA Port |
| JP11 | Power Mode Setting |
| JP12 | System Indicator |
| JP13 | VGA Power |

## 7-3-3 Jumper Setting

**COM2 RS232/485/422 Setting**

| Function | JP6<br>(1-2) (3-4) (5-6) (7-8) (9-10) (11-12) | JP4<br>(1-2) (3-4) (4-6) (5-7) (7-8) (9-10) |
|---|---|---|
| ▲RS232 |  |  |
| RS485 |  |  |
| RS422 |  |  |

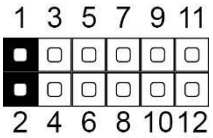
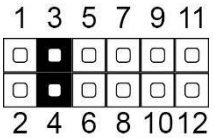
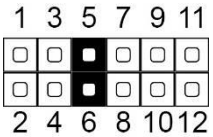
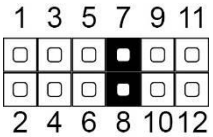
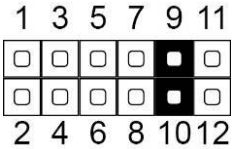
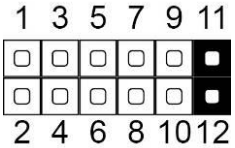
**System Indicator**

| Function | JP12<br>(1-2) (3-4) 5-6)(7-8) |
|---|---|
| Disable |  |
| ▲Enable |  |

**Power Mode Setting**

| Function | JP11<br>(1-2) |
|---|---|
| ▲ATX Power |  |
| AT Power |  |

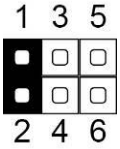
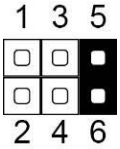
**COM3 & COM4 Power Setting**

| Function | | JP5<br>(1-2) (3-4) (5-6) (7-8) (9-10) (11-12) |
|---|---|---|
| COM3 Pin10 | ▲RI |  |
| | +5V |  |
| | +12V |  |
| COM4 Pin10 | ▲RI |  |
| | +5V |  |
| | +12V |  |

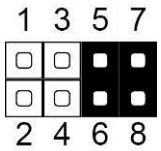
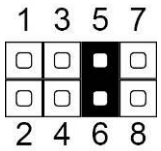
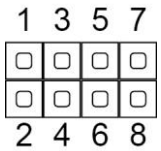
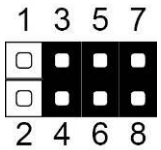
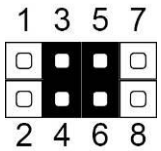
**CMOS Operation Mode**

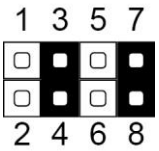
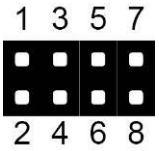
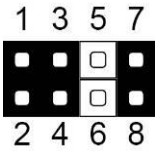
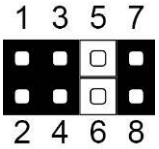
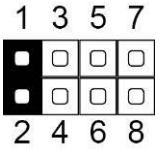
| Function | JP7<br>(1-2) |
|---|---|
| ▲CMOS Normal |  |
| CMOS Reset |  |

**Cash Drawer Power Setting**

| Function | JP3<br>(1-2) (3-4) 5-6) |
|---|---|
| +12V |  |
| ▲+19V<br>(for +24V Cash Drawer) |  |

**LCD ID Setting**

| Panel # | Resolution | LVDS | | Output Interface | JP8<br>(1-2) (3-4) (5-6) (7-8) |
|---|---|---|---|---|---|
| | | Bits | Channel | | |
| 1 | 1366 x 768 | 24 | Single | LVDS |  |
| 2 | 1440 x 900 | 24 | Dual | LVDS |  |
| 4 | 1920 x 1080 | 24 | Dual | LVDS |  |
| 5 | 1024 x 768 | 24 | Single | LVDS |  |
| 6 | 1280 x 1024 | 24 | Dual | LVDS |  |

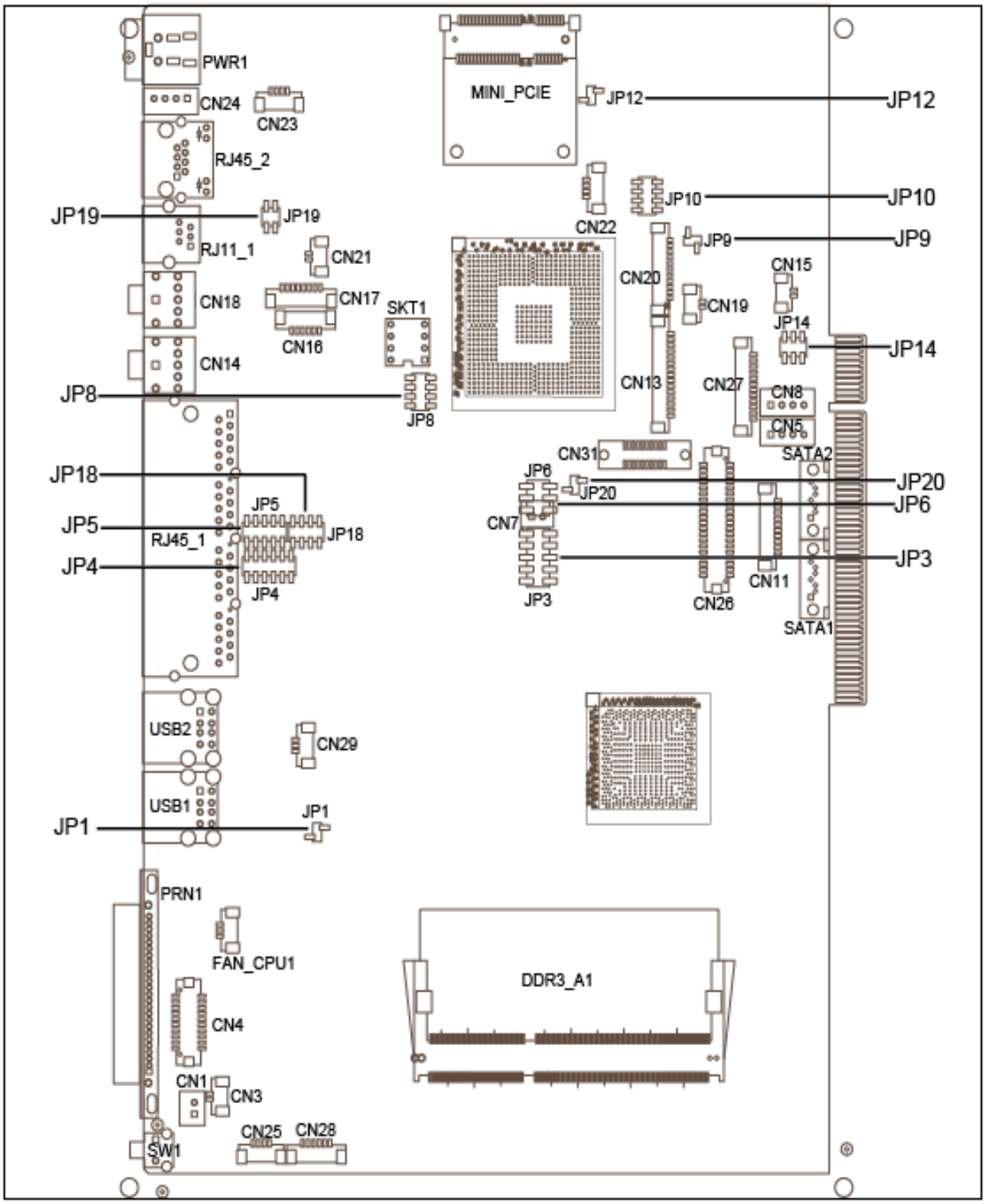
| | | | | | |
|---|---|---|---|---|---|
| 7 | 800 x 600 | 24 | Single | LVDS |  |
| 9 | 1024 x 768 | 18 | Single | LVDS |  |
| 11 | 800 x 600 | 18 | Single | LVDS |  |
| 12 | 800 x 600 | 18 | Single | LVDS |  |
| | | | | CRT |  |

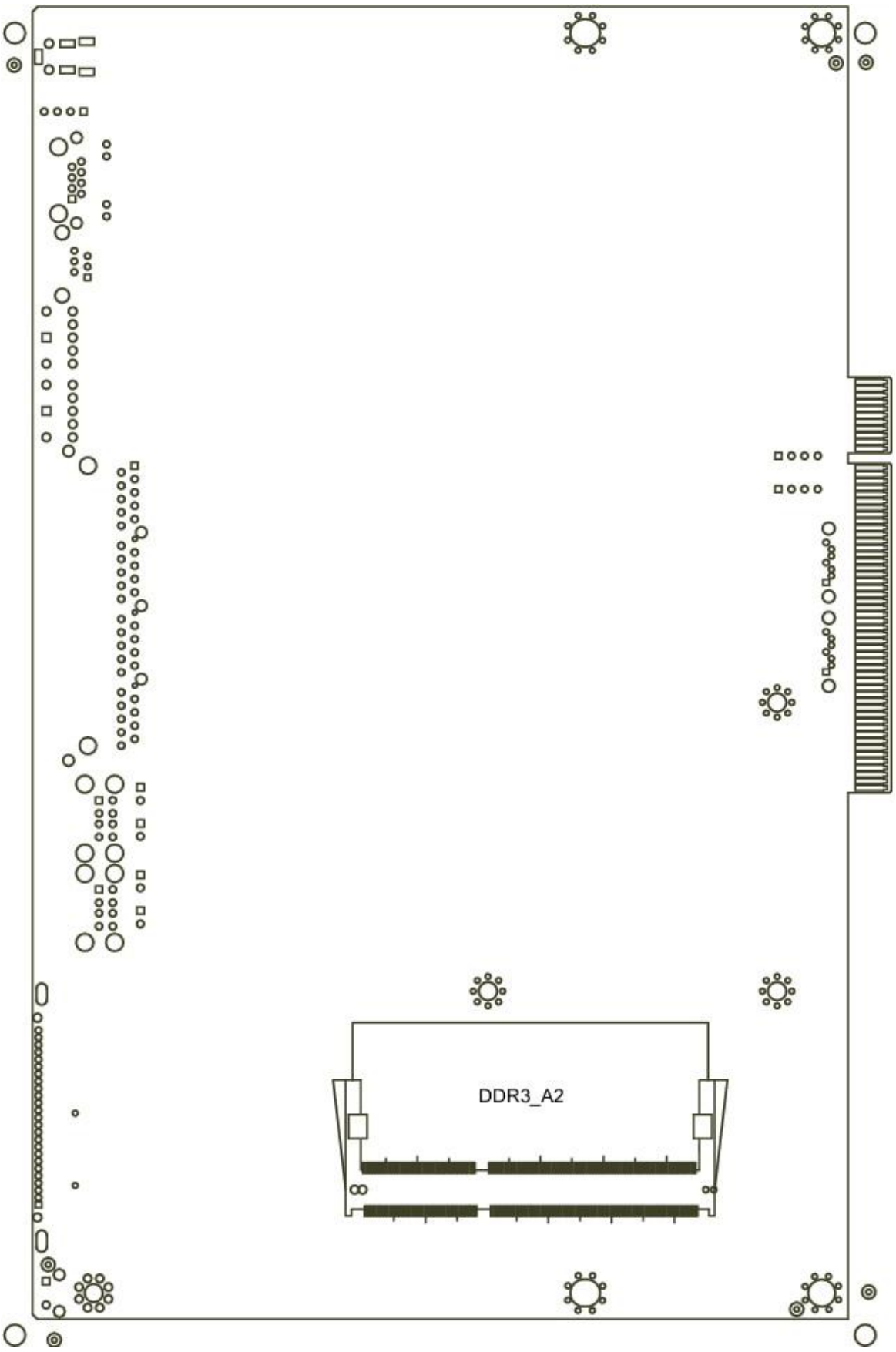
***** Panel ID #12 is only applied for Sharp 12” LQ121S1LG41 / LQ121S1LG42 panel.

▲ = Manufacturer Default Setting  OPEN  SHORT

# 7-4 C48 Motherboard

## 7-4-1 C48 Motherboard Layout



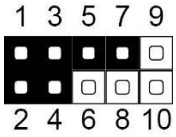
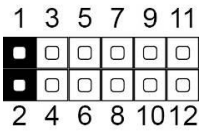
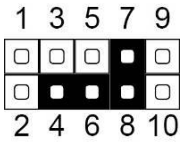
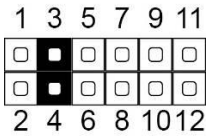
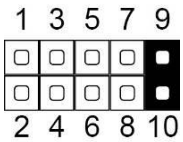
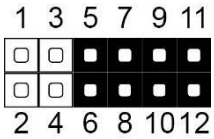

DDR3_A2

## 7-4-2 Connectors & Functions

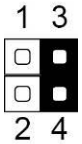
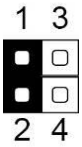
| Connector | Function |
|---|---|
| CN1 | Power Button Connector |
| CN3 | Printer Port Reset |
| CN4 | Printer Port |
| CN5/8 | HDD Power |
| CN11 | COM5 For Touch |
| CN13 | Card Reader Connector |
| CN14 | Line out |
| CN15 | HDD LED |
| CN16 | Speaker & MIC |
| CN18 | MIC IN |
| CN20/JP10 | System Indicator |
| CN22 | USB Port |
| CN23 | PS2 KEYBOARD |
| CN26 | LVDS |
| CN27 | Inverter Connector |
| CN29 | System Fan |
| DDR3_A1 | DDR3 SO-DIMM1 |
| DDR3_A2 | DDR3 SO-DIMM2 |
| PRN1 | Parallel Port |
| PWR1 | +19V DC Jack |
| RJ11_1 | Cash Drawer Connector |
| RJ45_1 | COM1, COM2, COM3, COM4 |
| RJ45_2 | LAN |
| SATA1 | SATA Connector |
| SATA2 | SATA Connector |
| USB1 | USB1, USB2 |
| USB2 | USB3, USB4 |
| SW1 | Power Button |
| JP1 | CMOS Operation Mode |
| JP3/6 | VGA Port |
| JP4/5 | COM2 RS232/485/422 Setting |
| JP8 | LCD ID Setting |
| JP9 | Power Mode Setting |
| JP12 | System Reset |
| JP14 | Inverter Selection |
| JP18 | COM3/4 Power Setting |
| JP19 | Cash Drawer Power Setting |

## 7-4-3 Jumper Setting

### COM2 RS232/485/422 Setting

| Function | JP5<br>(1-2) (3-4) (4-6) (5-7) (7-8) (9-10) | JP4<br>(1-2) (3-4) (5-6) (7-8) (9-10) (11-12) |
|---|---|---|
| ▲RS232 |  |  |
| RS485 |  |  |
| RS422 |  |  |

### Cash Drawer Power Setting

| Function | JP19<br>(1-2) (3-4 |
|---|---|
| +12V |  |
| ▲+19V<br>(for +24V Cash Drawer) |  |

### Power Mode Setting

| Function | JP9<br>(1-2) |
|---|---|
| ▲ATX Power |  |
| AT Power |  |

**System Reset**

| Function | JP12 (1-2) |
|---|---|
| ▲System Normal |  |
| System Reset |  |

**Inverter Selection**

| Function | JP14 (1-2) |
|---|---|
| CCFL |  |
| ▲LED |  |

## CMOS Operation Mode

### CMOS Reset

To clear the CMOS,

1. Remove the power cable from the system.
2. Open the system, and set the 'CMOS Operation jumper' from 'CMOS Normal' to 'CMOS Reset'. (refer to the jumper shown below)
3. Connect the power cable to the system, and **power on the system:**
   in ATX mode: press the power button and it will fail power on
   in AT mode: turn on system power
4. Remove the power cable from the system.
5. Return the "CMOS Operation mode" jumper setting from "CMOS Reset" to "CMOS normal".
6. Connect the power cable and power on the system.

**CMOS Operation Mode**

| Function | JP1 (1-2) |
|---|---|
| ▲CMOS Normal |  |
| CMOS Reset |  |

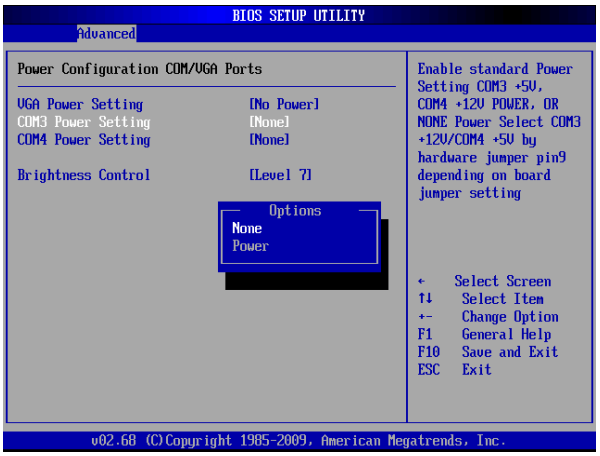
## COM3 & COM4 Power Setting

COM3 and COM4 can be set to provide power to your serial device.
The voltage can be set to +5V or 12V by setting jumper JP18 on the motherboard.
When enabled, the power is available on pin 10 of the RJ45 serial connector.
If you use the serial RJ45 to DB9 adapter cable, the power is on pin 9 of the DB9 connector. By default, the power option is **disabled** in the BIOS.

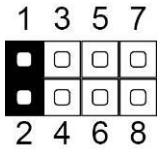
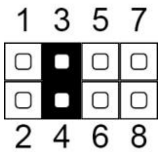
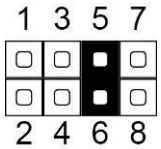
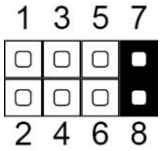
### Enable COM3/COM4 power in BIOS

1. Power on the system, and press the <DEL> key when the system is booting up to enter the BIOS Setup utility.
2. Select the Advanced tab
3. Select **Power Configuration COM/VGA** Ports and press <Enter> to go to display the available options.

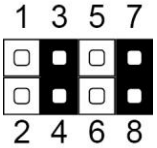
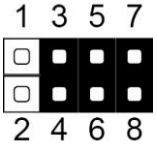
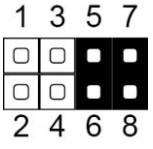
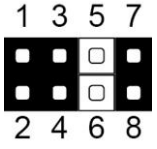

4. To enable the power, select **COM3 Power Setting or COM4 Power setting** and press <Enter>. Select **Power** and press <Enter>.
   Save the change by pressing F10

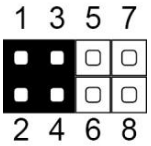
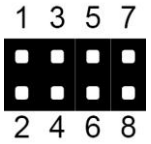
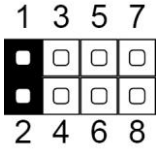


**COM3 & COM4 Power Setting**

| Function | | JP18 (1-2) (3-4) (5-6) (7-8) |
|---|---|---|
| COM3 | +5V |   |
| | ▲+12V |   |
| COM4 Pin40 | +5V |   |
| | ▲+12V |   |

**LCD ID Setting**

| Resolution | LVDS | | Output Interface | JP8 (1-2) (3-4) (5-6) (7-8) |
|---|---|---|---|---|
| | Bits | Channel | | |
| 800 x 600 | 24 | Single | 1st: LCD Panel<br>2nd: VGA Port |   |
| ▲1024 x 768 | 24 | Single | |   |
| 1366 x 768 | 24 | Single | |   |
| 800 x 600 | 18 | Single | |   |

| | | | | |
|---|---|---|---|---|
| 800 x 600 | 18 | Single | |   |
| 1024 x 768 | 18 | Single | |   |
| 1280 x 1024 | 24 | Dual | 1st: LCD Panel |   |

* specialized for Sharp 12.1" LQ121S1LG41/LQ121S1LG42 panel.

▲ = Manufacturer Default Setting  OPEN  SHORT

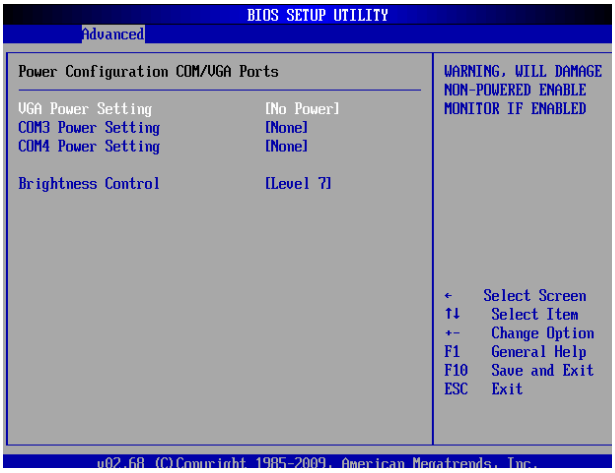
### 2nd VGA Power Setting

VGA port power must be on through BIOS/Utility for default is "No Power"

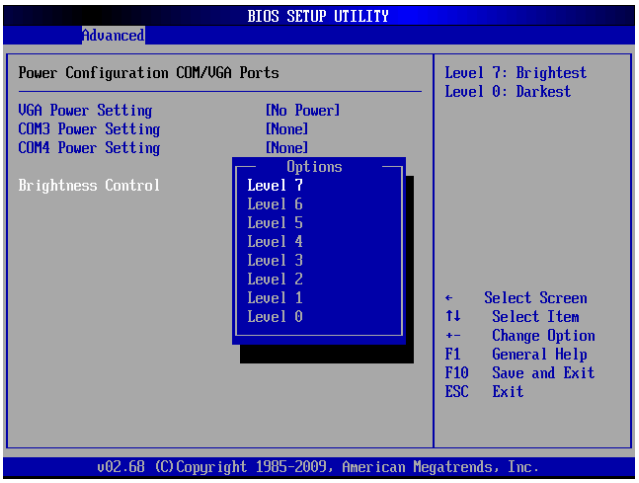
### Enable 2nd VGA Power in BIOS

1. Power on the system, and press the <DEL> key when the system is booting up to enter the BIOS Setup utility.
2. Select the Advanced tab
3. Select "Power Configuration COM/VGA Ports" and press <Enter> to go to display the available options.


4. To switch on the power, select "+12V" press <Enter>. Please Save the change by pressing F10

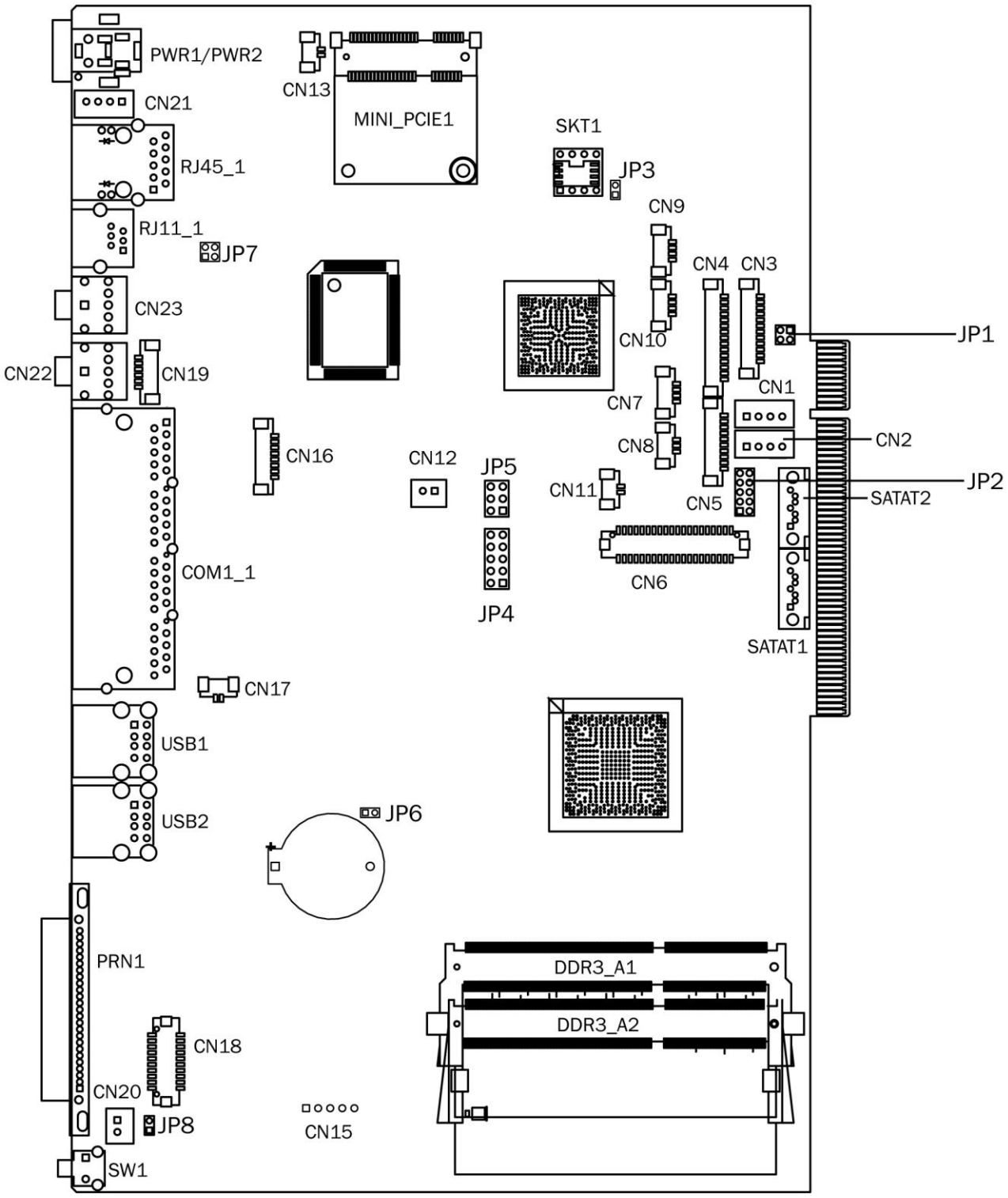


5. To switch brightness level, select brightness control and choose level. Please save the change before exiting BIOS to avoid data lost.



# 7-5 C58 Motherboard

## 7-5-1 Motherboard Layout

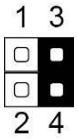
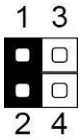


## 7-5-2 Connectors & Functions

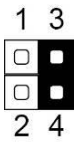
| Connector | Function |
|---|---|
| CN1/2 | SATA Power CONN |
| CN3 | Inverter Selection |
| CN4 | Card Reader |
| CN5 | COM5 Touch |
| CN6 | LVDS |
| CN7 | PS2 K/B |
| CN9/10 | USB |
| CN11 | STAT LED |
| CN15 | Touch Sensor |
| CN17 | Power LED |
| CN19 | Speaker & MIC-IN |
| CN20 | Power Button |
| CN22 | Power Adaptor CONN |
| CN22 | Line-out |
| CN23 | Mic-in |
| BAT1 | CMOS battery |
| COM1_1 | COM1~4 |
| PRN1 | Printer Port |
| PWR2 | Adaptor |
| RJ11_1 | Cash Drawer |
| RJ45_1 | LAN |
| SATA1/SATA2 | SATA CONN |
| USB1/USB2 | USB |
| JP1 | Inverter Selection |
| JP2 | LCD ID Setting |
| JP4/JP5 | CRT |
| JP7 | Cash Drawer Power Setting |

## 7-5-3 Jumper Setting

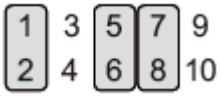
**Inverter Selection**

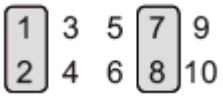
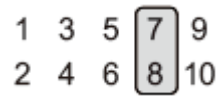
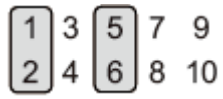
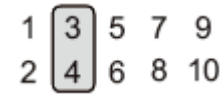
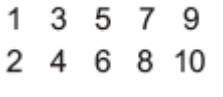
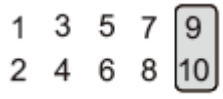
| Function | JP1<br>(1-2) |
|---|---|
| CCFL |  |
| ▲LED |  |

**Cash Drawer Power Setting**

| Function | JP7<br>(1-2) (3-4) |
|---|---|
| +12V |  |
| ▲+19V<br>(for +24V Cash Drawer) |  |

**LCD ID Setting**

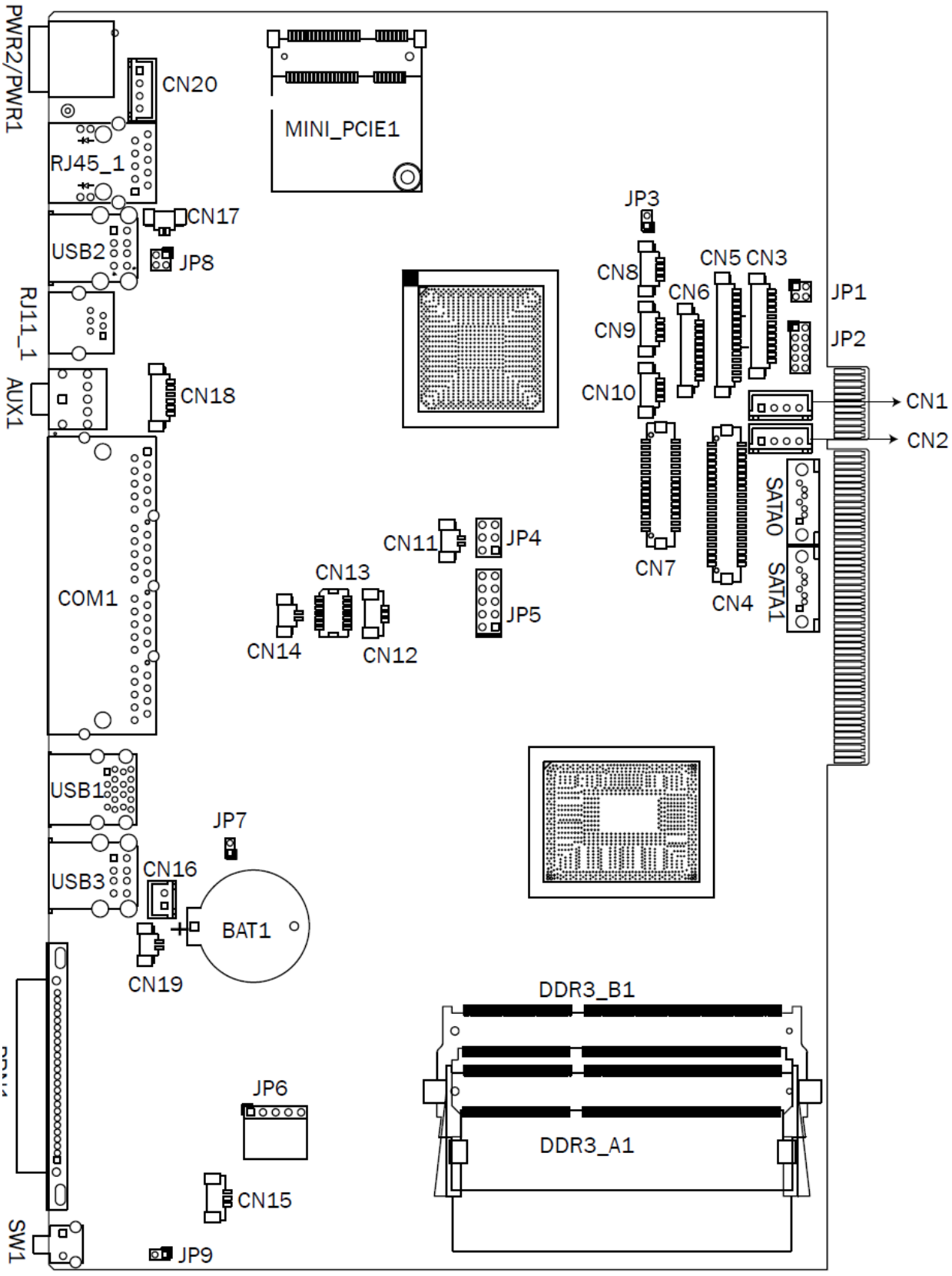
| Panel # | Resolution | LVDS | | Output Interface | JP2<br>(1-2) (3-4) (5-6)<br>(7-8)(9-10) |
|---|---|---|---|---|---|
| | | Bits | Channel | | |
| 1 | 800 x 600 | 18 | Single | LVDS |  |
| 2 | 800 x 600 | 18 | Single | LVDS |  |
| 3 | 800 x 600 | 24 | Single | LVDS |  |

| Panel # | Resolution | LVDS | | Output Interface | JP2 (1-2) (3-4) (5-6) (7-8)(9-10) |
|---|---|---|---|---|---|
| | | Bits | Channel | | |
| 6 | 800 x 600 | 24 | Single | LVDS |  |
| 4 | 1024 x 600 | 18 | Single | LVDS |  |
| 5 | 1024 x 768 | 18 | Single | LVDS |  |
| 7 | 1024 x 768 | 24 | Single | LVDS |  |
| 9 | 1280 x 1024 | 24 | Dual | LVDS |  |
| 10 | 1366 x 768 | 18 | Single | LVDS |  |
| 11 | 1366 x 768 | 24 | Single | LVDS |  |
| 13 | 1440 x 900 | 24 | Dual | LVDS |  |
| 15 | 1920 x 1080 | 24 | Dual | LVDS |  |
| | | | | CRT |  |

▲ = Manufacturer Default Setting  OPEN  SHORT

# 7-6 C78 Motherboard

## 7-6-1 Motherboard Layout

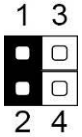


## 7-6-2 Connectors & Functions

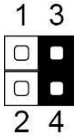
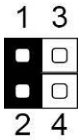
| Connector | Function |
|---|---|
| CN1/2 | SATA Power Connector |
| CN3 | Inverter |
| CN4 | LVDS |
| CN5 | MSR Connector |
| CN7 | DVI Connector |
| CN8/9 | USB Connector |
| CN10 | USB |
| CN10 | PS2 Keyboard |
| CN11 | HDD LED |
| CN16 | Power On Connector |
| CN17 | LAN LED |
| CN18 | Speaker & MIC Connector |
| CN19 | Power LED |
| CN20 | Power Adaptor Connector |
| BAT1 | CMOS battery |
| COM1_1 | COM1~4 |
| PRN1 | Printer Port |
| PWR2 | DC Jack |
| RJ11_1 | Cash Drawer Port |
| RJ45_1 | LAN |
| SATA0/SATA1 | SATA CONN |
| USB1 | USB3.0 |
| USB2/USB3 | USB2.0 |
| JP1 | Inverter Selection |
| JP2 | LCD ID Setting |
| JP4/5 | CRT Connector |
| JP6 | Touch Connector |
| JP8 | Cash Drawer Power Setting |

## 7-6-3 Jumper Setting

**Inverter Selection**

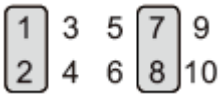
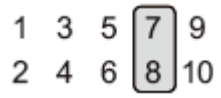
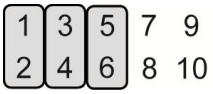
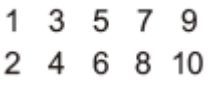
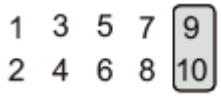
| Function | JP1 (1-2) |
|---|---|
| CCFL |   |
| ▲LED |   |

**Cash Drawer Power Setting**

| Function | JP8 (1-2, 3-4) |
|---|---|
| +12V |   |
| ▲+19V<br>(for +24V Cash Drawer) |   |

**LCD ID Setting**

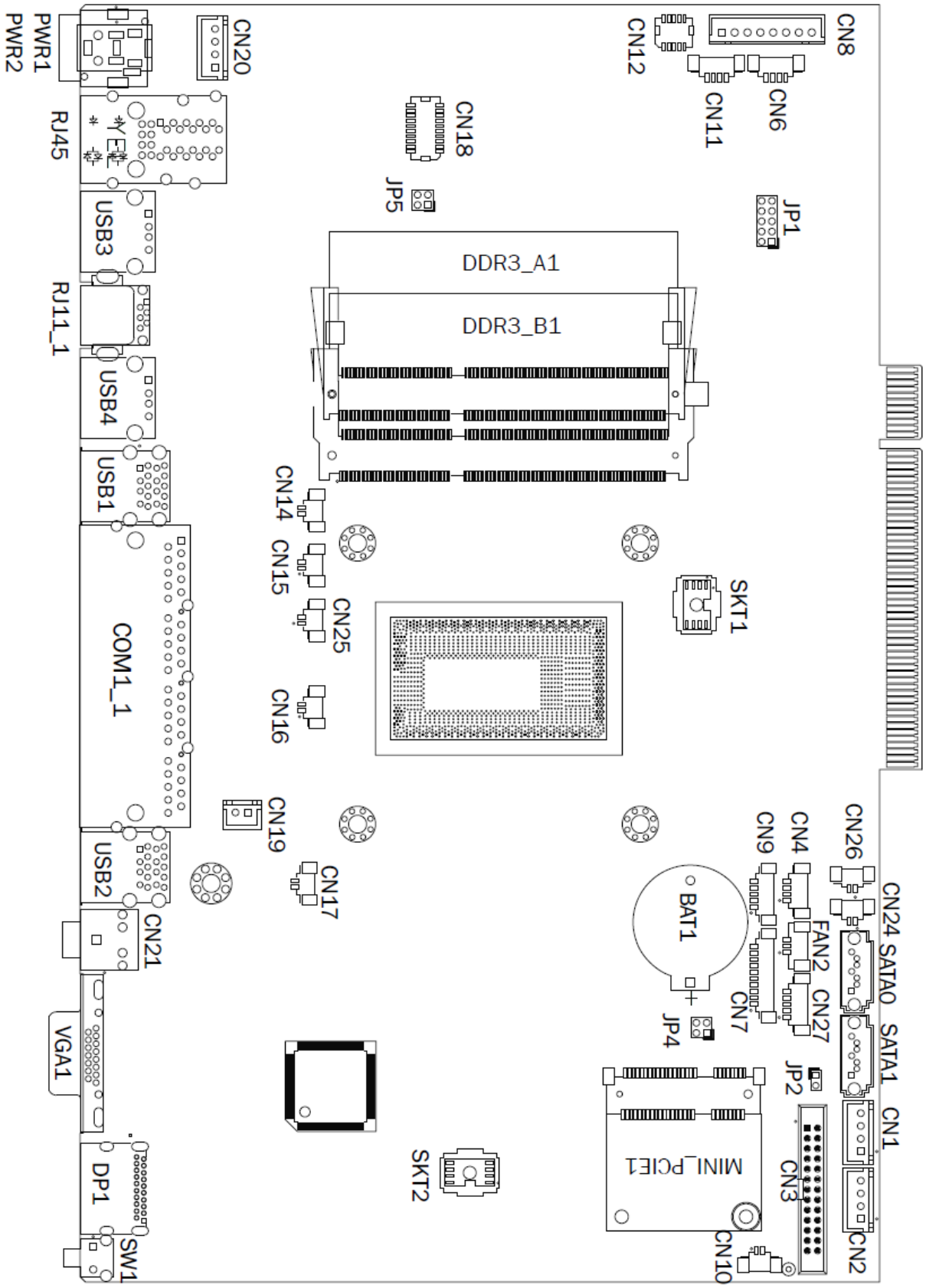
| Panel # | Resolution | LVDS | | Output Interface | JP2 (1-2) (3-4) (5-6) (7-8)(9-10) |
|---|---|---|---|---|---|
| | | Bits | Channel | | |
| 1 | 800 x 600 | 18 | Single | LVDS |   |
| 2 | 800 x 600 | 24 | Single | LVDS |   |

| | | | | | |
|---|---|---|---|---|---|
| 3 | 1024 x 768 | 18 | Single | LVDS |  |
| 4 | 1024 x 768 | 24 | Single | LVDS |  |
| 5 | 1366 x 768 | 18 | Single | LVDS |  |
| 6 | 1366 x 768 | 24 | Single | LVDS |  |
| 7 | 1024 x 600 | 18 | Single | LVDS |  |
| 8 | 1280 x 1024 | 24 | Dual | LVDS |  |
| 9 | 1440 x 9008 | 24 | Dual | LVDS |  |
| 15 | 1920 x 1080 | 24 | Dual | LVDS |  |
| | | | | CRT |  |

▲ = Manufacturer Default Setting  OPEN  SHORT

# 7-7 Skylake Motherboard

## 7-7-1 Motherboard Layout

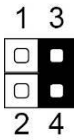
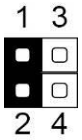


## 7-7-2 Connectors & Functions

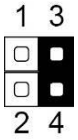
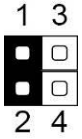
| Connector | Function |
|---|---|
| CN1,CN2 | SATA power |
| CN3 | Parallel port |
| CN4 | PS2 |
| CN5 | Speaker & Mic |
| CN6 | USB2.0 |
| CN7 | COM5 |
| CN8 | 24V Power board |
| CN9 | EC Debug port |
| CN10 | HDD LED |
| CN11 | USB2.0 for power USB |
| CN14 | COM3 LED |
| CN15 | COM4 LED |
| CN16 | CRT Power LED |
| CN17 | Power LED |
| CN18 | SDR |
| CN19 | Power on button |
| CN20 | 19V |
| CN21 | Audio jack |
| CN24 | Speaker L |
| CN25 | Mic |
| CN26 | Speaker R |
| CN27 | SDV |
| DDR3_A1 | DDR3L SODIMM |
| DDR3_B1 | DDR3L SODIMM |
| SATA0 | SATA |
| SATA1 | SATA |
| USB1 | USB3.0 |
| USB2 | USB3.0 |
| USB3 | USB2.0 |
| USB4 | USB2.0 |
| FAN2 | System fan |
| COM1_1 | COM port |
| VGA1 | CRT |
| DP1 | DP |
| RJ11_1 | Cash drawer |
| RJ45 | LAN |
| PWR1,PWR2 | 19V DC jack |
| JP1 | LCD ID setting |
| JP2 | Hardware reset |
| JP3 | Clear CMOS |
| JP4 | Inverter selection |
| JP5 | Cash drawer power seting |

## 7-7-3 Jumper Setting

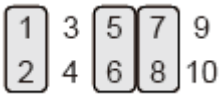
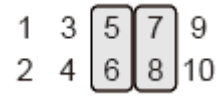
**Inverter Selection**

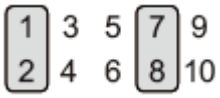
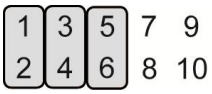
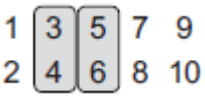
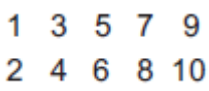
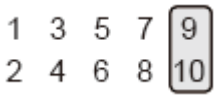
| Function | JP4 (1-2) |
|---|---|
| CCFL |   |
| ▲LED |   |

**Cash Drawer Power Setting**

| Function | JP5 (1-2, 3-4) |
|---|---|
| +12V |   |
| ▲+19V<br>(for +24V Cash Drawer) |   |

**LCD ID Setting**

| Panel Number | Resolution | LVDS | | Output Interface | JP1 (1-2) (3-4) (5-6) (7-8) (9-10) |
|---|---|---|---|---|---|
| | | Bits | Channel | | |
| 1 | 800 x 600 | 18 | Single | LVDS Panel |   |
| 2 | 800 x 600 | 24 | Single | LVDS Panel |   |
| 3 | 1024 x 768 | 18 | Single | LVDS Panel |   |

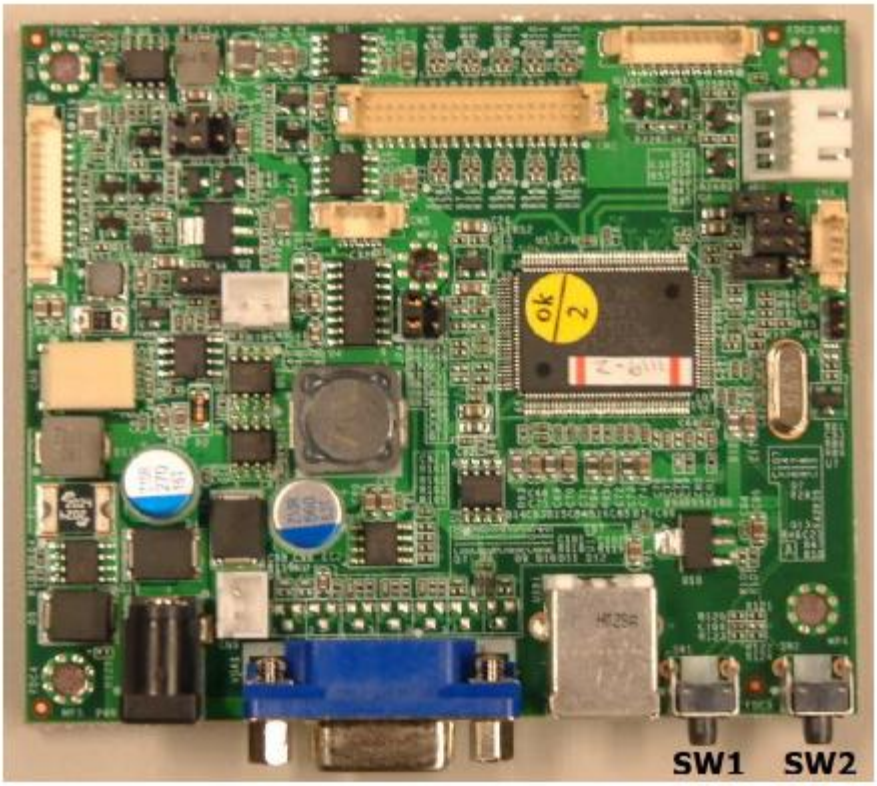
| | | | | | |
|---|---|---|---|---|---|
| 4 | 1024 x 768 | 24 | Single | LVDS Panel |  |
| 5 | 1366 x 768 | 18 | Single | LVDS Panel |  |
| 6 | 1366 x 768 | 24 | Single | LVDS Panel |  |
| 7 | 1024 x 600 | 18 | Single | LVDS Panel |  |
| 8 | 1280 x 1024 | 24 | Dual | LVDS Panel |  |
| 9 | 1440 x 900 | 24 | Dual | LVDS Panel |  |
| 15 | 1920 x 1080 | 24 | Dual | LVDS Panel |  |
| | | | | CRT |  |

▲ = Manufacturer Default Setting  OPEN  SHORT

# Appendix A: Drivers Installation

The shipping package includes a Driver CD in which you can find every individual driver and utility that enables you to install the drivers on the system.
Please insert the Driver CD into the drive and double click on the “index.htm” to select the models. You can refer to the drivers installation guide for each driver in the “Driver/Manual List”.

# Appendix B: OSD Functions for 2nd Display

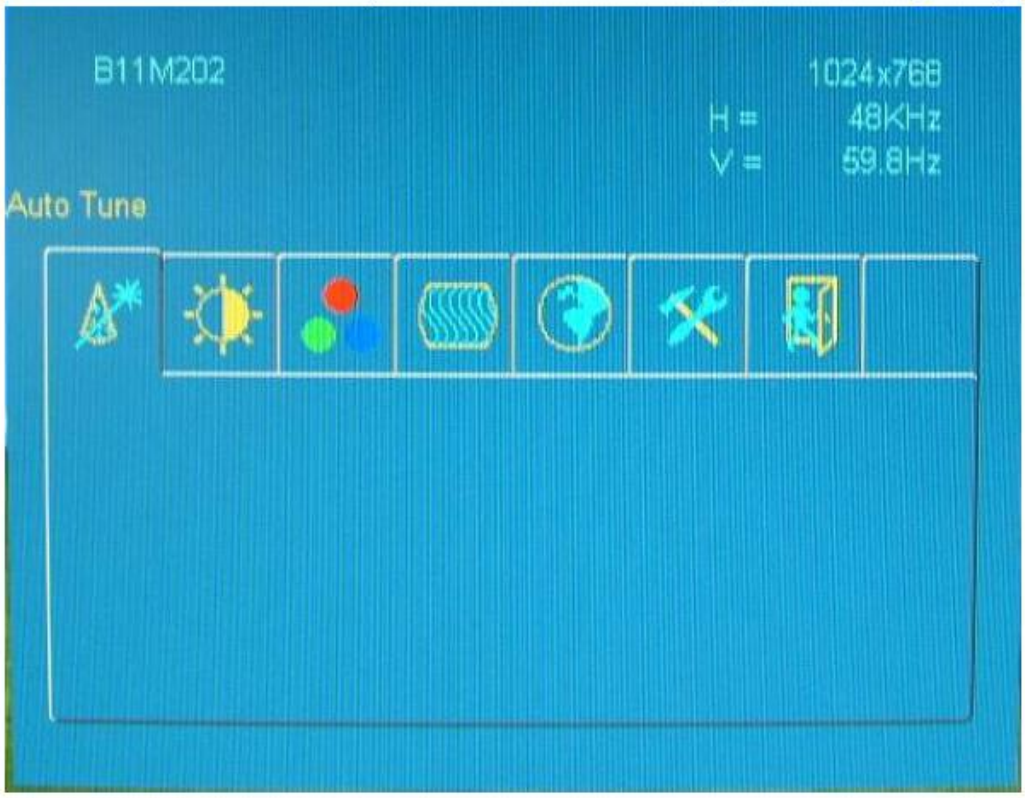



| Condition | SW1 | SW2 | SW1+SW2 |
|---|---|---|---|
| Normal Mode<br>(Signal Input Mode) | Power | Auto Tune | Menu Mode<br>(SW1 + SW2 keep press 3 seconds) |
| Menu Mode | Right | Select | No Function |

PS: 2 Key OSD only shifts to right when press SW1 key in menu mode.

(Ex: Brightness Value: 1→10→1)

1. In the signal input mode, keep pressing the SW1 + SW2 key 3 seconds at the same time.




2. Press the SW1 key to select video icon then press the SW2 key to enter brightness adjustment.

3. Press the SW1 key to adjust brightness value.

(Brightness value: 1→2→3→4.....10→1→2.....)


4. Menu mode window will automatically close when there is no command for 10 seconds.

# Appendix C: VFD Customer Display

## 1. Specification

| NO | Item | Description |
|---|---|---|
| 1 | Display method | Vacuum fluorescent display |
| 2 | Number of character | 40 characters<br>(20 columns x 2 lines) |
| 3 | Character font | 5 x 7 Dot matrix |
| 4 | Display color | Blue green |
| 5 | Brightness | 700 cd /m2 |
| 6 | Character type | 96 alphanumeric<br>25 kinds of international character set<br>1 user define character |
| 7 | Character size | 9.0mm x 5.25mm |
| 8 | Power supply | 12 ~ 24VDC<br>Manufacture offer +12V power adapter |
| 9 | Power consumption | 3 ~ 6 W |
| 10 | MTBF | 25000 hours (power on time) |
| 11 | Panel dimensions | 224 (W) x 93 (H) x 50(D) mm |
| 12 | Support dimensions | Long support : 22 cm<br>Short support : 9 cm |
| 13 | Base dimensions | 190(w)x55(h)x96(d)mm |
| 14 | Viewing angle | -5 ~ 60 degrees |
| 15 | Rotation angle | Maximum 270 degrees |

| | | |
|---|---|---|
| 16 | Weight | 1.25 Kg |
| 17 | Operating temperature | 5 ~ 45$^{o}$C |
| 18 | Operating Humidity | 30% ~ 85% |
| 19 | Storage Temperature | -10 ~ 55 $^{o}$C |
| 20 | Storage Humidity | 10% ~ 85% |

## 2. Interface

| | |
|---|---|
| **Data transmission** | Serial |
| **Synchronization** | Asynchronous |
| **Signal level** | MARK = -3 to –15 V (logic “1”)<br>SPACE = +3 to +15 V (logic “0”) |
| **Baud rates** | 4800, 9600, 19200, 38400 bps |
| **Parity** | None, even |
| **Bit length** | 8 bits |
| **Stop bits** | 1 bit |

# 3. Dip Switch and Software Setting

### 1.1. Command Type Selection

| SW1 | SW2 | SW3 | Command Type | Demo Mode Support | Default |
|---|---|---|---|---|---|
| ON | ON | ON | PS7300 | No | |
| OFF | ON | ON | EPSON ESC/POS | Yes | * |
| ON | OFF | ON | ADM 787/ ADM 788 | No | |
| OFF | OFF | ON | DSP800 | Yes | |
| ON | ON | OFF | AEDEX/ EMAX | No | |
| OFF | ON | OFF | UTC/P | No | |
| ON | OFF | OFF | UTC/S | No | |
| OFF | OFF | OFF | CD5220 | Yes | |

### 1.2. Baud Rate Selection

| SW8 | SW9 | Baud Rate (bps) | Default |
|---|---|---|---|
| ON | ON | 4800 | |
| OFF | ON | 9600 | * |
| ON | OFF | 19200 | |
| OFF | OFF | 38400 | |

### 1.3. Parity Check Selection

| SW10 | Parity Check | Default |
|---|---|---|
| ON | None-parity | * |
| OFF | Even-parity | |

## 1.4. Command Control

| SW12 | Function |
|---|---|
| ON | Depends on SW1~SW11 setting |
| OFF | Bypass SW1~SW11 setting, fixed at:<br>➢ Command type: POS7300,<br>➢ Baud rate: 9600<br>➢ Parity check: None-parity<br>➢ Demo mode: Disable |

## 1.5. International Character Set

| ID | SW 4 | SW 5 | SW 6 | SW 7 | SW 11 | Character Set (20h – 7Fh) | Code Table (80H-FFH) | Default | Note |
|---|---|---|---|---|---|---|---|---|---|
| 0 | ON | ON | ON | ON | OFF | U.S.A. | CP-437 (USA, Standard Europe) | * | |
| 1 | OFF | ON | ON | ON | OFF | FRANCE | CP-858 (Multilingual + Euro Symbol) | | |
| 2 | ON | OFF | ON | ON | OFF | GERMANY | | | |
| 3 | OFF | OFF | ON | ON | OFF | U.K. | | | |
| 4 | ON | ON | OFF | ON | OFF | DENMARK I | | | |
| 5 | OFF | ON | OFF | ON | OFF | SWEDEN | | | |
| 6 | ON | OFF | OFF | ON | OFF | ITALY | | | |
| 7 | OFF | OFF | OFF | ON | OFF | SPAIN | | | |
| 8 | ON | ON | ON | OFF | OFF | JAPAN | Katakana | | |
| 9 | OFF | ON | ON | OFF | OFF | NORWAY | CP-858 (Multilingual + Euro Symbol) | | |
| 10 | ON | OFF | ON | OFF | OFF | DENMARK II | | | |
| 11 | OFF | OFF | ON | OFF | OFF | Slawie | | | |
| 12 | ON | ON | OFF | OFF | OFF | RUSSIA | | | |
| 13 | OFF | ON | OFF | OFF | OFF | U.S.A. | CP-860 (Portuguese) | | |
| 14 | ON | OFF | OFF | OFF | OFF | U.K. | Greek | | |
| 15 | OFF | OFF | OFF | OFF | OFF | U.S.A. | CP-852 (Hungary) | | |
| 16 | ON | ON | ON | ON | ON | U.S.A. | CP-862 (Hebrew) | | |
| 17 | OFF | ON | ON | ON | ON | U.S.A. | CP-863 (Canadian-French) | | |
| 18 | ON | OFF | ON | ON | ON | U.S.A. | CP-865 (Nordic) | | |
| 19 | OFF | OFF | ON | ON | ON | U.S.A. | CP-866 (Cyrillic) | | |
| 20 | ON | ON | OFF | ON | ON | U.S.A. | Windows-1251 (Cyrillic) | | |
| 21 | OFF | ON | OFF | ON | ON | U.S.A. | Windows-1252 (West European Latin) | | |
| 22 | ON | OFF | OFF | ON | ON | U.S.A. | Windows-1255 (Hebrew) | | |
| 23 | OFF | OFF | OFF | ON | ON | U.S.A. | Windows-1257 (Baltic) | | |
| 24 | ON | ON | ON | OFF | ON | U.S.A. | Windows-1253 (Greek) | | |
| 25 | OFF | ON | ON | OFF | ON | U.S.A. | Windows-1250 (East European Latin) | | |

# 4. Software Status Setting Commands

When the system is powered on, the VFD will read the DIP switches to set the **Command Type**, **Baud Rate**, **Parity**, and **International Character set**. The user can change the settings as follows:

## 1.6. Baud Rate Setting Command

**STX 05 B n ETX** /Change the baud rate setting/

ASCII Format STX 05 B **n** ETX

Dec. Format [02] [05] [66] **n** [03]

Hex. Format [02h][05h][42h] **n** [ 0 3 h ] 30h≦**n**≦33h

Description Change the display communication baud rate. The baud rate setting can be selected from 4800 to 38400.

| n | Baud rate |
|---|---|
| 30h | 4800 |
| 31h | 9600 |
| 32h | 19200 |
| 33h | 38400 |

## 1.7. Parity Check Setting Command

**STX 05 P n ETX** /Change the Parity check setting/

ASCII Format STX 05 P **n** ETX

Dec. Format [02] [05] [80] **n** [ 0 3 ]

Hex. Format [02h][05h][50h] **n** [ 0 3 h ] **n**=30h, 31h

Description Change the display communication parity. Set 8 data bit and the parity set for even or non-parity.

| n | Parity check |
|---|---|
| 30h | None-parity |
| 31h | Even-parity |

## 1.8. International Character Set Setting Command

**STX 05 S n** /Change the international character set/
**ETX**

ASCII Format STX 05 S **n** ETX

Dec. Format [02] [05] [83] **n** [03]

Hex. Format [02h][05h][53h] **n** 30h≦ **n** ≦4Fh
[ 0 3 h ]

Description Change the display international character font.

| n | Character Set (20h – 7Fh) | Code Table (80H-FFH) | Note |
|---|---|---|---|
| 30h | U.S.A. | CP-437 (USA, Standard Europe) | |
| 31h | FRANCE | CP-858 (Multilingual + Euro Symbol) | |
| 32h | GERMANY | | |
| 33h | U.K. | | |
| 34h | DENMARK I | | |
| 35h | SWEDEN | | |
| 36h | ITALY | | |
| 37h | SPAIN | | |
| 38h | JAPAN | Katakana | |
| 39h | NORWAY | CP-858 (Multilingual+ Euro Symbol) | |
| 3Ah | DENMARK II | | |
| 3Bh | Slawie | | |
| 3Ch | RUSSIA | | |
| 3Dh | U.S.A. | CP-860 (Portuguese) | |
| 3Eh | U.K. | Greek | |
| 3Fh | U.S.A. | CP-852 (Hungary) | |
| 40h | U.S.A. | CP-862 (Hebrew) | |
| 41h | U.S.A. | CP-863 (Canadian-French) | |
| 42h | U.S.A. | CP-865 (Nordic) | |
| 43h | U.S.A. | CP-866 (Cyrillic) | |
| 44h | U.S.A. | Windows-1251 (Cyrillic) | |
| 45h | U.S.A. | Windows-1252 (West European Latin) | |
| 46h | U.S.A. | Windows-1255 (Hebrew) | |
| 47h | U.S.A. | Windows-1257 (Baltic) | |
| 48h | U.S.A. | Windows-1253 (Greek) | |
| 49h | U.S.A. | Windows-1250 (East European Latin) | |

## 1.9. Command Type Setting Command

**STX 05 C n ETX** /Change the command type setting/

ASCII Format STX 05 C **n** ETX

Dec. Format [02] [05] [67] **n** [03]

Hex. Format [02h][05h][43h] **n** 30h≦ **n** ≦37h

[ 0 3 h ]

Description This command will change the command type and initialize the display.

The display emulation mode is based on DSP800/ ESC/ ADM 787/ POS7300/ AEDEX/ UTC/ CD5220 mode.

| n | Command Type | n | Command Type |
|---|---|---|---|
| 30h | POS7300 | 34h | AEDEX |
| 31h | ESC/POS | 35h | UTC/P |
| 32h | ADM 787 | 36h | UTC/S |
| 33h | DSP800 | 37h | CD5220 |

## 1.10. Run Demo message

**STX 05 D 08 ETX** /Run demo message/

ASCII Format STX 05 D 08 ETX

Dec. Format [02][05][68][08][03]

Hex. Format [02h][05h][44h][08h][03h]

Description Run demo message for the display.

The display emulation mode is based on DSP800, EPSON ESC/POS, CD5220 command type.

## 1.11. Show Firmware Version

**STX 05 V 01 ETX** /Show Firmware Version/

ASCII Format STX 05 V 01 ETX

Dec. Format [02][05][86][01][03]

Hex. Format [02h][05h][56h][01h][03h]

Description Show firmware version.

# 5. Command List Table

## Command List Table – 1

| | POS7300 | CD5220 | EPSON D101 | UTC/S | UTC/P | AEDEX | ADM788 | DSP800 |
|---|---|---|---|---|---|---|---|---|
| Move cursor right | O | O | O | | | | | |
| Move cursor left | O | O | O | | | | | |
| Move cursor up | O | O | O | | | | | |
| Move cursor down | O | O | O | | | | | |
| Move cursor to right-most position | O | O | O | | | | | |
| Move cursor to left-most position | O | O | O | | | | | |
| Move cursor to home position | O | O | O | | | | | |
| Move cursor to bottom position | | O | O | | | | | |
| Move cursor to specified position | O | O | O | | | | | O |
| Clear display screen | O | O | O | O | | | O | |
| Clear cursor line | O | O | O | | | | | |
| Brightness adjustment | | O | O | | | | | O |
| Blink display screen | O | O | O | | | | | O |
| Initialize display | O | O | O | | | | | O |
| Select character code table | | O | O | | | | | |
| Select international character set | | O | O | | | | | O |
| Select/cancel reverse character | | | O | | | | | |
| Overwrite mode | O | O | O | O | | | | |
| Vertical scroll mode | O | O | O | O | | | | |
| Horizontal scroll mode | O | O | O | | | | | |
| Set/cancel the window range | | O | O | | | | | |
| Select peripheral device | | O | O | | | | | O |
| Set starting/ending position of macro definition | | | O | | | | | |
| Execute and quit macro | | | O | | | | | |
| Execute self-test | | O | O | | | | | O |
| Display time | | | O | | O | O | | |
| Display time continuously | | | O | | | | | |
| Display position | | | | O | | | | |

| | POS7300 | CD5220 | EPSON D101 | UTC/S | UTC/P | AEDEX | ADM788 | DSP800 |
|---|---|---|---|---|---|---|---|---|
| Cursor on/off | O | O | O | O | | | | |
| Change to UTC enhanced mode | | | | O | | | | |
| Change to UTC standard mode | | | | | O | | | |
| Write string to upper line | O | O | | | O | O | | |

## Command List Table – 2

| | POS7300 | CD5220 | EPSON D101 | UTC/S | UTC/P | AEDEX | ADM788 | DSP800 |
|---|---|---|---|---|---|---|---|---|
| Upper line message continuous scroll | O | O | | | O | O | | |
| Bottom line message scroll continuously | O | | | | | | | |
| Message vertical down scroll continuously | O | | | | | | | |
| Message vertical upper scroll continuously | O | | | | | | | |
| Carriage return | O | | | O | | | O | |
| Line feed | O | | | O | | | | |
| Back space | O | | | O | | | | |
| Horizontal tab | O | | | O | | | | |
| Command type select | | O | O | | | | | O |
| Upper line message scroll once pass | | | | | O | O | | |
| Change attention code | | | | | O | O | | |
| Two line display | | | | | O | O | | |
| Clear upper line and move cursor to upper left-end position | | | | | | | O | |
| Clear bottom line and move cursor to bottom left-end position | | | | | | | O | |
| Set period to upper line, last n position | | | | | | | O | |
| Set line blinking, upper line | O | | | | | | O | |
| Clear line blinking, upper line | O | | | | | | O | |

| | POS7300 | CD5220 | EPSON D101 | UTC/S | UTC/P | AEDEX | ADM788 | DSP800 |
|---|---|---|---|---|---|---|---|---|
| Clear field 1 and move cursor to field 1, first position | | | | | | | O | |
| Clear field 2 and move cursor to field 2,first position | | | | | | | O | |
| Clear display range from n position to m position and move cursor to n position | | | | | | | | O |
| Save the current displaying data to n layer for demo display | | | | | | | | O |
| Turn annunciator on/off | | | O | | | | | |
| Specify period | | | O | | | | | |
| Specify comma | | | O | | | | | |
| Specify semicolon (period + comma) | | | O | | | | | |

# 6. Command Details

## 6.1. POS7300 Series Command List

### POS7300 Standard Mode Command List-1

| Command | Code (hex) | Function Description |
|---|---|---|
| ESC F A **[DATA]** CR | 1B 46 41 **[DATA]** 0D | Write string to upper line<br>➢ Maximal **[DATA]** length is 40 |
| ESC F B **[DATA]** CR | 1B 46 42 **[DATA]** 0D | Write string to lower line<br>➢ Maximal **[DATA]** length is 40 |
| ESC F D **[DATA]** CR | 1B 46 44 **[DATA]** 0D | Upper line message scroll continuously<br>➢ Maximal **[DATA]** length is 40 |
| ESC F O **[DATA]** CR | 1B 46 4F **[DATA]** 0D | Bottom line message scroll continuously<br>➢ Maximal **[DATA]** length is 40 |
| ESC P **x y** | 1B 50 **x y** | Move cursor to specified position<br>➢ **x** = 1 ~ 14h, for columns location.<br>➢ **y** = 1 ~ 2, for lines location. |
| ESC _ **n** | 1B 5F **n** | Set cursor on/off<br>➢ **n** = 00 ~ 01 |
| ESC DC1 | 1B 11 | Overwrite mode |
| ESC DC2 | 1B 12 | Vertical scroll mode |
| ESC DC3 | 1B 13 | Horizontal scroll mode |
| ESC @ | 1B 40 | Initialize display |
| US MD1 **n** | 1F 01 **n** | Message vertical upper scroll continuously<br>➢ **n** = 01 ~ 0Ch |
| US MD2 **n** | 1F 02 **n** | Message vertical down scroll continuously<br>➢ **n** = 01 ~ 0Ch |
| US DC1 **n** | 1F 11 **n** | Set line blinking<br>➢ **n** = ’1’ ~ ’2’<br>■ **n** = ’1’ up line<br>■ **n** = ’2’ low line |
| US DC2 **n** | 1F 12 **n** | Clear line blinking<br>➢ **n** = ’1’ ~ ’2’<br>■ **n** = ’1’ up line<br>■ **n** = ’2’ low line |
| US E **n** | 1F 45 **n** | Blink display screen<br>➢ **n** = 00h ~ FFh<br>■ **n** = 0 for no blink |

| Command | Code (hex) | Function Description |
|---|---|---|
| NULL H | 0 48 | Move cursor up |
| NULL K | 0 4B | Move cursor left |
| NULL M | 0 4D | Move cursor right |
| NULL P | 0 50 | Move cursor down |
| NULL G | 0 47 | Move cursor to left-most position |
| NULL O | 0 4F | Move cursor to right-most position |

## POS7300 Standard Mode Command List-2

| Command | Code (hex) | Function Description |
|---|---|---|
| BS | 08 | Back space |
| HT | 09 | Horizontal tab |
| LF | 0A | Line feed |
| HOM | 0B | Move cursor to home position |
| CLR | 0C | Clear display screen |
| CLR | 12 | Clear display screen |
| CR | 0D | Carriage return |
| CAN | 18 | Clear cursor line, and clear string mode |
| DLE **n** | 10 **n** | Display position<br>➢ **n** = 0 ~ 27h, for location. |
| ESC = **n** | 1B 3D **n** | Select peripheral device, display or printer<br>➢ **n** = 1~3<br>■ **n** = '1': enable printer only<br>■ **n** = '2': enable display only<br>■ **n** = '3': enable both of printer and display |

## 6.2. CD5220 Standard Mode Command List

### CD5220 Standard Mode Command List-1

| Command | Code (hex) | Function Description |
|---|---|---|
| ESC DC1 | 1B 11 | Overwrite mode |
| US SOH | 1F 01 | |
| ESC DC2 | 1B 12 | Vertical scroll mode |
| US STX | 1F 02 | |
| ESC DC3 | 1B 13 | Horizontal scroll mode |
| US ETX | 1F 03 | |
| ESC Q A **[DATA]** CR | 1B 51 41 **[DATA]** 0D | Set the string display mode, write string to upper line. *1<br>➢ Maximal **[DATA]** length is 20 |
| ESC Q B **[DATA]** CR | 1B 51 42 **[DATA]** 0D | Set the string display mode, write string to lower line. *1<br>➢ Maximal **[DATA]** length is 20 |
| ESC Q D **[DATA]** CR | 1B 51 44 **[DATA]** 0D | Upper line message scroll continuously. *1 *2<br>➢ Maximal **[DATA]** length is 40 |
| ESD [ D | 1B 5B 44 | Move cursor left |
| BS | 08 | |
| ESC [ C | 1B 5B 43 | Move cursor right |
| HT | 09 | |
| ESC [ A | 1B 5B 41 | Move cursor up |
| US LF | 1F 0A | |
| ESC [ B | 1B 5B 42 | Move cursor down |
| LF | 0A | |
| ESC [ H | 1B 5B 48 | Move cursor to home position |
| HOM | 0B | |
| ESC [ L | 1B 5B 4C | Move cursor to left-most position |
| CR | 0D | |
| ESC [ R | 1B 5B 52 | Move cursor to right-most position |
| US CR | 1F 0D | |
| ESC [ K | 1B 5B 4B | Move cursor to bottom position |
| US B | 1F 42 | |
| ESC # **n** | 1B 23 **n** | Command type select<br>➢ **n** = 30h ~ 37h |
| US @ | 1F 40 | Execute self test |
| US E **n** | 1F 45 **n** | Blink display screen |

| Command | Code (hex) | Function Description |
|---|---|---|
| | | ➢ **n** = 00h ~ FFh<br>■ **n** = 0 for no blink |
| ESC l **x y** | 1B 6C **x y** | Move cursor to specified position<br>➢ **x** = 1 ~ 14h, for columns location.<br>➢ **y** = 1,2, for lines location. |
| US $ **x y** | 1F 24 **x y** | |
| ESC @ | 1B 40 | Initialize display |

## CD5220 Standard Mode Command List-2

| Command | Code (hex) | Function Description |
|---|---|---|
| ESC W **s x1 x2 y** | 1B 57 **s x1 x2 y** | Set or cancel the window range at horizontal scroll mode<br>➢ 1 ≦ **x1** ≦ **x2** ≦ 14h, for columns location.<br>➢ **y** = 1~2, for lines location.<br>➢ **s** = 0: cancel<br>**s** = 1: set |
| CLR | 0C | Clear display screen, and clear string mode |
| CAN | 18 | Clear cursor line, and clear string mode |
| ESC * **n** | 1B 2A **n** | Brightness adjustment<br>➢ **n** = 1 ~ 4, **n** = 4 for highest brightness |
| US X **n** | 1F 58 **n** | |
| ESC _ **n** | 1B 5F **n** | Set cursor on/off<br>➢ **n** = 1: cursor on<br>**n** = 0: cursor off |
| ESC f **n** | 1B 66 **n** | Select international fonts<br>➢ About **n**, refer. *3 |
| ESC c **n** | 1B 63 **n** | Select fonts, ASCII code or JIS code,<br>➢ About **n**, refer. *4 |
| ESC = **n** | 1B 3D **n** | Select peripheral device, display or printer<br>➢ **n**='1': enable printer only<br>**n**='2': enable display only<br>**n**='3': enable both of printer and display |

Note:

1. While using command “ESC Q A” or “ESC Q B”, other commands cannot be used except when using command “CLR” or “CAN” to change operating mode.
2. When using command “ESC Q D”, the upper line message will scroll continuously until a new command is received, it will then clear the upper line and move the cursor to the upper left-end position.
3. Select the international Character set (20h – 7Fh) by command “ESC f **n**”.

| **Parameter “n”** | | **International Character Set** | **Parameter “n”** | | **International Character Set** |
|---|---|---|---|---|---|
| **Character** | **Hex** | | **Character** | **Hex** | |
| ‘A’ | 41h | U.S.A. | ‘W’ | 57h | Sweden |
| ‘G’ | 47h | Germany | ‘D’ | 44h | Denmark I |
| ’I’ | 49h | Italy | ‘E’ | 45h | Denmark II |
| ‘J’ | 4Ah | Japan | ‘L’ | 4Ch | Slavonic |
| ‘U’ | 55h | U.K. | ‘R’ | 52h | Russia |
| ‘F’ | 46h | France | | | |
| ‘S’ | 53h | Spain | | | |
| ‘N’ | 4Eh | Norway | | | |

4. Select character code table (80H-FFH) by command “ESC c **n**”.

| **Parameter “n”** | | **character Code Table** |
|---|---|---|
| **Character** | **Hex** | |
| ‘A’ | 41h | Compliance with ASCII code (CP-437) |
| ‘J’ | 4Ah | Compliance with JIS code (Katakana) |
| ‘L’ | 4Ch | Compliance with Slawie code |
| ‘R’ | 52h | Compliance with RUSSIA code |
| ‘M’ | 4Dh | CP-850 (Multilingual) |
| ‘P’ | 50h | CP-858 (Multilingual+ Euro Symbol) |
| ‘p’ | 70h | CP-860 (Portuguese) |
| ‘F’ | 46h | CP-863 (Canadian-French) |
| ‘N’ | 4Eh | CP-865 (Nordic) |
| ‘u’ | 75h | CP-852 (Hungary) |
| ‘H’ | 48h | CP-862 (Hebrew) |
| ‘C’ | 43h | CP-866 (Cyrillic) |
| ‘G’ | 47h | Greek |
| ‘c’ | 63h | Windows-1251 (Cyrillic) |
| ‘W’ | 57h | Windows-1252 (West European Latin) |
| ‘h’ | 68h | Windows-1255 (Hebrew) |
| ‘B’ | 42h | Windows-1257 (Baltic) |
| ‘g’ | 67h | Windows-1253 (Greek) |

| Parameter “n” | | character Code Table |
|---|---|---|
| Character | Hex | |
| ‘E’ | 45h | Windows-1250 (East European Latin) |

## 6.3. UTC Standard Mode Command List

| Command | Code (hex) | Function Description |
|---|---|---|
| BS | 08 | Back space |
| HT | 09 | Horizontal tab |
| LF | 0A | Line feed |
| CR | 0D | Carriage return |
| DLE **n** | 10 **n** | Display position<br>➢ **n** = 0 ~ 27h, for location. |
| DC1 | 11 | Over write display mode |
| DC2 | 12 | Vertical scroll mode |
| DC3 | 13 | Cursor on |
| DC4 | 14 | Cursor off |
| US | 1F | Clear display |
| ESC d | 1B 64 | Change to UTC enhanced mode |

## 6.4. UTC Enhanced Mode Command List

| Command | Code (hex) | Function Description |
|---|---|---|
| ESC u A **[DATA]** CR | 1B 75 41 **[DATA]** 0D | Upper line display<br>➢ Maximal **[DATA]** length is 20 |
| ESC u B **[DATA]** CR | 1B 75 42 **[DATA]** 0D | Bottom line display<br>➢ Maximal **[DATA]** length is 20 |
| ESC u D **[DATA]** CR | 1B 75 44 **[DATA]** 0D | Upper line message scroll continuously<br>➢ Maximal **[DATA]** length is 40 |
| ESC u E **h h** : **m m** CR | 1B 75 45 **h h** ':' **m m** 0D | Display time<br>➢ **h**, **m** = '0' ~ '9' |
| ESC u F **[DATA]** CR | 1B 75 46 **[DATA]** 0D | Upper line message scroll Once pass<br>➢ Maximal **[DATA]** length is 40 |
| ESC u H **n m** CR | 1B 75 48 **n m** 0D | Change attention code<br>➢ **n** = 1 ~ 20h<br>➢ **m** = 1 ~ 20h |
| ESC u I **[DATA]** CR | 1B 75 49 **[DATA]** 0D | Two line display<br>➢ Maximal **[DATA]** length is 40 |
| ESC RS CR | 1B 0F 0D | Change to UTC standard mode |

## 6.5. AEDEX/EMAX Mode Command List

| Command | Code (hex) | Function Description |
|---|---|---|
| ! # 4 **[DATA]** CR | 21 23 34 **[DATA]** 0D | Upper line message scroll<br>➢ Maximal **[DATA]** length is 40 |
| ! # 5 **h h** : **m m** CR | 21 23 35 **h h** ':' **m m** 0D | Display time<br>➢ **h**, **m** = '0' ~ '9' |
| ! # 8 **n m** CR | 21 23 38 **n m** 0D | Change attention code<br>➢ **n**, **m** = 1 ~ 20 |
| ! # 9 **[DATA]** CR | 21 23 39 **[DATA]** 0D | Two line display<br>➢ Maximal **[DATA]** length is 40 |
| ! # 6 **[DATA]** CR | 21 23 36 **[DATA]** 0D | Upper line message scroll once pass<br>➢ Maximal **[DATA]** length is 40 |

## 6.6. ADM787/788 mode command list

| Command | Code (hex) | Function Description |
|---|---|---|
| CLR | 0C | Clear display |
| CR | 0D | Carriage return |
| SLE1 | 0E | Clear upper line and move cursor to upper left-end position |
| SLE2 | 0F | Clear bottom line and move, Cursor to bottom left-end position |
| DC0 **n** | 10 **n** | Set period to upper line last n position<br>➢ **n** = 31H ~ 37H |
| DC1 **n** | 11 **n** | Set line blinking, upper line<br>➢ **n** = '1' ~ '2'<br>■ **n** = '1': up line<br>■ **n** = '2': low line |
| DC2 **n** | 12 **n** | Clear line blinking, upper line<br>➢ **n** = '1' ~ '2'<br>■ **n** = '1': up line<br>■ **n** = '2': low line |
| SF1 | 1E | Clear field 1 and move cursor to field 1, first position |
| SF2 | 1F | Clear field 2 and move cursor to field 2, first position |

## 6.7. DSP800 Mode Command List

| Command | Code (hex) | Function Description |
|---|---|---|
| EOT SOH I **n** ETB | 04 01 49 **n** 17 | Select international character set<br>➢ **n** = 00 ~ 0Fh or 30 ~ 3Fh |
| EOT SOH P **n** ETB | 04 01 50 **n** 17 | Move cursor to specified position<br>➢ **n** = 31h ~ 58h |
| EOT SOH C **n m** ETB | 04 01 43 **n m** 17 | Clear display range from n position to m position and move cursor to n position<br>➢ 31h ≦ **n** ≦ **m** ≦ 58h |
| EOT SOH S **n** ETB | 04 01 53 **n** 17 | Save current view message to n layer for demo view data<br>➢ **n** = 31h ~ 35h |
| EOT SOH D **n m** ETB | 04 01 44 **n m** 17 | Display the saved demo message<br>➢ **n** = 31h ~ 4Fh<br>➢ **m** = 31h ~ 33h |
| EOT SOH A **n** ETB | 04 01 41 **n** 17<br>**n** =31h-34h | Brightness adjustment |
| EOT SOH F **n** ETB | 04 01 46 **n** 17<br>00h≦**n**≦FFh | Blink display Screen<br>➢ **n** = 00h ~ FFh, **n** = 0 for no blink |
| EOT SOH # **n** ETB | 04 01 23 **n** 17<br>**n** =30~37h | Command type select |
| EOT SOH % ETB | 04 01 25 17 | Initialize display |
| EOT SOH @ ETB | 04 01 40 17 | Execute self-test |
| EOT SOH = **n** ETB | 04 01 3D **n** 17 | Select peripheral device, display or printer<br>➢ **n** = '1': enable printer only<br>**n** = '2': enable display only<br>**n** = '3': enable both of printer and display |

## 6.8. EPSON ESC/POS Command List

### EPSON ESC/POS Command List-1

| Command | Code (hex) | Function Description |
|---|---|---|
| US r **n** | 1F 72 **n** | Select/cancel reverse character.<br>➢ **n** = 00,01 |
| US MD1 | 1F 01 | Specify overwrite mode. |
| US MD2 | 1F 02 | Specify vertical scroll mode. |
| US MD3 | 1F 03 | Specify horizontal scroll mode. |
| CAN | 18 | Clear cursor line |
| ESC # **n** | 1B 23 **n** | Command type select<br>➢ **n** = 30h ~ 37h |
| US # **n x** | 1F 23 **n x** | Turn annunciator on/off.<br>➢ **n** = 0 for annunciator off<br>**n** = 1 for annunciator on<br>➢ **x** = 1 ~ 14h, for columns location. |
| US C **n** | 1F 43 **n** | Set cursor on/off<br>➢ **n** = 00, 01 |
| BS | 08 | Move cursor left |
| HT | 09 | Move cursor right |
| US LF | 1F 0A | Move cursor up |
| LF | 0A | Move cursor down |
| US CR | 1F 0D | Move cursor to right-most position |
| CR | 0D | Move cursor to left-most position |
| HOM | 0B | Move cursor to home position |
| US B | 1F 42 | Move cursor to bottom position |
| US $ **x y** | 1F 24 **x y** | Move cursor to specified position<br>➢ **x** = 1 ~ 14h, for columns location.<br>➢ **y** = 1 ~ 2, for lines location. |
| CLR | 0C | Clear display screen |
| US E **n** | 1F 45 **n** | Blink display screen<br>➢ **n** = 00h ~ FFh<br>**n** = 0 for no blink |
| ESC @ | 1B 40 | Initialize display |
| US . **n** | 1F 2E **n** | Specify period<br>➢ **n** = a displayable character code |
| US , **n** | 1F 2C **n** | Specify comma<br>➢ **n** = a displayable character code |
| US ; **n** | 1F 3B **n** | Specify semicolon (period + comma) |

| Command | Code (hex) | Function Description |
|---|---|---|
| | | ➢ **n** = a displayable character code |
| US : | 1F 3A | Set starting/ending position of macro definition.<br>Ex.: 1F 3A … (macro string) … 1F 3A |
| US @ | 1F 40 | Execute self - test |
| US T h m | 1F 54 h m | Display time<br>➢ 0 ≦ h ≦ 17h, for hours setting.<br>➢ 0 ≦ m ≦ 3Bh, for minutes setting. |

## EPSON ESC/POS Command List-2

| Command | Code (hex) | Function Description |
|---|---|---|
| US ^ **n m** | 1F 5E **n m** | Execute and quit macro. It's an interval of n between the two words. It's an interval of m between the two strings.<br>➢ 00 ≦ (**n**, **m**) ≦ FFh<br>■ **n** = Word time<br>■ **m** = show string time |
| US U | 1F 55 | Display time continuously |
| US X **n** | 1F 58 **n** | Brightness adjustment<br>➢ **n** = 1 ~ 4 |
| ESC W **n s x1 y1 x2 y2** | 1B 57 **n s x1 y1 x2 y2** | Set or cancel the window range<br>➢ **n** = 1 ~ 4, for window number<br>➢ **s** = 0: cancel<br>**s** = 1: set<br>➢ 1 ≦ **x1** ≦ **x2** ≦ 14h, for columns location.<br>➢ 1 ≦ **y1** ≦ **y2** ≦ 2, for lines location. |
| ESC R **n** | 1B 52 **n** | Select international character set (20H~7Fh).<br>➢ **n** = 00 ~ 0Fh. See note *[1] |
| ESC t **n** | 1B 74 **n** | Select character code table (80H~FFh).<br>➢ **n** = 00 ~ 1Fh. See note *[2] |
| ESC = **n** | 1B 3D **n** | Select peripheral device, display or printer<br>➢ **n** = '1': enable printer only<br>**n** = '2': enable display only<br>**n** = '3': enable both of printer and display |

Note:

1. Select international character set (20H~7Fh) by command "ESC R **n**"

| n | International character set | n | International character set | n | International character set |
|---|---|---|---|---|---|
| **0h** | U.S.A. | **6h** | ITALY | **Ch** | RUSSIA |
| **1h** | FRANCE | **7h** | SPAIN | **Dh** | Not used |
| **2h** | GERMANY | **8h** | JAPAN | **Eh** | Not used |
| **3h** | U.K. | **9h** | NORWAY | **Fh** | Not used |
| **4h** | DENMARK I | **Ah** | DENMARK II | | |
| **5h** | SWEDEN | **Bh** | SLAVONIC | | |

2. Select character code table (80H~FFh) by command “ESC t **n**”

| n | Character code table | n | Character code table | n | Character code table |
|---|---|---|---|---|---|
| **0h** | CP-437<br>(USA, Standard Europe) | **7h** | Russia | **Fh** | Windows-1257 (Baltic) |
| **1h** | Katakana (for Japan) | **8h** | Greek | **10h** | Windows-1252<br>(West European Latin) |
| **2h** | CP-850 (Multilingual) | **9h** | CP-852 (Hungary) | **11h** | Windows-1253 (Greek) |
| **3h** | CP-860 (Portuguese) | **Ah** | CP-862 (Hebrew) | **12h** | Windows-1250<br>(East European Latin) |
| **4h** | CP-863<br>(Canadian-French) | **Bh** | CP-866 (Cyrillic) | **13h** | CP-858 (Multilingual+ Euro Symbol) |
| **5h** | CP-865 (Nordic) | **Ch** | Windows-1251 (Cyrillic) | | |
| **6h** | Slawie | **Eh** | Windows-1255 (Hebrew) | | |

# 7. Character Set

## 7.1. Character Code 20H – 7FH

### 7.1.1. International Character Sets

| Character Code Number | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hex / Country | 23 | 24 | 40 | 5B | 5C | 5D | 5E | 60 | 7B | 7C | 7D | 7E |
| Dec | 35 | 36 | 64 | 91 | 92 | 93 | 94 | 96 | 123 | 124 | 125 | 126 |
| U.S.A | # | $ | @ | [ | \ | ] | ^ | ` | { | ¦ | } | ~ |
| France | # | $ | à | ° | ç | § | ^ | ` | é | ù | è | ¨ |
| Germany | # | $ | § | Ä | Ö | Ü | ^ | ` | ä | ö | ü | β |
| U.K | £ | $ | @ | [ | \ | ] | ^ | ` | { | ¦ | } | ~ |
| Denmark I | # | $ | @ | Æ | Ø | Å | ^ | ` | æ | ø | å | ~ |
| Sweden | # | ¤ | É | Ä | Ö | Å | Ü | é | ä | ö | å | ü |
| Italy | # | $ | @ | ° | \ | é | ^ | ù | à | ò | è | ì |
| Spain | Pt | $ | @ | ¡ | Ñ | ¿ | ^ | ` | ¨ | ñ | } | ~ |
| Japan | # | $ | @ | [ | ¥ | ] | ^ | ` | { | ¦ | } | ~ |
| Norway | # | ¤ | É | Æ | Ø | Å | Ü | é | æ | ø | å | ü |
| Denmark II | # | $ | É | Æ | Ø | Å | Ü | é | æ | ø | å | ü |
| Slavonic | # | $ | @ | [ | \ | ] | ^ | ` | { | ¦ | } | ~ |
| Russia | # | $ | @ | [ | \ | ] | ^ | ` | { | ¦ | } | ~ |

### 7.1.2. USA, Standard Character Sets

| | 00h | 01h | 02h | 03h | 04h | 05h | 06h | 07h | 08h | 09h | 0Ah | 0Bh | 0Ch | 0Dh | 0Eh | 0Fh |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **20h** | | ! | “ | # | $ | % | & | ‘ | ( | ) | * | + | , | - | . | / |
| **30h** | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | : | ; | < | = | > | ? |
| **40h** | @ | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O |
| **50h** | P | Q | R | S | T | U | V | W | X | Y | Z | [ | \ | ] | ^ | _ |
| **60h** | ` | a | b | c | d | e | f | g | h | i | j | k | l | m | n | o |
| **70h** | p | q | r | s | t | u | v | w | x | y | Z | { | ¦ | } | ~ | |

## 7.2. Character Code 80H – FFH

### 7.2.1. CP-437 (USA, Standard Europe)

| | 00h | 01h | 02h | 03h | 04h | 05h | 06h | 07h | 08h | 09h | 0Ah | 0Bh | 0Ch | 0Dh | 0Eh | 0Fh |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **80h** | Ç | ü | é | â | ä | à | å | ç | ê | ë | è | ï | î | ì | Ä | Å |
| **90h** | É | æ | Æ | ô | ö | ò | û | ù | ÿ | Ö | Ü | ¢ | £ | ¥ | Pt | *ƒ* |
| **A0h** | á | í | ó | ú | ñ | Ñ | ª | º | ¿ | ⌐ | ¬ | ½ | ¼ | ¡ | « | » |
| **B0h** | ░ | ▒ | ▓ | │ | ┤ | ╡ | ╢ | ╖ | ╕ | ╣ | ║ | ╗ | ╝ | ╜ | ╛ | ┐ |
| **C0h** | └ | ┴ | ┬ | ├ | ─ | ┼ | ╞ | ╟ | ╚ | ╔ | ╩ | ╦ | ╠ | ═ | ╬ | ╧ |
| **D0h** | ╨ | ╤ | ╥ | ╙ | ╘ | ╒ | ╓ | ╫ | ╪ | ┘ | ┌ | █ | ▄ | ▌ | ▐ | ▀ |
| **E0h** | α | ß | Γ | π | Σ | σ | µ | τ | Φ | θ | Ω | δ | ∞ | ø | ε | ∩ |
| **F0h** | ≡ | ± | ≥ | ≤ | ⌠ | ⌡ | ÷ | ≈ | ° | • | · | √ | ⁿ | ² | ■ | |

### 7.2.2. CP-850 (Multilingual)

| | 00h | 01h | 02h | 03h | 04h | 05h | 06h | 07h | 08h | 09h | 0Ah | 0Bh | 0Ch | 0Dh | 0Eh | 0Fh |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **80h** | Ç | ü | é | â | ä | à | å | ç | ê | ë | è | ï | î | ì | Ä | Å |
| **90h** | É | æ | Æ | ô | ö | ò | û | ù | ÿ | ö | Ü | ø | £ | Ø | × | ƒ |
| **A0h** | á | í | ó | ú | ñ | Ñ | a | o | ¿ | ® | ¬ | ½ | ¼ | ¡ | « | » |
| **B0h** | ░ | ▒ | ▓ | │ | ┤ | Á | Â | À | © | ╣ | ║ | ╗ | ╝ | ¢ | ¥ | ┐ |
| **C0h** | └ | ┴ | ┬ | ├ | ─ | ┼ | ã | Ã | ╚ | ╔ | ╩ | ╦ | ╠ | ═ | ╬ | ¤ |
| **D0h** | ð | Ð | Ê | Ë | È | l | Í | Î | Ï | ┘ | ┌ | █ | ▄ | ¦ | Ì | ▀ |
| **E0h** | ó | ß | ô | ò | õ | Õ | µ | þ | Þ | Ú | Û | Ù | ý | Ý | ¯ | ´ |
| **F0h** | ¯ | ± | = | ¾ | ¶ | § | ÷ | ¸ | ° | ¨ | · | 1 | 3 | 2 | ■ | |

### 7.2.3. CP-858 (Multilingual + Euro Symbol)

| | 00h | 01h | 02h | 03h | 04h | 05h | 06h | 07h | 08h | 09h | 0Ah | 0Bh | 0Ch | 0Dh | 0Eh | 0Fh |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **80h** | Ç | ü | é | â | ä | à | å | ç | ê | ë | è | ï | î | ì | Ä | Å |
| **90h** | É | æ | Æ | ô | ö | ò | û | ù | ÿ | ö | Ü | ø | £ | Ø | × | ƒ |
| **A0h** | á | í | ó | ú | ñ | Ñ | a | o | ¿ | ® | ¬ | ½ | ¼ | ¡ | « | » |
| **B0h** | ░ | ▒ | ▓ | │ | ┤ | Á | Â | À | © | ╣ | ║ | ╗ | ╝ | ¢ | ¥ | ┐ |
| **C0h** | └ | ┴ | ┬ | ├ | ─ | ┼ | ã | Ã | ╚ | ╔ | ╩ | ╦ | ╠ | ═ | ╬ | ¤ |
| **D0h** | ð | Ð | Ê | Ë | È | € | Í | Î | Ï | ┘ | ┌ | █ | ▄ | ¦ | Ì | ▀ |
| **E0h** | ó | ß | ô | ò | õ | Õ | µ | þ | Þ | Ú | Û | Ù | ý | Ý | ¯ | ´ |
| **F0h** | ¯ | ± | = | ¾ | ¶ | § | ÷ | ¸ | ° | ¨ | · | 1 | 3 | 2 | ■ | |

### 7.2.4. Katakana for Japan

| | 00h | 01h | 02h | 03h | 04h | 05h | 06h | 07h | 08h | 09h | 0Ah | 0Bh | 0Ch | 0Dh | 0Eh | 0Fh |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **80h** | α | β | γ | ⊿ | ϵ | η | θ | λ | μ | π | ρ | σ | τ | Φ | Ω | ∑ |
| **90h** | £ | § | IE | IR | ∫ | x̄ | Ā | -1 | 2 | 3 | x | ½ | 1/ | √ | ± | ■ |
| **A0h** | | ◦ | 「 | 」 | 、 | • | ヲ | フ | ィ | ウ | エ | オ | ャ | ュ | ョ | ッ |
| **B0h** | ー | ア | イ | ウ | エ | オ | カ | キ | ク | ケ | コ | サ | シ | ス | セ | ソ |
| **C0h** | タ | チ | ツ | テ | ト | ナ | ニ | ヌ | ネ | ノ | ハ | ヒ | フ | ヘ | ホ | マ |
| **D0h** | ミ | ム | メ | モ | ヤ | ユ | ヨ | ラ | リ | ル | レ | ロ | ワ | ン | " | ◦ |
| **E0h** | ↑ | ↓ | ← | → | ↵ | ↳ | ↱ | ↰ | ⇤ | ⇥ | ” | “ | « | » | ∴ | ∵ |
| **F0h** | ≤ | ≥ | ≠ | ≒ | ‖ | ⏐ | ⊥ | ∞ | α | ∼ | ~ | ≡ | ∓ | ⍰ | ⊕ | Θ |

### 7.2.5. Slawie

| | 00h | 01h | 02h | 03h | 04h | 05h | 06h | 07h | 08h | 09h | 0Ah | 0Bh | 0Ch | 0Dh | 0Eh | 0Fh |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **80h** | Ç | ü | é | â | ä | ů | ć | ç | ļ | ë | õ | õ | î | ź | ä | ć |
| **90h** | é | Ĺ | í | ô | ö | Ľ | ĭ | ś | ś | Ö | Ü | ť | ť | ł | x | č |
| **A0h** | á | í | ó | ú | ą | ą | ž | ž | ę | ę | | ź | č | ş | « | » |
| **B0h** | ▒ | ▒ | ▓ | ⏐ | ┤ | á | â | ě | ş | | | | | ŧ | ŧ | |
| **C0h** | | | | | ─ | ┼ | ă | ă | | | | | | ═ | | ¤ |
| **D0h** | đ | đ | ď | ë | ď | ň | í | î | ě | | | ▉ | ▄ | ţ | ů | ■ |
| **E0h** | ó | β | ô | ń | ń | ň | š | š | ŕ | ú | ŕ | ũ | ý | ý | ţ | ´ |
| **F0h** | ─ | ˜ | ˛ | ˇ | ˘ | § | ÷ | ډ | ° | ¨ | · | ũ | ř | ř | ■ | |

### 7.2.6. Russia

| | 00h | 01h | 02h | 03h | 04h | 05h | 06h | 07h | 08h | 09h | 0Ah | 0Bh | 0Ch | 0Dh | 0Eh | 0Fh |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **80h** | А | Б | В | Г | Д | Е | Ж | З | и | Й | К | Л | М | Н | О | П |
| **90h** | Р | С | Т | У | Ф | Х | Ц | Ч | Ш | Щ | Ъ | Ы | Ь | Э | Ю | Я |
| **A0h** | а | б | в | г | д | е | ж | з | и | й | к | л | м | н | о | п |
| **B0h** | | | | | | | | | | | | | | | | |
| **C0h** | | | | | | | | | | | | | | | | |
| **D0h** | | | | | | | | | | | | | | | | |
| **E0h** | р | с | т | у | ф | х | ц | ч | ш | щ | ъ | ы | ь | Э | ю | я |
| **F0h** | ∂ | Ғ | Қ | Ң | θ | Ұ | Ү | Һ | ∂ | ғ | қ | ң | θ | ұ | Ү | |

### 7.2.7. CP-860 (Portuguese)

| | 00h | 01h | 02h | 03h | 04h | 05h | 06h | 07h | 08h | 09h | 0Ah | 0Bh | 0Ch | 0Dh | 0Eh | 0Fh |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **80h** | Ç | ü | é | â | ã | à | Á | ç | ê | Ê | è | Í | Ô | ì | Ã | Â |
| **90h** | É | À | È | ô | õ | ò | Ú | ù | Ì | Õ | Ü | ¢ | £ | Ù | ₧ | Ó |
| **A0h** | á | í | ó | ú | ñ | Ñ | a̲ | o | ¿ | Ò | ¬ | ½ | ¼ | ¡ | « | » |
| **B0h** | ░ | ▒ | ▓ | │ | ┤ | ╡ | ╢ | ╖ | ╕ | ╣ | ║ | ╗ | ╝ | ╜ | ╛ | ┐ |
| **C0h** | └ | ┴ | ┬ | ├ | ─ | ┼ | ╞ | ╟ | ╚ | ╔ | ╩ | ╦ | ╠ | ═ | ╬ | ╧ |
| **D0h** | ╨ | ╤ | ╥ | ╙ | ╘ | ╒ | ╓ | ╫ | ╪ | ┘ | ┌ | █ | ▄ | ▌ | ▐ | ▀ |
| **E0h** | α | β | Γ | π | Σ | σ | µ | τ | Φ | θ | Ω | δ | ∞ | ø | ϵ | ∩ |
| **F0h** | ≡ | ± | ≥ | ≤ | ⌠ | ⌡ | ÷ | ≈ | ° | • | · | √ | ⁿ | ² | ■ | |

### 7.2.8. Greek

| | 00h | 01h | 02h | 03h | 04h | 05h | 06h | 07h | 08h | 09h | 0Ah | 0Bh | 0Ch | 0Dh | 0Eh | 0Fh |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **80h** | A | B | Γ | Δ | E | Z | **H** | Θ | I | K | Λ | M | N | Ξ | O | Π |
| **90h** | P | Σ | T | Y | Φ | X | Ψ | Ω | α | β | γ | δ | ε | ζ | η | θ |
| **A0h** | ι | κ | λ | μ | ν | ξ | ο | π | ρ | σ | ς | τ | υ | φ | χ | ψ |
| **B0h** | | | | | | | | | | | | | | | | |
| **C0h** | | | | | | | | | | | | | | | | |
| **D0h** | | | | | | | | | | | | | | | | |
| **E0h** | ω | | | | | | | | | | | | | | | |
| **F0h** | | | | | | | | | | £ | | | | - | | |

### 7.2.9. CP-852 (Hungary)

| | 00h | 01h | 02h | 03h | 04h | 05h | 06h | 07h | 08h | 09h | 0Ah | 0Bh | 0Ch | 0Dh | 0Eh | 0Fh |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **80h** | Ç | ü | é | â | ä | ů | ć | ç | ł | ë | Ő | ő | î | Ź | Ä | Ć |
| **90h** | É | Ĺ | Í | ô | ö | Ľ | ľ | Ś | ś | Ö | Ü | Ť | ť | Ł | x | č |
| **A0h** | á | í | Ó | ú | Ą | ą | Ž | ž | Ę | ę | ¬ | ź | Č | ş | « | » |
| **B0h** | ░ | ▒ | ▓ | │ | ┤ | Á | Â | Ě | Ş | ╣ | ║ | ╗ | ╝ | ż | ż | ┐ |
| **C0h** | └ | ┴ | ┬ | ├ | ─ | ┼ | Ă | ă | ╚ | ╔ | ╩ | ╦ | ╠ | ═ | ╬ | ¤ |
| **D0h** | đ | Đ | Ď | Ë | ď | Ň | Í | Î | ě | ┘ | ┌ | █ | ▄ | Ţ | Ů | ▀ |
| **E0h** | Ó | ß | Ô | Ń | ń | ň | Š | š | Ŕ | Ú | ŕ | Ű | ý | Ý | ţ | ´ |
| **F0h** | ─ | ˜ | ˝ | ˇ | ˘ | § | ÷ | ¸ | ° | ¨ | ˙ | ũ | Ř | ř | ■ | |

### 7.2.10. CP-862 (Hebrew)

| | 00h | 01h | 02h | 03h | 04h | 05h | 06h | 07h | 08h | 09h | 0Ah | 0Bh | 0Ch | 0Dh | 0Eh | 0Fh |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **80h** | א | ב | ג | ד | ה | ו | ז | ח | ט | י | ך | כ | ל | ם | מ | ן |
| **90h** | נ | ס | ע | ף | פ | ץ | צ | ק | ר | ש | ת | ¢ | £ | ¥ | Pts | *ƒ* |
| **A0h** | á | í | ó | ú | ñ | Ñ | ª | º | ¿ | ⌐ | ¬ | ½ | ¼ | ¡ | « | » |
| **B0h** | ░ | ▒ | ▓ | │ | ┤ | ╡ | ╢ | ╖ | ╕ | ╣ | ║ | ╗ | ╝ | ╜ | ╛ | ┐ |
| **C0h** | └ | ┴ | ┬ | ├ | ─ | ┼ | ╞ | ╟ | ╚ | ╔ | ╩ | ╦ | ╠ | ═ | ╬ | ╧ |
| **D0h** | ╨ | ╤ | ╥ | ╙ | ╘ | ╒ | ╓ | ╫ | ╪ | ┘ | ┌ | █ | ▄ | ▌ | ▐ | ▀ |
| **E0h** | α | ß | Γ | π | Σ | σ | µ | τ | Φ | Θ | Ω | δ | ∞ | φ | ε | ∩ |
| **F0h** | ≡ | ± | ≥ | ≤ | ⌠ | ⌡ | ÷ | ≈ | ° | ∙ | · | √ | ⁿ | ² | ■ | |

### 7.2.11. CP-863 (Canadian- French)

| | 00h | 01h | 02h | 03h | 04h | 05h | 06h | 07h | 08h | 09h | 0Ah | 0Bh | 0Ch | 0Dh | 0Eh | 0Fh |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **80h** | Ç | ü | é | â | Â | à | ¶ | ç | ê | ë | è | ï | î | = | Ä | § |
| **90h** | É | È | Ê | ô | Ë | Ï | û | ù | ¤ | Ô | Ü | ¢ | £ | Ù | Û | *ƒ* |
| **A0h** | ¦ | í | ‘ | ó | ú | ¨ | ¸ | ¯ | Î | ⌐ | ¬ | ½ | ¼ | ¾ | « | » |
| **B0h** | ░ | ▒ | ▓ | │ | ┤ | ╡ | ╢ | ╖ | ╕ | ╣ | ║ | ╗ | ╝ | ╜ | ╛ | ┐ |
| **C0h** | └ | ┴ | ┬ | ├ | ─ | ┼ | ╞ | ╟ | ╚ | ╔ | ╩ | ╦ | ╠ | ═ | ╬ | ╧ |
| **D0h** | ╨ | ╤ | ╥ | ╙ | ╘ | ╒ | ╓ | ╫ | ╪ | ┘ | ┌ | █ | ▄ | ▌ | ▐ | ▀ |
| **E0h** | α | ß | Γ | π | Σ | σ | µ | τ | Φ | Θ | Ω | δ | ∞ | φ | ε | ∩ |
| **F0h** | ≡ | ± | ≥ | ≤ | ⌠ | ⌡ | ÷ | ≈ | ° | ∙ | · | √ | ⁿ | ² | ■ | |

### 7.2.12. CP-865 (Nordic)

| | 00h | 01h | 02h | 03h | 04h | 05h | 06h | 07h | 08h | 09h | 0Ah | 0Bh | 0Ch | 0Dh | 0Eh | 0Fh |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **80h** | Ç | ü | é | â | ä | à | å | ç | ê | ë | è | ï | î | ì | Ä | Å |
| **90h** | É | æ | Æ | ô | ö | ò | û | ù | ÿ | Ö | Ü | ø | £ | Ø | Pt | *ƒ* |
| **A0h** | á | í | ó | ú | ñ | Ñ | ª | º | ¿ | ⌐ | ¬ | ½ | ¼ | ¡ | « | ¤ |
| **B0h** | ░ | ▒ | ▓ | │ | ┤ | ╡ | ╢ | ╖ | ╕ | ╣ | ║ | ╗ | ╝ | ╜ | ╛ | ┐ |
| **C0h** | └ | ┴ | ┬ | ├ | ─ | ┼ | ╞ | ╟ | ╚ | ╔ | ╩ | ╦ | ╠ | ═ | ╬ | ╧ |
| **D0h** | ╨ | ╤ | ╥ | ╙ | ╘ | ╒ | ╓ | ╫ | ╪ | ┘ | ┌ | █ | ▄ | ▌ | ▐ | ▀ |
| **E0h** | α | ß | Γ | π | Σ | σ | µ | τ | Φ | θ | Ω | δ | ∞ | ø | ε | ∩ |
| **F0h** | ≡ | ± | ≥ | ≤ | ⌠ | ⌡ | ÷ | ≈ | ° | • | · | √ | ⁿ | ² | ■ | |

### 7.2.13. CP-866 (Cyrillic)

| | 00h | 01h | 02h | 03h | 04h | 05h | 06h | 07h | 08h | 09h | 0Ah | 0Bh | 0Ch | 0Dh | 0Eh | 0Fh |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **80h** | А | Б | В | Г | Д | Е | Ж | З | И | Й | К | Л | М | Н | О | П |
| **90h** | Р | С | Т | У | Ф | Х | Ц | Ч | Ш | Щ | Ъ | Ы | Ь | Э | Ю | Я |
| **A0h** | а | б | в | г | д | е | ж | з | и | й | к | л | м | н | о | п |
| **B0h** | ░ | ▒ | ▓ | │ | ┤ | ╡ | ╢ | ╖ | ╕ | ╣ | ║ | ╗ | ╝ | ╜ | ╛ | ┐ |
| **C0h** | └ | ┴ | ┬ | ├ | ─ | ┼ | ╞ | ╟ | ╚ | ╔ | ╩ | ╦ | ╠ | ═ | ╬ | ╧ |
| **D0h** | ╨ | ╤ | ╥ | ╙ | ╘ | ╒ | ╓ | ╫ | ╪ | ┘ | ┌ | █ | ▄ | ▌ | ▐ | ▀ |
| **E0h** | р | с | т | у | ф | х | ц | ч | ш | щ | ъ | ы | ь | э | ю | я |
| **F0h** | Ё | ё | Є | є | Ї | ї | Ў | ў | ° | ∙ | · | √ | № | ¤ | ■ | |

### 7.2.14. Windows-1250

| | 00h | 01h | 02h | 03h | 04h | 05h | 06h | 07h | 08h | 09h | 0Ah | 0Bh | 0Ch | 0Dh | 0Eh | 0Fh |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 80h | € | | ‚ | | „ | … | † | ‡ | | ‰ | Š | ‹ | Ś | Ť | Ž | Ź |
| 90h | | ‘ | ’ | “ | ” | • | – | — | | ™ | š | › | ś | ť | ž | ź |
| A0h | | ˇ | ˘ | Ł | ¤ | Ą | ¦ | § | ¨ | © | Ş | « | ¬ | | ® | Ż |
| B0h | ° | ± | ˛ | ł | ´ | µ | ¶ | · | ¸ | ą | ş | » | Ľ | ˝ | ľ | ż |
| C0h | Ŕ | Á | Â | Ă | Ä | Ĺ | Ć | Ç | Č | É | Ę | Ë | Ě | Í | Î | Ď |
| D0h | Đ | Ń | Ň | Ó | Ô | Ő | Ö | × | Ř | Ů | Ú | Ű | Ü | Ý | Ţ | ß |
| E0h | ŕ | á | â | ă | ä | ĺ | ć | ç | č | é | ę | ë | ě | í | î | ď |
| F0h | đ | ń | ň | ó | ô | ő | ö | ÷ | ř | ů | ú | ű | ü | ý | ţ | ˙ |

### 7.2.15. Windows-1251 (Cyrillic)

| | 00h | 01h | 02h | 03h | 04h | 05h | 06h | 07h | 08h | 09h | 0Ah | 0Bh | 0Ch | 0Dh | 0Eh | 0Fh |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 80h | Ђ | Ѓ | ‚ | ѓ | „ | … | † | ‡ | € | ‰ | Љ | ‹ | Њ | Ќ | Ћ | Џ |
| 90h | ђ | ‘ | ’ | “ | ” | • | – | — | | ™ | љ | › | њ | ќ | ћ | џ |
| A0h | | Ў | ў | Ј | ¤ | Ґ | ¦ | § | Ё | © | Є | « | ¬ | | ® | Ї |
| B0h | ° | ± | І | і | ґ | µ | ¶ | · | ё | № | є | » | ј | Ѕ | ѕ | ї |
| C0h | А | Б | В | Г | Д | Е | Ж | З | И | Й | К | Л | М | Н | О | П |
| D0h | Р | С | Т | У | Ф | Х | Ц | Ч | Ш | Щ | Ъ | Ы | Ь | Э | Ю | Я |
| E0h | а | б | в | г | д | е | ж | з | и | й | к | л | м | н | о | п |
| F0h | р | с | т | у | ф | х | ц | ч | ш | щ | ъ | ы | ь | э | ю | я |

### 7.2.16. Windows-1252 (West European Latin)

| | 00h | 01h | 02h | 03h | 04h | 05h | 06h | 07h | 08h | 09h | 0Ah | 0Bh | 0Ch | 0Dh | 0Eh | 0Fh |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **80h** | € | | ‚ | ƒ | „ | … | † | ‡ | ˆ | ‰ | Š | ‹ | Œ | | Ž | |
| **90h** | | ‘ | ’ | “ | ” | • | – | — | ˜ | ™ | š | › | œ | | ž | Ÿ |
| **A0h** | | ¡ | ¢ | £ | ¤ | ¥ | ¦ | § | ¨ | © | ª | « | ¬ | | ® | ¯ |
| **B0h** | ° | ± | ² | ³ | ´ | µ | ¶ | · | ¸ | ¹ | º | » | ¼ | ½ | ¾ | ¿ |
| **C0h** | À | Á | Â | Ã | Ä | Å | Æ | Ç | È | É | Ê | Ë | Ì | Í | Î | Ï |
| **D0h** | Ð | Ñ | Ò | Ó | Ô | Õ | Ö | × | Ø | Ù | Ú | Û | Ü | Ý | Þ | ß |
| **E0h** | à | á | â | ã | ä | å | æ | ç | è | é | ê | ë | ì | í | î | ï |
| **F0h** | ð | ñ | ò | ó | ô | õ | ö | ÷ | ø | ù | ú | û | ü | ý | þ | ÿ |

### 7.2.17. Windows-1253 (Greek)

| | 00h | 01h | 02h | 03h | 04h | 05h | 06h | 07h | 08h | 09h | 0Ah | 0Bh | 0Ch | 0Dh | 0Eh | 0Fh |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **80h** | € | | ‚ | ƒ | „ | … | † | ‡ | | ‰ | | ‹ | | | | |
| **90h** | | ‘ | ’ | “ | ” | • | – | — | | ™ | | › | | | | |
| **A0h** | | ΅ | Ά | £ | ¤ | ¥ | ¦ | § | ¨ | © | | « | ¬ | – | ® | ― |
| **B0h** | ° | ± | ² | ³ | ΄ | µ | ¶ | · | Έ | Ή | Ί | » | Ό | ½ | Ύ | Ώ |
| **C0h** | ΐ | Α | Β | Γ | Δ | Ε | Ζ | Η | Θ | Ι | Κ | Λ | Μ | Ν | Ξ | Ο |
| **D0h** | Π | Ρ | | Σ | Τ | Υ | Φ | Χ | Ψ | Ω | Ϊ | Ϋ | ά | έ | ή | ί |
| **E0h** | ΰ | α | β | γ | δ | ε | ζ | η | θ | ι | κ | λ | μ | ν | ξ | ο |
| **F0h** | π | ρ | ς | σ | τ | υ | φ | χ | ψ | ω | ϊ | ϋ | ό | ύ | ώ | |

### 7.2.18. Windows-1255 (Hebrew)

| | 00h | 01h | 02h | 03h | 04h | 05h | 06h | 07h | 08h | 09h | 0Ah | 0Bh | 0Ch | 0Dh | 0Eh | 0Fh |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **80h** | € | | ‚ | ƒ | „ | … | † | ‡ | ˆ | ‰ | | ‹ | | | | |
| **90h** | | ‘ | ’ | “ | ” | • | – | — | ˜ | ™ | | › | | | | |
| **A0h** | | ¡ | ¢ | £ | ₪ | ¥ | ¦ | § | ¨ | © | × | « | ¬ | – | ® | ¯ |
| **B0h** | ° | ± | ² | ³ | ´ | µ | ¶ | · | ¸ | ¹ | ÷ | » | ¼ | ½ | ¾ | ¿ |
| **C0h** | ְ | ֱ | ֲ | ֳ | ִ | ֵ | ֶ | ַ | ָ | ֹ | | ֻ | ּ | ֽ | ־ | ֿ |
| **D0h** | ׀ | ׁ | ׂ | ׃ | ׄ | ׅ | ׆ | ׇ | ׈ | ׉ | ׊ | ׋ | ׌ | ׍ | ׎ | ׏ |
| **E0h** | א | ב | ג | ד | ה | ו | ז | ח | ט | י | ך | כ | ל | ם | מ | ן |
| **F0h** | נ | ס | ע | ף | פ | ץ | צ | ק | ר | ש | ת | | | | | |

### 7.2.19. Windows-1257 (Baltic)

| | 00h | 01h | 02h | 03h | 04h | 05h | 06h | 07h | 08h | 09h | 0Ah | 0Bh | 0Ch | 0Dh | 0Eh | 0Fh |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **80h** | € | | ‚ | | „ | … | † | ‡ | | ‰ | | ‹ | | ¨ | ˇ | ¸ |
| **90h** | | ‘ | ’ | “ | ” | • | – | — | | ™ | | › | | ¯ | ˛ | |
| **A0h** | | | ¢ | £ | ¤ | | ¦ | § | Ø | © | Ŗ | « | ¬ | – | ® | Æ |
| **B0h** | ° | ± | ² | ³ | ´ | µ | ¶ | · | ø | ¹ | ŗ | » | ¼ | ½ | ¾ | æ |
| **C0h** | Ą | Į | Ā | Ć | Ä | Å | Ę | Ē | Č | É | Ź | Ė | Ģ | Ķ | Ī | Ļ |
| **D0h** | Š | Ń | Ņ | Ó | Ō | Õ | Ö | × | Ų | Ł | Ś | Ū | Ü | Ż | Ž | ß |
| **E0h** | ą | į | ā | ć | ä | å | ę | ē | č | é | ź | ė | ģ | ķ | ī | ļ |
| **F0h** | š | ń | ņ | ó | ō | õ | ö | ÷ | ų | ł | ś | ū | ü | ż | ž | ˙ |

# 8. Command Details

## A.1. Overwrite mode

In this mode, the cursor will move towards the right and begin from the upper left position. When the cursor has reached the end of the upper line, the cursor will move down to the bottom left position to continue. When the cursor has reached the end of the bottom line, it will move to up the upper left position and overwrite the previous characters.

## A.2. Vertical scroll mode

In this mode, the cursor will move towards the right. The cursor will begin from the upper left position until it has reached the end of the upper line. The cursor will then move down to the bottom left position to continue until it has reached the end of the bottom line.

## A.3. Horizontal scroll mode

In this mode, the extent of the cursor activity is bound by a predefined range, limited to the upper line. (Please refer to Set or cancel window command), where the default window is the whole upper line. The cursor will begin from the left-end of the range and move rightward until it reached the end of the range, to continue, the characters that comes thereafter will start pushing the previous characters leftward from the right-end, scrolling the characters to the left.

## A.4. Set the string display mode and write string to display

Set the string display mode, write to upper or lower line d1 d2 d3 … dn {1≦n≦20}. ‘A’ stands for the upper line, ‘B’ stands for the lower line. The string display mode will be cancelled and the display will return to the previous mode after receiving CLR or CAN.

## A.5. Upper line message continuous scroll

The message (previously defined) will scroll continuously in the horizontal direction until a new command is received.

## A.6. Move cursor left

When the current cursor is at the left-end position, this command operates differently depending on the display mode.

- **Overwrite mode:** When the cursor reached the left-end of the lower line, it will continue to the right-end of the upper line, overwrite previous characters. When it reached the left end of the upper line, it will continue to the right-end of the lower line.
- **Vertical scroll mode:** When the cursor reached the left-end of the lower line, the lower line will scroll up and replace the previous upper line, the lower line will be cleared and the cursor will continue to the right end of the lower line.
- **Horizontal scroll mode:** The cursor will remain stationary.

## A.7. Move cursor right

Move the cursor to the right. When the cursor has reached the right-end, this command operates differently depending on the display mode.

- **Overwrite mode:** When the cursor has reached the right-end of the lower line, it will continue to the left-end of the upper line and overwrite previous characters. When it has reached the right-end of the upper line, it will continue to the right-end of the lower line.

- **Vertical scroll mode:** When the cursor has reached the right-end of the lower line, the lower line will scroll up to replace the upper line, the lower line is cleared and ready to continue characters thereafter.
- **Horizontal scroll mode:** The cursor will remain stationary.

## A.8. Move cursor up

Move the cursor up one line. When the cursor is on the upper line, this command operates differently depending on the display mode.

- **Overwrite mode:** The cursor is moved to the same column the lower line.
- **Vertical scroll mode:** The characters displayed on the upper line is scrolled to the lower line, and the upper line is cleared. The cursor will remain at the same position.
- **Horizontal scroll mode:** The cursor will remain stationary.

## A.9. Move cursor down

Move the cursor down one line. When the cursor is on the lower line, this command operates differently depending on the display mode.

- **Overwrite mode:** The cursor is moved to the same column on the upper line.
- **Vertical scroll mode:** The characters displayed on the lower line are scrolled to the upper line, and the lower line is cleared. The cursor will remain at the same position.
- **Horizontal scroll mode:** The cursor will remain stationary.

## A.10. Move cursor to home position

The cursor will move to the left-end position of the upper line.

## A.11. Move cursor to left-most position

The cursor will be moved to the left-end position of the current line.

## A.12. Move cursor to right-most position

The cursor will be moved to the right-end position of the current line.

## A.13. Move cursor to bottom position

The cursor will be moved to the right-end position on the lower line.

## A.14. Move cursor to specified position

The cursor will be moved to column x on line y.

## A.15. Initialize display

The data in the input buffer will be cleared and reset from default.

## A.16. Reset the window

Reset the window on the display.
When s=0, the window is cancelled (values: x1, x2, and y are not required.)
When s=1, the window will be reset (values: x1, x2, and y are required.)
The x1 and x2 set the position of the left column and right column, respectively, of the window.
The y sets the upper line or the lower line of the window.
This function is valid within the horizontal mode.

## A.17. Clear display screen and clear string mode

All the display characters will be cleared, and the string mode will be cancelled.

## A.18. Clear current line and cancel string mode

The current line is cleared, and the string mode is cancelled.

## A.19. Brightness adjustment

Adjust the brightness of the vacuum fluorescent display.
When n=3, brightness=70%
When n=4, brightness=100%

## A.20. Set cursor ON or OFF

When n=0, cursor is OFF
When n=1, cursor is ON

# 9. Control Code Set

| HEX | CODE | HEX | CODE |
|---|---|---|---|
| 00H | NULL | 10H | DLE |
| 01H | SOH, MD1 | 11H | DC1 |
| 02H | STX, MD2 | 12H | DC2 |
| 03H | ETX, MD3 | 13H | DC3 |
| 04H | EOT, MD4 | 14H | DC4 |
| 05H | ENQ, MD5 | 15H | NAK |
| 06H | ACK, MD6 | 16H | SYN |
| 07H | BEL, MD7 | 17H | ETB |
| 08H | BS, MD8 | 18H | CAN |
| 09H | HT | 19H | EM |
| 0AH | LF | 1AH | SUB |
| 0BH | VT, HOM | 1BH | ESC |
| 0CH | FF, CLR | 1CH | FS |
| 0DH | CR | 1DH | GS |
| 0EH | SO, SLE1 | 1EH | RS, SF1 |
| 0FH | SI, SLE2 | 1FH | US, SF2 |