

User's Manual

HMI-043T-B

DMP Vortex86 EXm Processor

Compact Panel PC with 4.3" Touchscreen

HMI-043T-EM41N-B

HMI-043T-EM41B-B

HMI-043T-EM42N-B

HMI-043T-EM42B-B

(Version 1.3A)

REVISION

| DATE | VERSION | DESCRIPTION | | |
|------------|--------------|------------------------------|--|--|
| 2015/02/01 | Version 1.0A | New Release | | |
| 2015/12/04 | Version 1.1A | Correct power input range | | |
| 2016/01/27 | Version 1.2A | 1. Correct LED luminance | | |
| 2016/01/27 | version 1.2A | 2. Add ordering part numbers | | |
| 2016/07/05 | Version 1.3A | Add USB WLAN solution | | |

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This Manual is for the HMI-043T. Box Series

SAFETY INFORMATION

- Read these Safety instructions carefully.
- Please carry the unit with both hands, handle carefully.
- Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
- Do not expose your Panel PC to rain or moisture in order to prevent shock and fire hazard.
- Input voltage rated +7 ~ 24VDC (HMI-043T Box Series)
- Operating temperature between -20~+60°C (-4F~+140°F).
- Keep HMI-043T away from humidity.
- Never touch un-insulated terminals or wire unless your power adaptor is disconnected.
- Locate your Panel PC as close as possible to the socket outline for easy access and to avoid force caused by entangling of your arms with surrounding cables from the Panel PC.
- USB connectors are not supplied with Limited Power Sources.
- If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.

WARNING!



DO NOT ATTEMPT TO OPEN OR TO DISASSEMBLE THE CHASSIS (ENCASING) OF THIS PRODUCT. PLEASE CONTACT YOUR DEALER FOR SERVICING FROM QUALIFIED TECHNICIAN.

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Ch. 1

General Information

- 1.1 Product Description
- 1.2 Product Specifications
- 1.3 Inspection standard for TFT-LCD Panel
- 1.4 Product Dimensions
- 1.5 Odering Information

1.1 Product Description

ICOP Technology Inc. is proudly going to release a brand new HMI, which offers fanless design, low power consumption, and IP65 front panel. The HMI-043T is powered by DMP Vortex86Exm SoC, the new generation SoC of Vortex86 family, which is included 128MB/256MB memory and eMMC Flash memory. The resistive touch panel with LED backlight TFT LCD increases operation convenience and visibility in outdoor environments. The ultra-compact and thin exterior design is perfect for the present demanding embedded and productive applications.

The new HMI-043T inherited PDX/PMX-series' smooth appearance and ultra-texture aluminum exterior design to make your industrial applications look more stylish. The versatile I/O ports, 10/100Mps Ethernet, RS/232/485, GPIO and Can bus etc. can fulfill fundamental functions. Our consistent advantages feature stable performance, extended working temperature support, low power consumption and fanless design. The open frame model can be accommodated connectivity requirements to industrial machine platforms and industrial automation equipment's needs.

HMI-043T is not only supporting DOS, Linux, and Windows Embedded CE, but also compatible with Arduino platform, which is an open-source electronics prototyping platform based on flexible, easy to use hardware and software to meet ready-to-market demand and provide competitive advantages for customers.

1.2 Product Specifications

HARDWARE SPECIFICATIONS

| CPU | DMP Vortex86Exm 400MHz |
|------------------|--|
| BIOS | Coreboot BIOS |
| Cache | L1:16KB I-Cache, 16KB D-Cache L2: 4-way, 128KB L2 Cache |
| Memory | 128MB / 256MB DDRIII onboard |
| Nand-Flash | 512MB/1GB/2GB eMMC onboard (Optional) |
| Network | Integrated 10/100Mbps Ethernet Support IEEE 802.3AT, PoE/PD (Optional) |
| Serial Interface | RS-232 x 1 RS-485 x 1 Can bus x 1 (Optional) |
| USB | USB ports (Ver2.0) x 1 |

MECHANICAL & ENVIRONMENT

| Power Requirement | +7 ~ 24VDC |
|-----------------------|---|
| Power Consumption | +12V@1A |
| Operating Temperature | 0~+50°C (+32~+122°F) / -20~+60°C (-4~+140°F) |
| Storage Temperature | -30~+70°C (-22~ +158°F) |
| Operating Humidity | 0% ~ 90% Relative Humidity, Non-Condensing |
| Dimensions | 116.4 x 94.4 x 34.3mm (4.58 x 3.71 x 1.35 inches) |
| Weight | 300g |

LCD SPECIFICATIONS

| Display Type | 4.3" WQVGA TFT LCD |
|---------------------|--------------------------------|
| Backlight Unit | LED |
| Display Resolution | 480(W) x 272(H) |
| Luminance (cd/m²) | 280 cd/m ² |
| Contrast Ratio | 450 : 1 |
| Display Color | 16.7M |
| Pixel Configuration | R.G.B Vertical Stripe |
| Viewing Direction | 6 o'clock |
| Viewing Angle | Vertical 120°, Horizontal 140° |

TOUCHSCREEN

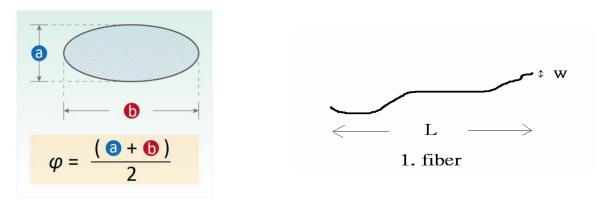
| Туре | Analog Resistive |
|--------------------|---------------------|
| Resolution | Continuous |
| Surface Properties | 3H / Anti-Glare |
| Transmittance | 80% |
| Controller | PS/2 interface |
| Software Driver | DOS / Linux / WinCE |
| Durability | 1 million |

1.3 Inspection standard for TFT-LCD Panel

| DEFECT TYPE | | | LIMIT | | | | | Note | |
|-------------------|----------------------------|---------------------|---|--|--|----------|----------|----------|-------|
| | | | | $\phi < 0.1$ | 5mm | | Ignore | | |
| | | SPOT | | 0.15mm≦¢ | o≦0.5mm | | N≦ | 4 | Note1 |
| | | | | 0.5mm | n<φ | | N=0 | 0 | |
| | | FIDED | 0.03 | 3mm <w≦0.< td=""><td>1mm, L≦5m</td><td>m</td><td>N≦</td><td>3</td><td rowspan="2">Note1</td></w≦0.<> | 1mm, L≦5m | m | N≦ | 3 | Note1 |
| VISUAL DEFECT | INTERNAL | FIBER | | 1.0mm <w,< td=""><td>1.5mm<l< td=""><td></td><td>N=0</td><td>0</td></l<></td></w,<> | 1.5mm <l< td=""><td></td><td>N=0</td><td>0</td></l<> | | N=0 | 0 | |
| DEFECT | | | | φ<0.1 | 5mm | | Igno | re | |
| | | POLARIZER BUBBLE | $0.15 \text{mm} \! \leq \! \phi \! \leq \! 0.5 \text{mm}$ | | | | N≦2 | | Note1 |
| | | | 0.5mm<φ | | | | N=0 | | |
| | | Mura | lt' OK if mura is slight visible through 6%ND filter | | | | | | |
| | BRIGHT DOT | | A Grade | | | B Grade | | | |
| | | | C Area | O Area | Total | C Area | O Area | Total | Note3 |
| | | | N≦0 | N≦2 | N≦2 | N≦2 | N≦3 | N≦5 | Note2 |
| ELECTRICAL DEFECT | DARK DOT | | N≦2 | N≦2 N≦3 | | N≦3 | N≦5 | N≦8 | |
| | TOTAL DOT | | N≦4 | | N≦5 | N≦6 | N≦8 | Note2 | |
| | TWO ADJACENT DOT | | N≦0 | N≦1 pair | N≦1 pair | N≦1 pair | N≦1 pair | N≦1 pair | Note4 |
| | THREE OR MORE ADJACENT DOT | | NOT ALLOWED | | | | | | |
| -11 | LINE D | EFECT | NOT ALLOWED | | | | | | |

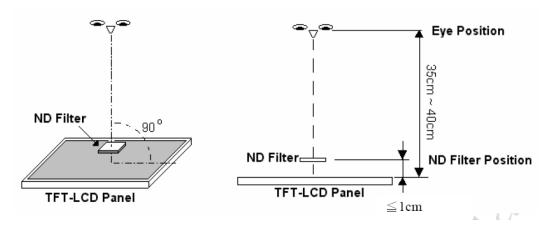
- (1) One pixel consists of 3 sub-pixels, including R, G, and B dot. (Sub-pixel = Dot)
- (2) Little bright Dot acceptitable under 6% ND-Filter.
- (3) If require G0 grand (Total dot N≤0), please contact region sales.

[Note 1] W: Width[mm]; L: Length[mm]; N: Number; φ: Average Diameter.

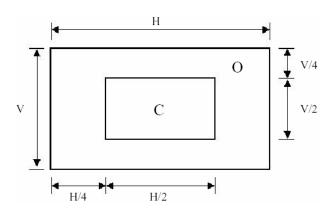


(a) White / Black Spot (b) Polarizer Bubble

[Note 2] Bright dot is defined through 6% transmission ND Filter as following.



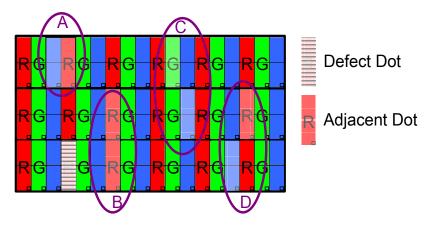
[Note 3] Display area



C Area: Center of display area O

O Area: Outer of display area

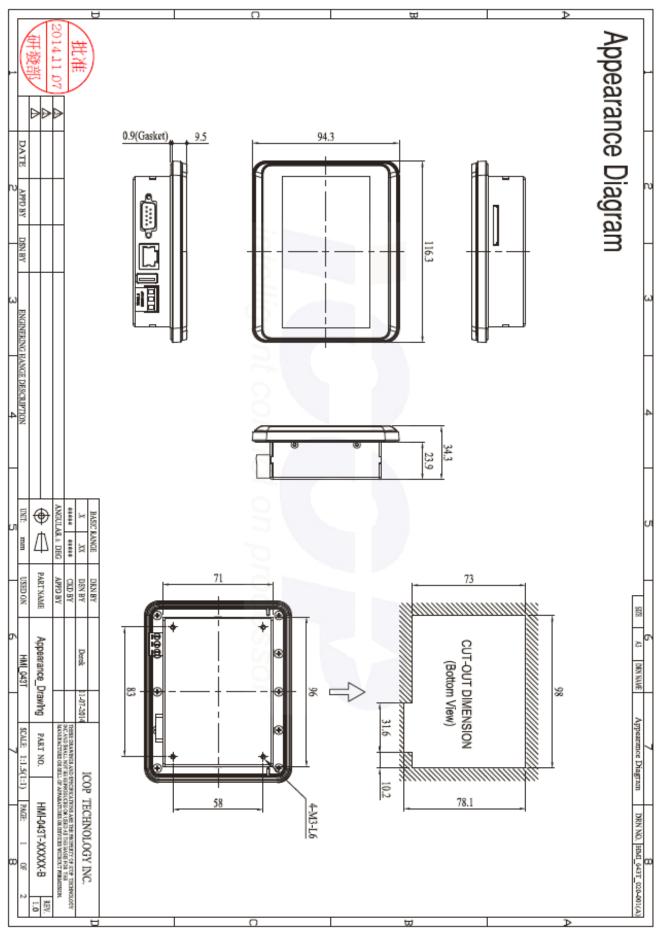
[Note 4] Judge the defect dot and the adjacent dot as following. Allow below (as A, B, C and D status) adjacent defect dots, including bright and dark adjacent dot. And they will be counted 2 defect dots in total quantity.



The defects that are not defined above and considered to be problem shall be reviewed and discussed by both parties.

Defects on the Black Matrix, out of Display area, are not considered as a defect or counted.

1.4 Product Dimensions



1.5 Ordering Information

| PART NUMBER | DESCRIPTION |
|--------------------|--|
| HMI-043T-EM41N-B01 | 4.3" HMI w/128MB/SD/USB/RS232/485/DC+7-24V |
| HMI-043T-EM41N-B02 | 4.3" HMI w/128MB/SD/USB/POE/RS232/485/DC+7-24V |
| HMI-043T-EM41B-B01 | 4.3" HMI w/128MB/512MB eMMC /USB/RS232/485/DC+7-24V |
| HMI-043T-EM41B-B02 | 4.3" HMI w/128MB/512MB eMMC /USB/POE/RS232/485/DC+7-24V |
| HMI-043T-EM41B-BC1 | 4.3" HMI w/128MB/512MB eMMC/USB/CAN/DC+7-24V |
| HMI-043T-EM42N-B01 | 4.3" HMI w/256MB/SD/USB/RS232/485/DC+7-24V |
| HMI-043T-EM42B-B01 | 4.3" HMI w/256MB/512MB eMMC /USB/RS232/485/DC+7-24V |
| HMI-043T-EM42B-B02 | 4.3" HMI w/256MB/512MB eMMC /USB/POE/RS232/485/DC+7-24V |

PACKING LIST

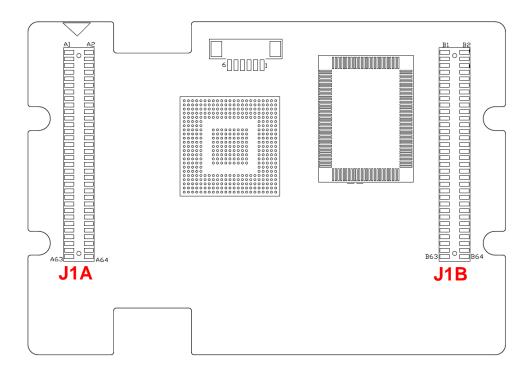
| PART NUMBER | PACKAGE |
|---------------------|------------------------|
| HMI-043T-EM41N-B01 | HMI-043T-EM41N-B01 *1 |
| HMI-043T-EM41N-B02 | HMI-043T-EM41N-B02 *1 |
| HMI-043T-EM41B-B01 | HMI-043T-EM41B-B01 *1 |
| HMI-043T-EM41B-B02 | HMI-043T-EM41B-B02 *1 |
| HMI-043T-EM41B-BC1 | HMI-043T-EM41B-BC1 *1 |
| HMI-043T-EM42N-B01 | HMI-043T-EM42N-B01 *1 |
| HMI-043T-EM42B-B01 | HMI-043T-EM42B-B01 *1 |
| HMI-043T-EM42B-B02 | HMI-043T-EM42B-B02 *1 |
| | USB-WLAN-IPEX-KIT |
| WLAN KIT (Optional) | WIRELESS-ANTENNA-157MM |
| | WIRELESS-CABLE-90MM |

Ch. 2

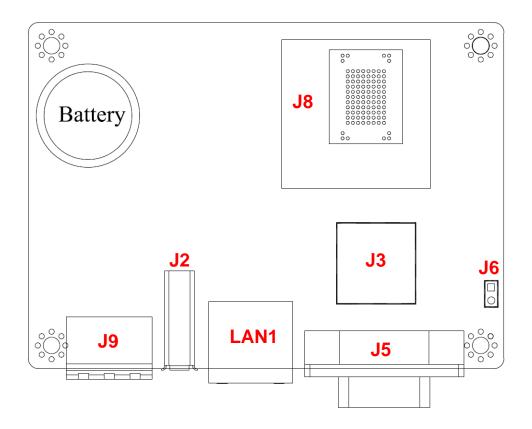
System Installation

- 2.1 CPU Board Outline
- 2.2 Connector Summary
- 2.3 Connector Pin Assignments
- 2.4 Connector I/O Overview

2.1 CPU Board Outline



HMI-043T-B CPU Board



HMI-043T-B I/O Board

2.2 Connector Summary

| No. | Description | Type of Connections | Pin# |
|------|---------------------------|-----------------------------------|--------|
| J1A | Expansion slot | 1.27mm 32x2-pin female box header | 64-pin |
| J1B | Expansion slot | 1.27mm 32x2-pin female box header | 64-pin |
| J2 | USB | External USB Connector | 6-pin |
| J3 | USB | External USB Connector | 6-pin |
| J5 | COM2 RS232/485 or CAN bus | External D-Sub Male Connector | 9-pin |
| J6 | COM2: RS232/485 setting | Pin Header, 2.54mm, 1x2 | 2-pin |
| J8 | SD Card Slot (Optional) | Internal SD Card Socket | |
| J9 | Power Terminal Connector | External Power Plug | 3-pin |
| LAN1 | Ethernet | External RJ45 Connector | 8-pin |

2.3 Connector Pin Assignments

J1A/J1B: Expansion Slot

| Pint | J1 | A1 | | 1A2 | J | 1B1 | J1B2 | | |
|--|------|-------------|------|-------------|------|-------------|------|-------------|--|
| 3 GP00 4 GP01 3 GP70 4 GP71 6 GP02 6 GP03 5 GP72 6 GP73 7 GP04 8 GP05 7 GP74 8 GP75 9 GP06 10 GP07 9 GP76 10 GP77 111 GP90 12 GP91 11 GP60 12 GP61 133 GP92 14 GP93 13 GP62 14 GF63 15 GP94 16 GP95 15 GP64 16 GP65 17 GP96 18 GP97 17 GP66 18 GP67 19 GND 20 GND 19 GND 20 GND 21 USBD1- 22 USBD2- 21 GP50 22 GP51 23 USBD1+ 24 USBD2- 21 GP50 22 GP51 25 AGND 26 AGND 25 GP54 26 GP55 27 ADC_0 28 ADC_1 27 GP66 28 GP57 29 ADC_2 30 ADC_3 29 GP40 30 GP41 31 ADC_4 32 ADC_5 31 GP42 32 GP43 33 ADC_6 34 ADC_7 33 GP44 34 GP45 35 GND 36 GND 35 GP46 36 GP47 37 SATA_TX- 38 SATA_RX- 37 GND 38 GND 39 SATA_TX+ 40 SATA_RX+ 39 GP30 40 GP31 41 GND 42 HSYNC 41 GP32 42 GP33 43 VGA_R 44 VSYNC 43 GP34 46 GP37 49 GND 50 GND 49 GP30 40 GP31 41 GND 42 HSYNC 41 GP32 42 GP35 45 VGA_G 46 PCRST- 45 GP36 46 GP37 47 VGA_B 48 RESET- 47 GP26 54 GP27 55 VBATT 56 VCC18_OUT 55 GND 56 GND 57 GP80 58 GP81 57 GP10 58 GP11 59 GP82 60 GP83 59 GP12 60 GP13 | Pin# | Signal Name | |
| 5 GP02 6 GP03 5 GP72 6 GP73 7 GP04 8 GP05 7 GP74 8 GP76 9 GP06 10 GP07 9 GP76 10 GP77 11 GP90 12 GP91 11 GP60 12 GP81 13 GP92 14 GP93 13 GP62 14 GP83 15 GP94 16 GP95 15 GP64 16 GP65 17 GP96 18 GP97 17 GP66 18 GP67 19 GND 20 GND 19 GND 20 GND 21 USBD1+ 22 USBD2+ 21 GP50 22 GP51 23 USBD1+ 24 USBD2+ 23 GP52 24 GP53 25 AGND 26 AGND 25 GP64 26 GP55 | 1 | RSTDRV | 2 | GND | 1 | VCC_IN | 2 | VCC_IN | |
| 7 GP04 8 GP05 7 GP74 8 GP75 9 GP06 10 GP07 9 GP76 10 GP77 11 GP90 12 GP91 11 GP60 12 GP61 13 GP92 14 GP93 13 GP62 14 GP63 15 GP94 16 GP95 15 GP64 16 GP65 17 GP96 18 GP97 17 GP66 18 GP67 19 GND 20 GND 19 GND 20 GND 21 USBD1- 22 USBD2- 21 GP50 22 GP51 23 USBD1+ 24 USBD2- 21 GP50 22 GP51 23 USBD1+ 24 USBD2- 23 GP52 24 GP53 25 AGND 26 AGND 25 GP54 26 GP55< | 3 | GP00 | 4 | GP01 | 3 | GP70 | 4 | GP71 | |
| 9 GP06 10 GP07 9 GP76 10 GP77 11 GP90 12 GP91 11 GP60 12 GP61 13 GP92 14 GP93 13 GP62 14 GP63 15 GP94 16 GP95 15 GP64 16 GP65 17 GP96 18 GP97 17 GP66 18 GP67 19 GND 20 GND 19 GND 20 GND 21 USBD1- 22 USBD2- 21 GP50 22 GP51 23 USBD1+ 24 USBD2+ 23 GP52 24 GP53 25 AGND 26 AGND 25 GP56 28 GP57 29 ADC_2 30 ADC_3 29 GP40 30 GP41 31 ADC_4 32 ADC_5 31 GP42 32 GP43 33 ADC_6 34 ADC_7 33 GP44 34 GP45 35 GND 36 GND 35 GP46 36 GP47 37 SATA_TX+ 40 SATA_RX+ 37 GND 38 GND 43 VGA_R 44 VSYNC 43 GP36 46 GP37 49 GND 50 GND 49 GP22 50 GP23 51 LANTX+ 54 LANRX+ 53 GP26 54 GP27 55 VBATT 56 VCC18_OUT 55 GND 56 GND 56 GND 57 GP80 58 GP81 57 GP10 58 GP11 59 GP82 60 GP83 59 GP12 60 GP13 | 5 | GP02 | 6 | GP03 | 5 | GP72 | 6 | GP73 | |
| 11 GP90 12 GP91 11 GP60 12 GP61 13 GP92 14 GP93 13 GP62 14 GP63 15 GP94 16 GP95 15 GP64 16 GP65 17 GP96 18 GP97 17 GP66 18 GP67 19 GND 20 GND 19 GND 20 GND 21 USBD1- 22 USBD2- 21 GP50 22 GP51 23 USBD1+ 24 USBD2+ 23 GP52 24 GP53 25 AGND 26 AGND 25 GP54 26 GP55 27 ADC_0 28 ADC_1 27 GP56 28 GP57 29 ADC_2 30 ADC_3 29 GP40 30 GP41 31 ADC_4 32 ADC_5 31 GP42 32 < | 7 | GP04 | 8 | GP05 | 7 | GP74 | 8 | GP75 | |
| 13 GP92 14 GP93 13 GP62 14 GP63 15 GP94 16 GP95 15 GP64 16 GP65 17 GP96 18 GP97 17 GP66 18 GP67 19 GND 20 GND 19 GND 20 GND 21 USBD1- 22 USBD2- 21 GP50 22 GP61 23 USBD1+ 24 USBD2+ 23 GP52 24 GP53 25 AGND 26 AGND 25 GP54 26 GP55 27 ADC_0 28 ADC_1 27 GP56 28 GP57 29 ADC_2 30 ADC_3 29 GP40 30 GP41 31 ADC_4 32 ADC_5 31 GP42 32 GP43 33 ADC_6 34 ADC_7 33 GP44 34 | 9 | GP06 | 10 | GP07 | 9 | GP76 | 10 | GP77 | |
| 15 GP94 16 GP95 15 GP64 16 GP65 17 GP96 18 GP97 17 GP66 18 GP67 19 GND 20 GND 19 GND 20 GND 21 USBD1- 22 USBD2- 21 GP50 22 GP51 23 USBD1+ 24 USBD2+ 23 GP52 24 GP53 25 AGND 26 AGND 25 GP54 26 GP55 27 ADC_0 28 ADC_1 27 GP56 28 GP57 29 ADC_2 30 ADC_3 29 GP40 30 GP41 31 ADC_4 32 ADC_5 31 GP42 32 GP43 31 ADC_4 32 ADC_7 33 GP44 34 GP45 35 GND 36 GND 35 GP46 36 < | 11 | GP90 | 12 | GP91 | 11 | GP60 | 12 | GP61 | |
| 17 GP96 18 GP97 17 GP66 18 GP67 19 GND 20 GND 19 GND 20 GND 21 USBD1- 22 USBD2- 21 GP50 22 GP51 23 USBD1+ 24 USBD2+ 23 GP62 24 GP63 25 AGND 26 AGND 25 GP54 26 GP55 27 ADC_0 28 ADC_1 27 GP56 28 GP57 29 ADC_2 30 ADC_3 29 GP40 30 GP41 31 ADC_4 32 ADC_5 31 GP42 32 GP43 31 ADC_6 34 ADC_7 33 GP44 34 GP45 35 GND 36 GND 35 GP46 36 GP47 37 SATA_TX- 38 SATA_RX- 37 GND 38 | 13 | GP92 | 14 | GP93 | 13 | GP62 | 14 | GP63 | |
| 19 GND 20 GND 19 GND 20 GND 21 USBD1- 22 USBD2- 21 GP50 22 GP51 23 USBD1+ 24 USBD2+ 23 GP52 24 GP53 25 AGND 26 AGND 25 GP54 26 GP55 27 ADC_0 28 ADC_1 27 GP56 28 GP57 29 ADC_2 30 ADC_3 29 GP40 30 GP41 31 ADC_4 32 ADC_5 31 GP42 32 GP43 33 ADC_6 34 ADC_7 33 GP44 34 GP45 35 GND 36 GND 35 GP46 36 GP47 37 SATA_TX- 38 SATA_RX- 37 GND 38 GND 39 SATA_TX+ 40 SATA_RX+ 39 GP30 40 GP31 41 GND 42 HSYNC 41 GP32 42 GP33 43 VGA_R 44 VSYNC 43 GP34 44 GP35 45 VGA_G 46 PCIRST- 45 GP36 46 GP37 47 VGA_B 48 RESET- 47 GP20 48 GP21 49 GND 50 GND 49 GP22 50 GP23 51 LANTX+ 54 LANRX+ 53 GP26 54 GP27 55 VBATT 56 VCC18_OUT 55 GND 56 GND 57 GP80 58 GP81 57 GP10 58 GP11 59 GP82 60 GP83 59 GP12 60 GP13 | 15 | GP94 | 16 | GP95 | 15 | GP64 | 16 | GP65 | |
| 21 USBD1- 22 USBD2- 21 GP50 22 GP51 23 USBD1+ 24 USBD2+ 23 GP52 24 GP53 25 AGND 26 AGND 25 GP54 26 GP55 27 ADC_0 28 ADC_1 27 GP56 28 GP57 29 ADC_2 30 ADC_3 29 GP40 30 GP41 31 ADC_4 32 ADC_5 31 GP42 32 GP43 33 ADC_6 34 ADC_7 33 GP44 34 GP45 35 GND 36 GND 35 GP46 36 GP47 37 SATA_TX- 38 SATA_RX- 37 GND 38 GND 39 SATA_TX+ 40 SATA_RX+ 39 GP30 40 GP31 41 GND 42 HSYNC 41 GP32 <td< td=""><td>17</td><td>GP96</td><td>18</td><td>GP97</td><td>17</td><td>GP66</td><td>18</td><td>GP67</td></td<> | 17 | GP96 | 18 | GP97 | 17 | GP66 | 18 | GP67 | |
| 23 USBD1+ 24 USBD2+ 23 GP52 24 GP53 25 AGND 26 AGND 25 GP54 26 GP55 27 ADC_0 28 ADC_1 27 GP56 28 GP57 29 ADC_2 30 ADC_3 29 GP40 30 GP41 31 ADC_4 32 ADC_5 31 GP42 32 GP43 33 ADC_6 34 ADC_7 33 GP44 34 GP45 35 GND 36 GND 35 GP46 36 GP47 37 SATA_TX- 38 SATA_RX- 37 GND 38 GND 39 SATA_TX+ 40 SATA_RX+ 39 GP30 40 GP31 41 GND 42 HSYNC 41 GP32 42 GP33 43 VGA_R 44 VSYNC 43 GP34 4 | 19 | GND | 20 | GND | 19 | GND | 20 | GND | |
| 25 AGND 26 AGND 25 GP54 26 GP55 27 ADC_0 28 ADC_1 27 GP56 28 GP57 29 ADC_2 30 ADC_3 29 GP40 30 GP41 31 ADC_4 32 ADC_5 31 GP42 32 GP43 33 ADC_6 34 ADC_7 33 GP44 34 GP45 35 GND 36 GND 35 GP46 36 GP47 37 SATA_TX- 38 SATA_RX- 37 GND 38 GND 39 SATA_TX- 40 SATA_RX+ 39 GP30 40 GP31 41 GND 42 HSYNC 41 GP32 42 GP33 43 VGA_R 44 VSYNC 43 GP34 44 GP35 45 VGA_G 46 PCIRST- 45 GP36 4 | 21 | USBD1- | 22 | USBD2- | 21 | GP50 | 22 | GP51 | |
| 27 ADC_0 28 ADC_1 27 GP56 28 GP57 29 ADC_2 30 ADC_3 29 GP40 30 GP41 31 ADC_4 32 ADC_5 31 GP42 32 GP43 33 ADC_6 34 ADC_7 33 GP44 34 GP45 35 GND 36 GND 35 GP46 36 GP47 37 SATA_TX- 38 SATA_RX- 37 GND 38 GND 39 SATA_TX- 40 SATA_RX- 39 GP30 40 GP31 41 GND 42 HSYNC 41 GP32 42 GP33 43 VGA_R 44 VSYNC 43 GP34 44 GP35 45 VGA_G 46 PCIRST- 45 GP36 46 GP37 47 VGA_B 48 RESET- 47 GP20 <t< td=""><td>23</td><td>USBD1+</td><td>24</td><td>USBD2+</td><td>23</td><td>GP52</td><td>24</td><td>GP53</td></t<> | 23 | USBD1+ | 24 | USBD2+ | 23 | GP52 | 24 | GP53 | |
| 29 ADC_2 30 ADC_3 29 GP40 30 GP41 31 ADC_4 32 ADC_5 31 GP42 32 GP43 33 ADC_6 34 ADC_7 33 GP44 34 GP45 35 GND 36 GND 35 GP46 36 GP47 37 SATA_TX- 38 SATA_RX- 37 GND 38 GND 39 SATA_TX- 38 SATA_RX- 37 GND 38 GND 39 SATA_TX- 40 SATA_RX- 37 GND 38 GND 41 GND 42 HSYNC 41 GP32 42 GP33 43 VGA_R 44 VSYNC 43 GP34 44 GP35 45 VGA_G 46 PCIRST- 45 GP36 46 GP37 47 VGA_B 48 RESET- 47 GP20 | 25 | AGND | 26 | AGND | 25 | GP54 | 26 | GP55 | |
| 31 ADC_4 32 ADC_5 31 GP42 32 GP43 33 ADC_6 34 ADC_7 33 GP44 34 GP45 35 GND 36 GND 35 GP46 36 GP47 37 SATA_TX- 38 SATA_RX- 37 GND 38 GND 39 SATA_TX+ 40 SATA_RX+ 39 GP30 40 GP31 41 GND 42 HSYNC 41 GP32 42 GP33 43 VGA_R 44 VSYNC 43 GP34 44 GP35 45 VGA_G 46 PCIRST- 45 GP36 46 GP37 47 VGA_B 48 RESET- 47 GP20 48 GP21 49 GND 50 GND 49 GP22 50 GP23 51 LANTX- 52 LANRX- 51 GP24 52 GP25 53 LANTX+ 54 LANRX+ 53 GP26 54 GP27 55 VBATT 56 VCC1.8_OUT 55 GND 56 GND 57 GP80 58 GP81 57 GP10 58 GP11 59 GP82 60 GP83 59 GP12 60 GP13 61 GP84 62 GP85 61 GP14 62 GP15 | 27 | ADC_0 | 28 | ADC_1 | 27 | GP56 | 28 | GP57 | |
| 33 ADC_6 34 ADC_7 33 GP44 34 GP45 35 GND 36 GND 35 GP46 36 GP47 37 SATA_TX- 38 SATA_RX- 37 GND 38 GND 39 SATA_TX+ 40 SATA_RX+ 39 GP30 40 GP31 41 GND 42 HSYNC 41 GP32 42 GP33 43 VGA_R 44 VSYNC 43 GP34 44 GP35 45 VGA_G 46 PCIRST- 45 GP36 46 GP37 47 VGA_B 48 RESET- 47 GP20 48 GP21 49 GND 50 GND 49 GP22 50 GP23 51 LANTX- 52 LANRX- 51 GP24 52 GP25 53 LANTX+ 54 LANRX+ 53 GP26 54 GP27 55 VBATT 56 VCC1.8_OUT 55 GND 56 GND 57 GP80 58 GP81 57 GP10 58 GP11 59 GP82 60 GP83 59 GP12 60 GP13 61 GP84 62 GP85 61 GP14 62 GP15 | 29 | ADC_2 | 30 | ADC_3 | 29 | GP40 | 30 | GP41 | |
| 35 GND 36 GND 35 GP46 36 GP47 37 SATA_TX- 38 SATA_RX- 37 GND 38 GND 39 SATA_TX+ 40 SATA_RX+ 39 GP30 40 GP31 41 GND 42 HSYNC 41 GP32 42 GP33 43 VGA_R 44 VSYNC 43 GP34 44 GP35 45 VGA_G 46 PCIRST- 45 GP36 46 GP37 47 VGA_B 48 RESET- 47 GP20 48 GP21 49 GND 50 GND 49 GP22 50 GP23 51 LANTX- 52 LANRX- 51 GP24 52 GP25 53 LANTX+ 54 LANRX+ 53 GP26 54 GP27 55 VBATT 56 VCC1.8_OUT 55 GND | 31 | ADC_4 | 32 | ADC_5 | 31 | GP42 | 32 | GP43 | |
| 37 SATA_TX- 38 SATA_RX- 37 GND 38 GND 39 SATA_TX+ 40 SATA_RX+ 39 GP30 40 GP31 41 GND 42 HSYNC 41 GP32 42 GP33 43 VGA_R 44 VSYNC 43 GP34 44 GP35 45 VGA_G 46 PCIRST- 45 GP36 46 GP37 47 VGA_B 48 RESET- 47 GP20 48 GP21 49 GND 50 GND 49 GP22 50 GP23 51 LANTX- 52 LANRX- 51 GP24 52 GP25 53 LANTX+ 54 LANRX+ 53 GP26 54 GP27 55 VBATT 56 VCC1.8_OUT 55 GND 56 GND 57 GP80 58 GP81 57 GP10 | 33 | ADC_6 | 34 | ADC_7 | 33 | GP44 | 34 | GP45 | |
| 39 SATA_TX+ 40 SATA_RX+ 39 GP30 40 GP31 41 GND 42 HSYNC 41 GP32 42 GP33 43 VGA_R 44 VSYNC 43 GP34 44 GP35 45 VGA_G 46 PCIRST- 45 GP36 46 GP37 47 VGA_B 48 RESET- 47 GP20 48 GP21 49 GND 50 GND 49 GP22 50 GP23 51 LANTX- 52 LANRX- 51 GP24 52 GP25 53 LANTX+ 54 LANRX+ 53 GP26 54 GP27 55 VBATT 56 VCC1.8_OUT 55 GND 56 GND 57 GP80 58 GP81 57 GP10 58 GP11 59 GP82 60 GP83 59 GP12 <td< td=""><td>35</td><td>GND</td><td>36</td><td>GND</td><td>35</td><td>GP46</td><td>36</td><td>GP47</td></td<> | 35 | GND | 36 | GND | 35 | GP46 | 36 | GP47 | |
| 41 GND 42 HSYNC 41 GP32 42 GP33 43 VGA_R 44 VSYNC 43 GP34 44 GP35 45 VGA_G 46 PCIRST- 45 GP36 46 GP37 47 VGA_B 48 RESET- 47 GP20 48 GP21 49 GND 50 GND 49 GP22 50 GP23 51 LANTX- 52 LANRX- 51 GP24 52 GP25 53 LANTX+ 54 LANRX+ 53 GP26 54 GP27 55 VBATT 56 VCC1.8_OUT 55 GND 56 GND 57 GP80 58 GP81 57 GP10 58 GP11 59 GP82 60 GP83 59 GP12 60 GP13 61 GP84 62 GP85 61 GP14 62 | 37 | SATA_TX- | 38 | SATA_RX- | 37 | GND | 38 | GND | |
| 43 VGA_R 44 VSYNC 43 GP34 44 GP35 45 VGA_G 46 PCIRST- 45 GP36 46 GP37 47 VGA_B 48 RESET- 47 GP20 48 GP21 49 GND 50 GND 49 GP22 50 GP23 51 LANTX- 52 LANRX- 51 GP24 52 GP25 53 LANTX+ 54 LANRX+ 53 GP26 54 GP27 55 VBATT 56 VCC1.8_OUT 55 GND 56 GND 57 GP80 58 GP81 57 GP10 58 GP11 59 GP82 60 GP83 59 GP12 60 GP13 61 GP84 62 GP85 61 GP14 62 GP15 | 39 | SATA_TX+ | 40 | SATA_RX+ | 39 | GP30 | 40 | GP31 | |
| 45 VGA_G 46 PCIRST- 45 GP36 46 GP37 47 VGA_B 48 RESET- 47 GP20 48 GP21 49 GND 50 GND 49 GP22 50 GP23 51 LANTX- 52 LANRX- 51 GP24 52 GP25 53 LANTX+ 54 LANRX+ 53 GP26 54 GP27 55 VBATT 56 VCC1.8_OUT 55 GND 56 GND 57 GP80 58 GP81 57 GP10 58 GP11 59 GP82 60 GP83 59 GP12 60 GP13 61 GP84 62 GP85 61 GP14 62 GP15 | 41 | GND | 42 | HSYNC | 41 | GP32 | 42 | GP33 | |
| 47 VGA_B 48 RESET- 47 GP20 48 GP21 49 GND 50 GND 49 GP22 50 GP23 51 LANTX- 52 LANRX- 51 GP24 52 GP25 53 LANTX+ 54 LANRX+ 53 GP26 54 GP27 55 VBATT 56 VCC1.8_OUT 55 GND 56 GND 57 GP80 58 GP81 57 GP10 58 GP11 59 GP82 60 GP83 59 GP12 60 GP13 61 GP84 62 GP85 61 GP14 62 GP15 | 43 | VGA_R | 44 | VSYNC | 43 | GP34 | 44 | GP35 | |
| 49 GND 50 GND 49 GP22 50 GP23 51 LANTX- 52 LANRX- 51 GP24 52 GP25 53 LANTX+ 54 LANRX+ 53 GP26 54 GP27 55 VBATT 56 VCC1.8_OUT 55 GND 56 GND 57 GP80 58 GP81 57 GP10 58 GP11 59 GP82 60 GP83 59 GP12 60 GP13 61 GP84 62 GP85 61 GP14 62 GP15 | 45 | VGA_G | 46 | PCIRST- | 45 | GP36 | 46 | GP37 | |
| 51 LANTX- 52 LANRX- 51 GP24 52 GP25 53 LANTX+ 54 LANRX+ 53 GP26 54 GP27 55 VBATT 56 VCC1.8_OUT 55 GND 56 GND 57 GP80 58 GP81 57 GP10 58 GP11 59 GP82 60 GP83 59 GP12 60 GP13 61 GP84 62 GP85 61 GP14 62 GP15 | 47 | VGA_B | 48 | RESET- | 47 | GP20 | 48 | GP21 | |
| 53 LANTX+ 54 LANRX+ 53 GP26 54 GP27 55 VBATT 56 VCC1.8_OUT 55 GND 56 GND 57 GP80 58 GP81 57 GP10 58 GP11 59 GP82 60 GP83 59 GP12 60 GP13 61 GP84 62 GP85 61 GP14 62 GP15 | 49 | GND | 50 | GND | 49 | GP22 | 50 | GP23 | |
| 55 VBATT 56 VCC1.8_OUT 55 GND 56 GND 57 GP80 58 GP81 57 GP10 58 GP11 59 GP82 60 GP83 59 GP12 60 GP13 61 GP84 62 GP85 61 GP14 62 GP15 | 51 | LANTX- | 52 | LANRX- | 51 | GP24 | 52 | GP25 | |
| 57 GP80 58 GP81 57 GP10 58 GP11 59 GP82 60 GP83 59 GP12 60 GP13 61 GP84 62 GP85 61 GP14 62 GP15 | 53 | LANTX+ | 54 | LANRX+ | 53 | GP26 | 54 | GP27 | |
| 59 GP82 60 GP83 59 GP12 60 GP13 61 GP84 62 GP85 61 GP14 62 GP15 | 55 | VBATT | 56 | VCC1.8_OUT | 55 | GND | 56 | GND | |
| 61 GP84 62 GP85 61 GP14 62 GP15 | 57 | GP80 | 58 | GP81 | 57 | GP10 | 58 | GP11 | |
| | 59 | GP82 | 60 | GP83 | 59 | GP12 | 60 | GP13 | |
| 63 GP86 64 GP87 63 GP16 64 GP17 | 61 | GP84 | 62 | GP85 | 61 | GP14 | 62 | GP15 | |
| | 63 | GP86 | 64 | GP87 | 63 | GP16 | 64 | GP17 | |

GPIO Function Pin

| POICOM1 PO | | \setminus | GPIO PIN | Function | $\overline{}$ | GPIO PIN | Function | |
|---|-------------------|---------------|----------|------------------------|---------------|----------|-------------|-----------------|
| POICOM1 POIC | | \rightarrow | | | _ | | ranouon | |
| Policomi | | | | | | | | |
| Policomi | | | | | | | | |
| P0 | P0/COM1 | | | | | GP53 | | P6 |
| P1 P1 P1 P1 P1 P1 P1 P1 | FU/COIVIT | P0 | GP04 | | P5 | | | |
| P1 P1 P1 P1 GP13 GP6 GP7 G | | | | | | | | |
| P1 P1 P1 GP10 GP57 GP60 SDA_D2 GP61 SDA_D3 GP62 SDA_CLK GP64 SDA_D0 GP65 SDA_D0 GP66 SDA_CLK GP66 SDA_CD GP66 SDA_D0 GP65 SDA_D0 GP65 SDA_D0 GP66 SDA_D0 GP70 GP70 GP70 GP71 GP71 GP71 GP71 GP71 GP71 GP72 GP72 GP72 GP72 GP72 GP74 GP74 GP74 GP74 GP74 GP75 GP76 GP77 GP | | | | | | | | |
| P1 | | | | | 1 | | | |
| P1 | | П | | <u> </u> | | | SDA D2 | |
| P1 | | | | | | | | |
| P1 P1 GP13 | | | | | | | | |
| GP14 | P1 | P1 | | | P6 | | | P6/SD/eMMC |
| P2/Bit-Rich-I/O P2 | - '' | [] | | | | | | - I Grobiemino |
| P2/Bit-Rich-I/O P4 GP45 GP45 GP46 GP47 GP46 GP47 GP70 GP70 GP70 GP70 GP71 GP71 GP71 GP71 GP72 GP72 GP72 GP72 GP72 GP72 GP74 GP74 GP74 GP75 | | | | | 1 | | | |
| P2/Bit-Rich-I/O P3 | | | | | | | | |
| P2/Bit-Rich-I/O P2 | | | | | | | | |
| P2/Bit-Rich-I/O P2 GP21 SPI_SCLK_Touch GP71 GP72 GP72 GP72 GP72 GP72 GP73 GP74 GP74 GP75 GP75 GP75 GP75 GP75 GP75 GP75 GP75 GP76 GP76 GP77 GP78 HD_SYNC GP82 HD_SYNC GP82 HD_SYNC GP82 HD_SYNC GP84 HD_SYNC GP84 HD_SYNC GP84 HD_SYNC GP84 HD_SYNC GP85 COM5_TXDEN5 GP86 COM6_TXDEN6 GP87 GP90 | | | | SPLCS Touch | | | | |
| P2/Bit-Rich-I/O P2 GP22 SPI_SDI_Touch GP72 GP73 GP73 GP74 GP74 GP74 GP74 GP75 GP75 GP75 GP75 GP75 GP76 GP76 GP77 GP78 HD_SYNC GP32 COM6_TXD6 GP82 HD_SD0 GP84 HD_SYNC GP84 HD_ST# GP85 COM5_TXDEN5 GP36 GP37 GP40 GP85 COM6_TXDEN6 GP87 GP87 GP90 GP91 GP91 GP92 GP91 GP92 GP92 GP94 GP94 GP94 GP95 GP94 GP95 GP77 GP | | | | | 1 | | | |
| P2/Bit-Rich-I/O P2 GP23 SPI_SDO_Touch P7 GP73 GP73 GP74 GP74 GP74 GP74 GP75 GP75 GP75 GP75 GP75 GP75 GP76 GP76 GP76 GP76 GP76 GP76 GP77 GP77 | | | | | | | | |
| GP24 SPI_INT_Touch GP74 GP74 GP75 GP75 GP75 GP75 GP76 GP76 GP76 GP77 GP82 HD SDO GP82 HD SDO GP82 HD SDO GP84 HD RST# GP85 COM5 TXDEN5 GP86 COM6_TXDEN5 GP86 COM6_TXDEN6 GP87 GP97 GP9 | P2/Bit-Rich-I/O | P2 | | | P 7 | | | P7/GPIO |
| P3/Rich-I/O P3 | 1 Z/Dit (tion i/o | | | | | | | 1 // 01 10 |
| P3/Rich-I/O GP26 En&PWM Dimming Control GP76 GP76 GP77 GP78 HD SVNC GP82 HD SD0 GP82 HD SD0 GP84 HD RST# GP85 COM5 TXDEN5 GP84 HD RST# GP85 COM5 TXDEN5 GP86 COM6_TXDEN6 GP87 GP87 GP90 GP91 GP91 GP91 GP92 GP92 GP93 GP94 GP94 GP95 GP96 GP97 GP97 GP97 GP97 GP98 GP98 | | | | | | | | |
| P3/Rich-I/O P3 | | | | En&PWM Dimming Control | | | | |
| P3/Rich-I/O P3 | | | | 14,318Mhz OUT | | | | |
| P3/Rich-I/O P3 | | | | | | | | |
| P3/Rich-I/O P3 | | | | | | | | |
| P3/Rich-I/O P3 | | | | | | | | |
| GP34 GP35 GP85 COM5 TXDEN5 GP86 COM6_TXDEN6 GP87 GP40 GP41 GP42 CAN-TXD GP91 GP92 GP44 GP45 GP95 GP95 | P3/Rich-I/O | P3 | GP33 | COM6 RXD6 | P8 | GP83 | | P8/Bit-Rich-I/O |
| GP36 | i ontion no | | GP34 | | | GP84 | HD RST# | |
| GP36 | | | GP35 | | | GP85 | COM5 TXDEN5 | |
| P4/Bit-Rich-I/O P4 GP43 CAN-TXD P9 GP93 P9 GP95 P9 GP95 | | | GP36 | | | | COM6 TXDEN6 | |
| P4/Bit-Rich-I/O P4 GP40 GP41 GP91 GP92 GP93 GP94 GP95 GP95 P9 | | | | | | | • | |
| P4/Bit-Rich-I/O P4 GP42 CAN-TXD P9 GP93 P9 GP94 GP95 P95 | | | GP40 | | | | | |
| P4/Bit-Rich-I/O P4 | | | GP41 | | | GP91 | | |
| GP44 GP95 GP95 | | | GP42 | CAN-TXD | | GP92 | | |
| GP44 GP94 GP95 | P4/Bit-Rich-I/O | P4 | GP43 | CAN-RXD | P 9 | GP93 | | P9 |
| | | | | | | | | |
| GD06 | | | | | | | | |
| | | | GP46 | | | GP96 | | |
| GP47 GP97 | | | GP47 | | | GP97 | | |

J2/J3: USB

| | Pin# | Signal Name |
|---|------|-------------|
| 1 | 1 | VCC |
| | 2 | USB0- |
| | 3 | USB0+ |
| | 4 | GND |
| | 5 | GGND |
| | 6 | GGND |

J6: COM2: RS232/485 setting

| Pin# | Signal Name | | |
|-------|---------------|--|--|
| OPEN | ENABLE RS-232 | | |
| CLOSE | ENABLE RS-485 | | |

J9: Power Connector DC-IN 24V

| 1 2 3 | Pin# | Signal Name |
|-------|------|-------------|
| | 1 | +7~24V |
| | 2 | GND |
| | 3 | FG |

J5: COM2 RS-232/485

(Change setting by J6 Jumper)

| 1 5 © 00000 © 6 9 | Pi n # | Signal Name | Pi n # | Signal Name |
|----------------------|--------------|----------------|--------------|----------------|
| | 1 | DCD2/ | 2 | RXD2/ |
| | • | RS485- | | RS485+ |
| | 3 | TXD2 | 4 | DTR2 |
| | 5 | GND | 6 | DSR2 |
| | 7 | RTS2 | 8 | CTS2 |
| | 9 | RI2 | | |

LAN1

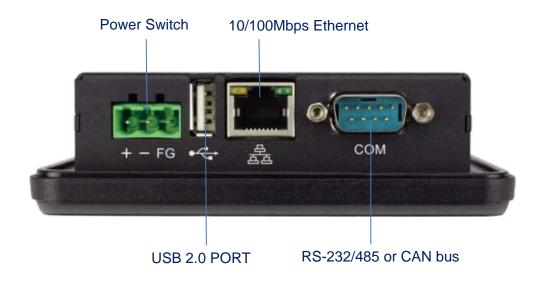
| | Pin | Signal | Pin | Signal |
|--------|-----|--------|-----|--------|
| 8 2, 1 | # | Name | # | Name |
| | 1 | FTXD+ | 2 | FTXD- |
| | 3 | FRXIN+ | 4 | NC |
| | 5 | NC | 6 | FRXIN- |
| | 7 | NC | 8 | NC |

J5: CAN bus (Optional)

| 1 5 © 00000 00000 6 9 | Pi n # | Signal Name | Pi n # | Signal Name |
|--------------------------------|--------------|----------------|--------------|----------------|
| | 1 | | 2 | CAN L |
| | 3 | | 4 | |
| | 5 | | 6 | |
| | 7 | CAN H | 8 | |
| | 9 | | | |

2.4 Connector I/O Overview





Ch. 3

Driver Installation

3.1 HMI-043T Development Note

VGA

Vortex86VGA is a programmable VGA controller in 22mm x 16mm LQFP 128 package. It integrates a PCIe bridge controller and a VGA controller with 4M-Byte Pseudo SRAM memory (16-bit data width). It also incorporates 3.3V DVO digital interfaces to support a third party LVDS/TMDS transmitter.

LAN

The Vortex86DX2 processor is integrated 10/100Mbps Ethernet controller that supports both 10/100BASE-T and allows direct connection to your 10/100Mbps Ethernet based Local Area Network for full interaction with local servers, wide area networks such as the Internet.

I/O and IRQ settings can be done by software with the supplied utility software, or it can be set for Plug and Play compatibility. The controller supports: Half / Full-Duplex Ethernet function to double channel bandwidth, auto media detection.

OPERATING SYSTEM SUPPORT

The HMI-043T provides the VGA and LAN drivers for DOS, Linux, and Windows CE, Please get the drivers from ICOP technical support URL: tech.icop.com.tw

HMI-043T is an open-source embedded platform based on Vortex86EXm SoC, easy-to-use hardware and software integrated. This platform can support many x86 O/S as well as those running on the original Arduino base system.

3.1 HMI-043T Development Note

< WINDOWS DEVELOPMENT GUIDE >

Windows Embedded CE 6.0 BSP and development notes, please visit technical website to get more information at http://tech.icop.com.tw/.

< LINUX INSTALLATION NOTE>

Please visit Linux technical website to get more information at ftp://ftp.dmp.com.tw/Linux_DEMO/Vortex86_Linux_Support_List_revised. htm.

Warranty

This product is warranted to be in good working order for a period of one year from the date of purchase. Should this product fail to be in good working order at any time during this period, we will, at our option, replace or repair it at no additional charge except as set forth in the following terms. This warranty does not apply to products damaged by misuse, modifications, accident or disaster. Vendor assumes no liability for any damages, lost profits, lost savings or any other incidental or consequential damage resulting from the use, misuse of, originality to use this product. Vendor will not be liable for any claim made by any other related party. Return authorization must be obtained from the vendor before returned merchandise will be accepted. Authorization can be obtained by calling or faxing the vendor and requesting a Return Merchandise Authorization (RMA) number. Returned goods should always be accompanied by a clear problem description.

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