

ACT8XX Manual

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1.Information

A. Model Classification:

ACT 8 1 0 G

① ② ③ ④ ⑤

①Model name: ACT

②Model number: 8

③Keypad type: 0→12 Keys

1→16 Keys

2→20 Keys

④Reader type: 0→without reader

2→MAG TK2

3→MAG TK1+TK2

6→MAG TK2+TK3

7→MAG TK1+TK2+TK3

8→LED barcode reader

9→IR barcode reader

⑤LCD type G→122*32Graphic LCD

none→16*2Character LCD

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.

B. Keypad Layout

12 Keys

1	2	3
4	5	6
7	8	9
CLR	0	ENT

16 Keys

1	2	3	F1
4	5	6	F2
7	8	9	F3
CLR	0	ENT	F4

20Keys

ESC	F1	F2	F3
1	2	3	F4
4	5	6	F5
7	8	9	F6
CLR	0	.	ENT

ASCII Look-Up Table for Keypad

Key	ASCII	Key	ASCII	Key	ASCII	Key	ASCII
0	30H	5	35H	F1	41H	F6	46H
1	31H	6	36H	F2	42H	ESC	1BH
2	32H	7	37H	F3	43H	.	3EH
3	33H	8	38H	F4	44H	CLR	08H
4	34H	9	39H	F5	45H	ENT	0DH

2.Introduction

Three in one ACT8XX is a compact designed product with the combination of Number keyboard, Reader, and LCD. Three in one device saves installation space and provides easy operation.

The product, designed with the state-of-the-art microprocessor and barcode/magnetic stripe card reader technology, is totally compatible with RS-232C interface. ACT8XX support many kind of operation modes (buffer/un-buffer mode; asterisk/digit displaying), you can change any one of modes to meet for your application by Paragraph **6-G** command. Once you change it, ACT8XX will keep this setting in memory (EEPROM). When you power-up ACT8XX, ACT8XX will take the last setting for the unit.

ACT8XX has built 12 text pages to quickly show messages. You just give the number of messages by Paragraph **6-B** command. ACT8XX will show that message immediately. If you want to show message directly or change messages in one of 12 text pages, please refer to Paragraph **6-J** command. The first page of 12 text pages is also for the start-up page. When you power up ACT8XX, ACT8XX take start-up page to show.

ACT8XX has reader for read barcode/magnetic strip card. You can enable/disable reader by Paragraph **6-D** command. If you disable reader, the reader will get no action, until you enable the reader. The card data will reply **Notice Message**, refer to Paragraph **6-M**.

For keypad, you can enable/disable keypad by Paragraph **6-E** command.

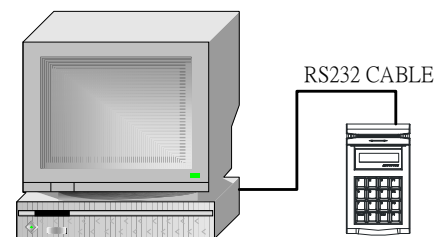
Note: When you power-up ACT8XX every time, both reader and keypad are always enabled, even though you did disable the reader or keypad last time.

ACT8XX is possible to connect next device by daisy chain via Y cables.

3.Installation

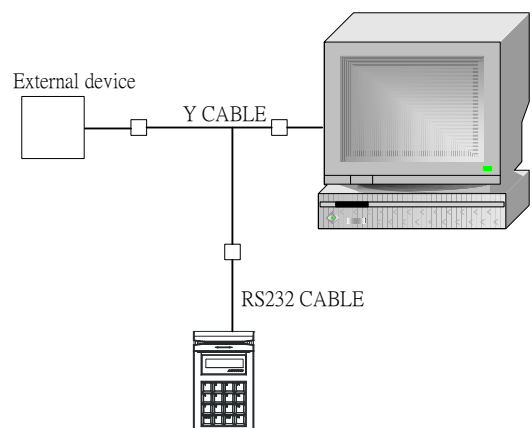
A. Direct connection

- 1.Connect the cable to the RS-232 port of the computer.
- 2.Plug in the DC power adaptor to the power jack on the ACT8XX.
- 3.Plug the adaptor to the power line.



B. Daisy chain connection

- 1.Make a Y cable between PC and external device, refer to "Pinout for Y cable" on page 4.
- 2.Plug each side like diagram.



4.Pin Assignment

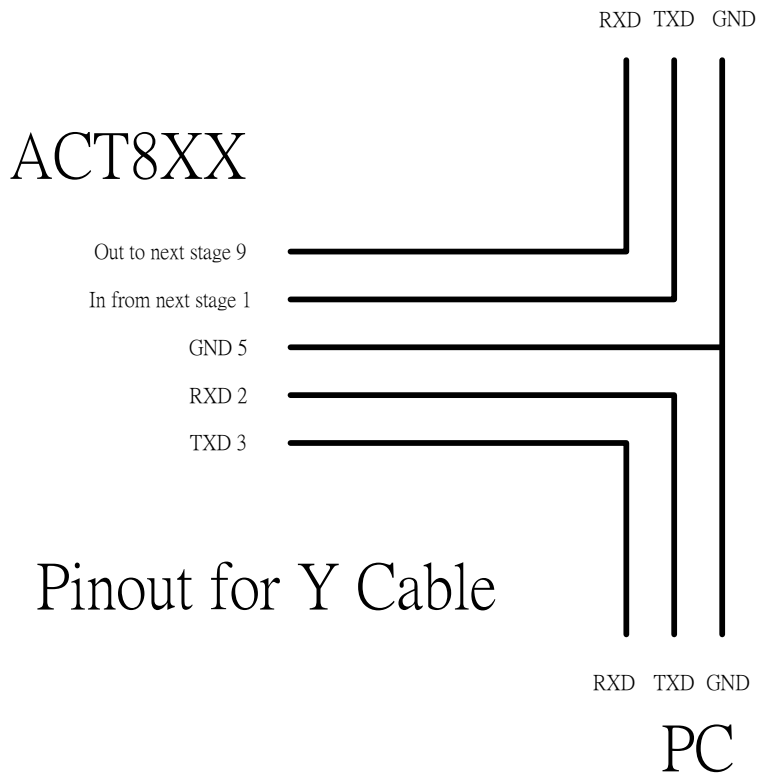
A. DB-9(female) pin

Pin#	Signal
1	In from next stage
2	RXD
3	TXD
9	Out to next stage
5	GROUND
Note: 4,6 short	
7,8 short	

B. DC power jack

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

External Device



5.Operations

When you start up ACT8XX, ACT8XX will set the boot-up status from memory (EEPROM). Then sound a beep and LCD shows the start-up page. After that, ACT8XX will stay at stand-by state. You can give a command to ACT8XX. For example, show a message to direct customer to do some action (refer to Paragraph **6-B** command). You can also blink the LCD by Paragraph **6-I** command to attract the customer attention.

You can press any key in the keypad. Please make sure keypad is enabled. If keypad is at “disable”, keypad doesn't work. The power-up state is at “enable”. When you press the first key, the screen on LCD will be cleared, and the key will be shown on the left-top side. Following key-in will be left-to-right top-to-bottom showing on LCD by sequence. The key-in digits are 32 maximum. It will be ignored, if key-in digits over 32 maximum.

If LCD always show asterisk sign(*) when you press key. It means ACT8XX is on asterisk displaying type. In fact, asterisk sign is just only for displaying. Real key is as the same as you pressed. You can change displaying type as normal by Paragraph **6-G** command. The LCD displaying will consistent with you pressing.

The ACT8XX have 2 operation modes. One mode is Un-Buffer mode. When you press one key, ACT8XX send out that key(ASCII) by RS232 interface immediately. And the other one is Buffer mode. It will be kept in buffer, when you press keys, it will not send out all keys(ASCII) in the buffer by RS232 interface until you press ENTER and then the key-in digits on LCD will be erased. The buffer size is 32 maximum. It will be ignored, if key-in digits over buffer size 32 digits.

CLR key is used to backspace the last key.

ESC key is used to erase all key in the LCD and buffer.

If you have already key-in some keys and then stop key-in over 10 seconds, ACT8XX will erase all keys in LCD and buffer. And issue a timeout notice to host (refer to Paragraph **6-M**).

Host can erase LCD and buffer by Paragraph **6-C** command.

If you need reader to read barcode/magnetic strip card, please make sure reader is enabled. If the card data can't be decoded, it sends an error notice to host. If the card data is correct, it sends the card data to host, and sounds a beep.

You can get the information and status on ACT8XX by Paragraph **6-A** command. We suggest you may use this command to make sure the correct correspondent settings you want between host and ACT8XX.

6.Communications

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)

Command	Hexadecimal Format	Description
V	STX V ETX	Get device firmware version & status
D	STX Dmn ETX	Show pre-saved message page on LCD
C	STX C ETX	Erase LCD and buffer
M	STX Mn ETX	Enable/Disable reader
K	STX Kn ETX	Enable/Disable keypad
B	STX Bn ETX	Control beep
P	STX Pmn ETX	Change operation parameters
@	STX @ ETX	Initialize device
F	STX F ETX	Blink the display
Y	STX Y n <Data...> ETX	Show text message and save it to the text message page
Z	STX Z <Data...> ETX	Show graphic message*
S	STX Sn ETX	Save currently viewing as graphic message page*

(*) only work with graphic LCD models

A. Get device firmware version & status

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

XXXX: Firmware Number

V: Revision

S: Status(8 bits as below)

B7	B6	B5	B4	B3	B2	B1	B0
0	0	Keypad	Reader	Display	Mode	Baudrate	
		1:enable 0:disable	1:enable 0:disable	1:asterisk 0:normal	1:buffer 0:unbuffer	00: 2400bps	01: 4800bps 10: 9600bps 11: 19200bps

You can get device information and status by this command.

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

B. Show pre-saved page message on LCD

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**; graphic page message, **m=31H**

n: page number, 31H<=**n**<=3CH(for **m=30H**, text page); 31H<=**n**<=36H(for **m=31H**, graphic page)

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

C. Erase LCD and buffer

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**.

D. Enable/Disable reader

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 keep this setting in EEPROM. Device use the last setting for its setting when restart.

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

Note: Reader is always enabled when the units restarted even though you did disable the reader last time.

E. Enable/Disable keypad

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 keep this setting in EEPROM. Device use the last setting for its setting when restart.

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

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

F. Control beep

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

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

G. Change Operation parameters

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;

Change Baudrate(m=31H)	Change Mode(m=32H)	Change Displaying Type(m=33H)
n=30H, 2400bps	n=30H, unbuffered mode	n=30H, normal(*)
n=31H, 4800bps	n=31H, buffer mode(*)	n=31H, asterisk mark
n=32H, 9600bps(*)		
n=33H, 19200bps		

(*) 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**.

H. Initialize Device (Reset)

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.

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

Otherwise, reply **NACK**.

I. Blink the display

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**.

J. Show text message and save it to the text message page

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 be replace the pre-saved page of 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.

K. Show graphic message(only work for graphic LCD model 122*32 dots)

HOST→DEVICE	STX	Z	XPOS	YPOS	XLEN	YLEN	<DATA...>	ETX
	02H	5AH	bin	bin	bin	bin	<DATA...>	03H
DEVICE→HOST	ACK/NACK							

Note. This command only work with graphic LCD models

00(H)<=**xpos**<=79(H), the left-most position of block image

00(H)<=**ypos**<=1F(H), the top-most position of block image.

01(H)<=**xlen**<=7A(H), the length of block image.

01(H)<=**ylen**<=20(H), the height of block image

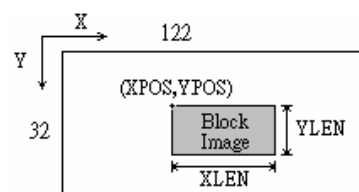
<DATA...>, block image data. Byte by byte, sequent, from top to bottom, left to right.

However,

(1)When **YLEN** is less than or equal to 8 dots(08H),the block image data should be made from top to bottom and from left to right until the maximum **XLEN**, and each data must be made as 8 bits(1 byte) from top to bottom. Please see the example as below to make D(1),D(2),D(3),....

(2)When **YLEN** is more than 8 dots(08H) and less than or equal to 16 dots(10H), the **YLEN** should be divided by 8 into two sectors. Then the block image data should be made from top to bottom and from left to right until the maximum **XLEN** within the most upper **YLEN** sector, then go to the second upper **YLEN** sector to make data as the same procedures as within the most upper **YLEN** sector.

(3)When **YLEN** is more than 16 dots(10H) and less than or equal to 24 dots(18H), the **YLEN** should be divided by 8 into three sectors. Then the block image data should be made as the same procedures as above



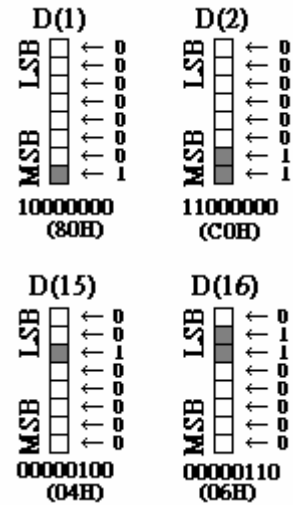
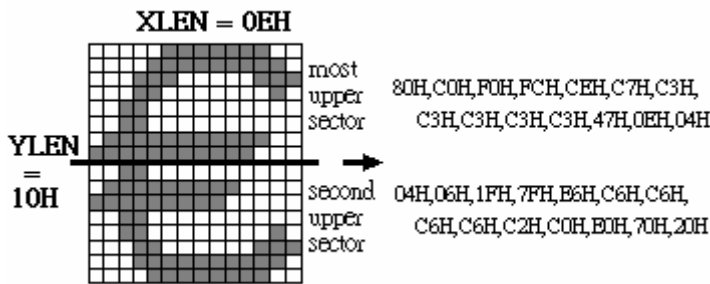
within the most upper sector and the second upper sector and then go to the third upper sector.

(4)When YLEN is more than 24 dots(18H) and less than or equal to 32 dots(20H), the YLEN should be divided by 8 into four sectors. Then the block image data should be made as the same procedures as above within the most upper sector and the second upper sector and the third upper sector and then go to the last(bottom) sector.

<DATA...> matrix such as:

D(1)	D(2)	D(3)	...	D(XLEN)
D(1XLEN+1)	D(1XLEN+2)	D(1XLEN+3)	...	D(1XLEN+XLEN)
D(2XLEN+1)	D(2XLEN+2)	D(2XLEN+3)	...	D(2XLEN+XLEN)
D(3XLEN+1)	D(3XLEN+2)	D(3XLEN+3)	...	D(3XLEN+XLEN)

Example: we draw an Euro sign at (8,9) of the display coordinative position.



After this, we send sequent command to the device as following,

STX, Z, 08H, 09H, 0EH, 10H,
80H, C0H, F0H, FCH, CEH, C7H, C3H, C3H, C3H, C3H, C3H, 47H, 0EH, 04H
04H, 06H, 1FH, 7FH, E6H, C6H, C6H, C6H, C6H, C2H, C0H, E0H, 70H, 20H, ETX

L. Save currently viewing as graphic message page(only work for graphic LCD model 122*32 dots)

HOST to DEVICE (4 bytes)	STX	s	n	ETX
	02H	53H	bin	03H
DEVICE to HOST (1 bytes)	ACK/NACK			

31H<=n<=36H, Save currently viewing as graphic message page n.

Device will reply **ACK** if this command is acknowledged.

Otherwise reply **NACK**.

M. Notice Message

Notice Message is Device to send a notice to host automatically.

Events	Message
Card read OK	<STX>+<S>+<TK data bytes>+<ETX>
Card read error	<STX>+<E>+<ETX>
Time out	<STX>+<O>+<ETX>

7.Specifications

Temperature: 5 – 45 Degree C

Humidity: 10 – 90 % Relative

Size: W 105 XL 185 XH 40 mm

Weight: 405 g

Communication: RS – 232