M-606

Linux ARM9 Single Board Computer

User Guide

Version 1.0

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1. Introduction

M-606 is a WinCE ready Single Board Computer featuring four serial ports, LCD TTL/LVDS Interface, 10/100Mbps Ethernet, USB port and SD socket for flash disk expansion. The pre-install WinCE 6.0 makes M-606 ready for your application development using Microsoft Visual Studio.

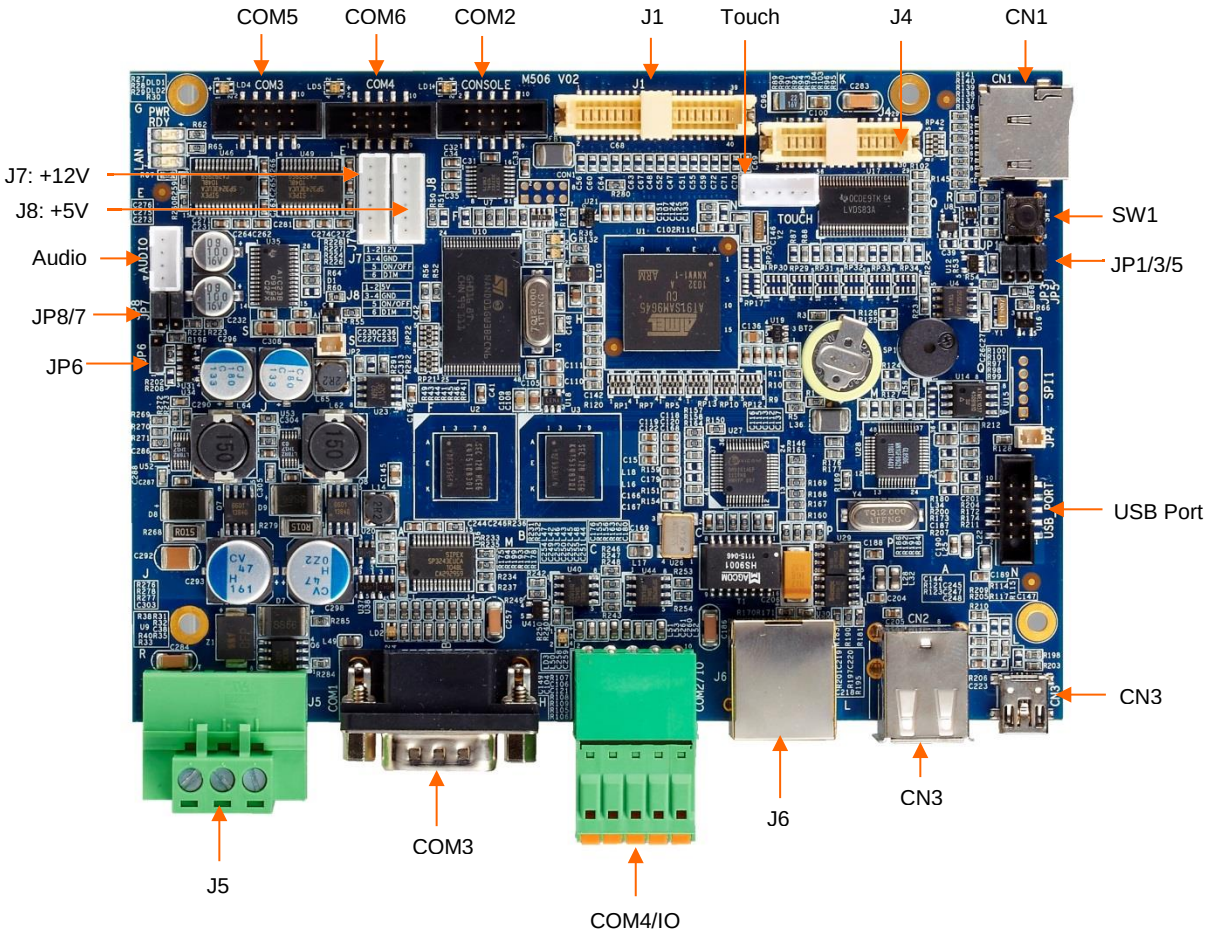
1.1 Features

- ARM926EJ-S ARM Thumb Processor 400MHz w/MMU
- 32-KByte Data Cache and 32-KByte Instruction Cache
- 128MB SDRAM, 128MB NAND Flash on board
- One 10/100Mbps Ethernet
- LCD TTL/LVDS Interface
- Four USB 2.0 High speed (480Mbps) Host Ports
- One software configurable RS-422/485 port and three RS-232 ports
- One three-wire RS-232 port (CONSOLE)
- 4 programmable GPIO
- 9 to 30 VDC power input
- Pre-installed WinCE 6.0 and file system
- SDK available on Artila FTP
- 3.5” Single Board Computer form factor

1.2 Packing List

- M-606
- 91-0P9M9-001: Console Cable (10Pin Header to DB9 Male, 20cm) x4

2. Layout



Please refer to Appendix Pin Assignment:

- J1 Connector: CSI-4585-400R
- J4 Connector: CSI-4585-300R
- J2 Connector: CSF-2481-401R (On the back)

3. Pin Assignment and Definition

3.1 Factory Default Settings

LAN IP Address: DHCP

LCD Resolution: 800 x 480 16-bit color

User disk: NandFlash

Web page path: NandFlash\www

Autoexec path: NandFlash

3.2 Power on and System boot up

Once Matrix-604 correctly power on, it will take about 30 seconds to hear a BEEP which means WinCE is successfully boot up. The system starts from the initial table and a batch file, ***autoexec.bat*** which is located at \NandFlash. Therefore user can edit the ***autoexec.bat*** file or init table for your auto run program. To skip the autoexec.bat, please repeatedly key $ (shift+4) right after system boot up.

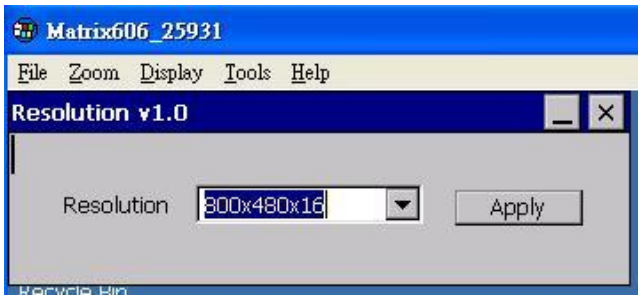
3.3 WinCE 6.0

Once WinCE boot up. You can use USB keyboard and mouse to access the system.

3.4 Configure LCD Resolution

To configure the LCD resolution, you can use the utility software at Program/Resolution as shown followed. Currently we support:

- 480x272 16-bit
- 640x480 16-bit
- 800x480 16-bit
- 800x600 16-bit
- 1024x768 16-bit



3.5 LCD Brightness Control

To configure the LCD brightness, you can use the utility software at Program/Backlight Control as shown followed:

3.6 Network Settings

To configure the network setting by serial console, you can use command ***ifconfig*** as followed. To check current network configuration, you can use command ***ipconfig.***

```
Windows IP configuration

Ethernet adapter [NET1]:
        IP Address ........ : 169.254.107.225
        Subnet Mask ....... : 255.255.0.0

        DNS Servers........ : 192.168.1.1

\> ifconfig -h
Ver. 1.00
Usage: ifconfig [-n|-i|-m| -g| -d| -h]
      -n <adapter name>          : Ethernet adapter name
      -i <IP address or DHCP>    : Static IP or DHCP
      -m <Netmask address>       : Subnet Mask
      -g <Gateway address>       : Default gateway
      -d <DNS address>           : Domain Name Server
      -h                         : Display this usage
\>
```

3.7 User Account Manager

To create user group and account, you can use command ***usrmgr.*** After user's account and password are created, user can add authentication in telnet and ftp function by using ***telnetdcfg*** and ***ftpdcfg***.

```
Usage: usrmgr [-a|-d|-l] [<user name> [<password>]]
      -a <user name> <password> : Add or update a user
      -d <user name>            : Remove a user
      -l                        : List all users
      -gn                       : Create a new group
      -gd                       : Delete a group
      -gl                       : List all groups
      -gm                       : List members in a group
      -gat                      : Add a user to a group
      -grf                      : Remove a user from a group
\>
```

3.8 Telnet Configuration

Telnet is enabled without authentication as factory default. To disable or add authentication, please use command ***telnetdcfg*** as follow:

```
telnetdcfg [IsEnabled] [UseAuthentication]
1:enabled, 0:disabled
```

3.9 FTP Configuration

FTP is enabled without authentication as factory default. To disable or add authentication, please use command ***ftpdcfg*** as follow:

```
ftpdcfg [IsEnabled] [UseAuthentication] [AllowAnonymous]
1:enabled, 0:disabled
\> _
```

3.10 File System

User programs and files should be saved at NandFlash. The other folders are saved as RAMDisk therefore do not save your data to them. Under NandFlash, you will find ***www*** folder and ***autoexec.bat*** file. WWW is for web page and ***autoexec.bat*** is for auto run program. If you have a USB disk plugged in Matrix-604, you will find a new folder ***Hard Disk*** available.

```
\> dir
    Directory of \

01/01/98  05:00a    <DIR>              NandFlash
07/13/10  05:35p    <DIR>              Application Data
07/13/10  09:35a                    23 Control Panel.lnk
07/13/10  09:35a    <DIR>              My Documents
07/13/10  09:35a    <DIR>              Program Files
07/13/10  09:35a    <DIR>              Temp
07/13/10  09:35a    <DIR>              Windows

    Found 7 file(s). Total size 23 bytes.
    1 Dir(s) 24530944 bytes free
```

```
\NandFlash> dir
    Directory of \NandFlash

07/13/10  07:47p    <DIR>              Documents and Settings
07/08/10  11:36p                   303 autoexec.bat
07/14/10  12:53p    <DIR>              www

    Found 3 file(s). Total size 303 bytes.
    1 Dir(s) 100098048 bytes free
```

3.11 Serial Ports Configuration

The serial port of M-606 is mapped as followed:

Serial 1=> USB Console (ActiveSync)

Serial 2=> Console (RS-232)

Serial 3=> M-605 Port 1 (RS-232)

Serial 4=> M-605 Port 2 (RS-422/485)

Serial 5=> M-605 Port 3 (RS-232)

Serial 6=> M-605 Port 4 (RS-232)

To configure serial port settings, please use command ***setuart*** as follow:

```
\> setuart -h
Ver. 1.00
Usage: setuart [-p|-t|-b|-h]
      -p <0,1,2...      >      : Specify port number
      -t <232,485,422>         : Set port type
      -b <9600...>             : Set port baud rate
      -h                       : Display this usage
\> _
```

3.12 GPIO Control

M-606 comes with five GPIO which share the serial console port connector. Use ***gpioctl*** command to control the GPIO port. The I/O number starts from #1 to #5 and can be configured as input or output independently.

```
\> gpioctl -h

Ver. 1.00
Usage: gpioctl [-i|-s|-m| -a| -h]
      -i <1,2...       >        : Specify IO number
      -s <0, 1>                 : Set IO state, 0:low, 1:high
      -m <0, 1>                 : Set IO mode, 0:input, 1:output
      -a                        : List all IO state/mode
      -h                        : Display this usage
\>
```

4. Artila Utility Software

4.1 Beep

Beep command will beep the buzzer as follow:

```
\> beep -h
Ver. 1.00
Usage: beep [-f|-d|-h]
      -f < Hz >                 : Set frequency
      -d < msec >               : Set duration
      -h                        : Display this usage
\>
```

4.2 update

update command is used to update the kernel and loader of WinCE 6.0. Current version of WinCE is available on Artila FTP.

```
\> update -h
Ver. 1.00
Usage: update [-k|-l|-v |-h]
      -k "filename"          : kernel image
      -l "filename"          : loader image
      -h                       : display this usage
\>
```

4.3 Web Page Directory

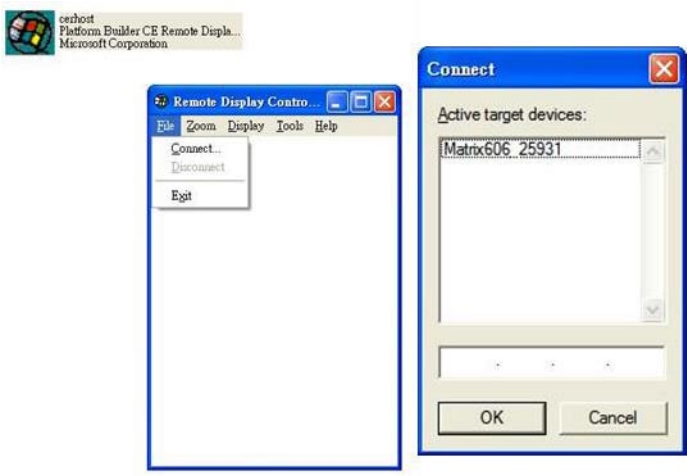
The web pages are placed at */NandFlash/www* and the home page name should be *index.htm.*

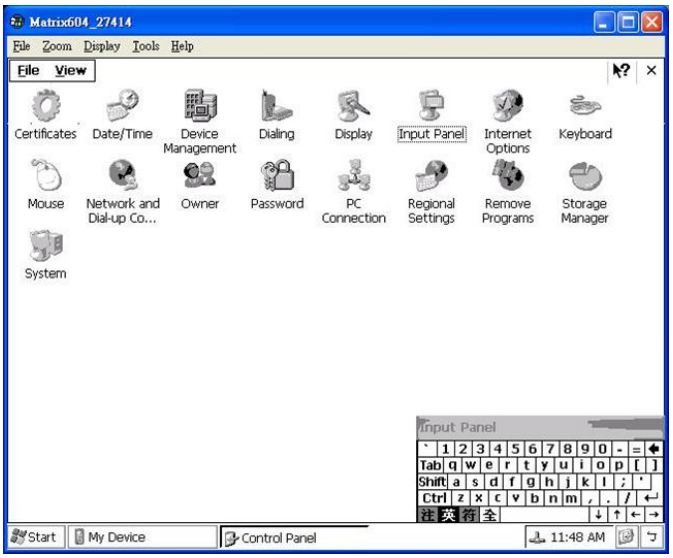
4.4 Reboot

Reboot command is used to reboot the system.

4.5 Remote Display Control

M-606 comes with WinCE remote display control software. You can find this software on Artila FTP at \tool\cerhost.exe. Choose ***connect*** to find and connect M-606 and ok to connect it. You can also enter the IP address of M-606 to connect it.



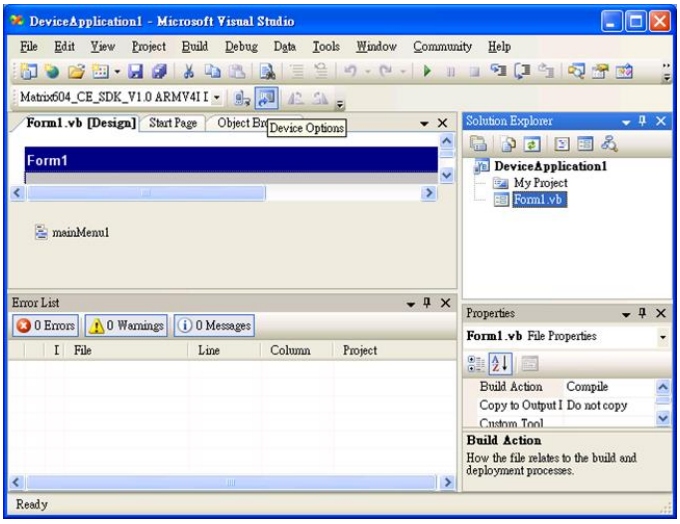


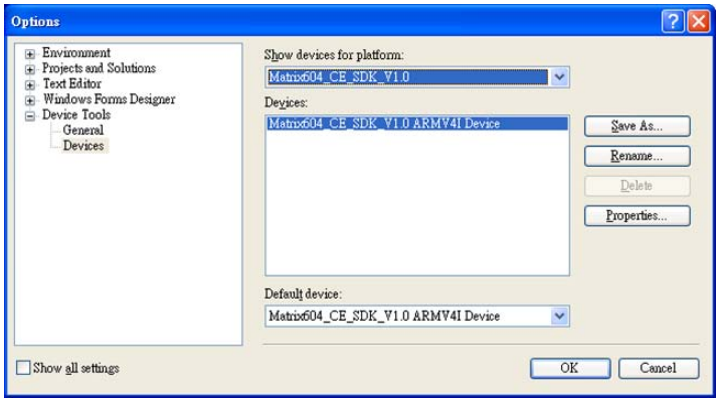
4.6 ActiveSync

M-606 supports Microsoft ActiveSync via USB client. You can download ActiveSync from Microsoft web server. ActiveSync provides an easy way to transfer files between PC and M-606.

4.7 Install M-606 SDK

M-606 WinCE 6.0 SDK is located at Artila FTP. You need to install Microsoft Studio 2005 before installing M-606 SDK. Choose M-606_CE_SDK for the smart device application and click the device option.



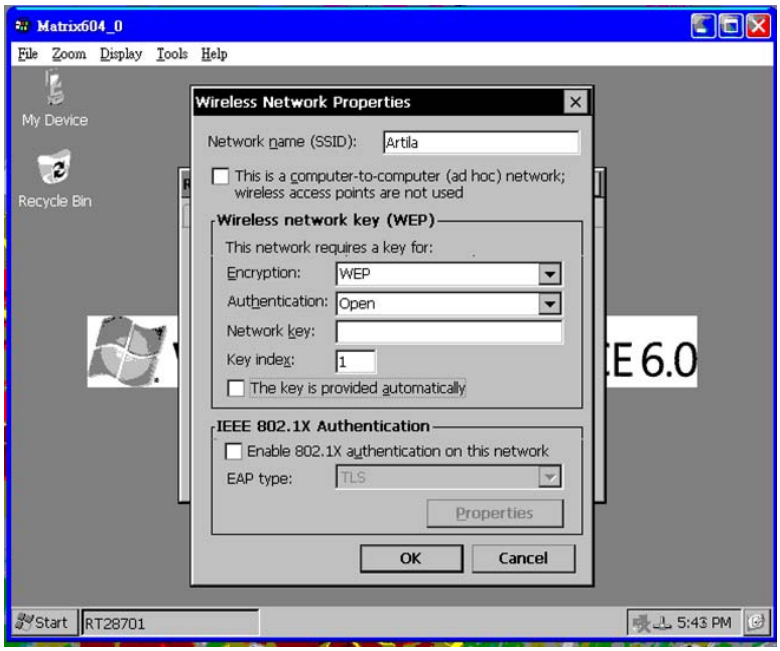


4.8 Install USB WLAN dongle

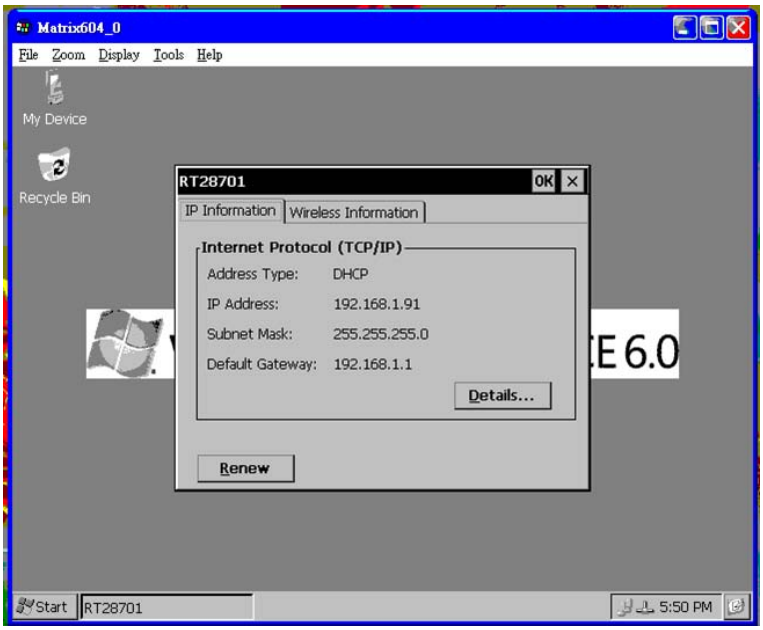
M-606 supports USB WLAN dongle which uses Ralink RT2870 Wireless LAN controller. While plug in USB WLAN dongle, you will see the new USB device detected. Follow the screen 1, 2, 3 to configure the Wireless LAN.

Screen 1

Screen 2



Screen 3


Matrix604_0
File Zoom Display Tools Help
My Device
Recycle Bin
RT28701
OK
IP Information
Wireless Information
Internet Protocol (TCP/IP)
Address Type: DHCP
IP Address: 192.168.1.91
Subnet Mask: 255.255.255.0
Default Gateway: 192.168.1.1
Details...
Renew
Start
RT28701
5:50 PM