

**Standard
Digital Watch Module
Universal Reception
with**

CME8000

RC Receiver IC

C-MAX

**SPECIFICATION
FOR
DIGITAL WATCH MODULE-
UNIVERSAL RECEPTION**

Project: CM-04-digital-standard
Project Description: Digital Watch Module with CME8000
Customer: C-MAX

Controller-type: S1C63654 Seiko Epson
Controller-code: TBD

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1. General Description

Feature	Details
Time Display	Top row: PMCE, alarm, radio tower, DST icons Second row: DOW, Date, Month, seconds Third row: PM indicator, Hours, Minutes
Local Time	Hours, minutes, seconds
UTC Time display	Hours, minutes
Date	DOW, month, date, year in settings mode
Alarm	Single alarm; Max alarm duration = 30 seconds No snooze
Time Zone display	USA time zone display as P,M,C,E icons; Time zone setting mode show deviation in hours; User settable time zone.
DST manual on / off	On: turn on DST even when auto detect no DST, but auto detection still in place Off : manually turn off DST hereon, auto detection also inactive
Date Alert	Silent alarm with icon flash to indicate alarm on a particular calendar date
Stop watch	Split time, Lap time, Elapsed time
Signal reception	Auto reception once daily, and manual activation possible
Low bat indication	Flashing icon indicates low battery condition
Back light	Independent EL button to activate EL back light for 3 seconds
Key Sound (Bond option)	Key sound can be turned on / off Key sound frequency = 2048 Hz, 1/8 sec
Chime (Bond option)	Hourly chime can be turned on / off Chime frequency = 4096 Hz, 1/4 sec
Multi-reception modes	<ol style="list-style-type: none"> 1. Receive only WWVB (USA) 2. Receive DCF / MSF (Germany & England) 3. Receive JJY60 / JJY40 (Japan)
Signal Strength Indication	During reception, if the LCD has icons for signal strength, the watch can display signal strength indication in a range from 0 to 3.
Automatic Accuracy Control	After reception of 2 consecutive radio control signal between 20 – 48 hours apart, timepiece will automatically compensate for crystal drift and display highly accurate time even when the timepiece is hereafter not receiving any signal at all.
Reset Mode	Performs a hardware reset and re-activate the timepiece with a beep and full house display until button is pressed.

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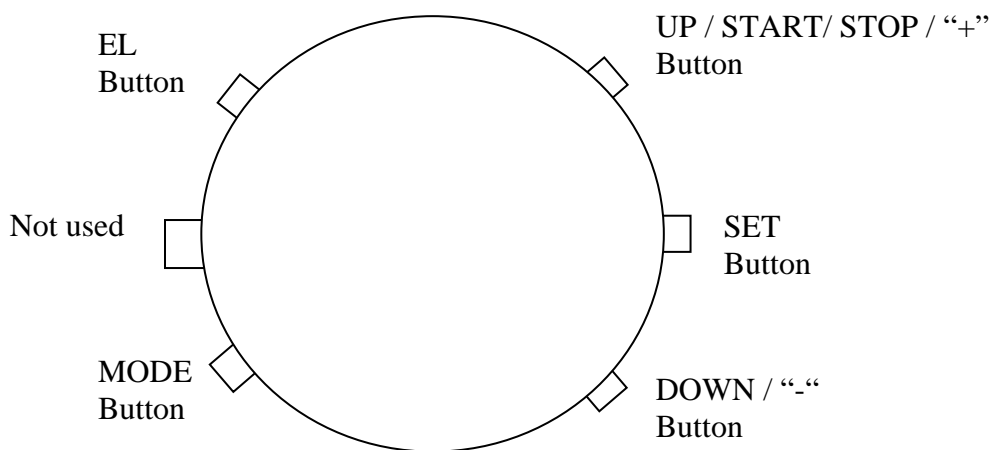
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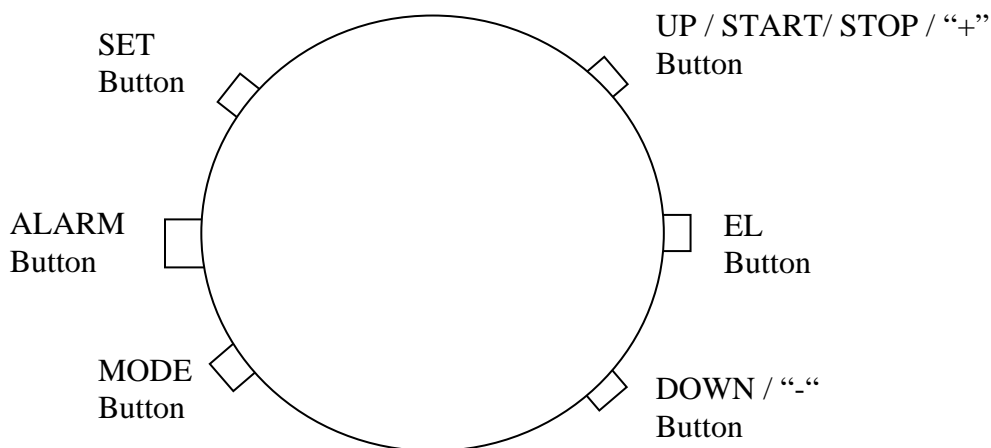
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2.1 Button Definition

Bond Option A.0



Bond Option A.1



2.2 Bonding Options

- A) 0 : 5 buttons (from top right : UP, SET, DOWN, MODE, NOT USED, EL)
1 : 6 buttons (from top right: UP, EL, DOWN, MODE, ALARM, SET) + Date Alert + Alarm sound = Modulation 1 (Bond option C not effective)
- B) 0 : No Key Sound & No Chime
1 : Key sound and Chime can be turned on and off
- C) 0 : Alarm sound = Modulation 2
1 : Alarm sound = Modulation 3

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3. Radio Control Reception

3.1 To start a new receiving trial (Manual reception)

Push button <DOWN> >2s to start reception in time mode. Reception can be cancelled by pushing <DOWN> >2s again.

3.2 Automatic receiving mode

The signal will be checked daily at local time 3:05 am (Summer time) or 2:05 am (winter time) automatically. If the reception was not successful, the signal will be checked again one hour later.

Reception will be cancelled by pushing <DOWN> >2s in the main mode during reception.

If during the receiving mode the alarm starts, the receiving mode will be interrupted if it is in multi-country scanning reception mode. After ending of the alarm, reception will be restarted at the start of the following minute.

3.3 Reception Signal

The signal to be received in any reception mode is dependant on the time zone set. (Refer to section 4.4)

If time zone set is at a location with no radio control signal , then the daily automatic reception trial will be turned off, until the time zone is changed to a location with radio control transmission.

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4.2 Mode 2 : Alarm mode

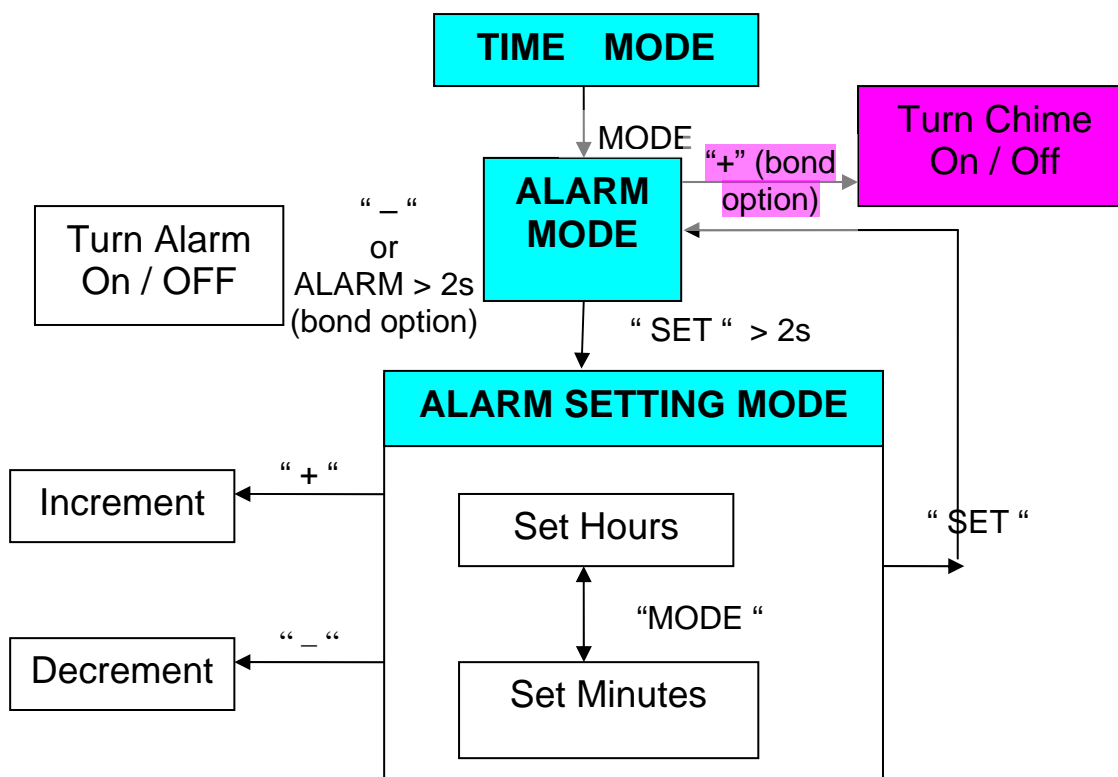
From the main display, press button "MODE" once, Alarm time is then shown on the main display. To adjust the alarm time, press and hold button "SET" for >3 seconds. Alarm time will then flash. To set the alarm time, press buttons "+" or "-" to set the alarm to the desired time. Holding the buttons "+" or "-" for > 8 seconds fast adjust the digits. After setting the alarm to the desired time press button "SET" once, and watch will return to main display. Note that setting the alarm automatically turns the alarm on.

To turn alarm on/off

In the alarm mode, press button "-" < 2s to turn the alarm on or off.

To stop alarm beeping

Press any button while the alarm is beeping

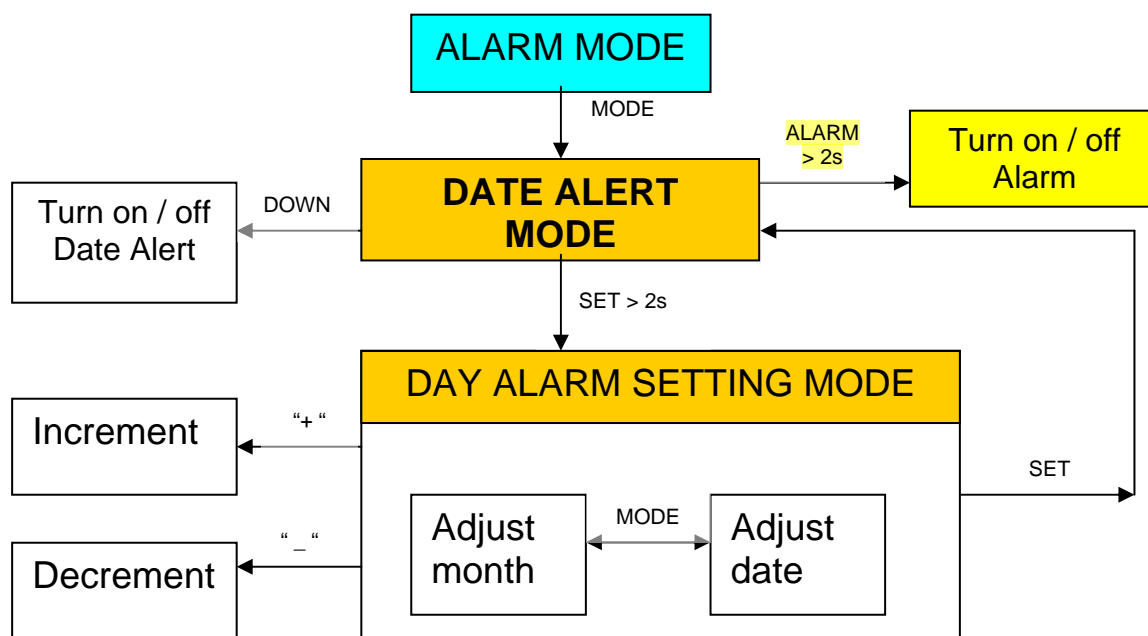


When daily Alarm is activated, Bell icon will flash with 2 Hz and beep sound will be emitted with following sound pattern. Three sound patterns are available:

	Modulation within 1 second (8 parts)							
Modulation	1	2	3	4	5	6	7	8
Modulation 1	4096	4096	4096	3276	Pause	Pause	Pause	Pause
Modulation 2	4096	Pause	3276	4096	Paused	3276	Pause	Pause
Modulation 3	4096	4096	3276	Pause	4096	Pause	Pause	Pause

4.3 Mode 3 (setting the Date Alert) – (BOND OPTION)

The Date Alert is a silent alarm that flashes on the watch display on the set day. Once the set alarm date is reached at 12 o'clock midnight, the day alarm icon continues to flash the entire day until



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4.4 Mode 4 (setting the Time Zone & signal)

When you receive your watch it will be set default to USA Eastern Time Zone. All time deviation is shown in the auxiliary display according to UTC time. For instance, Eastern time zone is shown as “-5h”. The four US time zones are indicated on the LCD abbreviated as “P” for Pacific, “M” for Mountain; “C” for Central, and “E” for Eastern.

Changing the time zone = changing the signal

The user is able to select the time zone that he/she is in. At the same time, the watch itself will depend on the selected time zone to select the signal available.

If there is more than one signal available, the watch try first for the previously successful reception signal in that area (if any), or else, it will go in to a auto search mode to look for the better signal to receive. It will first look for the local signal for 3 minutes and if no signal is recognized, then skip to the next available signal for another 3 minutes, if both signals are too weak, then will wait for the next reception. Selection of signal based on time zone is listed in the following table.

Time zone	Abbreviation in Time Zone Mode	Signal	Icon
-11h	US	WWVB	
-10 h	US	WWVB	
-9 h	US	WWVB	
-8 h	US	WWVB	P
-7 h	US	WWVB	M
-6 h	US	WWVB	C
-5 h	US	WWVB	E
0 h	EN	MSF/DCF	
+1 h	EU	DCF/MSF	
+2 h	EU	DCF	
+3 h	EU	DCF	
+8 h	CH	JJY60/JJY40	
+9 h	JP	JJY60/JJY40	
+4h~+7h, +10h~+12h, -1h~-4h	--	Radio control off	

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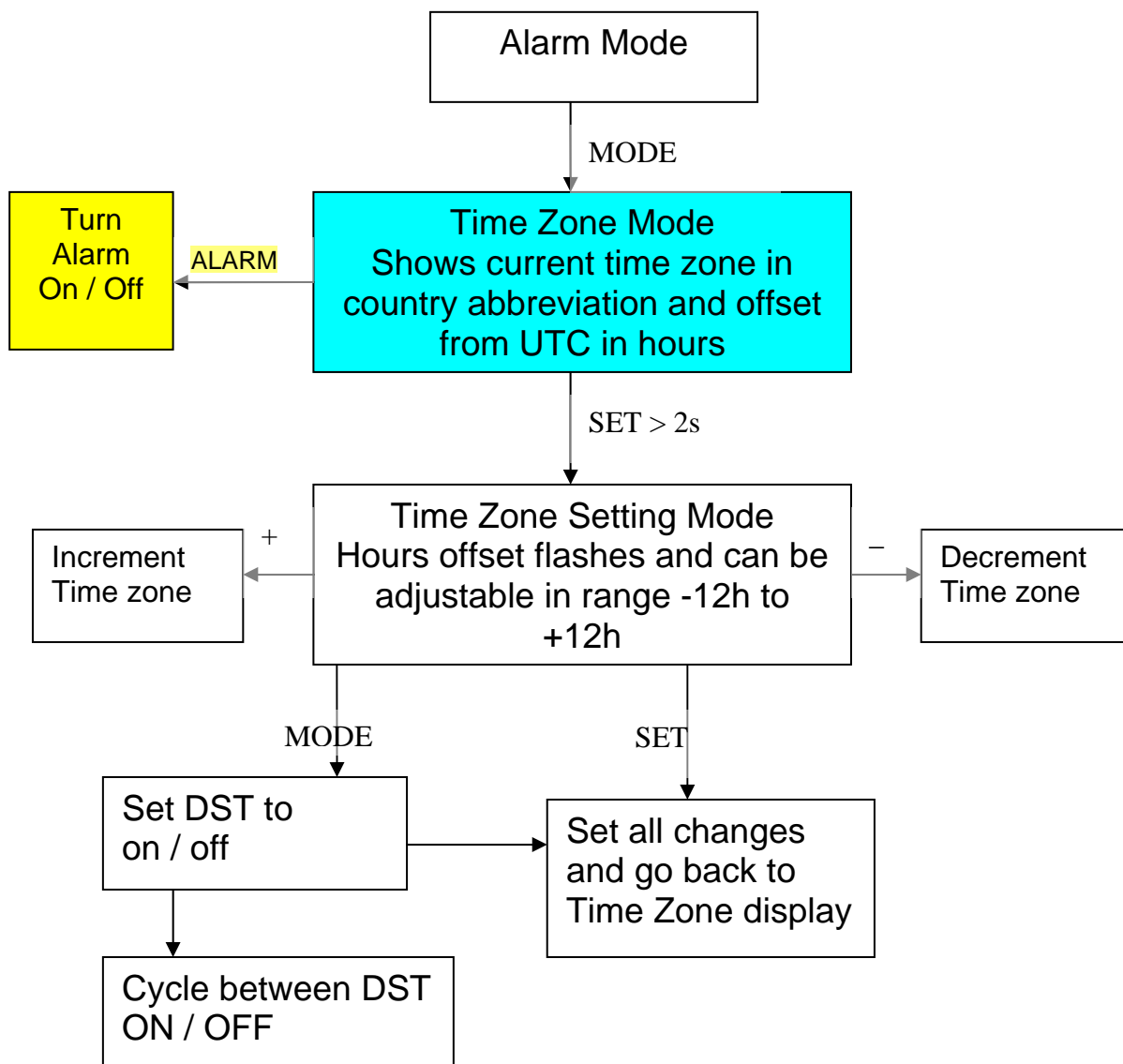


DST Setting

DST setting can be changed between two options :

ON : DST can be turned on manually from off state but if radio control signal indicates there is no DST, will revert back to DST off – required by e.g. user traveling from Germany in winter to Australia which is summer.

OFF: Always no DST, overriding any available radio control indication - which is required by e.g. State of Indiana in the USA



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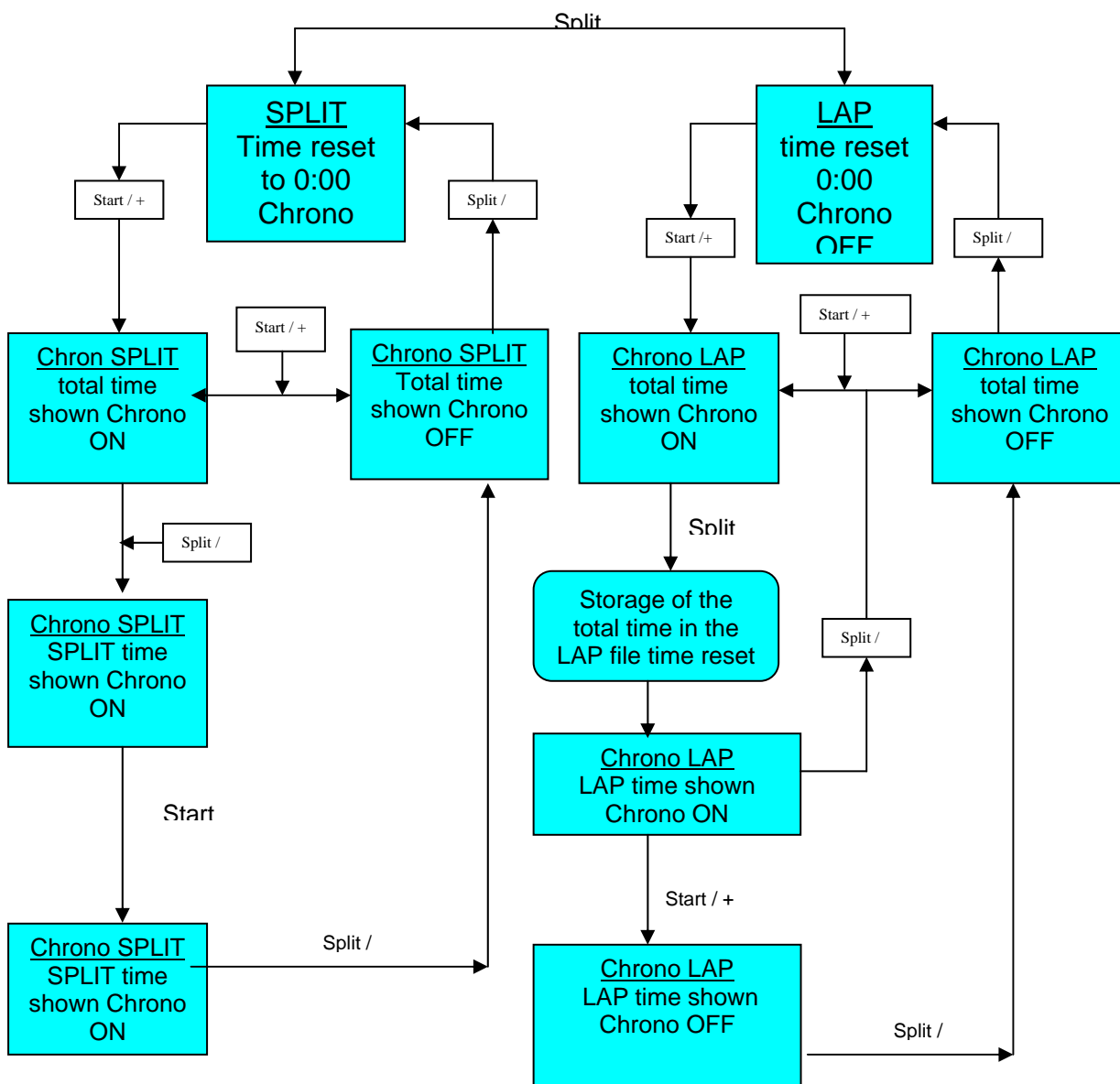
4.5 Mode 5 (using the stopwatch feature)

The stopwatch operates in three modes: Elapsed Time, Split Time, or Lap Time. Seconds are displayed in the main display, and the 1/100 seconds in the auxiliary display.

Using the stopwatch

From the main display press “MODE” four times. Display then shows the stopwatch display which indicates “0:00:00”.

To select Split Time or Lap Time press button “Split” while in stopwatch mode. Elapsed Time is available in both modes.



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Elapsed Time

Press button "S3" to start the stopwatch. Press button "S3" to stop the stopwatch. Press button "S5" to clear the screen to all zeros.

*NOTE: stopwatch will continue to run even if the mode is switched. Stopwatch should be stopped and cleared before switching back to other modes.

Split Time

Press button "S3" to start the stopwatch. Press button "S5" when the first finisher comes in or the first time is up. Read time. Press button "S3" when 2nd finisher comes in or the second and final time is up. Press button "S5" to view time of second finisher, or second time. Press button "S5" again to clear the screen to all zeros.

Lap Time

Press button "S3" to start the stopwatch. Press button "S5" to stop first lap and read out results. The stopwatch continues to keep time internally. Press button "S5" again for 2nd lap read-out. Stopwatch will continue to run internally. (You can repeat the above steps as many times as desired.) Press button "S3" to stop watch. Press button "S5" to clear screen to all zeros.

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C-MAX Asia Ltd

Unit 125, 1/F.,
Liven House,
61-63 King Yip Street,
Kwun Tong, Kowloon, HK SAR
Tel.: +852-2798-5182
Fax: +852-2798-5379
e-mail: inquiry@c-max.com.hk

C-MAX Technology Ltd (Shenzhen)

Room 31C, Block A,
World Finance Centre,
No. 4003 Shennan East Road,
Luohu, Shenzhen, PR China
Tel: +86-755-25181858
Fax: +86-755-25181859