



愛高實業(香港)有限公司
HICO INDUSTRIAL (HK) LIMITED

PRODUCT
SPECIFICATION

MINI TRAINER

Product Code:	HCS-T014-1
Version:	1.2
Date:	13 October 2004

Preliminary

Hong Kong 香港

22nd Floor, Delta House, 3 On Yiu Street, Siu Lek Yuen, Shatin, N. T., Hong Kong
香港新界沙田小瀝源安耀街三號匯達大廈二十二樓
Tel: 26486862 Fax: 26373691 Email: enquiry@hico.com.hk

Shenzhen 深圳

16/F., Times Plaza, 1 Prince Road, Shekou, Shenzhen, China
深圳蛇口太子路一號新時代廣場十六樓
Tel: (0755)6812638 Fax: (0755)6817308 Email: sales@sz.hico.com.hk

Shanghai 上海

Level 21, HSBC Tower, 101 Yin Cheng East Road, Pudong, Shanghai, China 200120
上海市浦東新區銀城東路 101 號匯豐大廈二十一樓，郵編：200120
Tel: (021)28903020 Fax: (021)28903022 Email: sales@sh.hico.com.hk

Room 833, No. 8 Huajing Road, Waigaoqiao Free Trade Zone, Pudong, Shanghai, China 200131
上海市浦東外高橋保稅區華京路八號八三三室，郵編：200131
Tel: (021)50462088 Fax: (021)50460960



愛高實業(香港)有限公司

HICO INDUSTRIAL (HK) LIMITED

22/F., DELTA HOUSE, 3 ON YIU STREET, SIU LEK YUEN, SHATIN, N.T., HONG KONG.


TEL: (852) 2648 6862 FAX: (852) 2637 3691 URL: <http://www.hico.com.hk> EMAIL: enquiry@hico.com.hk

香港新界沙田小瀝源安耀街三號匯達大廈二十二樓

Preliminary

Mini Trainer (HCS-T014-1)

DOCUMENT HISTORY

Date	Product Code	Version	Approved by	Revision Details
13 Oct. 2004	HCS-T014-1	1.2		<ul style="list-style-type: none">Updated circuit diagram (Rev. 1)Changed Shenzhen office address
6 May 2003	HCS-T014-1	1.1	OBSOLETE	<ul style="list-style-type: none">LCD display has 8 digitsLCD display is changed from 1/5 to 1/4 dutyMaximum chronograph time is 23 hours 59 minutes 59.99 seconds
7 Sept. 2002	HCS-T014-1	1.0	OBSOLETE	
31 Aug. 2001	HCS-T014-0	1.0	OBSOLETE	Original version



愛高實業(香港)有限公司

HICO INDUSTRIAL (HK) LIMITED

22/F., DELTA HOUSE, 3 ON YIU STREET, SIU LEK YUEN, SHATIN, N.T., HONG KONG.

TEL: (852) 2648 6862 FAX: (852) 2637 3691 URL: <http://www.hico.com.hk> EMAIL: enquiry@hico.com.hk

香港新界沙田小瀝源安耀街三號匯達大廈二十二樓

Preliminary

Mini Trainer (HCS-T014-1)

GENERAL DESCRIPTION

The MINI TRAINER is a single-chip micro-controller that is preprogrammed for digital watch applications. Features with 3-split memories Chronograph, Countdown Timer, and 5 Daily Alarms, it could be a useful tool for daily exercise.

FEATURES

- LSI Used
 - TENX TM8712
- Real Time Clock
 - Hour, Minute, Second, Month, Day, Year
 - 12 or 24 hour display format by user option
 - Hourly chime
 - Auto leap year adjustment from 2000-2049
- Daily Alarms
 - Five independent schedule alarms with adjustable Hour, Minute
 - Distinctive alert tone for each alarm
 - Five-minutes snooze function
- Countdown Timer
 - Preset time duration ranging from 1 to 240 minutes
 - Alert signal when countdown to zero
- Chronograph
 - Count up to 23 hours 59 minutes 59.99 seconds with 1/100 second display resolution
 - Accuracy up to 1/10 second
 - Memories for 3 split time
- Operates with 3 volts Lithium battery
- Operates with 3 buttons
- Beep tone alerts for key operations



愛高實業(香港)有限公司

HICO INDUSTRIAL (HK) LIMITED

22/F., DELTA HOUSE, 3 ON YIU STREET, SIU LEK YUEN, SHATIN, N.T., HONG KONG.

TEL: (852) 2648 6862 FAX: (852) 2637 3691 URL: <http://www.hico.com.hk> EMAIL: enquiry@hico.com.hk

香港新界沙田小瀝源安耀街三號匯達大廈二十二樓

Preliminary

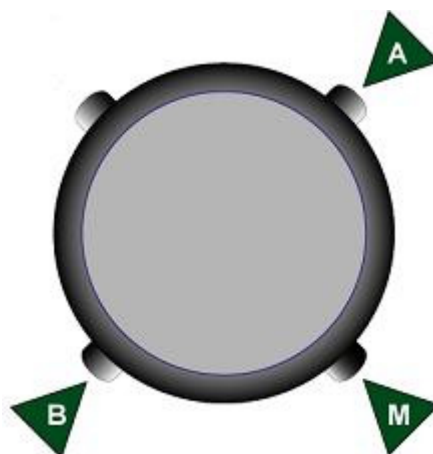
Mini Trainer (HCS-T014-1)

LCD PATTERN



- Operating Voltage: 4.5V
- Duty Cycle: 1/4
- Bias: 1/3
- Viewing Direction: 6H
- Connection: Top and Bottom

KEYBOARD





愛高實業(香港)有限公司

HICO INDUSTRIAL (HK) LIMITED

22/F., DELTA HOUSE, 3 ON YIU STREET, SIU LEK YUEN, SHATIN, N.T., HONG KONG.

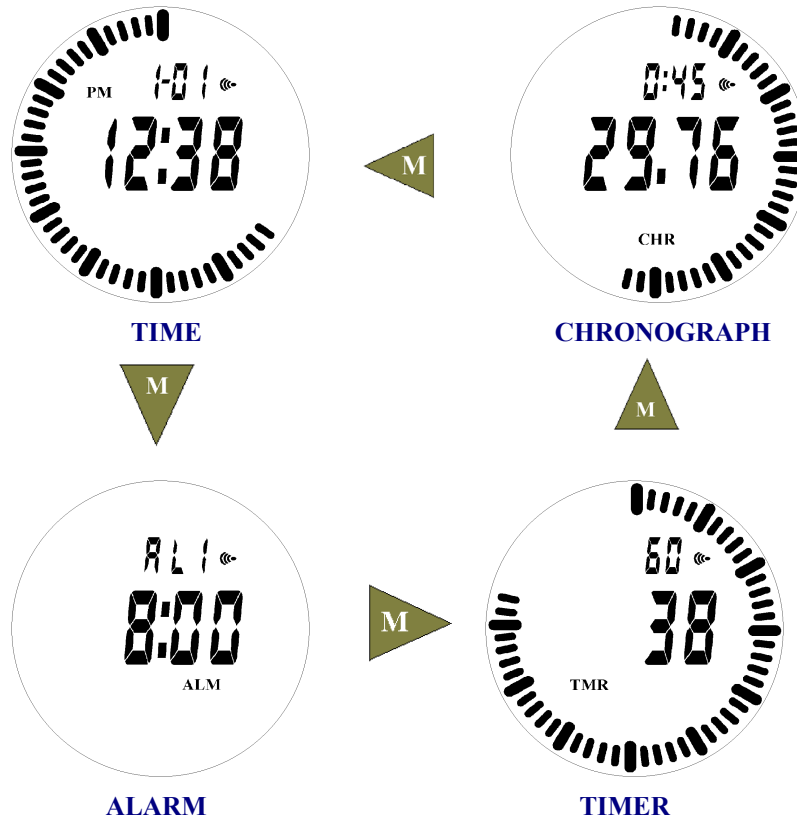
TEL: (852) 2648 6862 FAX: (852) 2637 3691 URL: <http://www.hico.com.hk> EMAIL: enquiry@hico.com.hk

香港新界沙田小瀝源安耀街三號匯達大廈二十二樓

Preliminary

Mini Trainer (HCS-T014-1)

FUNCTIONAL FLOWCHART



FUNCTIONAL DESCRIPTIONS

1. System Defaults

- System Defaults will be initialized upon system startup

MODE	ELEMENT	SETTING
Real Time	Time	12:00:00 AM
	Date	01-01-2003
	Display format	12-hour
	Chime	Disabled
Daily Alarms	Time	12:00 AM
	Alert	Disabled
Chronograph	Total Time	0 hour 0 minutes 00.00 second
	Split	All cleared
	Status	Stopped
Countdown Timer	Time	1 minute
	Status	Stopped



愛高實業(香港)有限公司

HICO INDUSTRIAL (HK) LIMITED

22/F., DELTA HOUSE, 3 ON YIU STREET, SIU LEK YUEN, SHATIN, N.T., HONG KONG.

TEL: (852) 2648 6862 FAX: (852) 2637 3691 URL: <http://www.hico.com.hk> EMAIL: enquiry@hico.com.hk

香港新界沙田小瀝源安耀街三號匯達大廈二十二樓

Preliminary

Mini Trainer (HCS-T014-1)

2. Auto Return

- Real Time Clock will be resumed if no key operation for 1 minute in any operating mode except the following:
 - Countdown Timer at running state
 - Chronograph at running state

3. Auto Advance

- In any setting mode, press and hold [A] for more than 2 seconds will activate Auto Advance function. Current selected digits will be adjusted at a rate of 5 steps per second until [A] is released.

4. Alert Signals

- Alert signals will be played based on the following priority:
 - Timer, Alarm 1, Alarm 2, Alarm 3, Alarm 4, Alarm 5

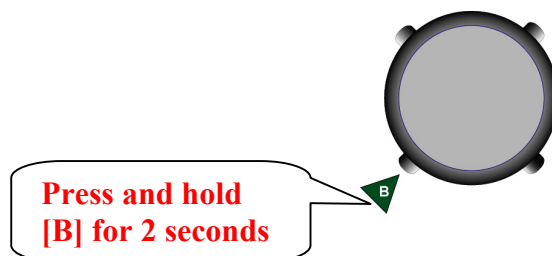
OPERATIONAL INSTRUCTIONS

1. Real Time Clock

- Basic display
 - e.g. 12:38:20 PM



- SECOND will be shown on the outer circle based on three different sequences. Press and hold [B] for two seconds to change to a different sequence:





愛高實業(香港)有限公司

HICO INDUSTRIAL (HK) LIMITED

22/F., DELTA HOUSE, 3 ON YIU STREET, SIU LEK YUEN, SHATIN, N.T., HONG KONG.

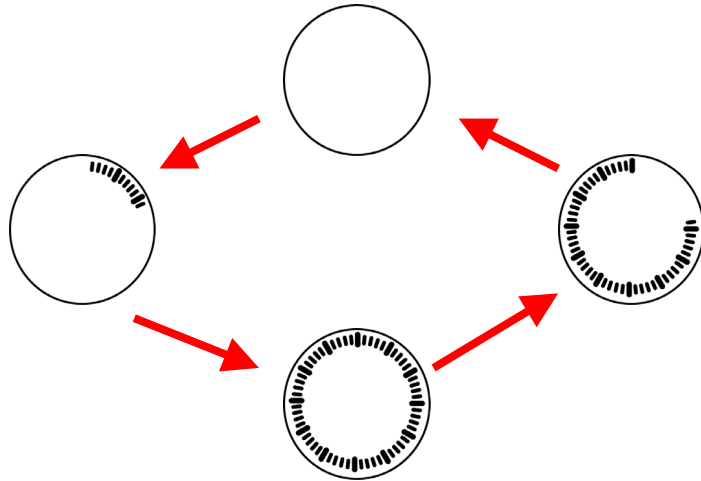
TEL: (852) 2648 6862 FAX: (852) 2637 3691 URL: <http://www.hico.com.hk> EMAIL: enquiry@hico.com.hk

香港新界沙田小瀝源安耀街三號匯達大廈二十二樓

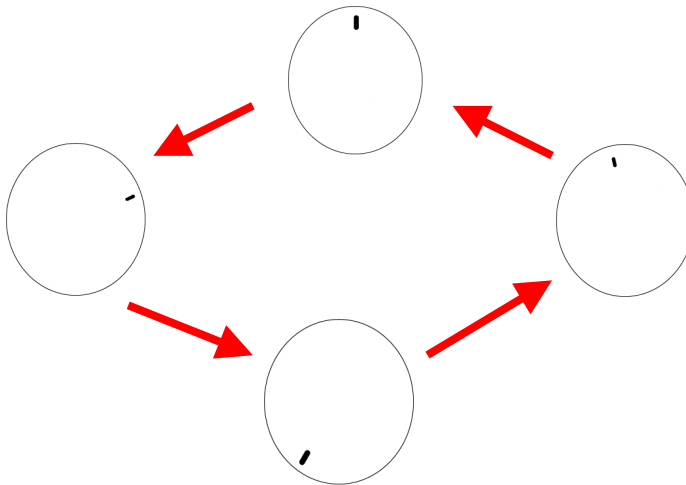
Preliminary

Mini Trainer (HCS-T014-1)

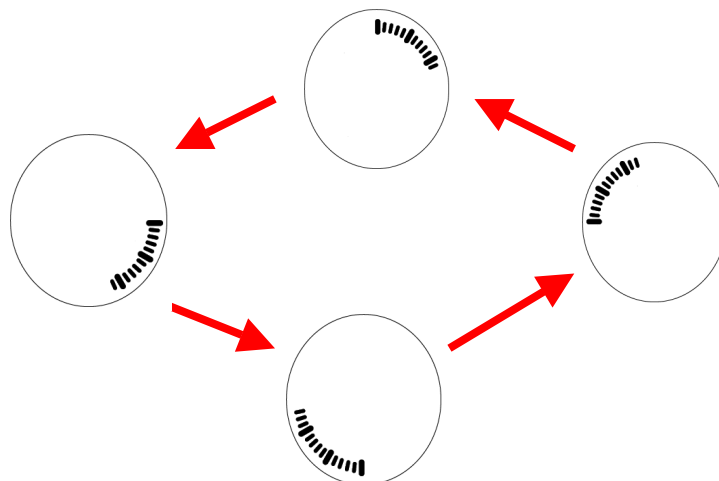
1. Default



2.



3.





愛高實業(香港)有限公司

HICO INDUSTRIAL (HK) LIMITED

22/F., DELTA HOUSE, 3 ON YIU STREET, SIU LEK YUEN, SHATIN, N.T., HONG KONG.

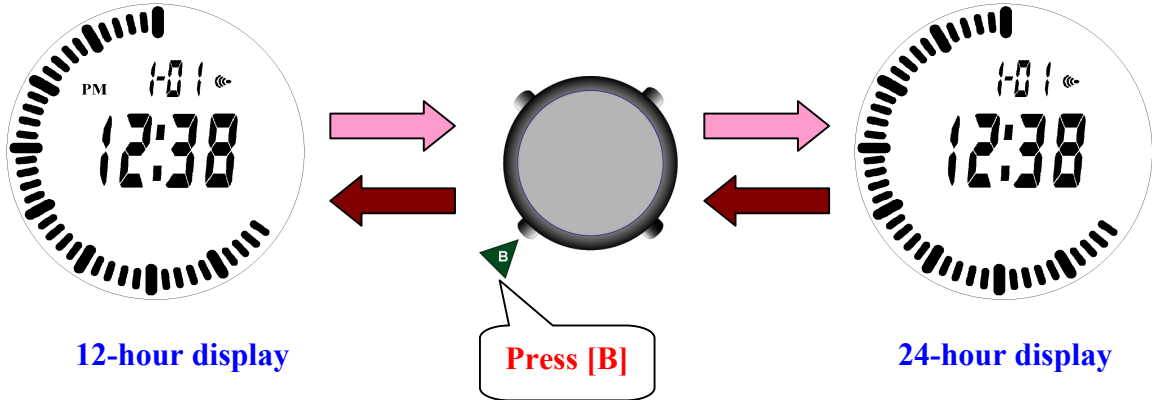
TEL: (852) 2648 6862 FAX: (852) 2637 3691 URL: <http://www.hico.com.hk> EMAIL: enquiry@hico.com.hk

香港新界沙田小瀝源安耀街三號匯達大廈二十二樓

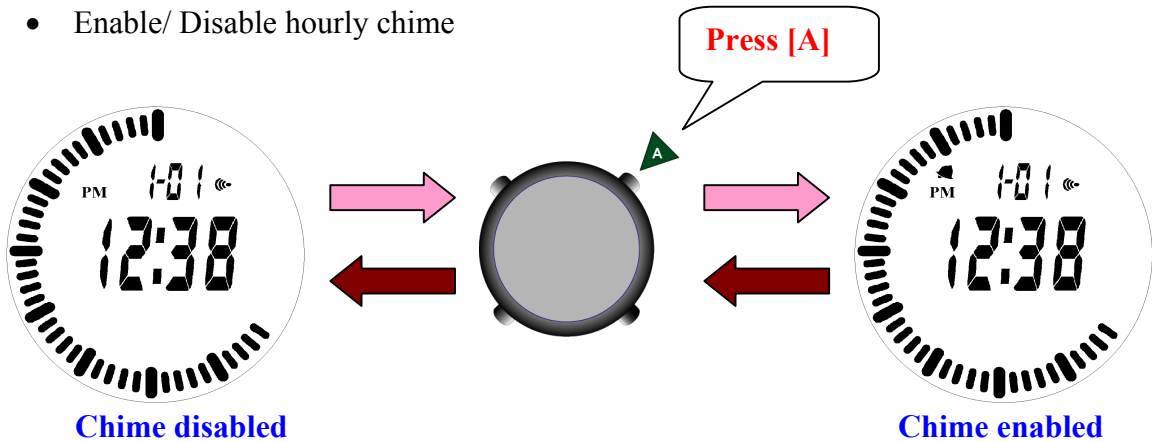
Preliminary

Mini Trainer (HCS-T014-1)

- Select 12/24-hour display system



- Enable/ Disable hourly chime



- Adjusting the Time and Date
 - Activate Time and Date setting



- On entry, segments in outer circle blinking for adjusting the Second.



愛高實業(香港)有限公司

HICO INDUSTRIAL (HK) LIMITED

22/F., DELTA HOUSE, 3 ON YIU STREET, SIU LEK YUEN, SHATIN, N.T., HONG KONG.

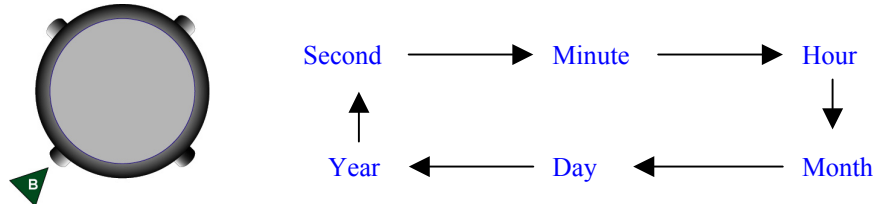
TEL: (852) 2648 6862 FAX: (852) 2637 3691 URL: <http://www.hico.com.hk> EMAIL: enquiry@hico.com.hk

香港新界沙田小瀝源安耀街三號匯達大廈二十二樓

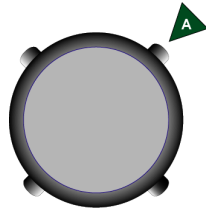
Preliminary

Mini Trainer (HCS-T014-1)

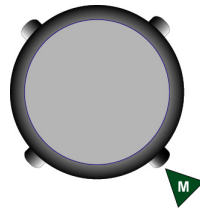
- Use [B] to select the blinking digits according to the following sequence:



- Use [A] to adjust the blinking digits



- Use [M] to confirm setting



2. Daily Alarm

- Basic display
 - e.g. Alarm with alert enabled on 8:00 AM





愛高實業(香港)有限公司

HICO INDUSTRIAL (HK) LIMITED

22/F., DELTA HOUSE, 3 ON YIU STREET, SIU LEK YUEN, SHATIN, N.T., HONG KONG.

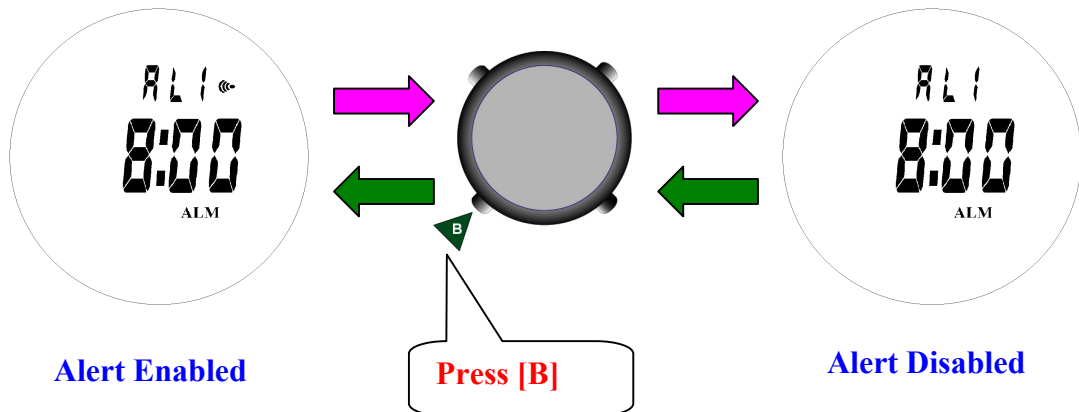
TEL: (852) 2648 6862 FAX: (852) 2637 3691 URL: <http://www.hico.com.hk> EMAIL: enquiry@hico.com.hk

香港新界沙田小瀝源安耀街三號匯達大廈二十二樓

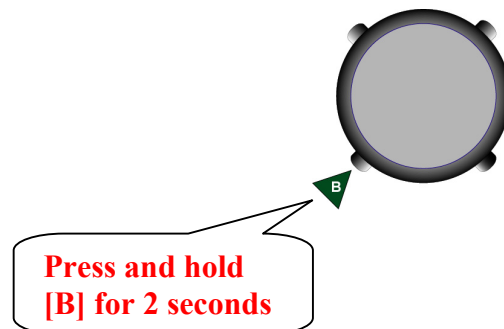
Preliminary

Mini Trainer (HCS-T014-1)

- Operating the Daily Alarm
 - All Alarms are operated identically with only difference in the alert tone.
 - Use [A] to select from Alarm 1 to Alarm 5.
 - To enable/disable the alert



- Test the alert tone



- Five-minutes snooze function
Within 30 minutes from the alarm time, the alert signal will be repeated to sound every 5 minutes if the alert sound stopped. Snoozing can be cleared by enabling/disabling any one of 5 alarms, setting current time or setting alarm.



愛高實業(香港)有限公司

HICO INDUSTRIAL (HK) LIMITED

22/F., DELTA HOUSE, 3 ON YIU STREET, SIU LEK YUEN, SHATIN, N.T., HONG KONG.

TEL: (852) 2648 6862 FAX: (852) 2637 3691 URL: <http://www.hico.com.hk> EMAIL: enquiry@hico.com.hk

香港新界沙田小瀝源安耀街三號匯達大廈二十二樓

Preliminary

Mini Trainer (HCS-T014-1)

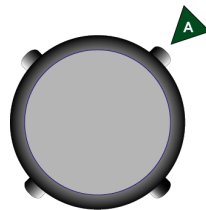
- Adjusting the Alarm
 - Activate the setting



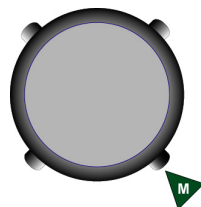
- Use [B] to select the blinking digits according to the following sequence:



- Use [A] to adjust the blinking digits



- Use [M] to confirm the setting and exit





愛高實業(香港)有限公司

HICO INDUSTRIAL (HK) LIMITED

22/F., DELTA HOUSE, 3 ON YIU STREET, SIU LEK YUEN, SHATIN, N.T., HONG KONG.

TEL: (852) 2648 6862 FAX: (852) 2637 3691 URL: <http://www.hico.com.hk> EMAIL: enquiry@hico.com.hk

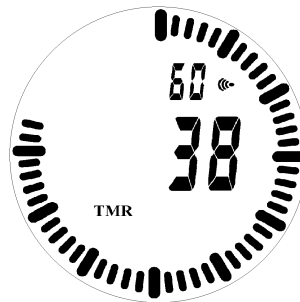
香港新界沙田小瀝源安耀街三號匯達大廈二十二樓

Preliminary

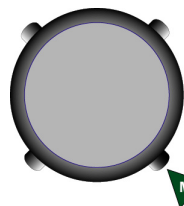
Mini Trainer (HCS-T014-1)

3. Countdown Timer

- Basic display
 - e.g. Timer left is 38 minutes 48 seconds

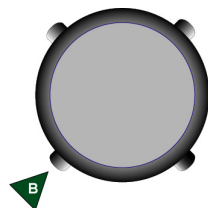


- Adjusting the Timer
 - Activate the setting

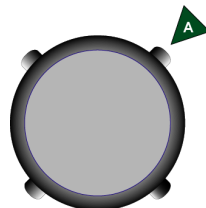


**Press and hold [M]
for 2 seconds**

- Use [B] to decrease the preset value by one minute



- Use [A] to increase the preset value by one minute





愛高實業(香港)有限公司

HICO INDUSTRIAL (HK) LIMITED

22/F., DELTA HOUSE, 3 ON YIU STREET, SIU LEK YUEN, SHATIN, N.T., HONG KONG.

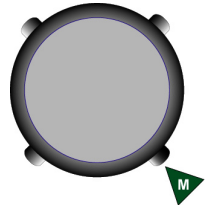
TEL: (852) 2648 6862 FAX: (852) 2637 3691 URL: <http://www.hico.com.hk> EMAIL: enquiry@hico.com.hk

香港新界沙田小瀝源安耀街三號匯達大廈二十二樓

Preliminary

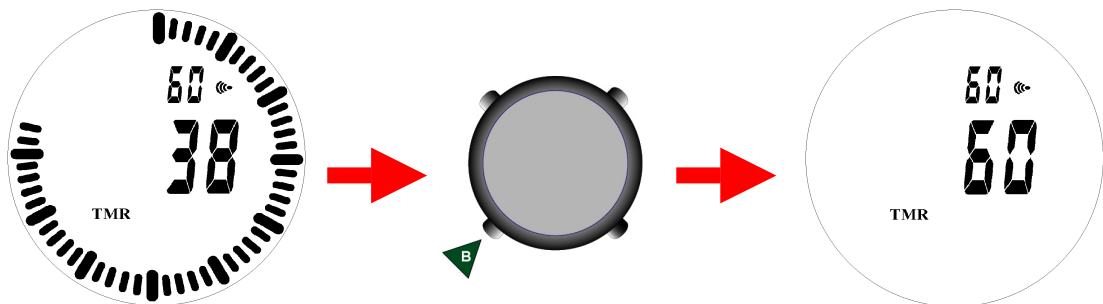
Mini Trainer (HCS-T014-1)

- Use [M] to confirm the setting and exit



- Operating the timer

- Preset time duration ranging from 1 to 240 minutes.
- Use [A] to start/stop the counting
- Press and hold [B] for two seconds while timer stopped to reload the preset value.



Timer Stopped

Timer Reloaded

- When timer has 10 seconds remaining, it starts to alert with 'beep' sound.
- When timer has 5 seconds remaining, it starts to alert with 'beep beep' sound
- Upon counting down to zero, the Timer will be stopped automatically. Alert signal 'beep, beep, beep, beep' will be sounded for 15 seconds with all the segments on the outer circle blinking.

4. Chronograph

- Maximum count is 23 hours 59 minutes 59.99 seconds. When maximum count is reached, counting will continue with time reset to zero.
- Three Split records (SPL1 to SPL3) can be stored in the internal memory. When all the records are occupied, new SPL entry will overwrite the 3rd record.
- During SPL Recall, press [B] will retrieve all SPL records sequentially.



愛高實業(香港)有限公司

HICO INDUSTRIAL (HK) LIMITED

22/F., DELTA HOUSE, 3 ON YIU STREET, SIU LEK YUEN, SHATIN, N.T., HONG KONG.

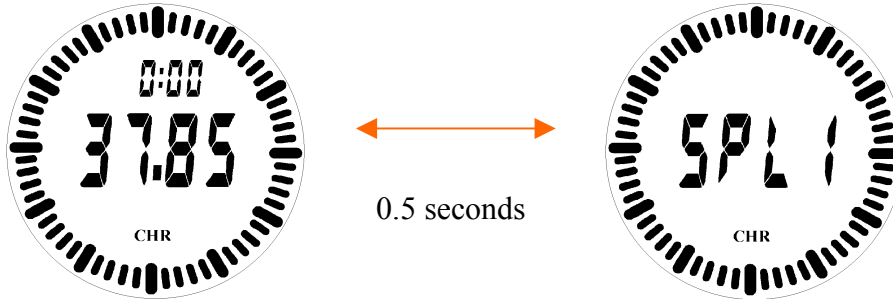
TEL: (852) 2648 6862 FAX: (852) 2637 3691 URL: <http://www.hico.com.hk> EMAIL: enquiry@hico.com.hk

香港新界沙田小瀝源安耀街三號匯達大廈二十二樓

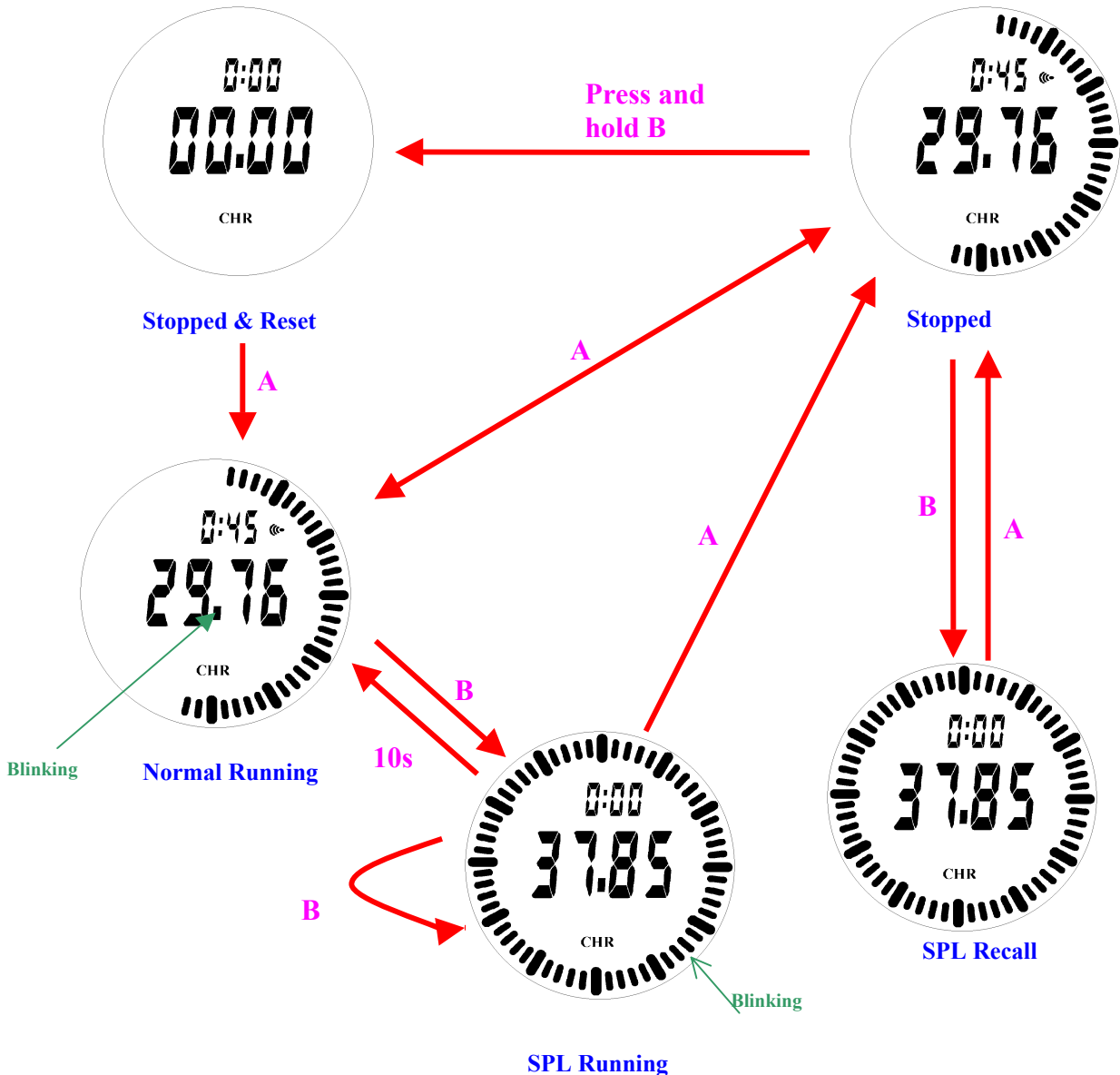
Preliminary

Mini Trainer (HCS-T014-1)

- During SPL Recall or SPL Running, it displays SPL number and SPL time alternatively.



- Operating the Chronograph





愛高實業(香港)有限公司

HICO INDUSTRIAL (HK) LIMITED

22/F., DELTA HOUSE, 3 ON YIU STREET, SIU LEK YUEN, SHATIN, N.T., HONG KONG.

TEL: (852) 2648 6862 FAX: (852) 2637 3691 URL: <http://www.hico.com.hk> EMAIL: enquiry@hico.com.hk

香港新界沙田小瀝源安耀街三號匯達大廈二十二樓

Preliminary

Mini Trainer (HCS-T014-1)

LCD Assignment Table

PAD NO.	LSI NAME	LSI PAD No.	COM1	COM2	COM3	COM4
1	COM1	10	COM1	--	--	--
2	COM2	11	--	COM2	--	--
3	COM3	12	--	--	COM3	--
4	COM4	13	--	--	--	COM4
5	SEG1	15	D4d	T12	ALM_U	D3e
6	SEG2	16	D4c	T9	T11	D4e
7	SEG3	17	D4b	T8	T10	D4g
8	SEG4	18	D4a	T5	T7	D4f
9	SEG5	19	D3c	T4	T6	D3d
10	SEG6	20	D3b	T1	T3	D3g
11	SEG7	21	D3a	T60	T2	D3f
12	SEG8	22	COL	T57	T59	D2d
13	SEG9	23	DOT_U	T56	T58	D2c
14	SEG10	24	D2a	T53	T55	D2b
15	SEG11	25	D2f	T52	T54	D2g
16	SEG12	26	D2e	T49	T51	D1c
17	SEG13	27	D1a	T48	T50	D1b
18	SEG14	28	Bell	T45	T47	PM
19	SEG15	29		T44	T46	
20	COM2	11	--	COM2	--	--
21	SEG16	30	D5a	T43	T41	D6a
22	SEG17	31	D5f	T42	T40	D5b
23	SEG18	32	D5e	T39	T37	D5g
24	SEG19	33	D5d	T38	T36	D5c
25	SEG20	34	TMR	T35	T33	D6f
26	SEG21	35	D6d	T34	T32	D6e
27	SEG22	36	D6c	T31	T29	D6g
28	SEG23	37	CHR	T30	T28	D6b
29	SEG24	38	DOT_L	T27	T25	DOT_M
30	SEG25	39	D7d	T26	T24	D7c
31	COM3	12	--	--	COM3	--
32	SEG26	40	ALM_L	T23	T21	D8d
33	SEG27	41	D8c	T22	T20	D8e
34	SEG28	42	D8b	T19	T17	D8g
35	SEG29	43	D8a	T18	T16	D8f
36	SEG30	44	D7b	T15	T13	D7g
37	SEG35	49	D7f	T14	D7a	D7e



愛高實業(香港)有限公司

HICO INDUSTRIAL (HK) LIMITED

22/F., DELTA HOUSE, 3 ON YIU STREET, SIU LEK YUEN, SHATIN, N.T., HONG KONG.

TEL: (852) 2648 6862 FAX: (852) 2637 3691 URL: <http://www.hico.com.hk> EMAIL: enquiry@hico.com.hk

香港新界沙田小瀝源安耀街三號匯達大廈二十二樓

Preliminary

Mini Trainer (HCS-T014-1)





愛高實業(香港)有限公司

HICO INDUSTRIAL (HK) LIMITED

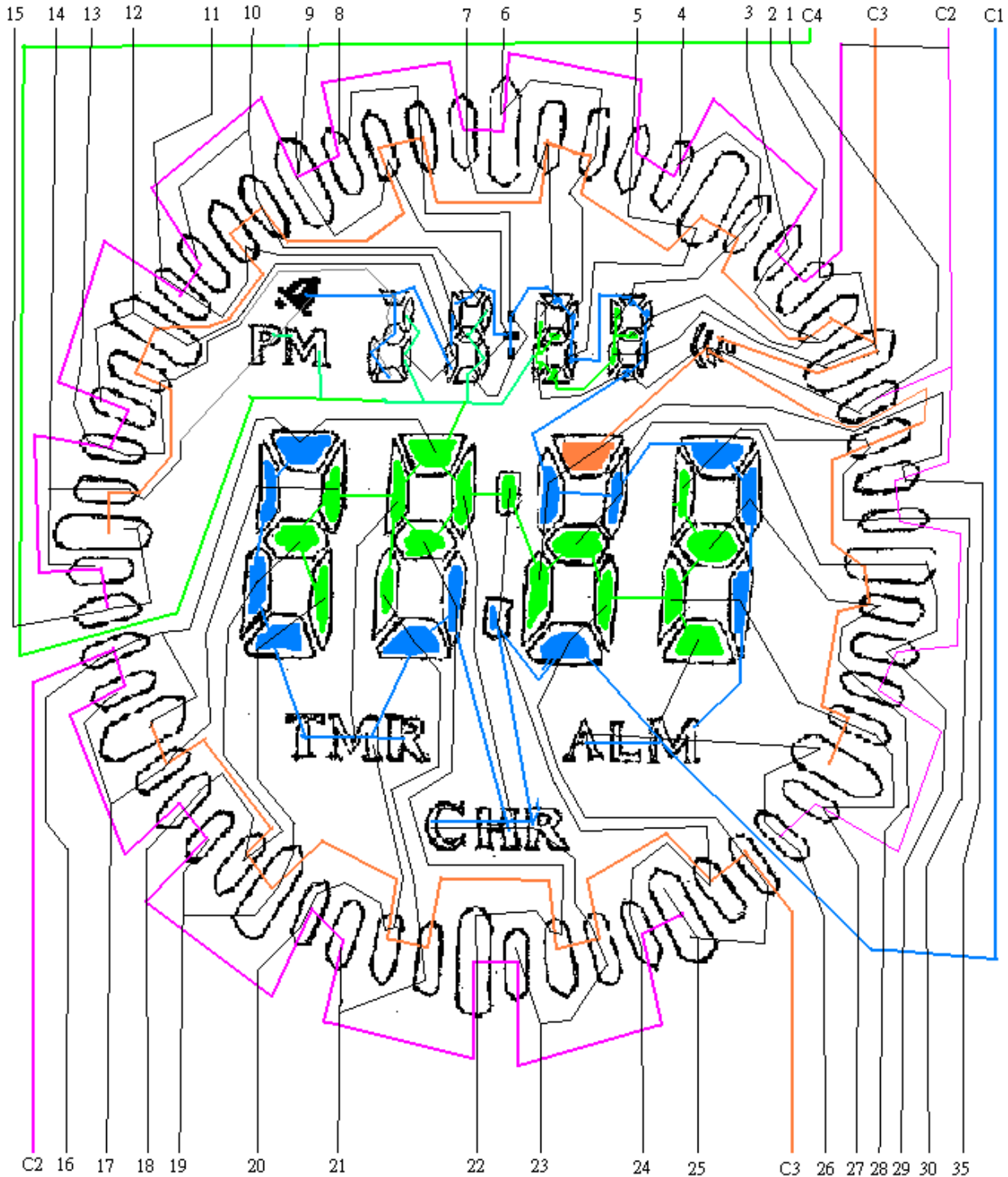
22/F., DELTA HOUSE, 3 ON YIU STREET, SIU LEK YUEN, SHATIN, N.T., HONG KONG.

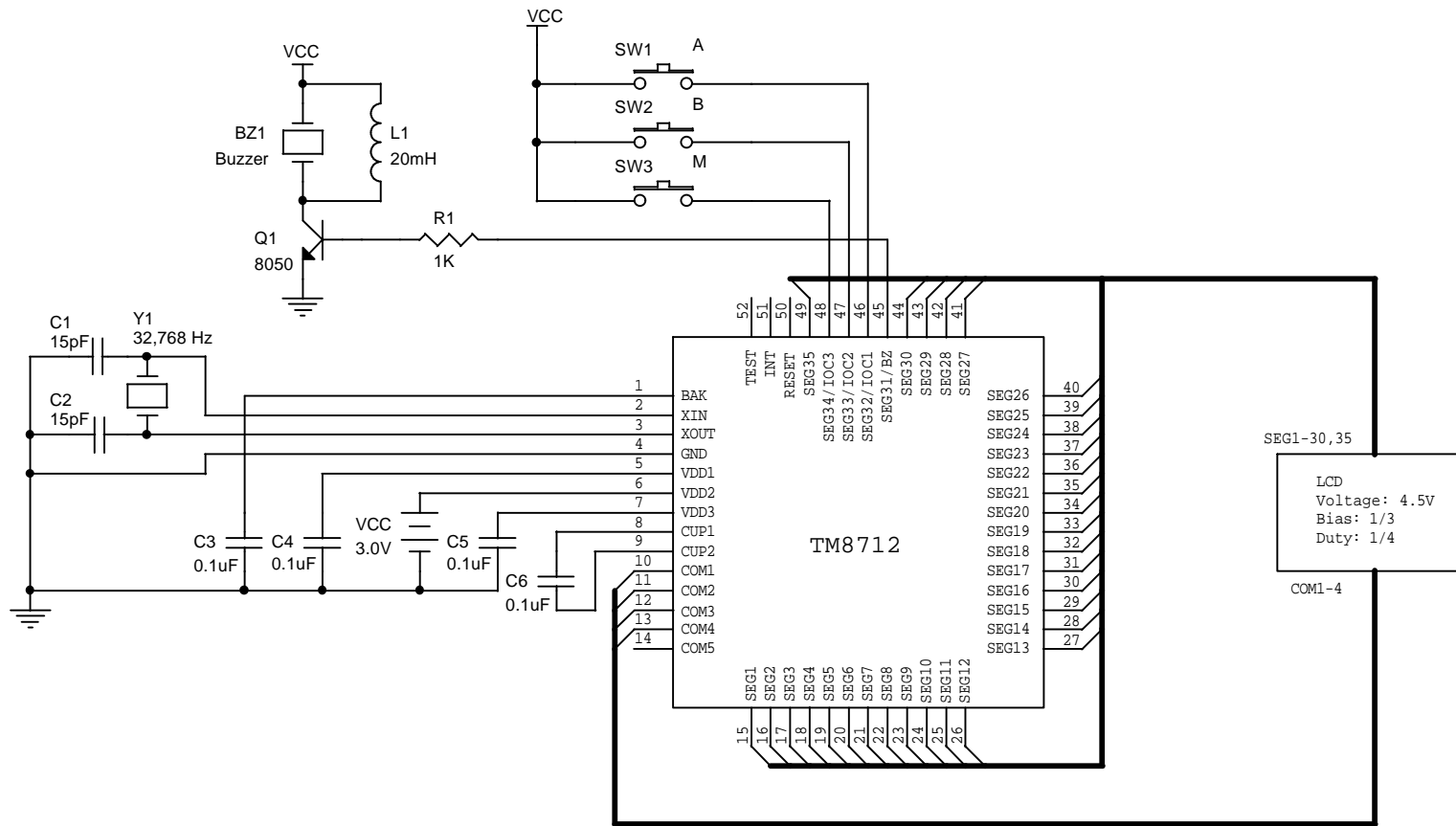
TEL: (852) 2648 6862 FAX: (852) 2637 3691 URL: <http://www.hico.com.hk> EMAIL: enquiry@hico.com.hk

香港新界沙田小瀝源安耀街三號匯達大廈二十二樓

Preliminary

Mini Trainer (HCS-T014-1)





*IC substrate should be connected to GND

Title		
Mini Trainer		
Size	Document Number	Rev
A	HCS-T014-1	1
Date:	Thursday, October 14, 2004	Sheet 1 of 1