Residential eHome Terminal
EH-7106-XPE0E

User Manual

V 1.01

I. About This Guide

This user guide aims to describe the EH-7106 series device in an easy way to follow manner. It describes the hardware feature and software settings for EH-7106. Users will learn how to use the EH-7106 and its powerful features just by reading and following the instructions in this guide.

Information is organized as follows:

1. About This Guide
   This Chapter describes the organization of this manual.

2. Introduction
   This Chapter briefly introduces the EH-7106 product.

3. Hardware Description
   This Chapter describes the hardware features of the EH-7106.

4. Software Description
   This Chapter describes the software features of the EH-7106.

5. Environmental & Validation Specification
   This Chapter describes the design specification of the EH-7106.

6. Installation
   This Chapter describes the installation of the EH-7106.

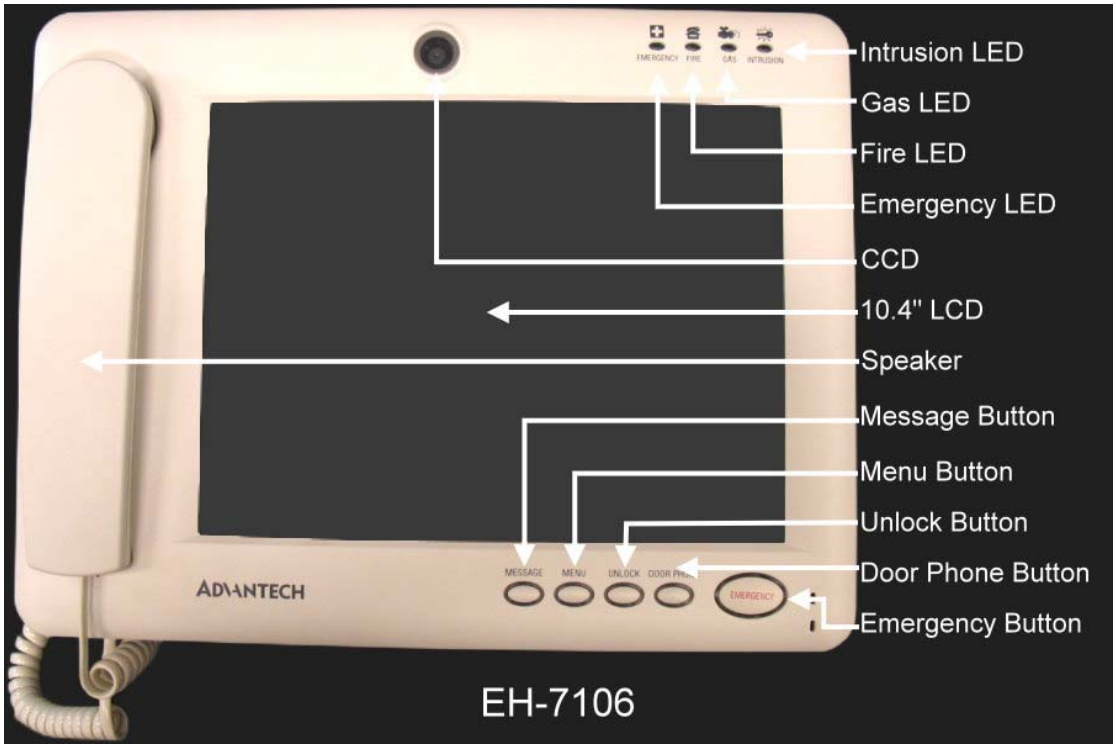
II. Introduction

1. Overview

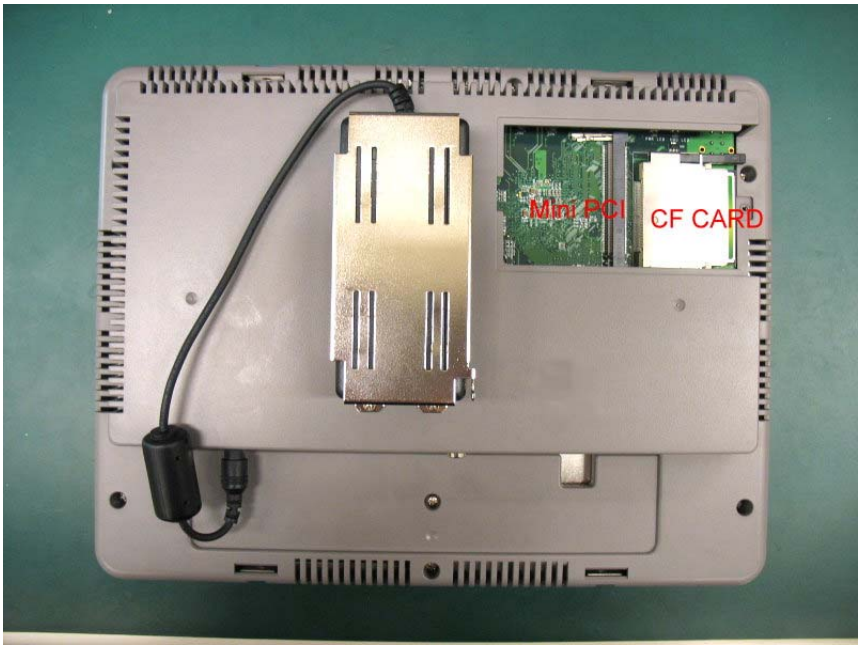
The EH-7106 residential terminal is Advantech's standard product with a built-in Windows XP Embedded . In addition to the Home Appliance Control, Remote Monitoring/Security and Home Service functions, the 800MHz CPU speed and the web-enabled architectures can achieve an integrated Home Gateway function. The EH-7106 equipped with a Celeron M 800 CPU, 10.4" touch screen, onboard Ethernet and audio plays as the key of a home/ building security & automation solution. It connects the service / emergency calls and sensor signals of an apartment unit through the LAN to the administration center.

2. Illustrations

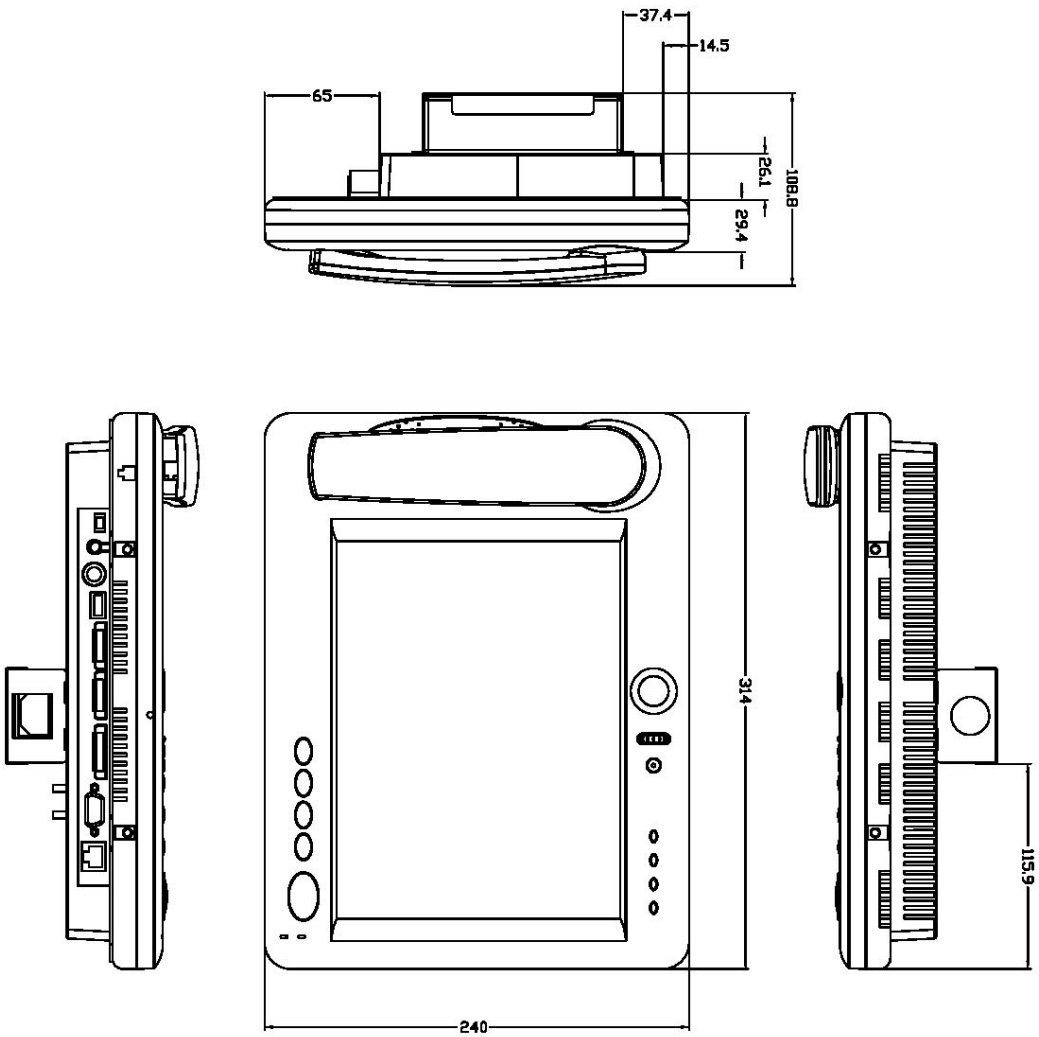
2.1 Front View



2.2 Review



2.3. Overall Dimension


37.4
14.5
65
26.1
108.8
29.4
314
115.9
240

3. Product Feature

Interface to End User

- 10.4" SVGA TFT LCD module
- RS-232 interface Touch Screen
- 4 Hot-keys (Menu, Message, Unlock and Door phone)
- 1 CCD-On and 4 Status LED indicators(Emergency Call, Fire Alarm, Gas Leakage and Intrusion)
- 1 Emergency button
- 1 mini-PCI interface for wireless LAN option
- Handset to pick up audio signals from Door Phone and Inter-phone calls routing through the I/O Box
  - ✓ If it is on-hooked the door phone/inter-phone will be connected to the microphone/speaker of the HT. The user can press a soft key on the touch screen to answer the incoming calls via the microphone/speaker.
  - ✓ If it is off-hooked the handset pick up the door phone/inter-phone audio signals directly whenever there is a phone call.
- Pressing down a soft key can select to use built-in microphone/speaker or just pick up handset for message recording and music/speech playback on the HT
- One built-in color CCD camera for image capturing (250,000 pixels)
- One slide switch at the back switch controlling the DC power input from an external 100~250VAC 50/60 Hz switching power adapter

Interface to the Internet

- Only one 10/100BT Ethernet port to the ADSL/Cable Modem
- Play as gateway for local LAN devices to access Internet

Interface to System Integrator

- E-IDE Compact Flash Socket for Application Software

and non-volatile user data storage

- E-IDE header connector for external 2.5” HDD when in trouble-shooting & testing
- Network upgradeable system program
- Local control via USB ports for mouse & keyboard when in software development & trouble-shooting
- Transmit control data and sensor status through RS-422/485

Feature Expansion

- One Mini PCI slot mainly for the following applications
  - ✓ 10/100 base-T Ethernet
  - ✓ 802.11b Wireless LAN Access Point

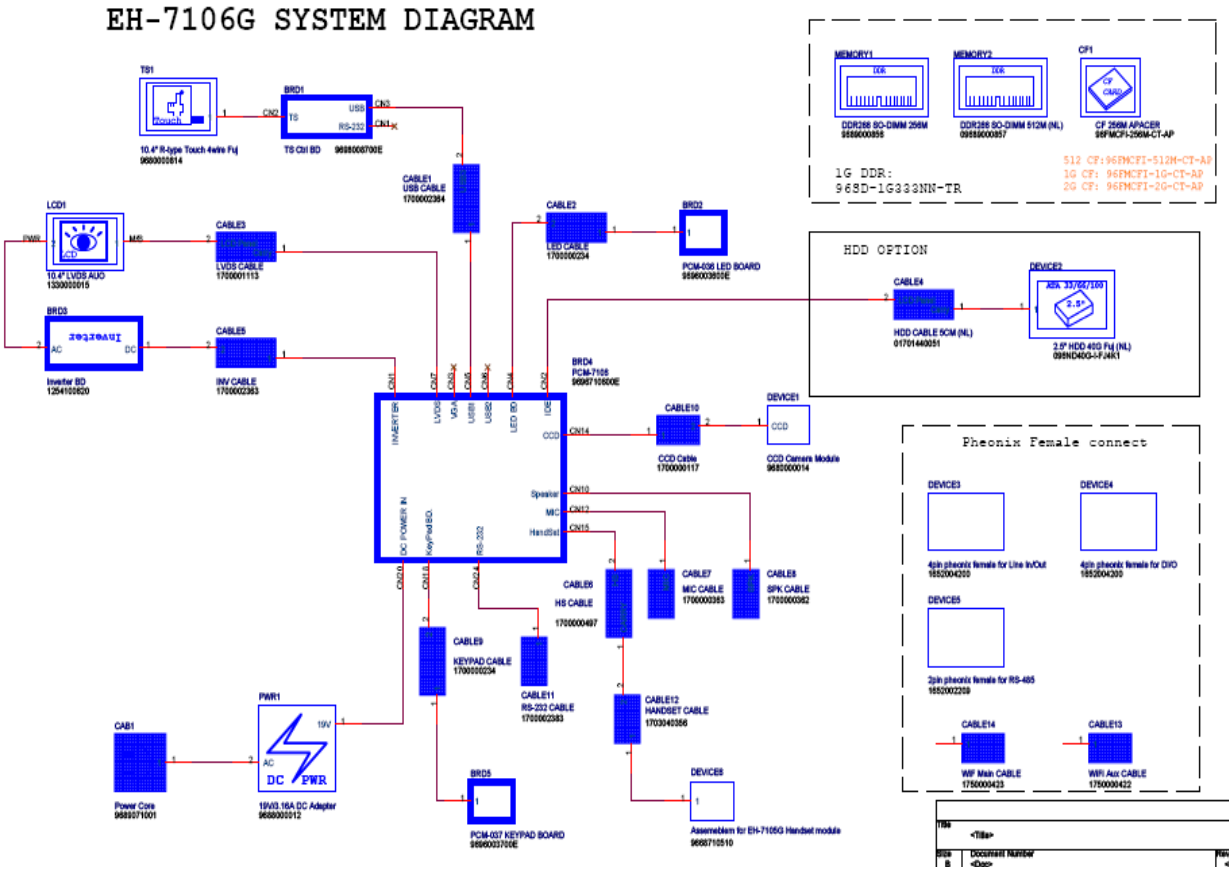
Power Saving Mode

- The 10.4" SVGA TFT LCD will be turned OFF automatically after the HT has been idle for certain period of time.
- Default setting in the OS is 10 min.

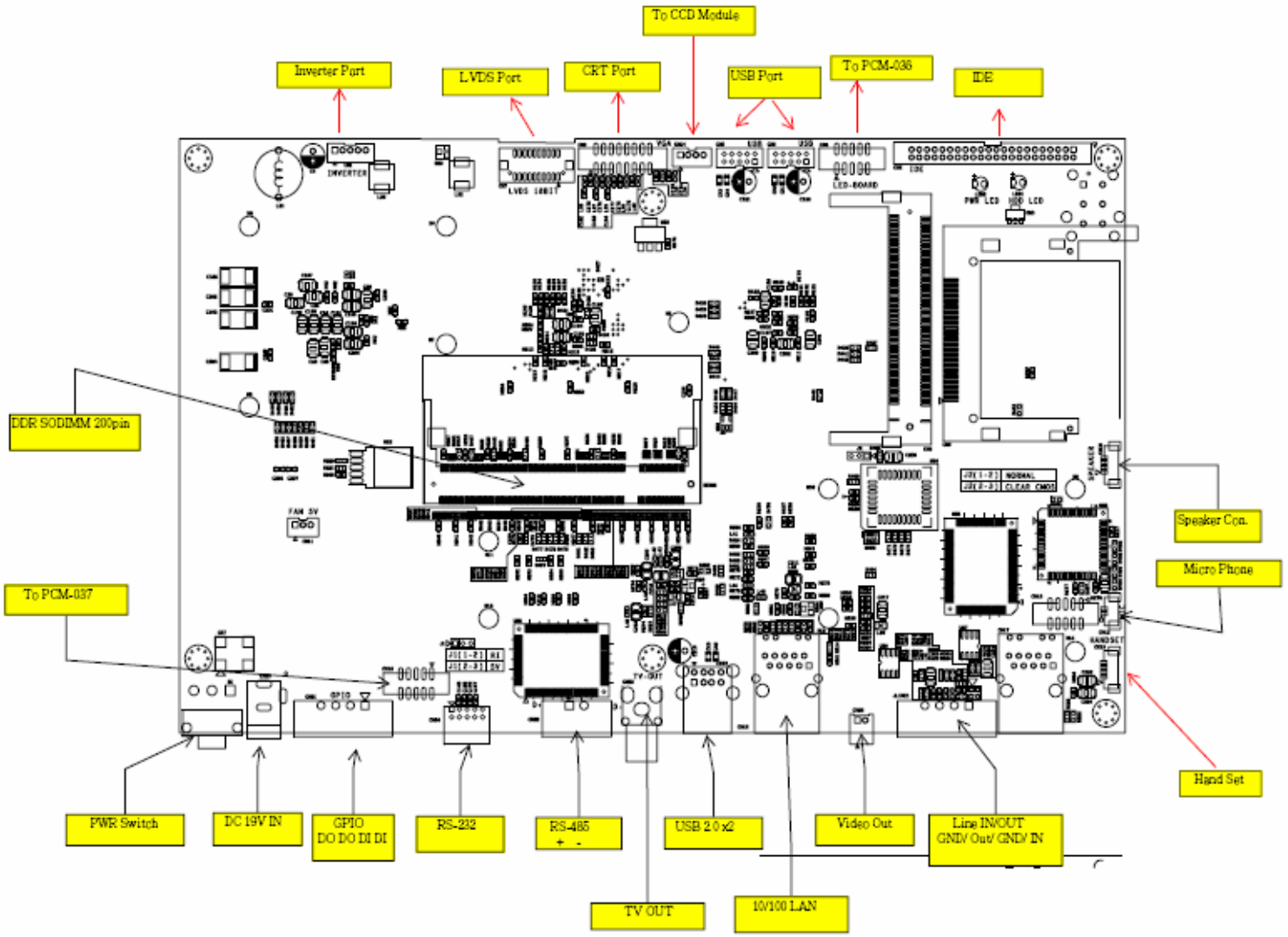
The LCD will be ON once the user press the touch screen.

III. Hardware Description

1. System Diagram



Main Board Layout & Connector Table



2. Hardware Spec. Table

Items		Specifications
CPU		Celeron M 800 MHz
Display	Panel type	TFT color LCD
	Screen Size	10.4” (Diagonal)
	Resolution	800 (H) x 600 (V)
	Luminance	150 nit (w/i TS)
	Viewing angle	Horizontal 80◦/ Vertical +30◦-10◦
	Backlight MTBF	20,000 hours (typ)
Memory	Working	512MB SDRAM
	Storage	2G CF pre-installed for XPE image
		Internal HDD Interface reserved
Interface for User	Stylus Pen	NO
	Hotkeys	4 Keys & 1 Emergency Button
	Status indicator	4 LED for Message, Menu, Unlock, Door Phone
Interface for System Integrator	IDE CF Socket	1
	GPIO	4-PIN Header Connector
	Mini PCI	1 for WLAN
	USB	2 USB (2.0)
Interface to Appliances	RS-485 / RS-232	1
	RS-232	1
Interface to the Internet	RJ-45	10/100 Base T Ethernet
A/V Interface to Door Phone	Audio Signal Interface	Yes
	TV –out	RCA connector for NTSC / PAL
	CRT	By 2-pin Header
	Door un-lock Button	Yes
	Handset	1 for Intercom communication

Embedded OS	Windows XP embeded	Pre-installed in CF card
Power Comsumption		< 48W
Power Adaptor		19v@3.16A , 60W power adaptor pre-installed (100~240AC)
Dimension (W x H x D)		240 x 315 x 60 mm (80)
Weight		2.5 kg
Operation Temperature		0 ~ 40 °C
Certificates		UL, FCC / CE Class B, CCC

3. Board Functionality

Main Board

- Chipset: Intel 852GM
- BIOS: Award 512K Flash BIOS
- DRAM: 512MB, 1 SO-DIMM socket
- CF : one 2G E-IDE Compact Flash socket is preinstalled with Advantech XPE default image
- Ethernet: RTL-8100CL series LAN chip, 10/100Base-T
- Audio Codec: ALC203 w/ 3Watt NS LM4871 amplifier
- LCD controller interface: to route the control signals from CPU Board to SVGA TFT LCD panel
- RS-232 Interface: with 4-wire controller for Analog Resistance Film Touch Screen(Fujitech)
- IDE HDD Interface
- I/O Ports:
  - ✓ Serial (RS 422/232) x 1, Standard RS232 x1, USB x 1, Ethernet RJ45 x1
  - ✓ Reserved Digital Inputs x2, Digital outputs x2(phoenix Header Connector)
- Audio interface: to audio Codec and external door phone audio signals
  - ✓ Internal Mic-in / External Line-in / Line-out
  - ✓ Speaker-out (<3W, pin header)
  - ✓ Switching Circuit to allow multiple audio signal paths (door phone <-> mic/speake, door phone <-> handset, handset <-> mic/speake)

- Video Capturing circuit (BT878A)
  - ✓ NTSC composite video decoding.
  - ✓ Interface to built-in color CCD camera
- CRT
  - ✓ Pin-header connecter 2x8 pin
- TV-out
  - ✓ Chrontel CH7009B support NTSC and PAL

- DC Power Jack
  - ✓ Powered by an external 100~240VAC 50/60 Hz input AC-DC switching power adapter (19v dc-in @3.16A)
  - ✓ No Sleep or LAN wake-up function is supported. (No stand-by power is supplied.)

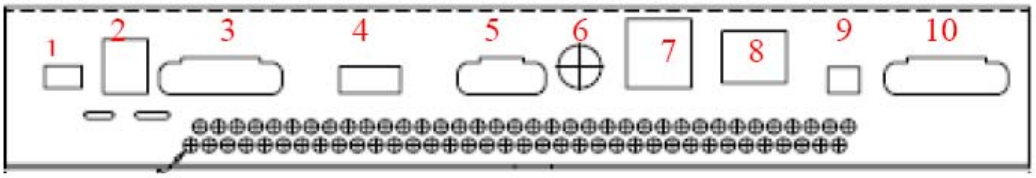
Daughter Boards

- Audio Conversion Board
  - ✓ Connect, convert and switch between the door phone, handset and the Home Terminal line-in/line-out signals
- Message LED/Button Board
- Status LED Board
- CCD-On LED Board
- Hook Switch Board

Mechanical Specifications

- Dimensions: 315 (W) x 240 (H) x 60 (D) mm =>85 (D) including Handset
- Fixing System: Mounting Plate for Hook-on
- Weight: 2.5 kg (net)
- Opening of the wall H 190mm x W 230mm

4. I/O Pin-out Definition



1. Power ON/OFF Switch
2. DC Input (19V)
3. GPIO (Out / Out / In / In) Port
4. RS-232 Port
5. RS-485 (- , +) Port
6. TV-Out Port
7. USBx2
8. LAN Port
9. Video In (+ , -)
10. Audio IN/OUT (GND / Line Out / GND / Line In)

5. GPIO setting

EH-7106 GPIO Setting List

1. Using W83627HF GPIO

GPIO Setting

Pin	I/O	Default value	Define on EH-7106
GPIO 10	input		Using for customer
GPIO 11	input		Using for customer
GPIO 12	output	0	Using for customer
GPIO 13	output	0	Using for customer

GPIO 14	output	0	Emergency LED
GPIO 15	output	0	Fire LED
GPIO 16	output	0	Gas LED
GPIO 17	output	0	Intrusion LED

2. Using Parallel port signals for other GPIO setting

Pin	I/O	Default value	Define on EH-7106
Address 0	output	0	Message LED
Address 1	output	0	Menu LED
Address 2	output	0	Unlock LED
Address 3	output	0	Door Phone LED
Address 4	output	0	Emergency LED
Address 5	output	0	Line in/out signal ON/OFF
Address 6	output	0	CCD ON/OFF

IV. Software Description

1. Windows XPE Software Spec

OS Kernel

- Windows XP Embedded Version

Advantech Susi API package

- The Susi package is development set for application developer including the following package. It is requested by project, so pls contact Advantech PM & AE for details.

- Contents:
  - Hot keys API
  - Status LED API
  - CCD API
  - Other I/O API

V. Design Requirements

Environmental Specifications

- Temperature & Humidity
  - ✓ Operating Temperature: 0 ~ 45 ^{o} C
  - ✓ Storage Temperature: 0 ~ 60 ^{o} C
  - ✓ Relative Humidity: 0 ~ 95% RH (Non-condensed)
- Case / Panel Temperature
  - ✓ Less than 40 ^{o} C @ 25 ^{o} C ambient temperature (front bezel)
- Safety
  - ✓ UL/CSA
- EMI
  - ✓ VCCI, FCC class B approved
- ESD
  - ✓ IEC 61000-4-2 Level 3
- EFT/B
  - ✓ IEC 61000-4-4 Level 2
- Vibration:
  - ✓ 10~18Hz, 1.5mm peak-to-peak displacement
  - ✓ 18~500Hz, 1G acceleration

Reliability

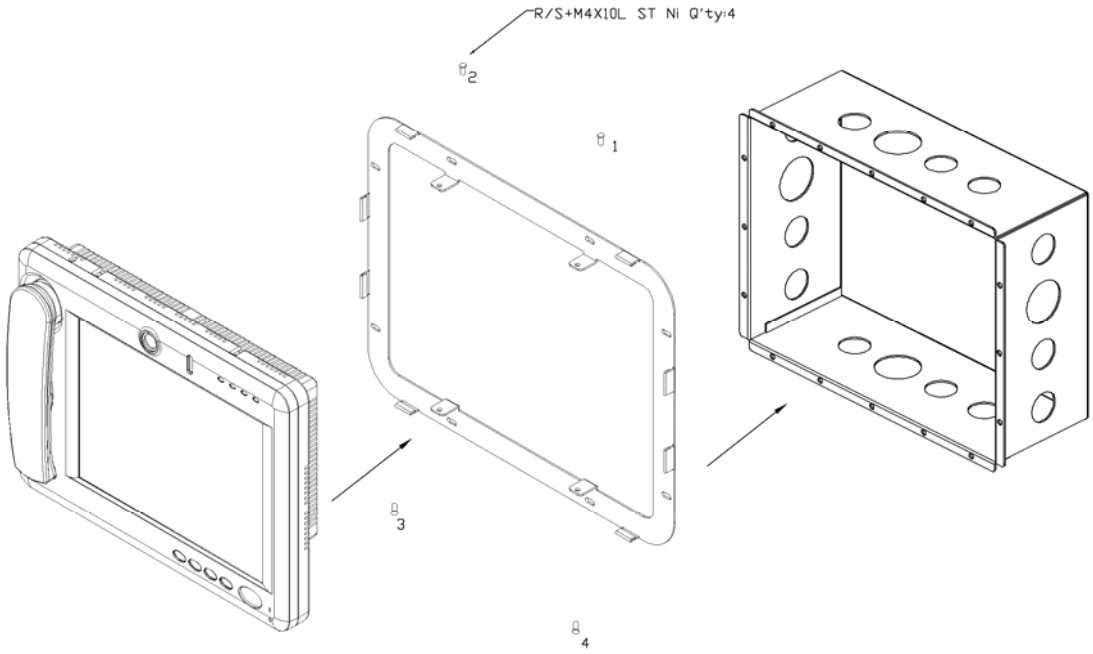
- MTBF
  - ✓20,000 hours
- Touch Screen
  - ✓1 million touch actuation times on a single point with a 5/8" diameter silicon finger under a 350g load at 2 Hz

- Power Requirements
  - ✓ DC Input Voltage: 19V
  - ✓ Power Consumption: less than 50W

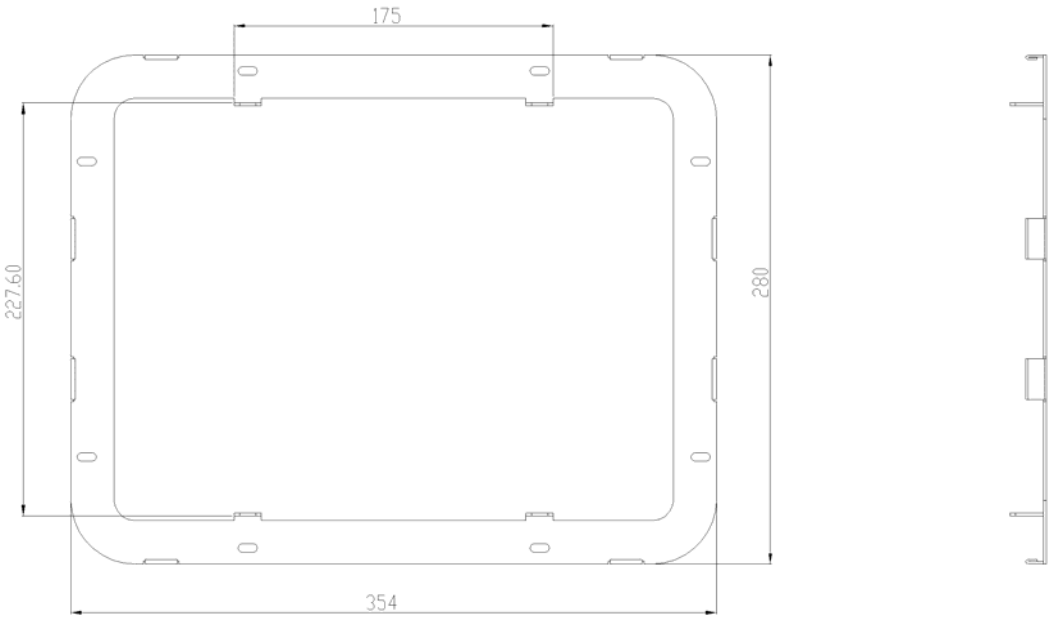
VI. Installation

1. Step by step to screw up the system

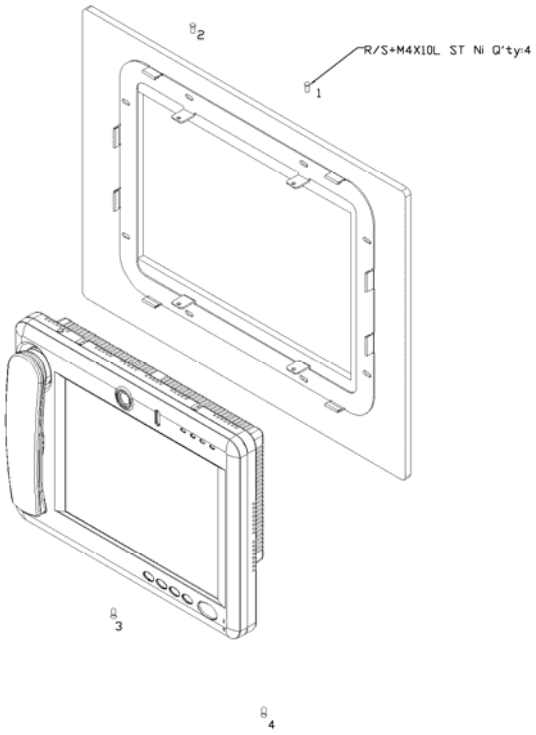
Without Deco plate

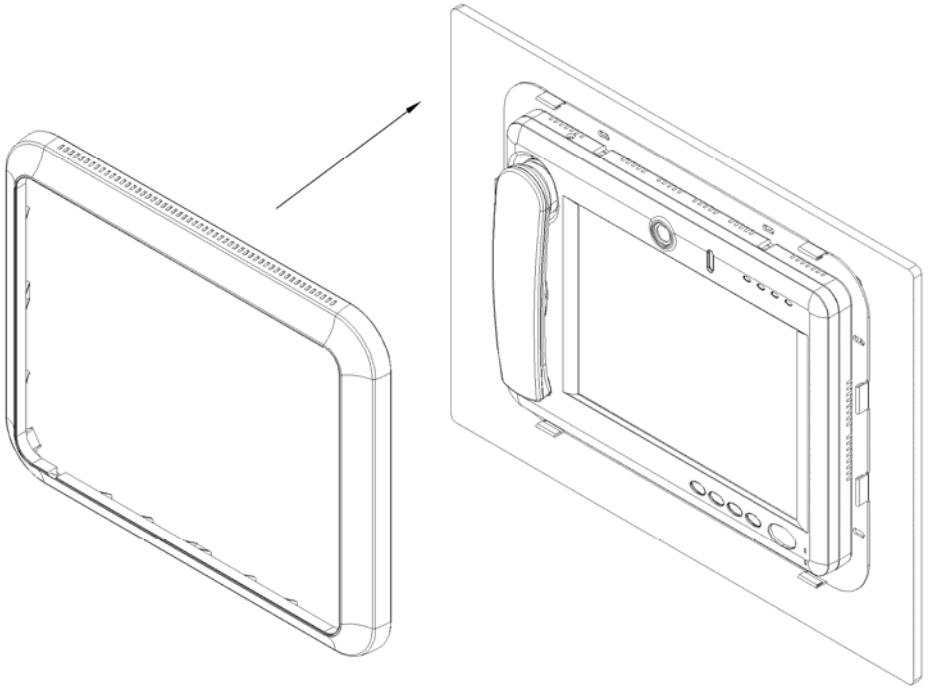


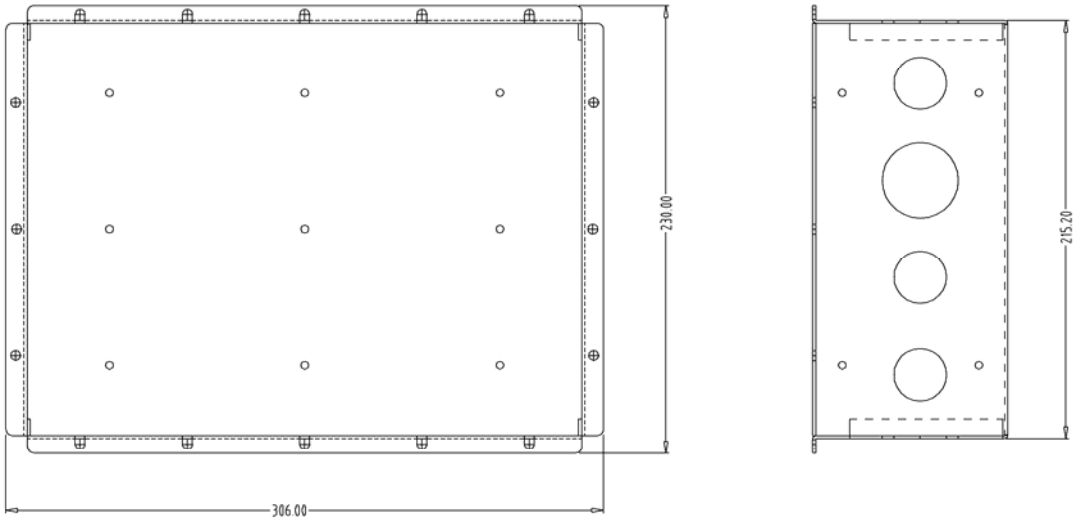
2. The dimension of mounting plate



With Deco plate






230.00
306.00
215.20

VII. EH-7106 Software Description

VIII. 1. Windows XPE Software Spec

OS Kernel

- Windows XP Embedded Version SP2

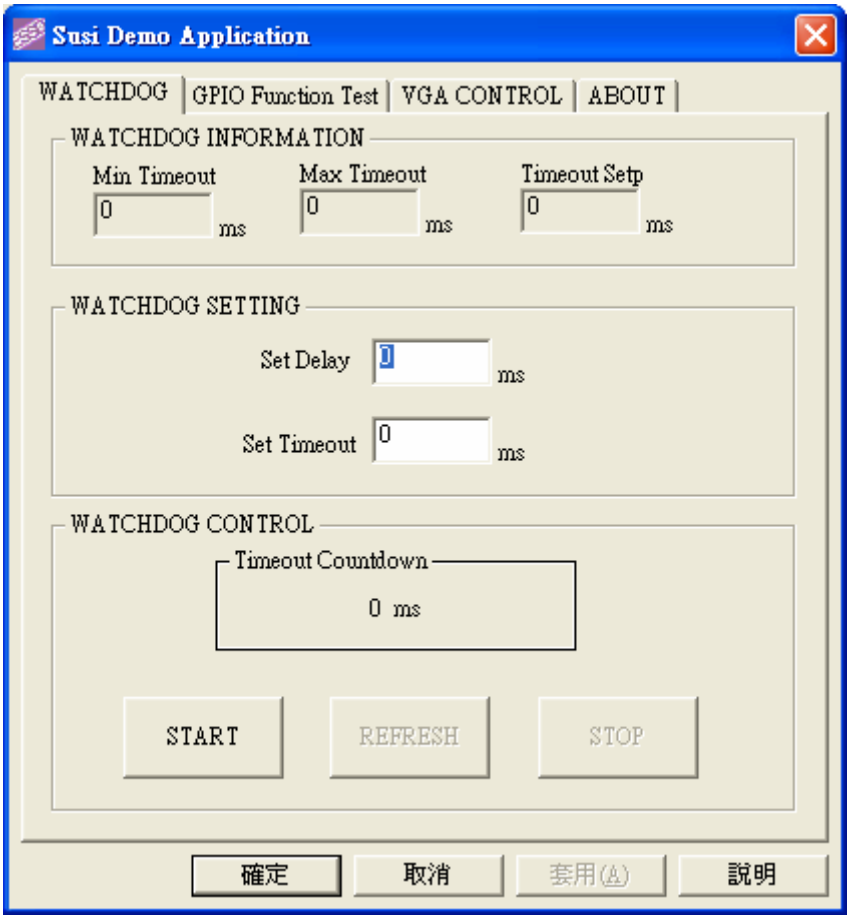
Advantech Susi API package

- The Susi package is development set for application developer including the following package. It is requested by project, so pls contact Advantech PM & AE for details.

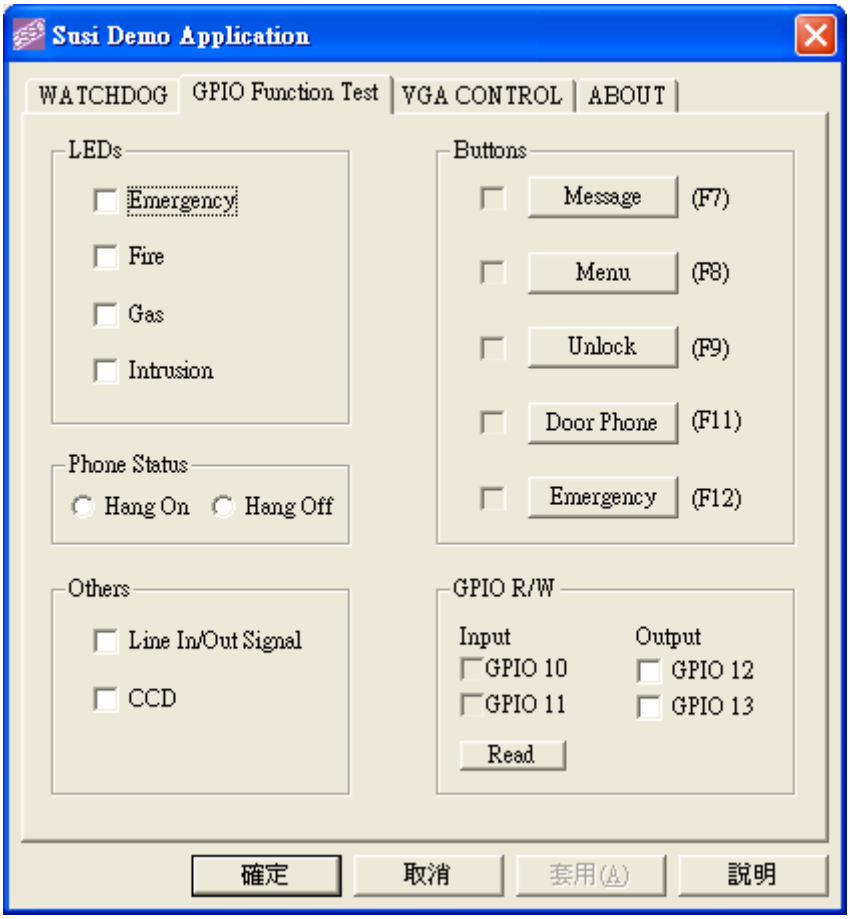
- Contents:
  - API for controlling Hot keys, Status LED, CCD, and Other I/O API
  - Demo Application: WATCHDOG, GPIO Function List, VGA Control
  - Demo Application Source Code
- API List:
  - GPIO Pin Definition
  - GPIO Virtual-Key Codes
  - SusiIORead
  - SusiIOReadMulti
  - SusiIOWrite
  - SusiIOWriteMulti

- Demo Application:

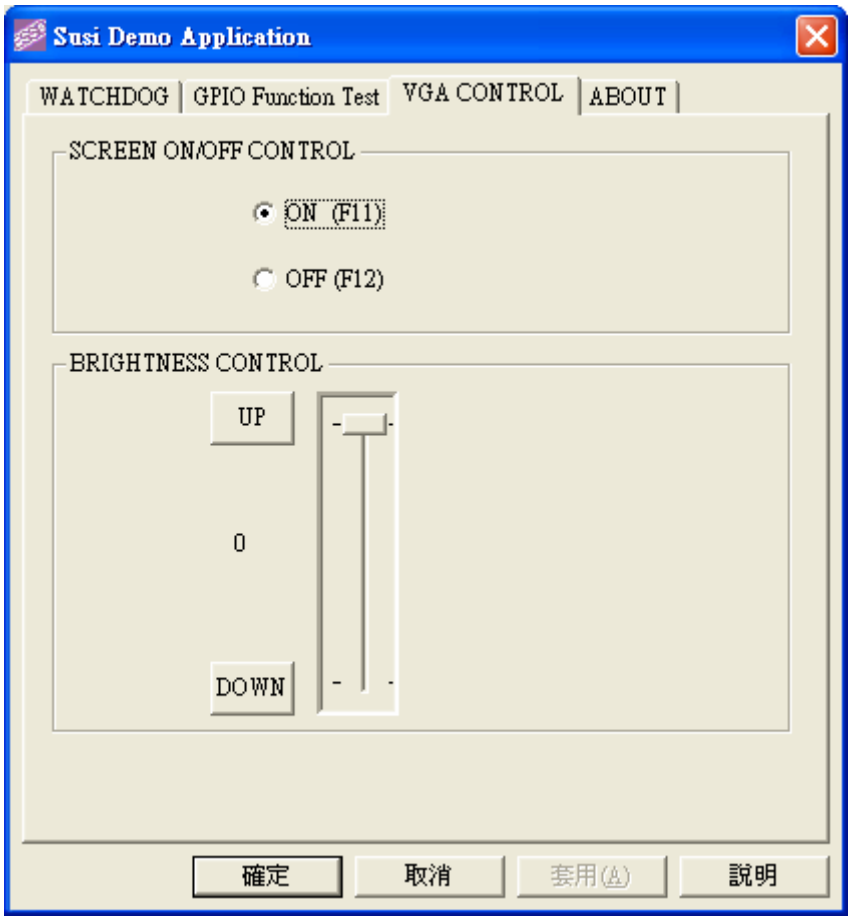
WATCHDOG: A watchdog timer (abbreviated as WDT) is a hardware device which triggers an action, e.g. rebooting the system, if the system does not reset the timer within a specific period of time. The WDT API in the Susi provides developers with functions such as starting the timer, reset the timer, and set the timeout value if the hardware supports customized timeout value.



GPIO Function: General Purpose Input/Output (GPIO) is a flexible parallel interface that allows a variety of custom connections. Supports Digital I/O Devices. You can control cash drawers , LED light or buttons with GPIO.



VGA Control: There are two kinds of VGA control APIs, backlight on/off control and brightness control, in the Susi. Backlight on/off control can allow a developer to turn on or turn off the backlight. Our API allows a developer to turn on /off the backlight and to control brightness smoothly.



GPIO Pin Definition

List the GPIO pin definitions.

Constants

GPIO_PIN_FIRE
GPIO_PIN_GAS
GPIO_PIN_INTRUSION
GPIO_PIN_MESSAGE
GPIO_PIN_MENU
GPIO_PIN_UNLOCK
GPIO_PIN_DOORPHONE
GPIO_PIN_EMERGENCY
GPIO_PIN_LINESIGNAL
GPIO_PIN_CCD

Remarks

Use to specify pin number for functions SusiIORead, SusiIOReadMulti, SusiIOWrite, SusiIOWriteMulti.

GPIO Virtual-Key Codes

List the GPIO Virtual-Key Codes.

Constants

GPIO_VK_MESSAGE
GPIO_VK_MENU
GPIO_VK_UNLOCK
GPIO_VK_DOORPHONE
GPIO_VK_EMERGENCY

Remarks

The above Virtual-Key codes are posted with window messages when relative button is pressed.

SusiIORead

Read current status of one GPIO pin.

```
BOOL SusiIORead(BYTE pin, BOOL *status);
```

Parameters

pin

[in] Specifies the GPIO pin demanded to be read. Begin from 0.

status

[out] If the pin is active (high), status is nonzero. If the pin is inactive (low), status is zero.

Return Value

TRUE (nonzero) on success.

FALSE (zero) on failure.

Remarks

Application should specify valid input pin number to read. If the specified pin is invalid, the return value is FALSE.

SusiIOReadMulti

Read current statuses of several GPIO pins.

```
BOOL SusiIOReadMulti(DWORD pins, DWORD *statuses);
```

Parameters

pins

[in] Specifies the GPIO pins demanded to be read. The pins to read are bitwise-ored. Pin number begins from 0.

statuses

[out] Bitwise-ored status of assigned pins. For pins that are not specified, the related bit value is useless. For valid assigned pins, if the pin is active(high), the bit status is 1, otherwise 0.

Return Value

TRUE (nonzero) on success.

FALSE (zero) on failure.

Remarks

Read multiple input pins at the same time. The parameter pins is bitwise-ored. Bit 0 stand for GPIO 0, bit 1 stand for GPIO 1, etc. For example, if you want to read pin 0, 1, and 5, the pins parameter should be 0x00000023.

SusiIOWrite

Set high/low value to one GPIO pin.

```
BOOL SusiIOWrite(BYTE pin, BOOL status);
```

Parameters

pin

[in] Specifies the GPIO pin demanded to be written. Begin from 0.

status

[in] Set status to TRUE will set the pin active (high). Otherwise, set the pin inactive (low).

Return Value

TRUE (nonzero) on success.

FALSE (zero) on failure.

Remarks

Application should specify valid input pin number to write. If the specified pin is invalid, the return value is FALSE.

SusiIOWriteMulti

Set several GPIO pins at the same time.

```
BOOL SusiIOWriteMulti(DWORD pins, DWORD statuses);
```

Parameters

pins

[in] Specifies the GPIO pins demanded to be written. The pins to write are bitwise-ored. Pin number begin from 0.

statuses

[in] Bitwise-ored status of assigned pins. Set related bit of assigned pin to 1 will set the pin active (high). Otherwise, set the pin inactive (low).

Return Value

TRUE (nonzero) on success.

FALSE (zero) on failure.

Remarks

Write multiple output pins at the same time. The parameter pins and statuses are bitwise-ored. Bit 0 stand for GPIO 0, bit 1 stand for GPIO 1, etc. For example, if you want to set pin 0 and 1 high, 5 to low, the pin parameter should be 0x00000023, and statuses parameter can be 0x00000003.