

# FAT810 Manuals

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# Revision History

Date Completed	Version	Description of Version
Thursday, April 14, 2008	V1.0	Original document release

# Hardware Manuals

This part of documentation describes the hardware of FAT810 terminal.

## Information

### Model Classification

#### FAT 810 M - 00

① ② ③ ④

① **Model name:** FAT

② **Model number:** 810

③ **Reader:** M → MAG TK2

B → barcode reader, LED type

F → barcode reader, IR type

R → RFID (125KHz) reader

MF → Mifare (13.56MHz) reader

None → without reader

④ **Type:** 00 → standard

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

### Accessories

- WAS-1499 for LAN cable.
- Bracket and screws package for wall-mount installation.
- WAS-T0090 (optional) for extend I/O
- Disk 5337 including manual file

### Features

- Display Type: Character Type
- Display Font : Character 16 words, 2Lines
- LCD Mode: STN Positive, Gray
- LCD Active View Area 66\*16 (mm)
- Built-in with 12 pages text messages to display 32 ASCII characters each page and serves as a shortcut display
- Able to accept the commands sent from the server to LCD to display the real time message
- Capable of blinking display messages in eye catching
- Able to control the beep pattern in buzzer

- Auto saving all modified parameter values and start the boot-up status from memory once the device is powered up
- Available for desktop and wall mount usage
- Equipped with RJ45 comport which is able to apply with your company's Ethernet LAN and supports TCP/IP, UDP ... protocol.
- 20 programmable keys and each key can be programmed with the user defined value
- Options of readers for different applications
- 4 general-purpose I/O design
- Supports duplex serial RS232 device.
- Supports clock/data device.

## Introduction

FAT810 is a terminal which is capable of communicating with SERVER or terminals based on 100Base-T Ethernet network.

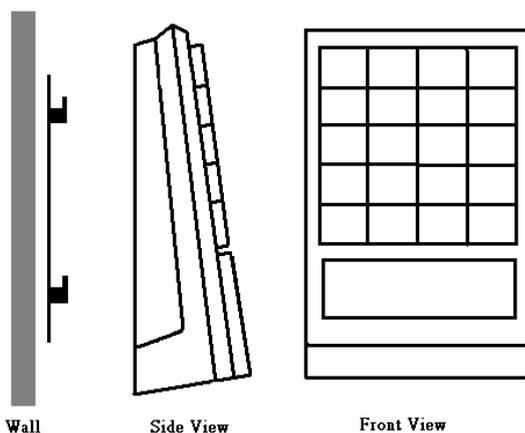
## Installation

### Connection in LAN

- Connect the cable (WAS-1499) to the RJ45 port of the hub.
- Plug in the DC power adaptor to the power jack on the FAT810.
- Plug the adaptor to the power line.

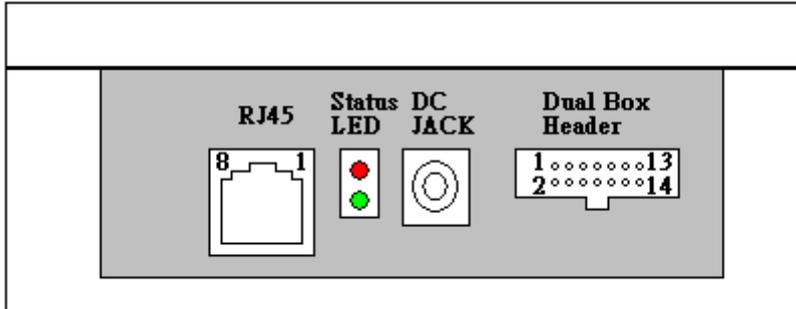
### Wall-Mount installation

- Place the bracket on the wall (4 hooks on top).
- Put FAT810 on the bracket, like the diagram as below.



# Pin Assignment

## Back View



## RJ45

Pin#	Signal
1	TX+(Positive line of the differential output signal pair)
2	TX- (Negative line of the differential output signal pair)
3	RX+ (Positive line of the differential input signal pair)
6	RX- (Negative line of the differential input signal pair)
4,5 short connection & 7,8 short connection	

## Status LED

The green (EG) and red (EY) LEDs represent the status of the Ethernet port. The EG is normally ON, and will temporarily turn off when the FAT810 receives a network packet. The EY is normally OFF, and will temporarily turn on when a data collision is detected on the Ethernet.

## DC power jack

Pin#	Signal
Center (D2.1mm)	+9V~+12VDC
Outer	GROUND

# Dual Box Header

Clock/Data interface			Serial interface			I/O interface		
Pin#	Signal	Color (WAS-T0090)	Pin#	Signal	Color (WAS-T0090)	Pin#	Signal	Color (WAS-T0090)
1	+5V	RED	9	RxD	BLUE	2	+5V	RED
3	GND	BLACK	11	TxD	GRAY	4	GND	BLACK
5	CLOCK	YELLOW	13	GND	BLACK	6	I/O1	ORANGE
7	DATA	BROWN	RxD(Input), to FAT810. TxD(Output), from FAT810			8	I/O2	GREEN
						10	I/O3	PURPLE
						12	I/O4	WHITE

**Note.** The extended serial interface is disabled when reboot and is effected once you set I/O0=0 to enable it.

# Operations

## Data Routing

There are two modes of data routing between host PC and FAT810 terminal. The routing mode is setting up by the state of I/O 0. Below details how these two mode works.

- Mode #1 ([I/O0 state = 1](#)): All the data from host PC to FAT810 will be handled by FAT810 itself and will not pass to external serial RS232 device. This mode is the default mode while powering on FAT810.
- Mode #2 ([I/O0 state = 0](#)): All the data from host PC to FAT810 will be passed to external serial RS232 device. FAT810 will not handle the data itself until the I/O0 state is set to 1.

## Power up and Reboot

When you start up FAT810, it will set the boot-up status from memory (EEPROM). A beep sound will react at the same time and the LCD screen shows the start-up page message. What you have now is the whole procedure of booting up FAT810. While the FAT810 is booting up, the terminal itself also does the initialization to its built-in Ethernet module to check whether the Ethernet port is in good condition according to the [Status LED](#) content, the Green LED will give a blink to acknowledge the Ethernet port receipt of the package. This will help you with the simple checking of FAT810 connects to LAN in good status. You have to establish the connection with FAT810 again on Ethernet network at every time of reboot. This can be done automatically by the application software from SERVER.

When you power up, you will get the I/O0=1 and FAT810 stays at the stand-by mode. Now you are able to give a command to FAT810. The FAT810 will reply an "ACK" or a related message

as a positive feedback or it will react a “NACK”. Also be noted that the keypad and reader are enabled while the terminal is power up.

## Operation Parameters Setting and obtaining the value

Applying [command to get the firmware and current status of the operation parameter](#) on FAT810.

We suggest you use this command to get the current version and correspondent operation parameter settings between server and FAT810. [Get firmware and status parameters command](#) will send a “byte” as the feedback to stand for its current status. You may use the bit to review the buffer/un-buffer mode, asterisk/digit displaying, wall-mount/desk-top viewing, external data/clock port enable/disable, reader enable/disable, keypad enable/disable...etc values.

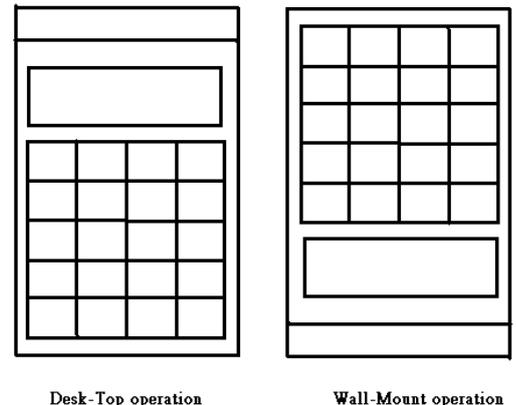
Applying [Change operation parameters command](#) set up the values [Change operation parameters command](#) serves as the command of values setting up. All settings are saved in FAT810 memory (excluding reader and keypad). While you power up FAT810, it will always take the last setting from the terminal.

## Desktop and Wall-mount usage

FAT810 is designed for available for two types of installation (Refer to right hand side figure for easy identification), Desktop operation or Wall-mount operation.

The default usage is Desktop mode. If you want change the usage mode to Wall-mount, please follow steps:

- For Display:
  1. Open the FAT810 case.
  2. Pull out the LCD panel, rotate (up side down) and push in (make sure the panel is locked firmly).
- For Keypad:
  1. Apply [Inquiry key code command](#) and [Define the key code command](#) to adjust the arrangement of keyboard layout. Also apply [Initialize Device command](#) to set the default value if you would like to use the default setting.



## Initialization commands

- Make the right keypad layout according to the current status
- Change 12-page pre-saved text messages to Default messages

- Real digit code prompts on display once a key is pressed
- Set the output format of the buffer mode
- Disable the external serial ports.
- Reboot setting

## Real digit code and Asterisk code Displaying

The so-call asterisk code stands for sign (\*) on the LCD screen when you press the said key. It means FAT810 LCD displaying a sign (\*) and in a real key code data being transmitted at the same time. What is the meaning of a Real digit code? That is what you press is what you read on the LCD screen and keycode data transmission. Apply [Change Operation Parameters](#) for change when needed.

## BUFFER-MODE and NON-BUFFER Output

The FAT810 features 2 operation modes.

**One is Non-Buffer mode.** When you press one key, the FAT810 will send out the key value (ASCII) by ETHERNET interface immediately, **the other is Buffer mode;** the key value will be kept in buffer, when you press keys. It will not send out all key values (ASCII) in the buffer by ETHERNET interface until you press ENTER Key and then the key-in digits on LCD will be erased. The buffer size is good for 32 key values maximum. Once it is over, extra ones will be ignored.

## LCD displaying

For a quick presentation of displaying message, The FAT810 is easy to achieve with its built-in pre-saved maximum 12-page text messages (32 characters per page) feature.

Please refer to [Show pre-saved page message on LCD command](#). Argument **m** serves as a text message setting (m=0). Argument **n** in this command serves as a page of content setting which page you want to exhibit.

When you power up FAT810, it will take the start-up page to show up. The first page among 12-pages pre-saved text messages refers to start-up page.

If you would like to show message directly or change any message in one of 12-pages pre-saved texts, please refer to [Show text message and save it to the text message page command](#).

Apply [Blink the Display command](#) to set the command of blinking to catch customers' attentions.

## Reader operation

You can enable/disable the reader by [Enable/Disable reader command](#). When you disable the

reader, it will get no action till the reader is enabled. The reader will reply [Notice Message](#), please refer to [Notice Message command](#) for details.

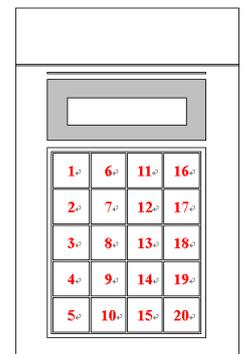
When the card data can't be decoded, FAT810 sends an error notice to the server. On the contrary when the card data is correct, it sends the card data to the host, and sounds a beep.

## Keypad operation

Make sure the keypad is enabled while you press any key on the keypad. If keypad is at "disable" mode, it will not work. While the terminal is at power up state, it means the terminal is ready to work. You can enable/disable keypad by [Enable/Disable reader command](#).

When you press the first key, the previous message on LCD will be cleared up accordingly, and the value will be shown on the left-top side. The following key-in message is from left-to-right top-to-bottom showing on LCD by sequence. The maximum of key-in digits is 32. It will be ignored once key-in digits are over 32 maximum.

The table of mapping below shows the default value of each key while you initialize the device by [Initialize Device command](#). The key layout for Desktop type is on the left hand side and the key layout for Wall-mount type is on the right hand side. The same key represents different value in different installation type (Desktop: LCD on top, Wall-Mount: LCD on bottom). If you want to redefine the Symbol on specific key, please see [Inquiry the key code](#) and [Define the key code](#) commands.



1	6	11	16
2	7	12	17
3	8	13	18
4	9	14	19
5	10	15	20

Key Position  
Coordinate

Each key only maps one symbol except the following 3 symbols which stand for their own definitions served as the control keys if you program these symbols for some specific keys.

### CLR key

The key used to clear (delete) the last one character inside buffer and backward one character on LCD screen (Buffer mode).

The key used to send out the key value CLR (08H) and backward one character on the LCD screen (Non-buffer mode).

### ESC key

The key used to clear up all key values on LCD screen and delete all data inside Buffer (Buffer mode)

The key also used to send out the key value ESC (1BH) and clear up the value on LCD (Non buffer mode)

### ENT key

The key used to dispatch (send out) all data on the buffer with ending of ENT (0DH) and delete all the data on the buffer and on the LCD. (Buffer mode)

The key used to dispatch out the key value ENT (0DH) and clear up the value on LCD screen (Non-buffer mode).

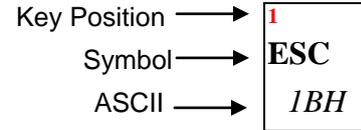
## Default Table of Key Position and Symbol mapping

### Desk-top Key Layout

LCD			
<b>1</b> <b>ESC</b> <i>1BH</i>	<b>6</b> <b>A</b> <i>41H</i>	<b>11</b> <b>B</b> <i>42H</i>	<b>16</b> <b>C</b> <i>43H</i>
<b>2</b> <b>1</b> <i>31H</i>	<b>7</b> <b>2</b> <i>32H</i>	<b>12</b> <b>3</b> <i>33H</i>	<b>17</b> <b>D</b> <i>44H</i>
<b>3</b> <b>4</b> <i>34H</i>	<b>8</b> <b>5</b> <i>35H</i>	<b>13</b> <b>6</b> <i>36H</i>	<b>18</b> <b>E</b> <i>45H</i>
<b>4</b> <b>7</b> <i>37H</i>	<b>9</b> <b>8</b> <i>38H</i>	<b>14</b> <b>9</b> <i>39H</i>	<b>19</b> <b>F</b> <i>46H</i>
<b>5</b> <b>CLR</b> <i>08H</i>	<b>10</b> <b>0</b> <i>30H</i>	<b>15</b> <b>.</b> <i>2EH</i>	<b>20</b> <b>ENT</b> <i>0DH</i>

### Wall-Mount Key Layout

LCD			
<b>1</b> <b>ENT</b> <i>0DH</i>	<b>6</b> <b>.</b> <i>2EH</i>	<b>11</b> <b>0</b> <i>30H</i>	<b>16</b> <b>CLR</b> <i>08H</i>
<b>2</b> <b>F</b> <i>46H</i>	<b>7</b> <b>9</b> <i>39H</i>	<b>12</b> <b>8</b> <i>38H</i>	<b>17</b> <b>7</b> <i>37H</i>
<b>3</b> <b>E</b> <i>45H</i>	<b>8</b> <b>6</b> <i>36H</i>	<b>13</b> <b>5</b> <i>35H</i>	<b>18</b> <b>4</b> <i>34H</i>
<b>4</b> <b>D</b> <i>44H</i>	<b>9</b> <b>3</b> <i>33H</i>	<b>14</b> <b>2</b> <i>32H</i>	<b>19</b> <b>1</b> <i>31H</i>
<b>5</b> <b>C</b> <i>43H</i>	<b>10</b> <b>B</b> <i>42H</i>	<b>15</b> <b>A</b> <i>41H</i>	<b>20</b> <b>ESC</b> <i>1BH</i>



The text in red **bold** font (1~20) is used for the absolute position of Key on this keypad. The text in black **bold** means the Symbol and the *Italic* text mean the ASCII code in HEX of Key respectively.

If you have already key-in some keys and then stop key-in over 10

seconds, FAT810 will erase all keys on LCD and buffer and issue a timeout notice to host (refer to [Notice Message](#)).

Host can erase LCD and buffer by [Erase LCD and buffer command](#).

When 2 keys or more are pressed simultaneously in vertical direction, none data will be sent out; two more keys pressed simultaneously in horizontal direction, the data of the smallest key position value among of the two more keys will be transmitted accordingly.

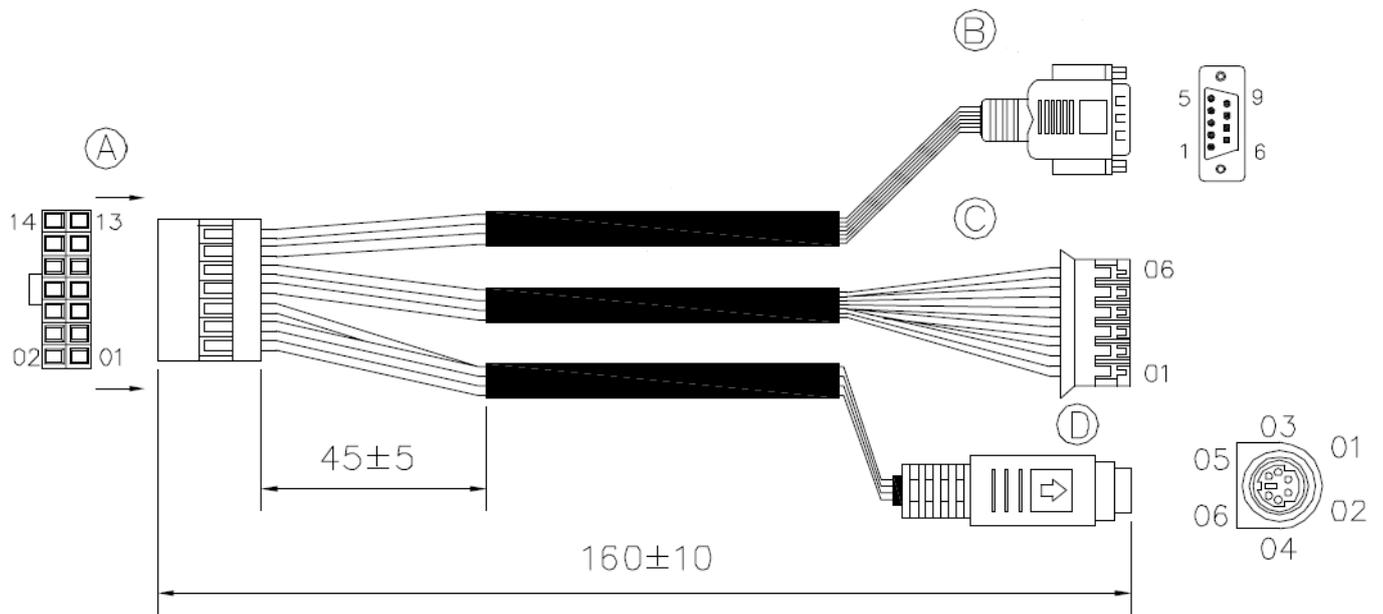
## External Data/Clock Serial Device

Apply [Change operation parameters command](#) to enable the external data/clock serial device, value is set to m=5, n=1 to enable the extended data/clock serial device functioning. When the said device is enabled, it will send data/clock data via this port; then the buzzer of FAT810 will sound a beep and show the data on Display.

## Specifications

- Display:
  - Number of characters: 32(16 columns \* 2 lines) without backlight.
  - 12 Text-Messages
- Power consumption: 200mA@12VDC
- Network: Ethernet RJ45

# Appendix A.WAS-T0090 cable



## WIRE CONNECTION

Red	Red	Black	Black	Brown	Orange	Yellow	Green	Blue	Purple	Gray	White	Black		
A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13		
D4		D3		D5		D1								
	C6		C5		C4		C3		C2		C1			
								B2		B3		B5	B4,B6 short	B7,B8 short

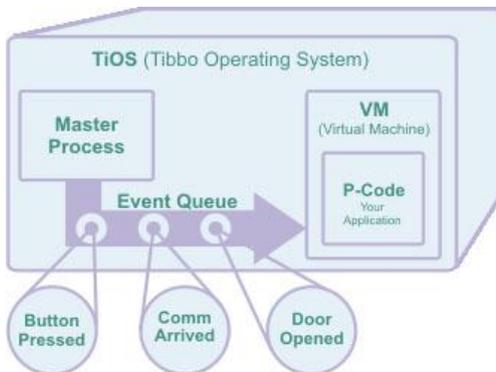
# Firmware Manuals

This part of the documentation describes all firmware components related to FAT810 terminal. FAT810 contains below two firmwares:

- [TiOS \(Tibbo Operating System\) firmware](#) provides the environment (services) for FAT810 application firmware running.
- [FAT810 application firmware](#) implements all the FAT810 inputs and outputs interface control, such as Display, Keypad, serial ports interface and Ether net communication.

## TiOS (Tibbo Operation System) Firmware

FAT810 is built in an EM1000 Ethernet module. It serves as a building block of FAT810 terminal, and its firmware, called TiOS (Tibbo Operating System) features a BASIC virtual machine that executes FAT810 application written in Tibbo BASIC.



To upload the TiOS firmware to FAT810 terminal, please refer to [Uploading TiOS Firmware](#).

## FAT810 Application Firmware

The FAT810 application firmware, built by [Tibbo IDE \(TIDE\)](#) program, is running under [TiOS operating system](#). The application firmware is writing by Tibbo Basic language. All the commands of FAT810 are implemented into the application firmware, such as buzzer control, message displaying.

The source code of FAT810 application firmware is opened, which all the files are located in the [Mics\Firmwares\SourceCode] folder of the setup CD. If there are needed functions you want to extend or modify, you can use [TIDE](#) to open the application firmware source code and do the modification. For more details, please refer to [TIDE](#).

To upload the application firmware to FAT810 terminal, please refer to [Uploading FAT810 Application Firmware](#).

# Programming

The FAT810 is programmed using programming commands that can be only sent through via the network. For each command the FAT810 issues a reply.

The FAT810 commands are categorized in two kinds of commands, messages and replies.

- [Control commands, messages and replies](#) utilize all the inputs and outputs of FAT810. Such as message displaying, buzzer control and keypad programming. Control commands and messages are using TCP protocol. The default port used is 1001. The control commands listed below are all also compatible with FAT800 terminal.

All control commands will use following format:

STX	Command	ETX
-----	---------	-----

**STX** (ASCII code 2) and **ETX** (ASCII code 3) characters provide necessary encapsulation. All data before the STX and after the ETX is ignored. **Command** field content has been explained in [Control Commands, Messages and Replies](#). The FAT810 replies to the commands- reply codes or inquired data indicate the result of command execution. Only two reply codes are possible returned- **ACK** (ASCII code 6) and **NAK** (ASCII code 21). For more information see [Control Commands, Messages and Replies](#).

**Example:** here is a sample exchange between a FAT810 and the host PC. Special characters are represented as follows: STX- ☺, ETX- ♥, ACK- ♠, §- NAK.

---TCP connection established

```
Host→FAT810: ☺D01♥      'show pre-saved message, text page number #1
FAT810→Host: ♠          'OK
```

```
Host→FAT810: ☺C♥       'clear LCD message and keypad buffer
FAT810→Host: ♠          'OK
```

```
Host→FAT810: ☺K9♥      'enable the keypad but use wrong format
FAT810→Host: §          'failed, command format is invalid
```

- [DS \(Tibbo Device Server\) commands and replies](#) configure the network settings and IO pin status of FAT810. The DS commands are using UDP protocol, the port used is 65535. The DS commands listed below are all compatible with Tibbo Device Server commands.

Because each command and reply is sent in a separate UDP datagram no additional encapsulation (i.e. using STX and ETX characters as in [control commands, messages and replies](#)) is necessary.

**Example:** here is a sample exchange between the network host and the FAT810. Each line represents the data in a separate UDP datagram.

```
Host→FAT810: SPN1002    'set the port number to be 1002
FAT810→Host: A         'OK
```

# Control Commands, Messages and Replies

Command symbols definitions are as below:

**STX**        02H  
**ETX**        03H  
**ACK**        06H  
**NACK**       15H  
**m**            1 byte parameter  
**n**            1 byte parameter  
**<Data...>**   contents of data

(Command list)

C.C.	Command Format	Description
V	V	<a href="#">Get device firmware version &amp; status</a>
D	Dmn	<a href="#">Show pre-saved message page on LCD</a>
C	C	<a href="#">Erase LCD and buffer</a>
M	Mn	<a href="#">Enable/Disable reader</a>
K	Kn	<a href="#">Enable/Disable keypad</a>
B	Bn	<a href="#">Control beep</a>
P	Pmn	<a href="#">Change operation parameters</a>
@	@	<a href="#">Initialize device</a>
F	F	<a href="#">Blink the display</a>
I	In	<a href="#">Inquire the key code</a>
X	Xmn	<a href="#">Define the key code</a>
Y	Yn<Data...>	<a href="#">Show text message and save it to the text message page</a>
S	<Data...>	<a href="#">Notification Message- receiving card data of internal reader</a>

## Notes:

- **C.C.-** Command Code

## Get device firmware version & status (V) command

HOST to DEVICE (3 bytes)	STX	V	ETX
	02H	56H	03H
DEVICE to HOST (10 bytes)	"ROMXXXXV S"		

XXXX: Firmware Number

V: Revision

B7	B6	B5	B4	B3	B2	B1	B0
External Clock/Data Device	Reserved	Keypad	Reader	Display	Mode	Reserved	

S: Status (8 bits as below)

1:enable 0:disable	Always "1"	1:enable 0:disable	1:enable 0:disable	1:asterisk 0:normal	1:buffer 0:unbuffer	Always "10"
-----------------------	------------	-----------------------	-----------------------	------------------------	------------------------	-------------

You can get device information and status by this command.

You will get nothing, if the computer's baud rate didn't match with the device.

## Show pre-saved page message on LCD (D) command

HOST to DEVICE (5 bytes)	STX	D	m	n	ETX
	02H	44H	bin	bin	03H
DEVICE to HOST (1 bytes)	ACK/NACK				

**m:** text page message, **m=30H**

**n:** page number, **31H<=n<=3CH**

You can show page message, which is kept in EEPROM, on your LCD.

Device will reply **ACK** and display the pre-saved message, if this command is acknowledged.

Otherwise, reply **NACK**.

The default text page table

Page#	Message	Page#	Message	Page#	Message
1	Welcome	5	Card error	9	Verify fail
2	Enter PIN	6	Press ENT	10	Re-enter PIN
3	PIN error	7	Time out	11	Thank you
4	Swipe card	8	Please try again	12	Not working

## Erase LCD and buffer (C) command

HOST to DEVICE (3 bytes)	STX	C	ETX
	02H	43H	03H
DEVICE to HOST (1 bytes)	ACK/NACK		

You can clear all screen and buffer by this command.

Device will reply **ACK**, if this command is acknowledged. Otherwise, reply **NACK**.

## Enable/Disable reader (M) command

HOST to DEVICE (4 bytes)	STX	M	n	ETX
	02H	4DH	bin	03H
DEVICE to HOST (1 bytes)	ACK/NACK			

**n=31H**, Enable reader(default)

**n=30H**, Disable reader

Device will reply **ACK**, if this command is acknowledged. Otherwise, reply **NACK**.

**Note:** Reader is always enabled when the unit is restarted even though you did disable the

reader last time.

## Enable/Disable keypad (K) command

HOST to DEVICE (4 bytes)	STX	K	n	ETX
	02H	4BH	Bin	03H
DEVICE to HOST (1 bytes)	ACK/NACK			

n=31H, Enable keypad (default)

n=30H, Disable keypad

Device will reply **ACK**, if this command is acknowledged. Otherwise, reply **NACK**.

**Note:** Keypad is always enabled when the unit is restarted even though you did disable the keypad last time.

## Control beep (B) command

HOST to DEVICE (4 bytes)	STX	B	n	ETX
	02H	42H	bin	03H
DEVICE to HOST (1 bytes)	ACK/NACK			

n: beep string, composed of 0 and 1. Each 1 will activate buzzer, 0 will stop buzzer. Each bit control buzzer 0.1 sec.

For example, n=F5H (11110101), it sounds like “BBBB-B-B”.

Device will reply **ACK** and beep, if this command is acknowledged. Otherwise, reply **NACK**.

## Change Operation parameters (P) command

HOST to DEVICE (5 bytes)	STX	P	m	n	ETX
	02H	50H	bin	bin	03H
DEVICE to HOST (1 bytes)	ACK/NACK				

Parameter description as below;

Reserved (m=31H)	Change Mode (m=32H)	Change Displaying Type (m=33H)	Reserved (m=34H)	Change Ext.Clock/Data Device (m=35H)
-	n=30H, unbuffered mode n=31H, buffer mode(*)	n=30H, normal(*) n=31H, asterisk mark	-	n=30H, disable(*) n=31H, enable

The (\*) means factory default

When you set the parameter, device will keep this setting into memory (EEPROM).

Device will reply **ACK** and change as you selected, if this command is acknowledged.

Otherwise, reply **NACK**.

## Initialize Device (Reset) (@) command

HOST to DEVICE (3 bytes)	STX	@	ETX
	02H	40H	03H
DEVICE to HOST (1 bytes)	ACK/NACK		

Host sets all settings into device as factory default. The key layout will meet the setting of viewing.

Device will reply **ACK** and reset all settings to factory default, if this command is acknowledged.

Otherwise, reply **NACK**.

## Blink the display (F) command

HOST to DEVICE (3 bytes)	STX	F	ETX
	02H	46H	03H
DEVICE to HOST (1 bytes)	ACK/NACK		

Display will blink by this command, until the device is interrupted by next operation, like communication, key-in, etc.

Device will reply **ACK**, if this command is acknowledged. Otherwise, reply **NACK**.

## Inquire the key code (I) command

HOST to DEVICE (4 bytes)	STX	l	m	ETX
	02H	49H	Bin	03H
DEVICE to HOST (1 bytes)	Key Value of specific key position/NACK			

01H<=m<=14H, the key position where you want to inquire.

Device will reply the **Key Value of the specific key position**, if this command is acknowledged. Otherwise, reply **NACK**.

## Define the key code (X) command

HOST to DEVICE (5 bytes min.)	STX	X	m	n	ETX
	02H	58H	bin	bin	03H
DEVICE to HOST (1 bytes)	ACK/NACK				

You can change the code of key by this command.

01H<=m<=14H, the key position where you want to changed.

n, the ASCII of key you programmed.

Device will reply **ACK**, if this command is acknowledged. Otherwise, reply **NACK**.

## Show text message and save it to the text message page (Y) command

HOST to DEVICE (5 bytes min.)	STX	Y	n	<DATA...>	ETX
	02H	59H	bin	<DATA...>	03H
DEVICE to HOST (1 bytes)	ACK/NACK				

**n**=30H, Show text message to LCD, but never keep it.

31H<=**n**<=3CH, Show text message to LCD, and save it to the text message page **n**.

The maximum number of text message is 32 digits for each page and can save 12 pages maximum.

**Note:** This new saved message will replace the pre-saved page or factory default page for next use.

Device will reply **NACK** if the message is over this maximum value.

Device will reply **ACK** and display this message on LCD, if this command is acknowledged.

## Notification Messages- receiving card data of internal reader (S) message

**Notification message** is not a command, it is a message that the FAT810 sends to the host PC when the internal reader get the card data. The data will be sent out to host PC automatically. **Notification messages** are not commands so they do not require any reply from the receiving end.

Events	Message
Reader get data	<STX>+<S>+<reader data bytes>+<ETX>

Example: supposing, the following Notification message is sent:

Host PC-->FAT810: ☺S0123456789ABCDEF♥

This means that the card data will be 0123456789ABCDEF.

## DS (Tibbo Device Server) Commands and Replies

This section contains a reference for all DS commands and replies.

DS commands are used to configure the network settings and the status of IO pins of FAT810.

The FAT810 replies to the commands- reply codes indicate the result of command execution.

**Table below lists all available commands:**

C.C.	Description
I	<a href="#">Initialize command</a>
S	<a href="#">Set Setting command</a>
G	<a href="#">Get Setting command</a>
P	<a href="#">Parameter command</a>
X	<a href="#">Echo command</a>
B	<a href="#">Buzz command</a>
A	<a href="#">Assign IP-address command</a>

**Notes:**

- **C.C.** - command codes.

Listed below are all available reply codes:

R.C.	Description
<b>A</b>	OK (command completed successfully)
<b>C</b>	Error (incorrect command was issued)
<b>R</b>	Rejected (command was rejected by the DS)
<b>D</b>	Denied (access was denied by the DS)
<b>F</b>	Failed (command execution failed)

**Notes:**

- **R.C.** - reply code.

## Initialize (I) command

**Function:** Initializes the settings of FAT810

**Command format:** **I**

**Possible replies:** **A**

**Details:**

Initialize command restores the settings of the FAT810 to their default factory values.

## Set Setting (S) command

**Function:** Sets (writes) new setting value

**Command format:** **Sssvv...v**, where **ss**: setting mnemonic, **vv...v**: new setting value

**Possible replies:** **A, C**

**Details:**

Set Setting command assigns new values to the selected setting. **ss** is the setting mnemonic, i.e. "IP" for the IP-address (IP) setting.

Example: to set IP-address to 192.168.100.40 issue the following command:

→FAT: **SIP192.168.100.40**

FAT→: **A**

## Get Setting (G) command

**Function:** Gets (reads) new setting value

**Command format:** **Gss**, where **ss** is the setting name

**Possible replies:** **A vv...v, C**, where **vv...v** is current setting value

**Details:**

Get Setting command reads out current value of the selected setting. **ss** is the setting mnemonic, i.e. "IP" for the [IP-address \(IP\) setting](#).

Example: to read current IP-address issue the following command:

→FAT: **GIP**

FAT→:       **A192.168.100.40**

## Parameters (P) command

**Function:**                       Sends parameter or instruction to the DS  
**Command format:**               **P<relevant data>** (see description of individual [parameters and instructions](#) for details)

**Possible replies:**               **A, C**

### Details:

**Command code 'P' (Parameter)** serves as a "common entry point" for sending a variety of [parameters and instructions](#)..

Example: to set the IO Pin #0 to low.

→FAT:       **PS01**

FAT→:       **A**

## Echo (X) command

**Function:**                       Returns FAT810 status information

**Command format:**               **X**

**Possible replies:**               ***Annn.nnn.nnn.nnn.nnn.nnn/ppppp/iiii/bb/oo...o/dd...d***,  
where ***nnn.nnn.nnn.nnn.nnn.nnn***- MAC-address of the FAT810;  
***ppppp***- [data port number](#) of the FAT810;  
***iiii***- reserved;  
***bb***- reserved;  
***oo...o***- [owner name](#);  
***dd...d***- [device name](#).

### Details:

The primary use of the network **Echo command** is to auto-discover FAT810 terminals on the network: when the network host sends this command in the broadcast mode, it collects the replies from all locally attached FAT810 terminals (hence, the name of the command). Reply from each FAT810 contains all necessary information (MAC-address, etc.) that is needed to continue communicating with each specific FAT810 in a non-broadcast mode.

## Buzz (B) command

**Function:**                       Makes the beep sound of FAT810

**Command format:**               **B**

**Possible replies:**               **A**

### Details:

**Buzz command**, when received by the FAT810, makes the device sound a beep for reorganization. This can be used to match an IP-address to a physical FAT810.

## Assign IP-address (A) command

**Function:** Assigns new IP-address to the FAT810 which is referenced by its MAC-address

**Command format:** **Ammm.mmm.mmm.mmm.mmm.mmm/pp...p/iii.iii.iii.iii**,  
where **mmm.mmm.mmm.mmm.mmm.mmm**- MAC-address of the target FAT810;  
**pp...p**- reserved;  
**iii.iii.iii.iii**- new IP-address to be assigned to the FAT810.

**Possible replies:** **A, C**

### Details:

**Assign IP-address command** is used to set the new IP-address of a certain FAT810 over the network. Command should be sent in the broadcast mode, the target FAT810 is referenced by its MAC-address (supplied in the command body). All locally attached devices receive the broadcast but only the FAT810 with matching MAC-address reacts to it.

Example: if the MAC-address of the target FAT810 is 0.150.30.213.55.74, and the new IP-address is to be 192.168.100.41 then the following command should be sent:

→FAT: **A0.150.30.213.55.74//192.168.100.41**

FAT→: **A**

New IP-address is saved into the [IP-address \(IP\) setting](#), just as if the [Set Setting \(S\) command](#) (i.e. "SIP iii.iii.iii.iii") was executed. Differences with the [Set Setting \(S\) command](#) are in that the FAT810 starts using the new IP-address immediately (no rebooting required) and that the target FAT810 is referenced by its MAC-address.

## Settings

This section contains a reference for all settings of DS [Set Setting](#) and [Get Setting](#) commands.

Settings are permanent functioning parameters that are stored in the non-volatile memory (EEPROM) of the FAT810. Once programmed, they remain intact even when the FAT810 is powered off.

**All settings are divided into four groups:**

- [Network settings](#) include basic set of parameters that define "networking environment" of the FAT810.
- [Connection Settings](#) define how and in which fashion the FAT810 establishes connections to and accepts connections from other hosts.

## Network Settings

**Network settings** include basic set of parameters that define "networking environment" of the FAT810.

**The following settings belong to this group:**

Setting	Description
---------	-------------

<a href="#">Owner Name (ON) setting</a>	Defines the owner name identifier for the FAT810
<a href="#">Device Name (DN) setting</a>	Defines the device name identifier for the FAT810
<a href="#">IP-address (IP) setting</a>	Defines the IP-address of the FAT810
<a href="#">Port Number (PN) setting</a>	Defines the data port number of the FAT810
<a href="#">Gateway IP-address (GI) setting</a>	Defines the IP-address of the default gateway
<a href="#">Netmask (NM) setting</a>	Defines the IP-address range for the local subnet

### Owner Name (ON) setting

**Function:** Defines the owner name identifier for the DS

**[Set \(S\) Command format:](#)** **SONoo...o**, where **oo...o** is the name string, 0-8 characters long

**[Get \(G\) Command format:](#)** **GON**

**Post-initialization value:** **GIGA-TMS**

**Details:**

This setting, together with the [Device Name \(DN\) setting](#) forms a name identifier for the FAT810. Owner name and device name are returned by the [Echo \(X\) command](#).

### Device Name (DN) setting

**Function:** Defines the device name identifier for the DS

**[Set \(S\) Command format:](#)** **SDNdd...d**, where **dd...d** is the name string, 0-8 characters long

**[Get \(G\) Command format:](#)** **GDN**

**Post-initialization value:** **FAT810**

**Details:**

This setting, together with the [Owner Name \(ON\) setting](#) forms a name identifier for the FAT810. Owner name and device name are returned by the [Echo \(X\) command](#).

### IP-address (IP) setting

**Function:** Defines the IP-address of the FAT810

**[Set \(S\) Command format:](#)** **SIPxxx.xxx.xxx.xxx**, where **xxx.xxx.xxx.xxx** is the IP-address in dot-decimal notation (i.e. 192.168.100.40)

**[Get \(G\) Command format:](#)** **GIP**

**Post-initialization value:** **Doesn't take effect, remains original IP-address setting**

**Details:**

**IP-address** must be compatible with the network on which the FAT810 is installed.

### Port Number (PN) setting

**Function:** Defines the data port number of the FAT810

**[Set \(S\) Command format:](#)** **SPNppppp**, where **ppppp** is the port number in the 0-65534 range.

**[Get \(G\) Command format:](#)** **GPN**

**Post-initialization value:** 1001

**Details:**

This setting defines the *Data Port* on which the FAT810 is accepting incoming data connections.

**Gateway IP-address (GI) setting**

**Function:** Defines the IP-address of the default gateway  
**Set (S) Command format:** **SGI***xxx.xxx.xxx.xxx*, where *xxx.xxx.xxx.xxx* is the IP-address of the default gateway in dot-decimal notation (i.e. 192.168.100.1)

**Get (G) Command format:** **GGI**  
**Post-initialization value:** **0.0.0.1**

**Details:**

**Gateway IP-address** defines the IP-address of default gateway through which the FAT8100 will (attempt to) establish a connection to the destination network host at **current Destination IP-address (DI)** in case this host is not on the same subnet with the DS.

Whether or not the destination network host is on the local subnet is determined by comparing the **IP-address (IP) setting**, current Destination IP-address (DI), and the **Netmask (NM) setting** (see this setting's description for details).

**Netmask (NM) setting**

**Function:** Defines the IP-address range for the local subnet  
**Set (S) Command format:** **SNM***nn...n*, where *nn...n* is the netmask for the local subnet in dot-decimal notation (i.e. 255.255.255.0)

**Get (G) Command format:** **GNM**  
**Post-initialization value:** **0.0.0.0**

**Details:**

**Netmask** defines the boundaries of a local subnet.

**Connection Settings**

**Connection settings** define how and in which fashion the FAT810 establishes connections to and accepts connections from other hosts.

**The following settings belong to this group:**

Setting	Description
<b><u>Source IP Filtering (SF) setting</u></b>	Defines whether the FAT810 will accept incoming data connections from any network host or specific host only
<b><u>Destination IP-address (DI) setting</u></b>	Defines the IP-address of the destination network host to which the FAT810 will attempt to connect to (by default)

**Source IP Filtering (SF) setting**

**Function:** Defines whether the FAT810 will accept incoming data

connections from any network host (filtering disabled) or specific host only (filtering enabled)

**Set (S) Command format:** **SSFx**, where **x**: 0 (disabled), 1 (enabled)

**Get (G) Command format:** **GSF**

**Post-initialization value:** **0 (disabled)**

**Details:**

When **Source IP Filtering** is 0 (disabled) the FAT810 will accept an incoming data connection from any network host.

When **Source IP Filtering** is 1 (enabled) the FAT810 will accept an incoming data connection only from host whose IP-address matches the one specified by **Destination IP-address**.

### Destination IP-address (DI) setting

**Function:** Defines the IP-address of the destination network host to which the DS will attempt to connect to (by default)

**Set (S) Command format:** **SDIxxx.xxx.xxx.xxx**, where **xxx.xxx.xxx.xxx** is the IP-address of the destination in dot-decimal notation (i.e. 192.168.100.41)

**Get (G) Command format:** **GDI**

**Post-initialization value:** **1.0.0.2**

**Details:**

This defined IP-address specifies the only network host from which an incoming data connection will be accepted when **Source IP Filtering (SF)** is 1 (enabled).

## Parameters and Instructions

This section contains a reference for all FAT810 parameters and instructions.

Parameters are temporary overrides for settings. Parameters are not saved into the EEPROM and take immediate effect (no rebooting required). Instructions are used to make the FAT810 perform a certain action.

**Below is the list of parameters and instructions:**

Parameter/ instruction	Description
<a href="#">Get I/O Pin Status (Gx) instruction</a>	Reads the status of a certain I/O line of the FAT810
<a href="#">Set I/O Pin Status (Sx) instruction</a>	Sets the status of a certain I/O line of the FAT810

### Get I/O Pin Status (Gx) instruction

**Function:** Reads the status of a certain I/O line of the FAT810

**Parameter cmd (P) format:** **PGx**, where **x** is the I/O line number

**Possible replies:** **As, C, D, R**, where **s** is the state of I/O line (0 or 1)

**Details:**

**Get I/O Pin Status instruction** returns the status of the FAT810 I/O line specified by the **x** parameter:

Value of x	Description
------------	-------------

<b>0</b>	P0*
<b>1</b>	P20*
<b>2</b>	P21*
<b>3</b>	P22*
<b>4</b>	P23*

\* *These are general-purpose input/output pins.*

I/O line status (**s**) returned by the **Get I/O Pin Status instruction** indicates current status of the I/O lines of Modules. If **s=0** then the line is at HIGH, if **s=1**- the line is at LOW. Notice, that not only inputs, but also outputs can be monitored using this command.

### Set I/O Pin Status (Sx) instruction

**Function:** Sets the status of a certain I/O line of the FAT810

**Parameter cmd (P) format:** **PSxs**, where **x** is the I/O line number and **s** is the desired status of the I/O line (0 or 1)

**Possible replies:** **A, C, D, R.**

#### Details:

**Sets I/O Pin Status instruction** allows the network host to remotely set the status of the FAT810 I/O line. Parameter **x** specifies the I/O line:

<b>Value of x</b>	<b>Description</b>
<b>0</b>	P0*
<b>1</b>	P20*
<b>2</b>	P21*
<b>3</b>	P22*
<b>4</b>	P23*

\* *These are general-purpose input/output pins.*

Desired I/O line state (**s**) corresponds to the status of I/O lines of Modules. if **s=0** then the line will be set to HIGH, if **s=1**- the line will be set to LOW.

# Software Manuals

This part of the documentation describes all PC software related to FAT810 terminal.

## FAT8xx Utility

### Introduction

Thank you for purchasing FAT (FAT800/FAT810) terminal. FAT8xx Utility program has been designed to work in conjunction with the FAT terminal equipped with keypad, reader and display. The FAT8xx Utility program provides an easy way to utilize the functions and get all the data inputted by user from the terminal.

### Installing and Loading the Program

If your system has ever installed the old version program (including FAT800 Utility), please remove it before installing.

- Insert the FAT8xx Utility Setup CD into the CD-ROM drive of your PC. The setup program begins automatically. There is no need to choose your CD-ROM drive from your on-screen settings, or to use the <RUN> prompt.
- A html page will pop up. Click [Install FAT8xx Utility program]. The setup wizard will now guide you through the setup procedure. You will be prompted to accept a default path for the FAT8xx Utility program, which is ""C:\Program Files\GIGA-TMS\FAT8xx Utility".
- You will now be asked to choose a name for your Start menu entry. You may type in your own name if you wish, otherwise click <OK> to accept.
- When the setup procedure is complete, remove the software CD-ROM disk from your CD-ROM drive and accept the prompt to restart your PC.
- From the [Start]/[Programs], select the [GIGA-TMS] (default folder), click [FAT8xx Utility].

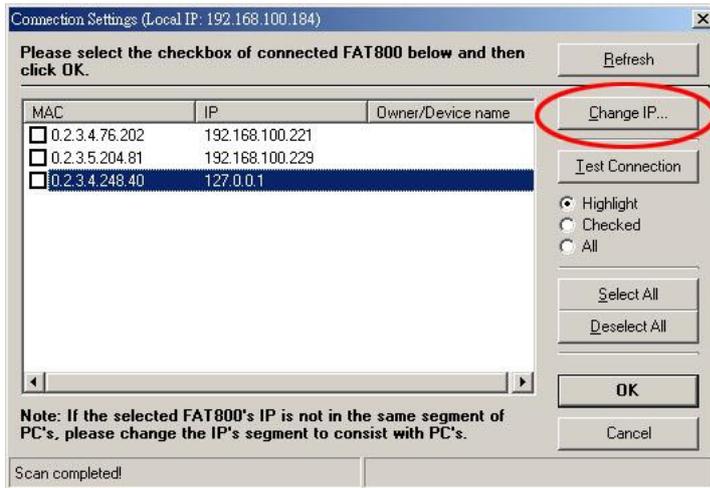
### Getting Started

#### Hardware setup

- Plugged in power adaptor
- Connect FAT terminal to PC via communication cable. There are two kinds of cables that can be used by FAT terminal. The following two net-link methods point you which cable to be used.
  - The communication goes through the hub: Using the WAS-1499 cable.
  - Terminal is directly connected to PC: Using the WAS-1498 cable.

## Program Setup

- Launch FAT8xx Utility program.
- For the first launch, a Broadcast window will pop up automatically.



- In the Broadcast window, click the item of connected FAT's IP (default value is 127.0.0.1)
- Click [Change IP]. In the [Change IP-address] window, modify the selected FAT's IP. The IP subnet value should consist with PC's.

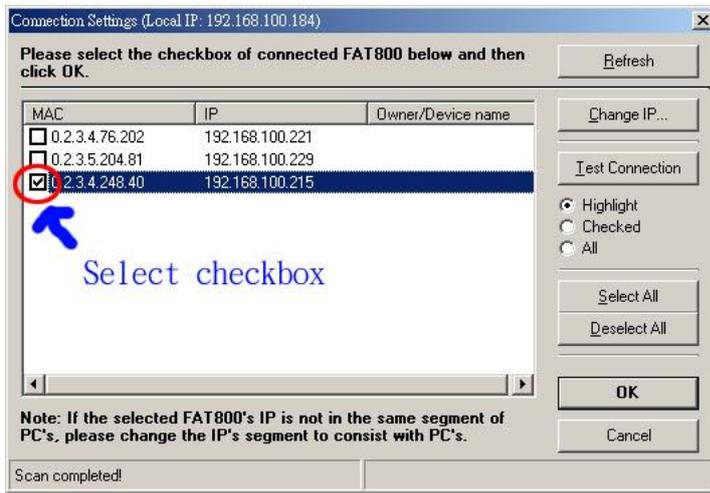


**Tip:** If there are more than two terminals on the list and you are not sure which is the certain one to be modified, turning off the terminal and clicking [Refresh], you can find out the vanished one is just what you want. Then turning on the terminal and clicking [Refresh] again.

192.	168.	100.	49
Network Address		Subnet Address	Hosts Address

**Note:** An invalid IP will cause the PC and terminal can't communicate to each other. If you don't well know about the network settings, it is better to set the network and subnet address of terminal IP as same as the PC's (each IP is composed of network address, subnet address and hosts address). And the address that is going to be modified is the hosts address. For example, if the PC's IP is 192.168.100.49 (you can get the PC's IP from the caption of program windows), then the value of terminal IP should be 192.168.100.xxx, the xxx value is within 0~255 and must be unique in the LAN/network system.

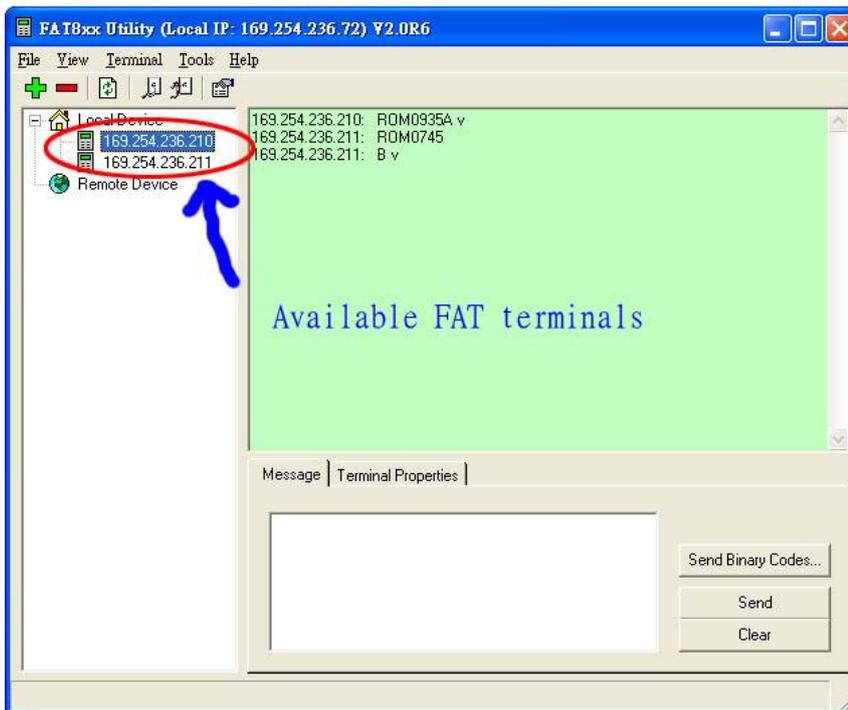
- Click [OK], the new IP will apply on the selected FAT terminal.
- In the Broadcast window, select the checkbox, and then click [OK].



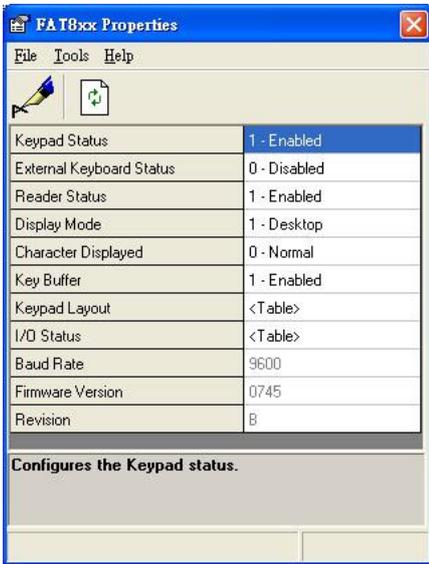
- If you have more than two FAT terminals connected to PC, re-select the checkboxes to include into the list.

## Configuring FAT terminal

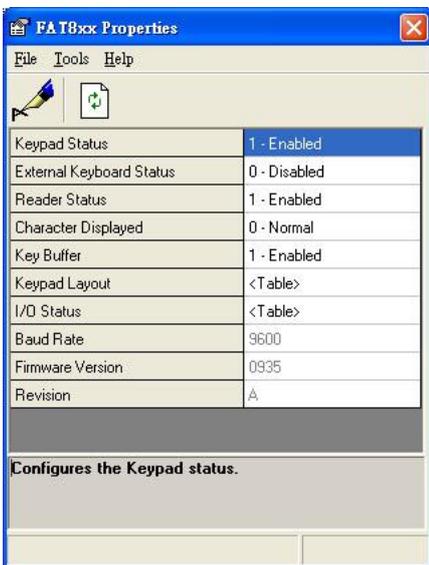
Before loading the main window, program will try to establish the connection between FAT terminal and PC. No matter the result of establishing connection is succeeded or failed, the selected FAT IP will be listed on the tree view list of left side of main window.



Select an IP listed on the tree view, click  button on the tool bar. A [FAT8xx Properties] window will pop up. In this window, it allows you to configure all the parameters and functions of FAT in an easy way.

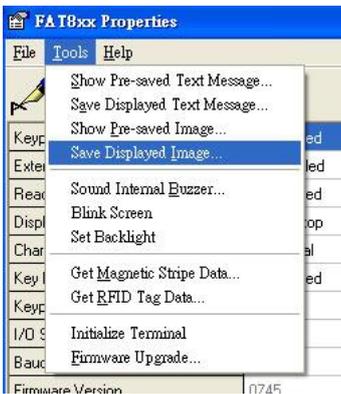


FAT800 Properties Window



FAT810 Properties Window

Each parameter can be modified just by double-clicking the item value. For example, to change the [Keypad Status], using the mouse to double-click the first row, second column cell, then an editing window will pop up. Select the value you want, then click [OK] to modify the [Keypad Status]. The functions are all located on the Tools menu.



For FAT800 Tools menu



For FAT810 Tools menu

Below is the list of parameters and functions that FAT provides.

## Parameters

Name	Description
Keypad Status	Switch on/off the function of FAT keypad.
External Keypad Status	Switch on/off the function of external keypad. Only supported on FAT800A version terminal.
Reader Status	Switch on/off the function of internal Reader. The type of reader includes Magnetic Stripe reader, Barcode reader and RFID reader.
Display Mode *	Configures the way that how to display the message on the screen. Wall-Mount or Desktop.
Character Displayed	Determines whether characters typed by a user or asterisk (*) character are displayed on the screen.
Key Buffer	Determines whether directly send out typed characters or kept in buffer until hitting Enter key.
Keyboard Layout	Programs keys of the Keypad.
I/O Status	Configure the I/Os of EM module.
Baud Rate	Displays the internal baud rate that FAT800 uses.
Firmware Version	Displays the version of a currently loaded firmware.
Revision	Displays the revision of a currently loaded firmware.

## Functions

Name	Description
Show Pre-saved Text Message	There are 12 text messages and 6 images that are available to be stored in the memory of terminal. If you have some messages that are often shown on the display, it is a good way to pre-save these messages (please refer to [Save Displayed Text Message] and [Save Displayed Image] functions) and show them just

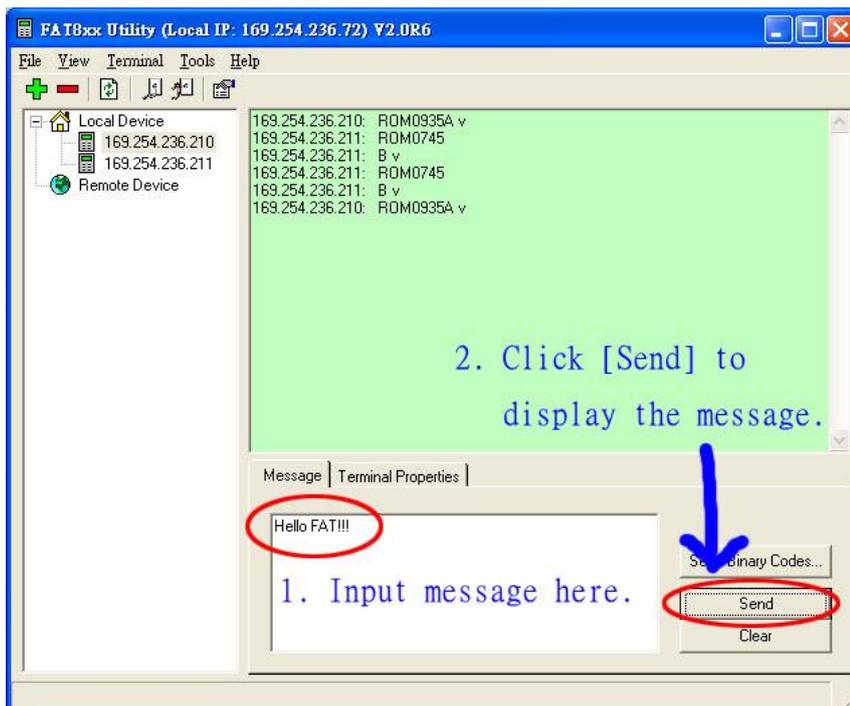
	sending a simple command. By using this function will be more speedy than sending the message (a string or graph image).
Save Displayed Text Message	Store the current displayed text message to the specified [Page Number].
Show Pre-saved Image *	Displays the specified page number of stored image.
Save Displayed Image *	Store the current displayed image to the specified [Page Number].
Sound Internal Speaker	Specifies the way of composing beeps to sound the buzzer.
Blink Screen	The terminal will blink the display every 1 ~ 2 second(s). The terminal will stop blinking if there is any interruption occurs. Like getting the data from PC, keypad pressed by user etc.
Get Magnetic Stripe Data	Get the track data from magnetic card reader.
Get RFID Tag Data	Get the RFID Tag data from RFID reader.
Initialize Terminal	Restore default settings.
Firmware Upgrade *	Upgrade firmware by specifying the firmware file.

**Note:** Marked \* item is not support by FAT810 terminal.

## Miscellaneous

### Sending Message

If you want to send a message to specified FAT terminal, select the FAT's IP in the tree view, then enter the message in text box and click [Send] button.



## Adding Remote Device

For the local terminals, it's easy to get the connected FAT's IP by using Broadcast (from [Tools] menu, click [Broadcasts]). But for the remote FAT (not in the same subnet as PC), it has to enter by manually.

To do this, click  on the tool bar. Input the IP and select the location to [Remote Device, (located behind the routes)], after entering the IP-address, then click [OK].



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## Appendix

Error code	Description
0	SUCCESS
-1	TIMEOUT
-2	INVALID COMMAND
-3	COMMAND EXECUTION FAILED
-4	ACCESS DENIED
-5	UNKNOWN
-6	NETWORK NOT INSTALLED
-101	PORT NOT OPEN
-102	TIMEOUT
-103	INVALID DATA

-104	UNKNOWN
-105	INVALID PAGE MODE
-106	INVALID PAGE NUMBER
-107	GET NAK
-108	INVALID LENGTH OF BEEP STRING
-109	INVALID DATA OF BEEP STRING
-110	PORT ALREADY OPEN
-111	PORT ALREADY CLOSE
-112	INVALID BAUDRATE
-113	INVALID KEYPAD MODE
-114	INVALID DISPLAY
-115	INVALID MESSAGE LENGTH
-116	INVALID X POS
-117	INVALID Y POS
-118	INVALID X LEN
-119	INVALID Y LEN
-120	DEVICE NOT FOUND
-121	INVALID TRACK DATA
-122	CARD READ
-123	DEVICE TIMEOUT
-124	BUSY
-125	TCP NOT CONNECTED
-126	IP DUPLICATED
-127	DEVICE FULL
-128	DEVICE CONNECT FAILED
-129	IP NOT FOUND
-130	EM100 CONNECT FAILED
-131	CANNOT ESTABLISH TCPIP CONNECT

# Tibbo IDE (INTEGRATED DEVELOPMENT ENVIRONMENT)

## Introduction

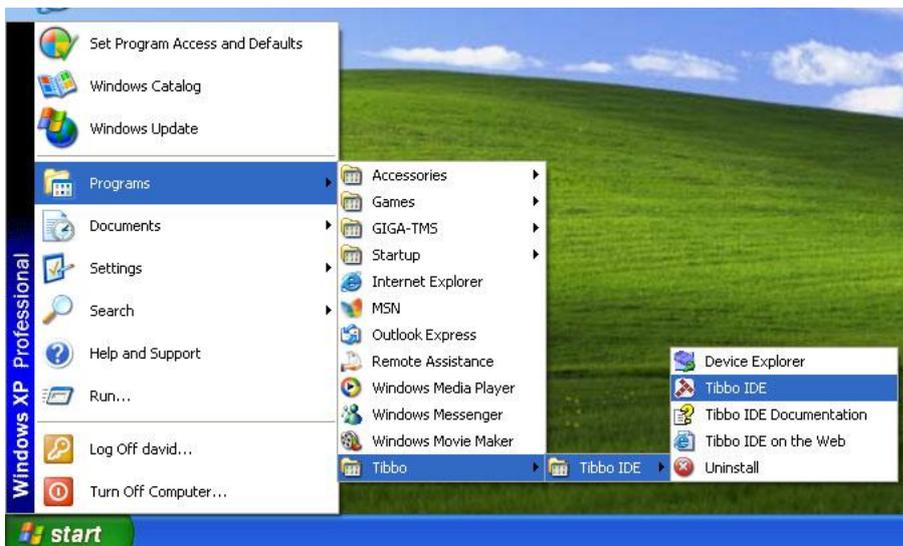
FAT810 opens the source code of [application firmware](#) that allows the user to modify by the **Tibbo IDE (TIDE)** program to meet the needs. For example, implements the reserved two serial ports to connect to other serial devices or do the off-line transaction with wanted commercial logic. It is also able to create a html web page to allow the user to use web

browser to configure FAT810 settings without using FAT8xx Utility program. The language that TIDE uses is Tibbo Basic. For the Tibbo Basic, the programming fundamentals are similar to the QB (Quick Basic\*) and VB (Visual Basic\*) languages, which allows the Basic programmer to get started with developing the application firmware easily and quickly.

\* QB (Quick Basic) and VB (Visual Basic) are registered trademarks of Microsoft Corporation Inc.

## Installing and Loading the Program

- Insert the FAT8xx Utility Setup CD into the CD-ROM drive of your PC. The setup program begins automatically. There is no need to choose your CD-ROM drive from your on-screen settings, or to use the <RUN> prompt.
- A html page will pop up. Click [Install Tibbo IDE program]. The setup wizard will now guide you through the setup procedure.
- When the setup procedure is complete, remove the software CD-ROM disk from your CD-ROM drive and accept the prompt to restart your PC.
- From the [Start]/[Programs]/[Tibbo] select the [Tibbo IDE], click [Tibbo IDE].



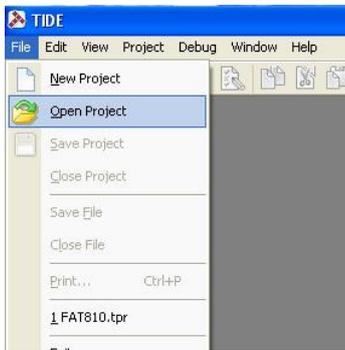
## Programming with TIDE

The topics below attempt to give you a general understanding about programming of the FAT810 application firmware. Before starting to use TIDE, make sure the FAT810 terminal is connected well under the network.

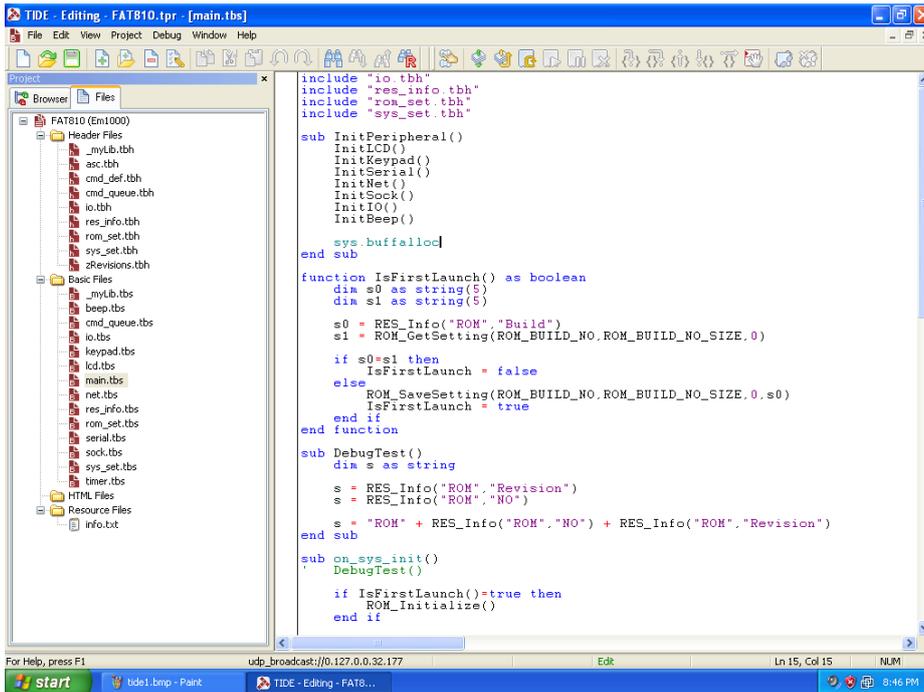
### Opening the Project

The source code files for application firmware are located in the path [**Mics \ Firmwares \ SourceCode**] of setup CD. Please copy the files to PC hard driver and set the read-only attribute of all files to be unchecked.

Launching TIDE, to open the project file, from **File**, click **Open Project**.



Select the project file - FAT810.tpr, and then click OK to open it. Below is the screen shot for opening the FAT810 project.

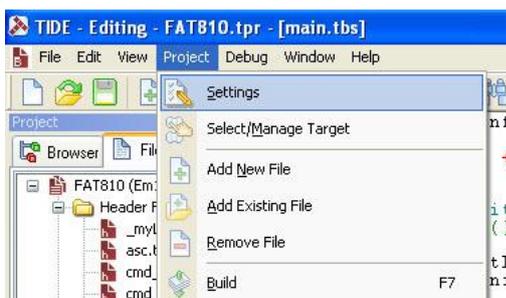


## Connecting to FAT810

It needs to specify the address of the FAT810 you will use for debugging and testing this project. This should be a reachable address with a live FAT810. Your project will still be created even if you do not specify this parameter, but you will not be able to upload or debug until you specify this setting using the **Project Settings** dialog.

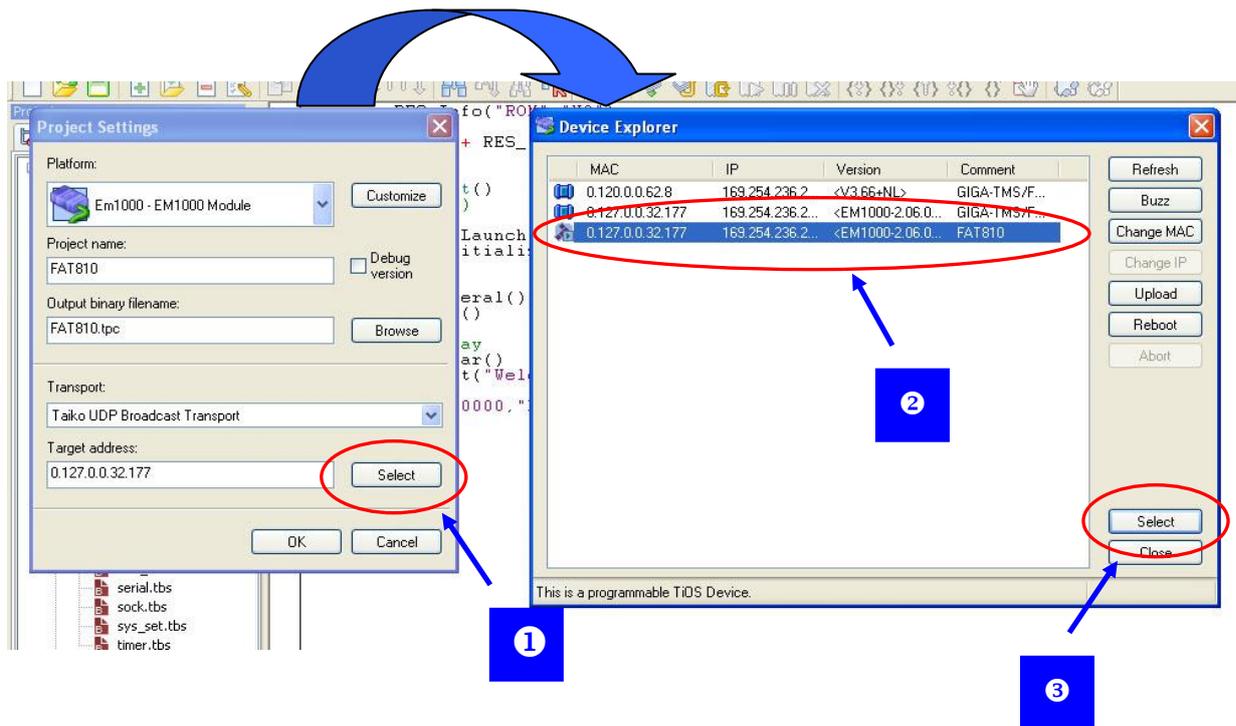
To do this, please follow below steps:

- From **Project**, click **Setting**



- On **Project Setting** window, click **Select**

- Select the connected FAT810 item (with red color T letter icon), click **Select**



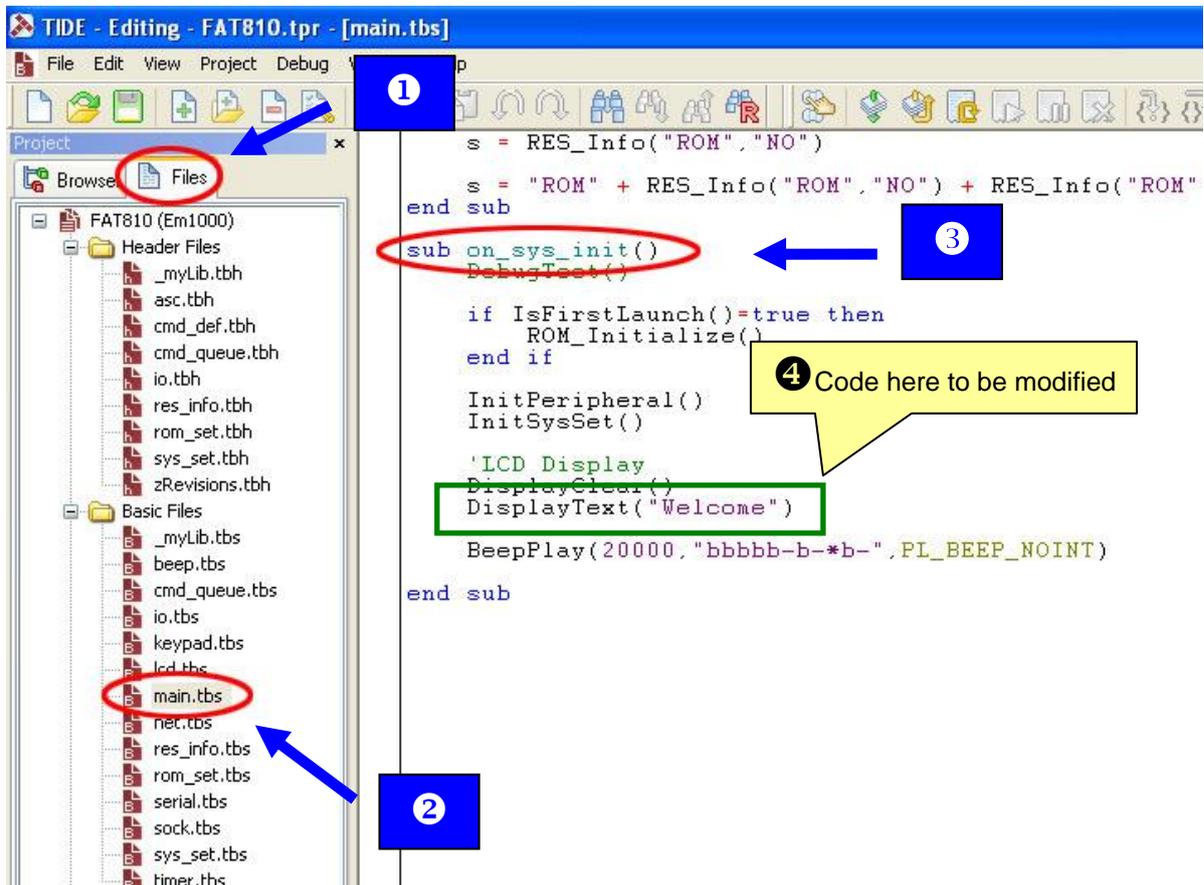
## Coding the Project

This topic will not go details for the using way of TIDE code editor. For this part, the TIDE on-line help can give you very detail information. Below give a example to demonstrate the way of how to use TIDE to modify the FAT810 project to meet the needs.

### Example

This example will make the code modification to show the way of changing the startup displaying message while powering on the terminal. When starting the FAT810, the LCD will display "Welcome" message and then give a one-long and two-short beep sound. Below steps for the code modification will modify this to show the displaying message to be the terminal IP-address.

- On **Project** browser (with tree view), click **File** tab
- Click **main.tbs** file
- Scroll the vertical bar of the code editor window to move cursor to on\_sys\_init sub routine.



- Remark the code “DisplayTest(“Welcome”)” by entering the apostrophe character in the beginning of the code
- Go to the next line, writing the new code “DisplayTest(net.ip)”, see:

```
'DisplayText("Welcome")
DisplayText(net.ip)
```

- Pressing F5 (or from **Debug**, click **Run**) and wait
- You will see the project compiling. The output pane will display any errors (if you copied the code as it is, there should be no errors).
- The status bar will show you the project building, uploading, and running.
- Once the status bar says RUNNING, you may see the LCD will display the IP-address of FAT810 terminal

## Building, Uploading and Running

Once you are done with writing the FAT810 project, it is time to build, upload and run it. These three operations can be done by pressing F5. For more details, please refer to the section of **Making, Uploading and Running an Executable Binary** of the **TIDE** on-line help.

## Compiling a Final Binary

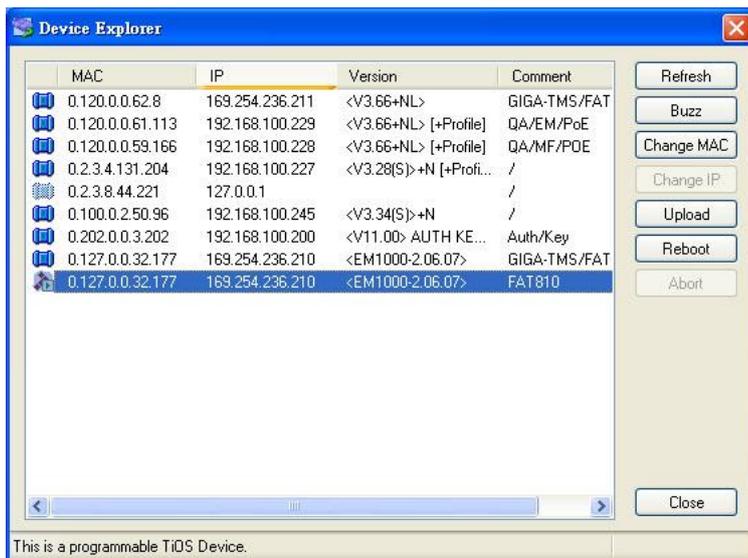
The binary executable file you compiled in the previous step is called a debug binary. This type of binary is used while creating FAT810 project and debugging it.

When you decide FAT810 project is ready to be deployed in the real world, you should compile a release binary. To do this, select Project > Settings and uncheck the Debug version checkbox.

The next time you will press F5, a release binary will be created and uploaded to your target. It will automatically start running and will not provide any debug information.

This release binary file also remains on your hard drive, inside your project folder. You may take it and upload it to any number of FAT810s.

## Device Explore



This program shows all targets found on the current network segment. A target is a hardware device capable of running TiOS. For example, the FAT810 terminal.

### Cannot See the Connected Terminal

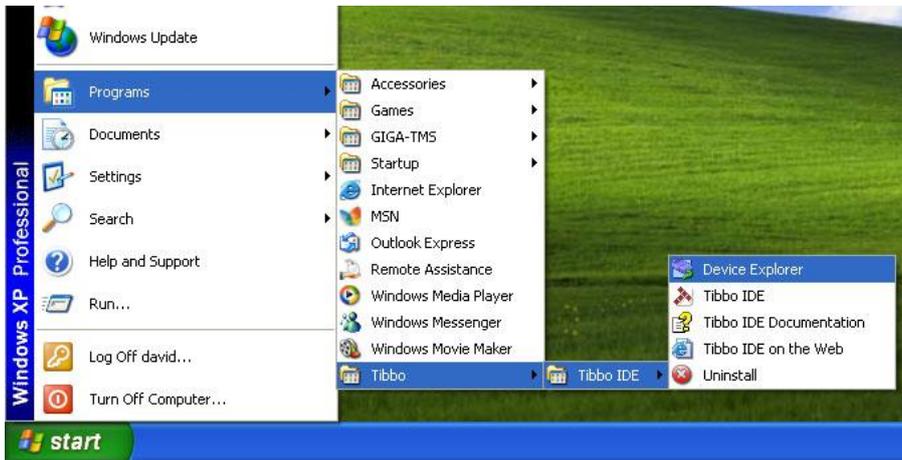
There can be several possible causes why you cannot see the terminal. Two of the most common ones are:

1. The target is not connected to the same subnet as the computer. I.e, there is a router between the computer and the terminal. To fix this: Connect the terminal to the same hub as the computer.
2. There is a local firewall installed on the computer. Local firewalls usually block broadcast UDP datagrams, which are used to communicate with the target. To fix this: Configure the firewall to allow Device Explore to send broadcast UDP datagrams.

## Installing and Loading the Program

Device Explore program is installed together with TIDE program. If you want to use with stand-alone without installing TIDE, please run the setup.exe file that located in the [Programs \ Device Explore] folder of setup CD.

To run the program, from [Start] / [Programs] / [Tibbo] / [Tibbo IDE], click **Device Explore**.

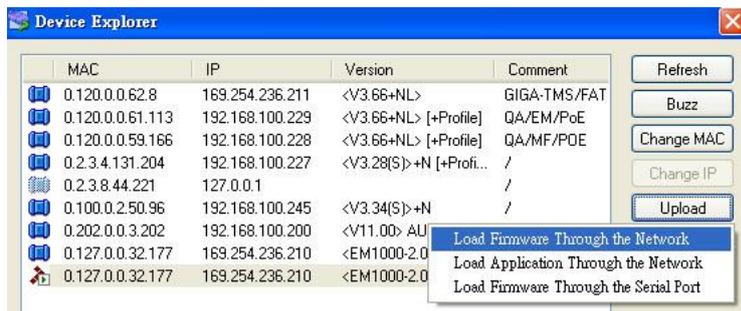


Below section will introduce how to upload the firmware by Device Explore. For more details about this program, please refer to TIDE on-line help.

## Uploading TiOS Firmware to FAT810

This section will guide you how to use **Device Explore** to upload TiOS firmware.

- Run Device Explore program
- Select connected FAT810 terminal item on the list view
- Click Upload, a drop-down menu will pop up



- Select and click **Load Firmware Through the Network**
- Select the firmware file (the file extension name is .bin, for example, tios-em1000-2\_06\_07.bin )
- Click Open to start uploading

## Uploading Application Firmware to FAT810

This section will guide you how to use Device Explore to upload FAT810 application firmware.

- Run Device Explore program
- Select connected FAT810 terminal item on the list view
- Click Upload, a drop-down menu will pop up
- Select and click **Load Application Through the Network**
- Select the firmware file (the file extension name is .tpc, for example, FAT810.tpc )
- Click Open to start uploading