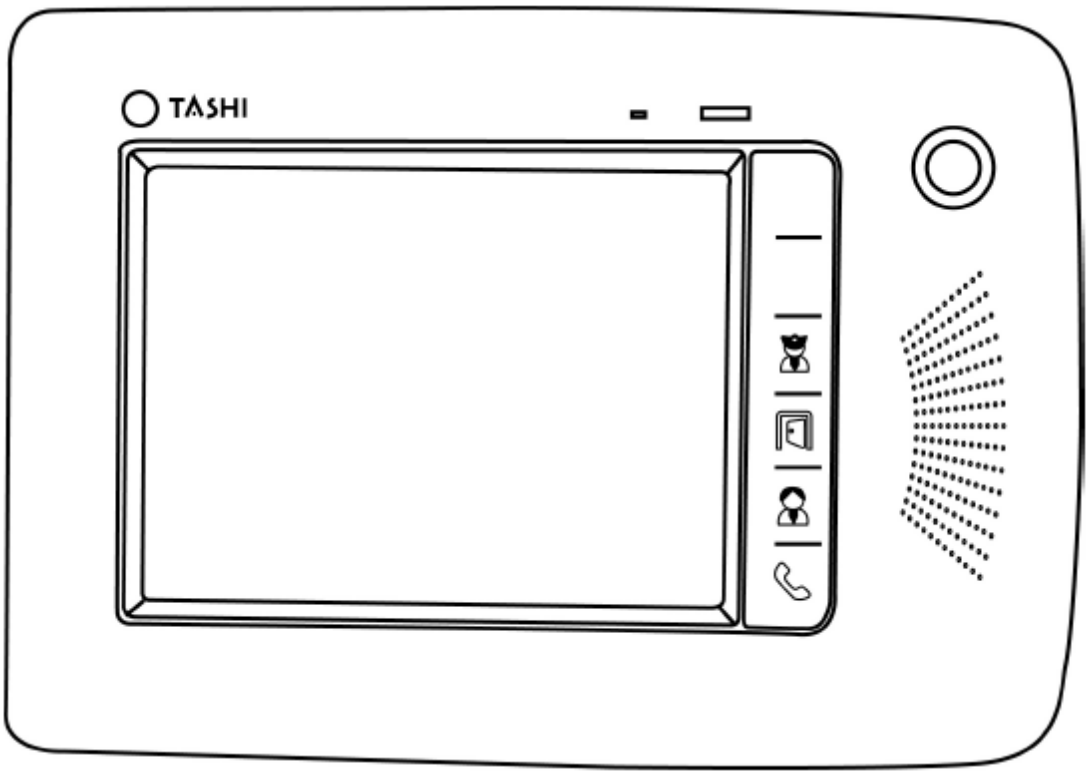
unitech TASHI

Multi-Function Versatile Controller

MT688



User's Manual

400790G Version 1.1

Preface

About This Manual

This manual explains how to install, operate and maintain the MT688 Multi-Function Versatile Controller.

Unitech global website address: http:\\www.unitech-adc.com

Regulatory Compliance Statements

FCC Warning Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following:

- Relocate the receiving antenna.

- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit that is different from the receiver.
- Consult the dealer or an experienced radio/television technician for help.

1. This Transmitter must not cohabitate or operate in conjunction with any other antenna(s) or transmitter(s).
2. This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body. To maintain compliance with FCC RF exposure compliance requirements, avoid direct contact to the transmitting antenna during transmission.
3. Any changes or modifications (including the antennas) made to this device that are not expressly approved by the manufacturer may void the user's authority to operate the equipment.

Canadian Compliance Statement

This Class B Digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe B respecte les exigences du Règlement sur le matériel broilleur du Canada.

European Conformity Statement

Declaration of Conformity with Regard to the R&TTE 1999/5/EC and EMC 89/336/ EEC directives.

RoHS Statement

This device conforms to RoHS (Restriction of Hazardous Substances) European Union regulations that set maximum concentration limits on hazardous materials used in electrical and electronic equipment.

Taiwan NCC Warning Statement

根據 NCC 低功率電波輻射性電機管理辦法規定：

第十二條　經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

第十四條　低功率射頻電機之使用不得影響飛航安全及幹擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。前項合法通信，指依電信法規定作業之無線電通信。

低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

Warranty

The following items are covered under Unitech Limited Warranty:

- MT688 Multi-Function Versatile Controller – 1-year limited warranty.
- Cables – three-month limited warranty.

Table of Contents

Chapter 1

Getting Started

Introducing the MT688

The MT688 is a versatile fixed-mount TASHI (Time & Attendance, Access Control, Surveillance, Home Automation and Intercom) Controller. This multi-functional device offers a built-in 2.0-Megapixel CMOS digital camera, RFID reader, microphone and audio speaker. It runs on a Windows CE 5.0 operating system which provides a variety of applications that benefit numerous industries.

Features

Internal System

- Samsung 6410, 667Mhz Processor
- Microsoft Windows CE 6.0

Memory

- 128 MB SDRAM
- 128 MB FlashROM

Display

- 8” SVGA TFT-LCD touch-screen
- 800 x 600 resolution

Multimedia

- 2.0 Megapixel CMOS Camera
- Speaker Audio Outputs
- Microphone Audio Input

RFID Reader (Optional)

- MiFare, 13.56MHz

Wireless Connectivity (Optional)

- Supports 802.11b/g Wireless LAN

Communication

- RS232/485
- USB 1.1 Host
- USB 1.1 Client (for developing use only)
- Relay Outputs (4)
- Photo-Coupler Inputs (4)
- Ethernet 10/100Base-T
- Power-over-Ethernet

Expansion Slot

- SDHC Memory Slot

User Interface

- 6-Hard Buttons
- Touch-screen

Software Programming Tools

- C#, VB.NET, C++

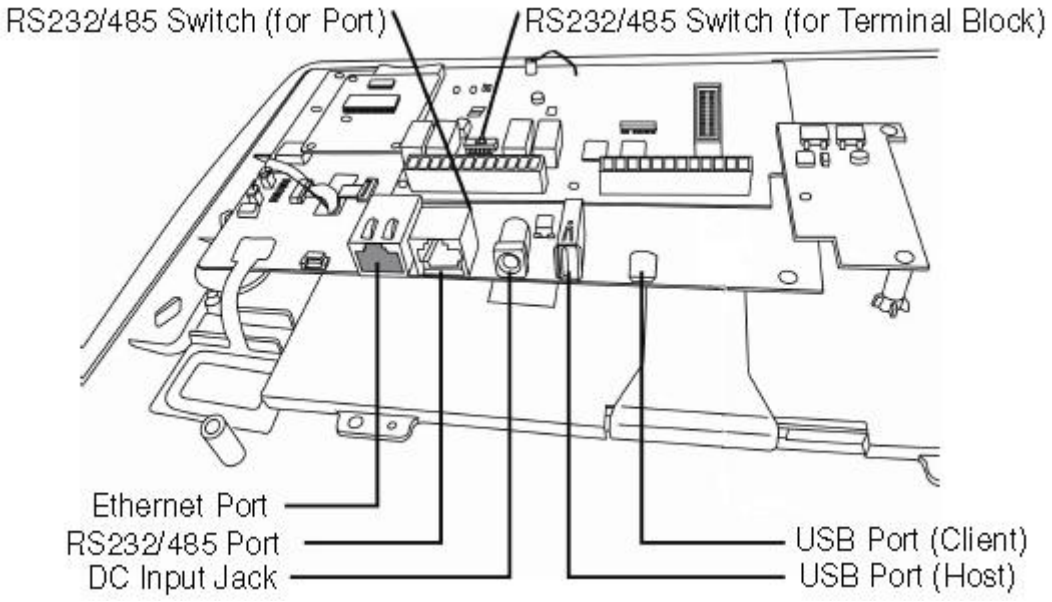
TASHI Middleware

- SIP and IP-CAM server/client SDK
- ModBus SDK supporting
- Elfin utility

Setting up the MT688

Connecting Power

Connect power to the MT688 through the following instruction: Plug the Power Adapter Cable into the MT688's DC input jack and then connect the other end of the Power Adapter into an electrical outlet.



Powering On the MT688

The MT688 automatically powers on when the Power Adapter plugs into an external power source. The MT688 welcome screen appears, followed by the Windows CE screen.

Using the MT688 for the First Time

Using the Touch-screen

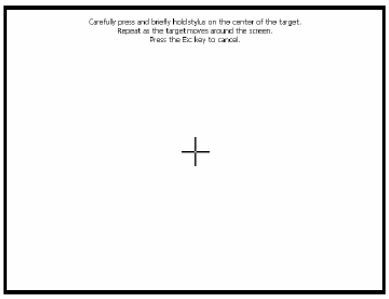
1. Tap the screen to choose a menu option.

2. Double tap to open programs.
3. Use the Windows CE Keyboard to type letters or numbers into a data field or on a form.

Calibrating the Screen

The calibration screen automatically appears when the MT688 is powered ON for the first time or when the system is reset.

Tap a sequence of target marks across the screen. Tap gently, but firmly by touching the screen.

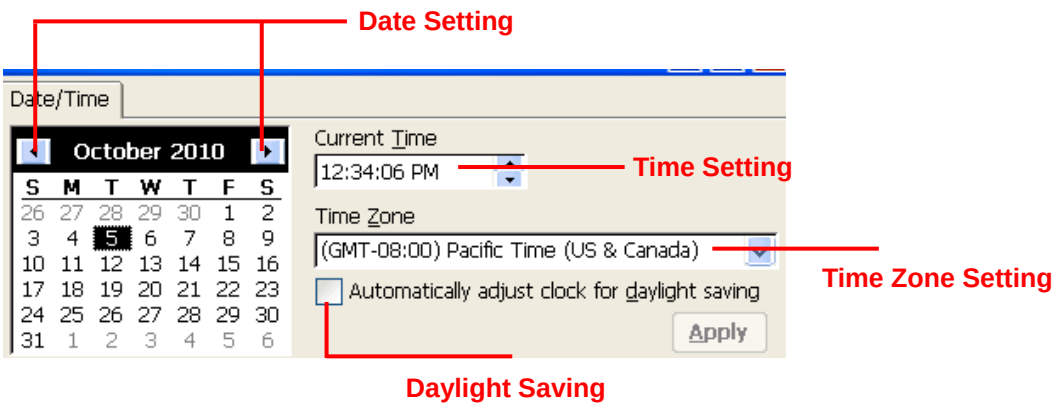


The Date/Time properties screen will appear after the screen calibration has been confirmed.

Setting the Date and Time

In the Date/Time Properties window, touch the screen to select the current date/time, time zone and daylight saving time option.

- Tap the Left or Right arrows to scroll through the desired year and month, or directly tap the year or month to change the setting.
- Tap on the Hr/Min/Sec AM/PM to input the Hr/Min/Sec to set the time.
- Tap the arrow and set the correct time zone from the drop-down menu.
- Check the box to enable Windows to automatically adjust for day-light saving time.
- Tap Apply to save the settings and exit the Date/Time Properties dialog, or tap to exit without saving.

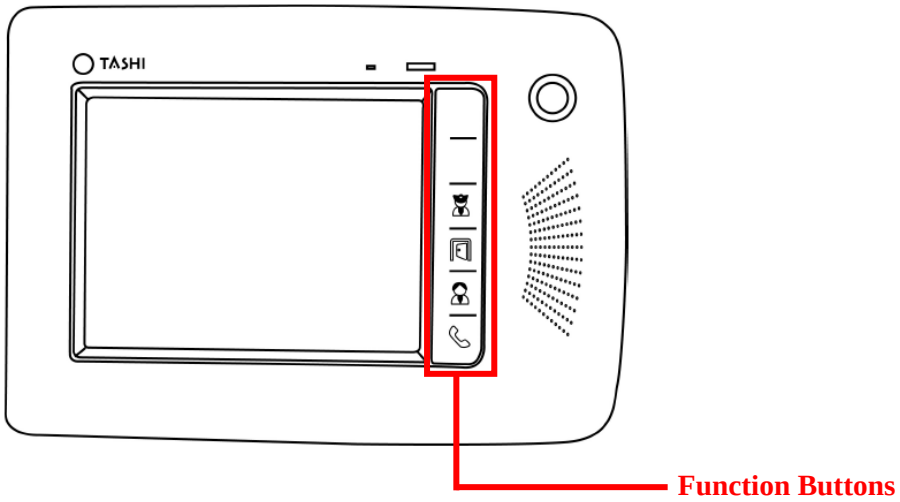


Chapter 2

Using the Hardware

Using the Function Buttons

The MT688 contains six function Buttons.



Function Key Descriptions

F1	Function button
F2	Function button
(F3)	Function button for calling the security guard
(F4)	Function button for door opening
(F5)	Function button enabling communication with administrator
(F6)	Function button for calling

Using the Windows CE 6.0 Keyboard

The Windows CE Software provides a touch-screen keyboard for alphanumeric input. The Windows-based keyboard replicates the layout of a standard PC keyboard.

Open the Windows CE keyboard by tapping → LargeKB.

Entering Characters

Entering alphabetic and numeric characters on the MT688 is the same as character input on a standard PC keyboard. Tap the onscreen button corresponding to the desired character.

Moving the Keyboard

Tap the title bar and drag the keyboard to the desired location.

Closing the Keyboard

Tap the keyboard icon → Hide Input Panel to close the Windows CE keyboard.

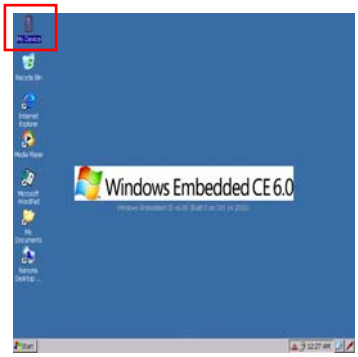
Using the RFID Reader (Optional)

If your MT688 is provided with RFID reader, you will see the RFID reader logo on the front panel of MT688. The MT688 features a standard RFID reader, which is compatible with 13.56MHz MiFare cards.

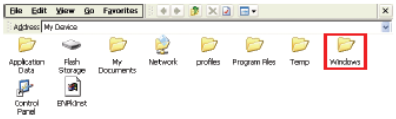
Testing RFID Card Verification

The MT688 has built-in demo programs that allow RFID card verifications.

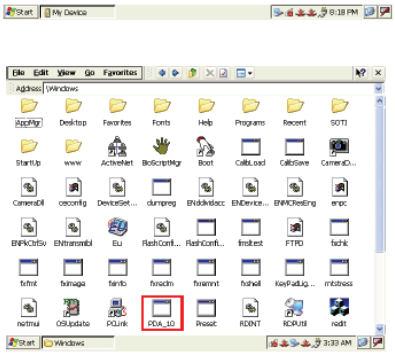
1. Double-tap the My Device icon on the Windows CE desktop.



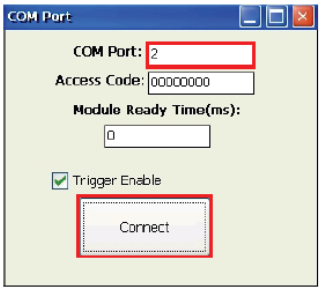
2. Double-tap Windows.



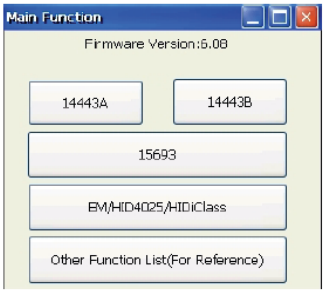
3. Double-tap PDA_10 to open the demo program.



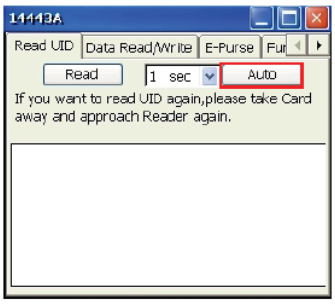
4. Set the COM Port: field at 2. Tap Connect.



5. Choose a card type to activate the demo test program.



6. Tap Auto and bring the RFID card close to the sensor. The code will display on the field below.



7. Tap Stop to end the reading.

Using the Camera

The MT688 has a built-in 2.0-Megapixel camera that provides the following:

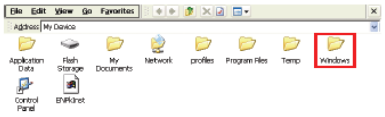
- Capture still images.
- Serve as video recorder.
- Function as an audio/video intercom.
- Incorporates facial recognition through third party software.

Testing the Imager

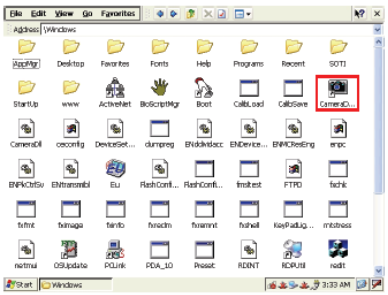
Test the camera's efficiency with the MT688's built-in CameraDemo program through the following steps:

1. Double-tap My Device on the Windows CE desktop.

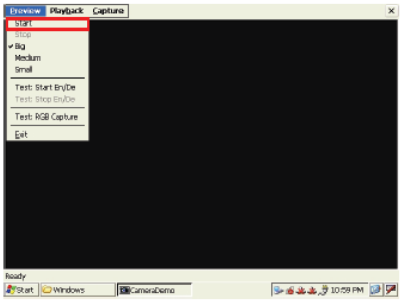
2. Double-tap Windows.



3. Double-tap CameraDemo to open the demo program.



4. Tap Preview → Start.
   A continuous image is displayed for capturing an image/audio/video.



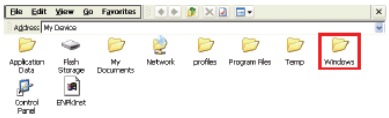
5. Tap Capture to photograph an image.
6. To view the image, tap Preview → Stop. And, tap Playback → Show Image. Double-tap the image file name from the My Device folder.
7. To exit the image, tap Playback → End Show Image.
8. Exit the CameraDemo window by tapping X, or Preview → Exit.

Using the Audio Input/Output

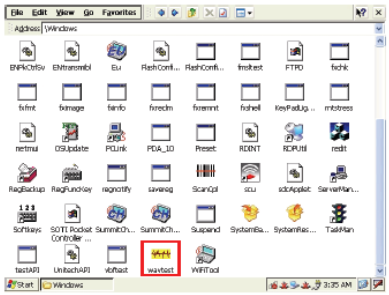
An audio demo program will test the audio input (recording) and output (playback).

1. Double tap My Device on the Windows CE desktop.

2. Double-tap Windows.



3. Double-tap wavtest to open the demo program.

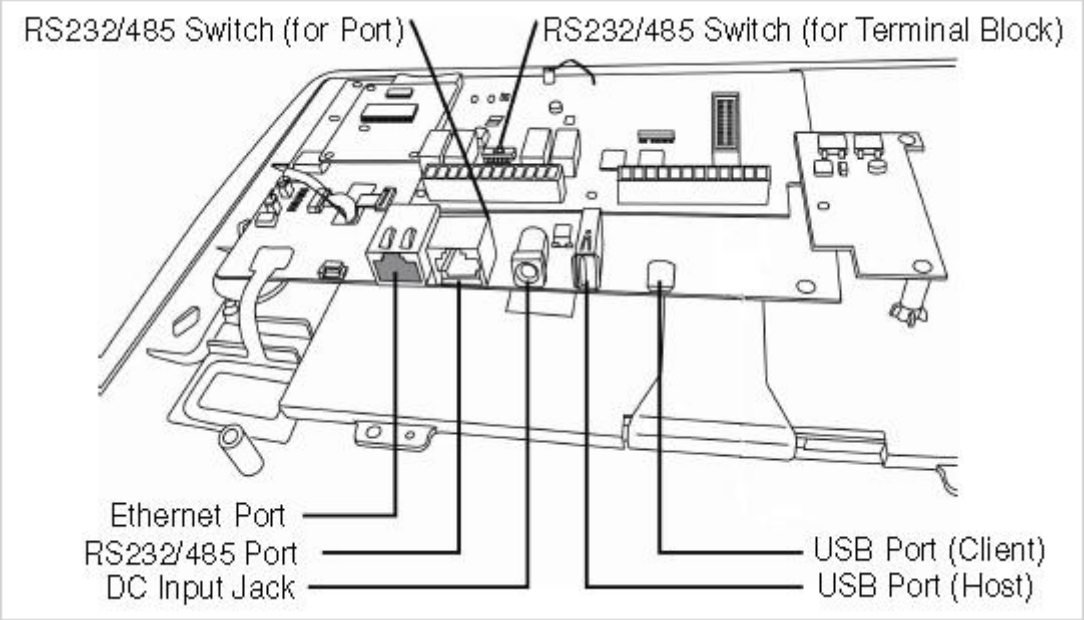


4. Do one of the following:
   -- Tap Rec to record the voice.
   -- Tap Stop to finish recording.
   -- Tap Play to listen to the recording.

Chapter 3

Data Communication

The MT688 can link to a host computer for data communication via USB, RS232/485 or Ethernet cables.



Establishing the USB Connection

Connect a USB cable to the MT688's USB host port, and connect the other end to a USB peripheral, such as a: Keyboard, mouse, memory card or HID compliant device.

Establishing the MT688/PC Connection

The MT688 supports the following connection methods:

USB Cable

Connect a USB cable to the PC's USB host port, and connect the other end to the MT688's USB client port. The USB connection allows data synchronization. See the Using Mircosoft ActiveSync section.

Serial Cable

Plug an RS232 communication cable into the PC's 9-pin COM port, and

connect the other end to the MT688's RS232/485 Port.

NOTE: Turn the RS232/485 Switch to the left (RS232) position.

Ethernet Cable

Plug an Ethernet cable into the PC's RJ-45 ethernet port, and connect the other end of the cable into the MT688's Ethernet Port.

NOTE: In order for the Power-over-Ethernet module to support power over the RJ-45 Ether-net cable, the client side must have a POE Hub.

Using Mircosoft ActiveSync

Using Microsoft ActiveSync to synchronize and transfer information between any desktop computer and the MT688.

Additional Capabilities

Microsoft ActiveSync can:

- Backup and restore data.
- Copy files (rather than synchronize) between the MT688 and a desktop computer.
- Control synchronization.
- Select the type and amount of synchronized data.

Requirements

In order to synchronize, Microsoft ActiveSync must be installed on the desktop computer and the MT688. The MT688 is already installed with Microsoft ActiveSync. The most updated version of Microsoft ActiveSync can be downloaded from www.microsoft.com.

Installing Microsoft ActiveSync

NOTE: Uninstall the previous version of Mircosoft ActiveSync before installing the latest version of Microsoft ActiveSync. The MT688 requires ActiveSync version 4.5 or higher.

Install Microsoft ActiveSync on a computer through the following:

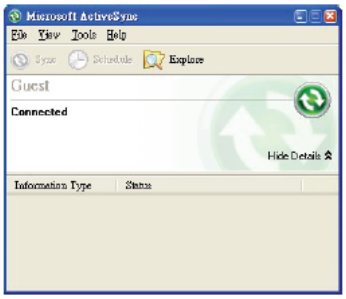
1. Close all programs, including those that run during startup.
2. Disable all virus-scanning software.
3. Download ActiveSync from: http://www.microsoft.com/windowsmobile/activesync/activesync45.mspx
4. Go to the download file location, and double-click the file download.
5. Follow the onscreen instructions to complete installation.

Connecting the MT688 to the Computer

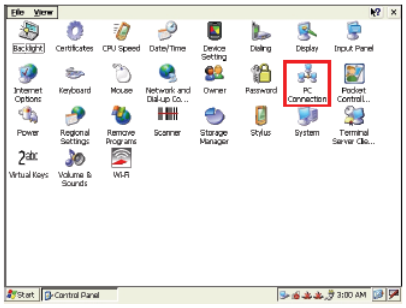
1. Power on the MT688.
2. Connect a USB cable to the MT688's USB host port, and connect the other end to a computer.
3. Microsoft ActiveSync starts automatically configuring the communication port to work with the MT688. The New Partnership setup wizard automatically starts.

NOTE: **Click** Start → Programs → Microsoft ActiveSync if ActiveSync doesn't automatically start.
Click Cancel and manually configure the communication settings, if a message appears indicating that it is unable to detect a connection. Manually configure the communications settings on the computer by clicking MAS → File → Connection Settings → Connect Device.

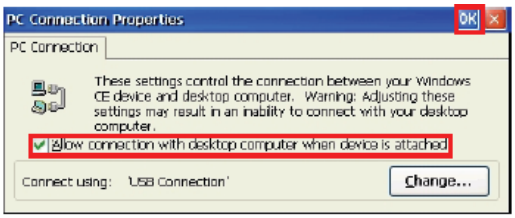
4. Follow the onscreen instructions.
The Microsoft ActiveSync window appears, when the configuration process is complete.
Synchronization will initiate periodically, or upon connection.
NOTE: The computer can create a connection with multiple MT688 devices. In addition, an MT688 can create a connection with up to two computers.



5. To ensure the correction, on the MT688, tap Start → Settings → Control Panel → double-tap PC Connection.



6. Check Allow connection with desktop computer when device is attached. Tap OK.



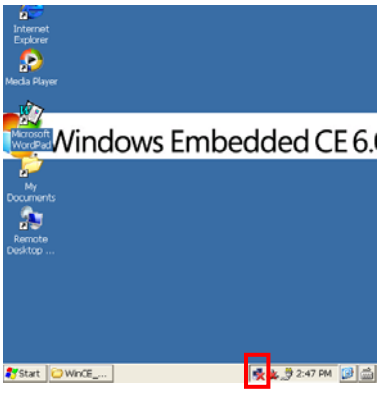
Establishing a Wi-Fi Connection

The MT688 supports wireless communication with a built-in Wi-Fi card for 802.11b/g WLAN. It is possible to use the WiFi Utility to set up or modify the Wi-Fi settings through the following steps:

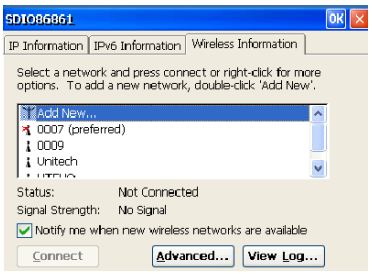
NOTE: Wi-Fi access requires a separate service contract through a wireless service provider. Contact a wireless service provider for more information.

Unitech terminals come with built-in RF facility. This chapter guides you through the RF setting.

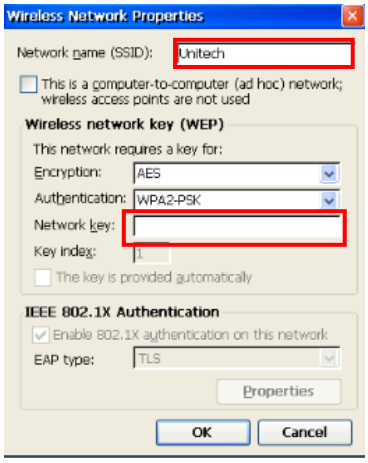
1. Tap the wireless network icon as a shortcut on the desktop.



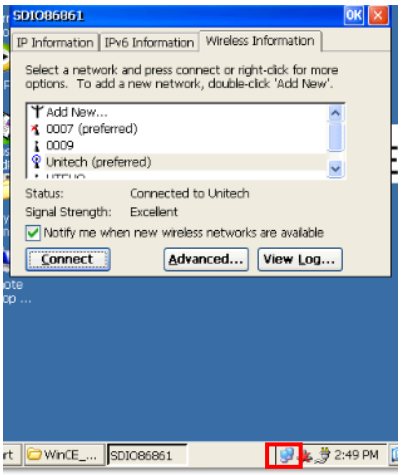
2. Move to **Wireless Information**, and tap **Add New** or double tap a preferred network.



3. Enter a Network Name (SSID) and a Network Key. For the detailed instruction on wireless network encryption setting, please visit Microsoft website.
   Then, tap OK.



4. The network icon appears on the taskbar when the RF is connected.



Set Up an IP Address

The MT688 automatically detects WLAN module during the first installation. Set the IP address through one of the following methods:

- Obtaining an IP Address via Dynamic Host Configuration Protocol (DHCP) Server.
- Specifying an IP Address.

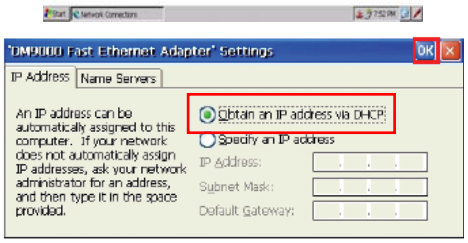
Obtaining an IP Address via DHCP Server

Make sure a DHCP server is available in the LAN environment before trying to obtain the IP address through a DHCP server.

1. Tap Start → Settings → Network and Dial-up Connections.
   NOTE: Tap Start → Settings → Control Panel → double-tap Network and Dial-up Connections.

2. Double-tap DM9000.

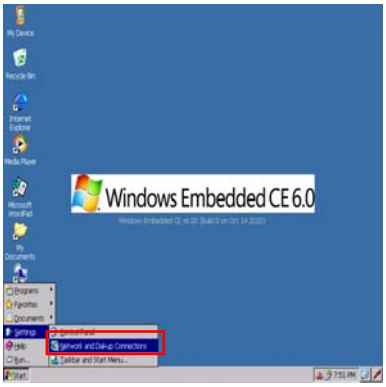
3. Tap the radio button next to Obtain an IP address via DHCP and then tap OK.



Specifying an IP Address

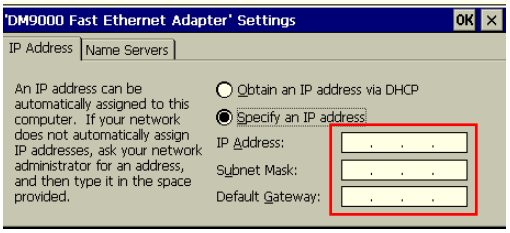
If no DHCP server is available, assign an IP address to each MT688 through the following:

1. Tap Start → Settings → Network and Dial-up Connections.
   NOTE: Tap Start → Settings → Control Panel → double-tap Network and Dial-up Connections.

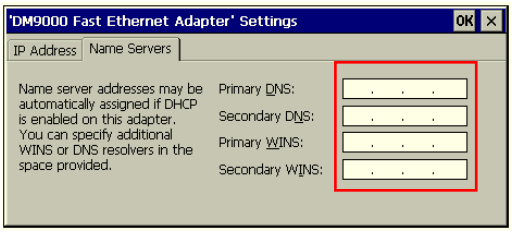


2. Double-tap DM9000.

3. Tap the radio button next to Specify an IP address. Input the proper IP address, Subnet Mask and Default Gateway.



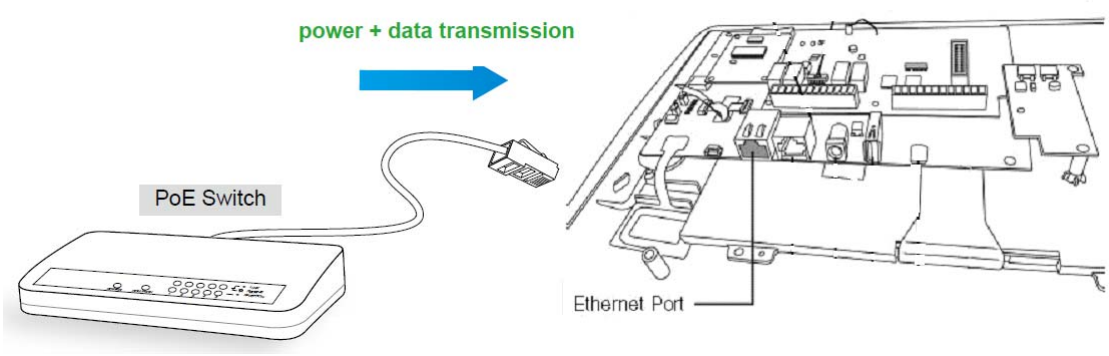
4. In the Name Servers tab, input the proper Primary DNS:, Secondary DNS:, Primary WINS: and Secondary WINS:. Tap OK.



NOTE: To avoid conflict with the Local Area Network environment, consult an MIS department for the correct Transmission Control Protocol / Internet Protocol setting.

When using a PoE-enabled switch

The MT688 is PoE-compliant, which allows it to be powered via a single Ethernet cable. If your switch/router supports PoE, refer to the following illustration to connect the MT688 to a PoE-enabled switch/router.



Chapter 4

Power and Hardware

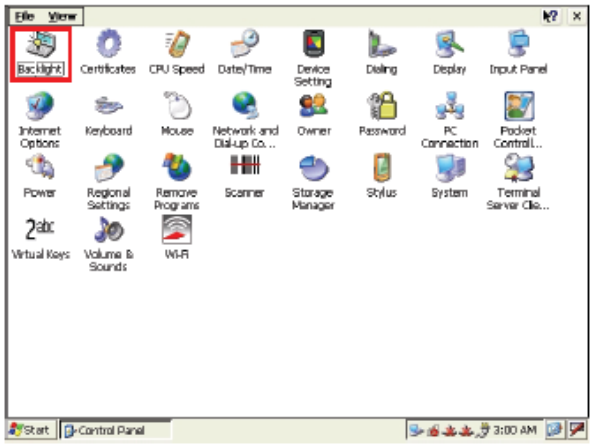
The MT688 must work with external power. In this case, connect the MT688 to the AC outlet with the power adapter.

Adjusting the Backlight

Adjust the backlight screen settings through the following steps:

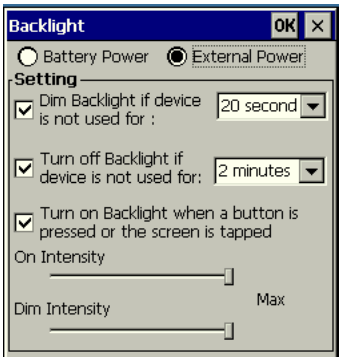
NOTE: The MT688 screen contrast has been preset by Unitech for optimum performance.

1. Tap Start → Settings → Control Panel → double-tap Backlight to adjust the screen brightness.



2. The color display's backlight can be customized for the Battery Power and External Power conditions. Set the backlight behavior and drag the On Intensity and Dim Intensity sliders to the desired levels.

Field	Description
Dim Backlight	Minutes until the backlight dims.
Turn Off Backlight	Minutes until the backlight turns automatically off.
Turn on Backlight	The backlight turns on when a button is pressed, or the touch-screen is tapped.



Performing a Hardware Reset

Perform a reset if the MT688 is frozen (i.e., the device no longer responds to pressing buttons on/or the touch-screen).

Performing a Warm Boot

A Warm Boot is used to reset or reboot the device without losing data stored in RAM memory. Perform a Warm Boot in any of the following situations:

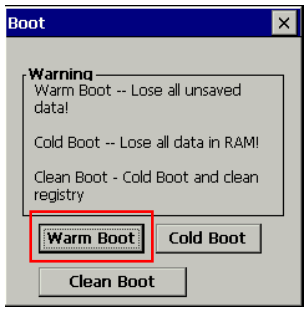
- The MT688 fails to respond.
- After installing software applications.
- After making changes to certain system settings (i.e. SD card).

CAUTION! A Warm Start will erase all unsaved data.

From Windows CE

1. Tap My Device → Windows → Boot.

2. Tap Warm Boot.



Performing a Cold Boot

A Cold Boot will erase all added data and programs, but it will restore the device to the default factory settings. However, data and application programs stored in the Flash Storage will not be deleted.

Always perform a Warm Boot before attempting to use a Cold Start to correct a problem. Data previously synchronized to the computer can be restored during a future Microsoft ActiveSync operation, or data can be restored from a backup storage card.

Perform a Cold Boot by using the BootMode utility in the operating system, or by pressing the function Buttons on the MT688's front panel.

Perform a cold boot in the following situations:

Reset the operating system.

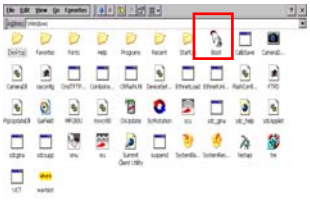
Restore the MT688 back to factory settings.

Reset the MT688 after a boot loader, keyboard and kernel upgrade.

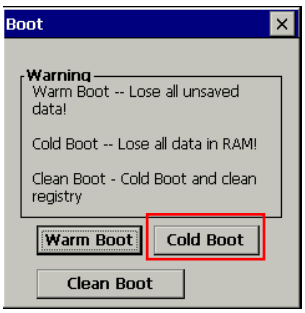
CAUTION! A cold boot will erase all data and installed applications in RAM memory.

Method 1: From Windows CE

1. Tap My Device → Windows → Boot.

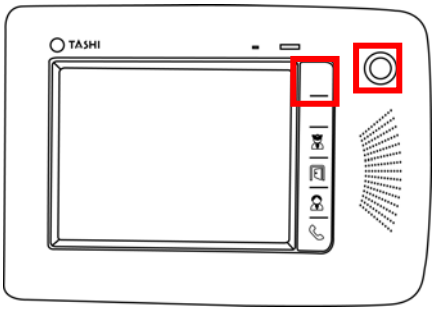


2. Tap Warm Boot.



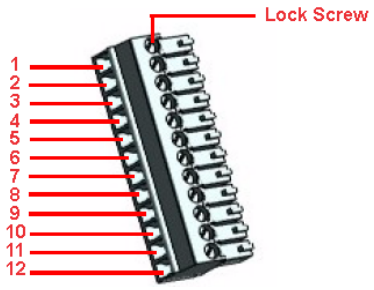
Method 2: From Hardware

Locate the Function Buttons on the MT688's front panel, and simultaneously press the first button and the emergency button.



Using the Terminal Block

The MT688 provides two 12-position terminal blocks for input/output signals. Insert the wire's stripped end into the desired terminal block position. Tighten the lock screw to secure the wire.



Terminal Block Pin Assignment

J2 Terminal Block Port

Pin	Name	Description	Pin	Name	Description
1	D1+	Photo-IN Anode (+)	7	D4+	Photo-IN Anode (+)
2	D1-	Photo-IN Cathode (-)	8	D4-	Photo-IN Cathode (-)
3	D2+	Photo-IN Anode (+)	9	PLC TX	PLC TX
4	D2-	Photo-IN Cathode (-)	10	PLC RX	PLC RX
5	D3+	Photo-IN Anode (+)	11	12V	External DC 12V input
6	D3-	Photo-IN Cathode (-)	12	GND	GND

J3 Terminal Block Port

Pin	Name	Description
1	R1-C	Relay 1 Common
2	R1-NO	Relay 1 Normal Open
3	R1-NC	Relay 1 Normal Close
4	R2-C	Relay 2 Common
5	R2-NO	Relay 2 Normal Open
6	R2-NC	Relay 2 Normal Close
7	R3-C	Relay 3 Common
8	R3-NO	Relay 3 Normal Open
9	R3-NC	Relay 3 Normal Close
10	R4-C	Relay 4 Common
11	R4-NO	Relay 4 Normal Open
12	R4-NC	Relay 4 Normal Close

Relay Output

RL1-CTRL → High	R1 (C & NO Linked)
RL1-CTRL → Low	R1 (C & NC Linked)
RL2-CTRL → High	R2 (C & NO Linked)
RL2-CTRL → Low	R2 (C & NC Linked)
RL3-CTRL → High	R3 (C & NO Linked)
RL3-CTRL → Low	R3 (C & NC Linked)
RL4-CTRL → High	R4 (C & NO Linked)
RL4-CTRL → Low	R4 (C & NC Linked)

Digit Input

D1+ and D1- are the positive and negative nodes of the external signal inputs.

D1+ = 3V ~ 12V, D1- = GND	DIGIT-INPUT1 = High
D1+ = 0V ~ 2V, D1- = GND	DIGIT-INPUT1 = Low

D2+ and D2- are the positive and negative nodes of the external signal inputs.

D2+ = 3V ~ 12V, D2- = GND	DIGIT-INPUT2 = High
D2+ = 0V ~ 2V, D2- = GND	DIGIT-INPUT2 = Low

D3+ and D3- are the positive and negative nodes of the external signal inputs.

D3+ = 3V ~ 12V, D3- = GND	DIGIT-INPUT3 = High
D3+ = 0V ~ 2V, D3- = GND	DIGIT-INPUT3 = Low

D4+ and D4- are the positive and negative nodes of the external signal inputs.

D4+ = 3V ~ 12V, D4- = GND	DIGIT-INPUT4 = High
D4+ = 0V ~ 2V, D4- = GND	DIGIT-INPUT4 = Low

Appendix A

System Specification

Processor/Memory	CPU	Samsung 6410, 667Mhz Processor
	Memory	SDRAM: 128 MB Flash ROM: 128 MB
OS	Microsoft Windows CE 6.0 Professional Plus	
Button	Six function buttons	
Display	8” SVGA (800 x 600) Pixels Backlight Touch-screen, TFT-LCD	
Communication	One RJ45 with POE (DC12V/1A, IEEE802.3af Compliant) RS232 Support (Optional RJ45 to D-Sub 9pin cable) RS485 Support (Optional RS485+, RS485-) baud rate at 38400 bps or lower *RS232/RS485 (Single Port - use S2 switch to select connection type) USB v1.1 Host USB v1.1 Client (For developing use only) Relay Outputs (4) Photo-coupler Inputs (4) Supports 802.11b/g via CF Interface	
Multimedia	Camera: 2.0 megapixel CMOS camera Audio output: 2W speaker Microphone audio input	
TASHI Middleware	SIP and IP-CAM server/client SDK ModBus SDK supporting Elfin utility	
Expansion Slot	SDHC Compliant, Supports 4GB and Up	
Power Source	External Power (DC12V/2A)	
Enclosure	Weight	1365.7 g. (3.01 lbs.)
	Dimension	295mm (L)*43mm (W)*203mm(H)
Environmental	Operating temperature	23℉~ 113℉(-5℃~45℃)

	Storage temperature	-4°F~140°F(-20℃~60℃)
	Relative Humidity	5% – 95% RH non-condensing
Certification	CE, FCC, NCC, and RoHS compliant	
Programming	Video Streaming	
RFID Reader (Optional)	MiFare, 13.56MHz (ISO14443A/B & 15693, or ISO14443A only)	

Appendix B

Worldwide Support

At unitech, we have a professional support team to answer your questions or any related technical issues. If the equipment problem occurs, you may contact our regional services representatives to get the quick response. We have six regional services center, and choose your region to get our quick sup-port and their contact information can be found in our websites provided as below.

Region	Web Site
Global Operation Center	http://www.ute.com
Unitech Taiwan	http://tw.ute.com
Unitech Asia Pacific & Middle	http://apac.ute.com http://india.ute.com
Unitech China	http://cn.ute.com
Unitech Japan	http://jp.ute.com
Unitech America	http://us.ute.com http://can.ute.com
Unitech Latin America	http://latin.ute.com
Unitech Europe	http://eu.ute.com