Keep it Simple Timing

Support

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Disclaimer

The KitST clocks are designed to support the timing of sport and recreational events and are not designed to support life support or 'mission critical' systems. Information in this document is subject to change without notice. The manufacturer does not make any representations or warranties (implied or otherwise) regarding the accuracy and completeness of this document and shall in no event be liable for any loss of profit or any other commercial damage, including but not limited to special, incidental, consequential, or other damages. No part of this document may be reproduced or transmitted in any form by any means without the express written permission of the manufacturer. All brand names and product names used in this document are trademarks or registered trademarks of their respective holders.

The clock specification and software is subject to revision from time to time.

The latest version of the software can be obtained from KitST. The upgrade entails exchanging the microprocessor chip.

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Introduction

The KitST Clock is designed to provide an easy to use display clock for timing sports and other activities. The bright LED display shows Hours, Minutes and Seconds in a 24 hour format.

The clock also has a battery backed Real Time Clock which maintains the time when the main display clock is turned off. Once the clock has been configured then in most cases the clocks 'Turn on and Go'.

Adjustments to the clock are made by sending commands via the serial port from a PC terminal programme or the supplied software.

KitST Clock Display @ 13:26:08

KitST Rear showing switches and connectors.

Turn On and Go

Slide the Off-On switch to the right. The clock will (re)start with the saved settings and display the time based on the data obtained from the battery backed Real Time Clock

Start Clock for Orienteering

In Orienteering Start mode the clock gives a warning beep at 50 seconds, count down beeps from 57 seconds and a long BEEP at Zero. Competitors can be reminded to 'Go on the Long Beep'.

For large events a second clock can be used as a Pre Start / Call up Clock. In pre start mode the displayed time is offset by the Pre Start delay – normally 3 minutes. If the start time is 11:15 then the pre start shows 11:18. Starters then move forward through the start boxes each minute and start at the correct time.

The Start Interval is 1 minute by default but can be adjusted to give a 30 second interval or 2 to 6 minute interval.

**Typical Start Layout for Orienteering
or Time Trial event**

Start -1 Box	**Start Clock** "Go on the Long Beep"
-2 Box.	Maps on Display
Call up -3 Box.	**Pre Start Clock** Collect Descriptions

Pre Start Clock for Orienteering

In Pre Start mode the clock display is offset by the Pre Start setting and gives a long BEEP at each Start interval.

Real Time / Finish Clock

The clock can be used as a Real Time Clock for example to show the time at the Finish line. In this mode the Buzzer would be OFF.

For Orienteering the Real Time display can be used as a Finish clock to enable competitors and officials to note the finish time. If required the Push Button on the rear of the clock can be used to send finish times via the serial port for processing on a computer.

As an alternative to the Push Button an optional hand held push button can be used. The hand held push button is attached to the connector on the lower right of the back of the clock. Align the 4 pins of the connector and secure the connector by screwing up the 'lock ring'.

A short press of either button will transmit a lap or finish time.

Timer Clock

The clock can be started in Timer mode by holding down the Push Button (or optional Hand held Push Button) for 3 seconds when turning on the clock. The clock starts with a 00:00:00 display.

Push the button to START the timer.

Push the button to transmit Lap times to a computer via the serial port.

Hold the button down to STOP the timer.

Push the button to RESET to Zero.

(Short and Long Beeps give feedback when using the push button)

Configuring the Clock

The clock can be configured using the supplied KitST Configure software or a standard 'Terminal' application such as HyperTerminal. The software permits settings to be adjusted and then to be sent to the clock via the serial communication port. The time and other settings are retained in battery backed memory and are retrieved when the clock is turned on.

Connect a serial communication cable from the clock to the serial port on the computer and start the KitST Configuration application.
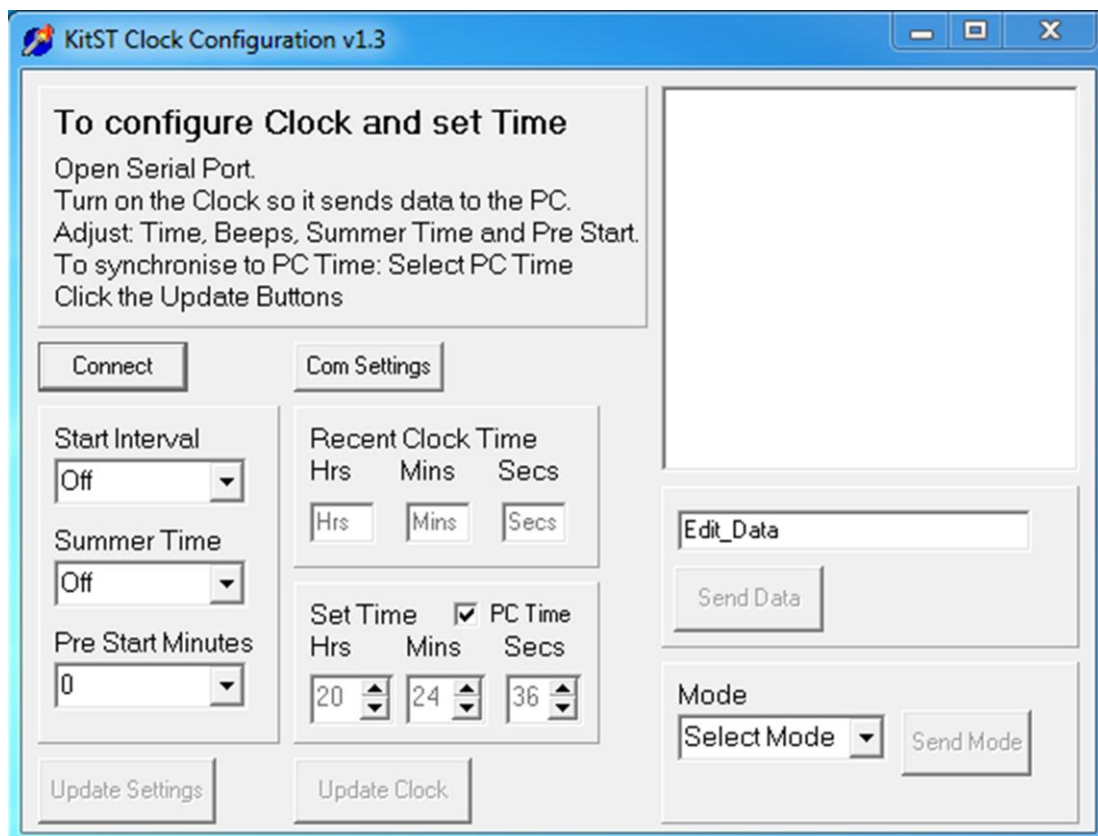
Initial Screen - note buttons are not active as no connection has been made.

Press Com Settings to select a COM port and set the communication protocol to:

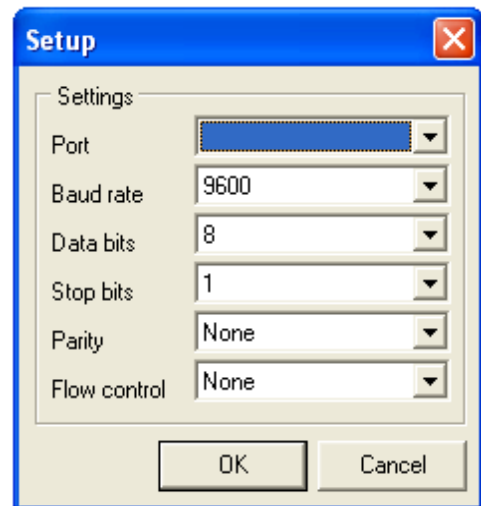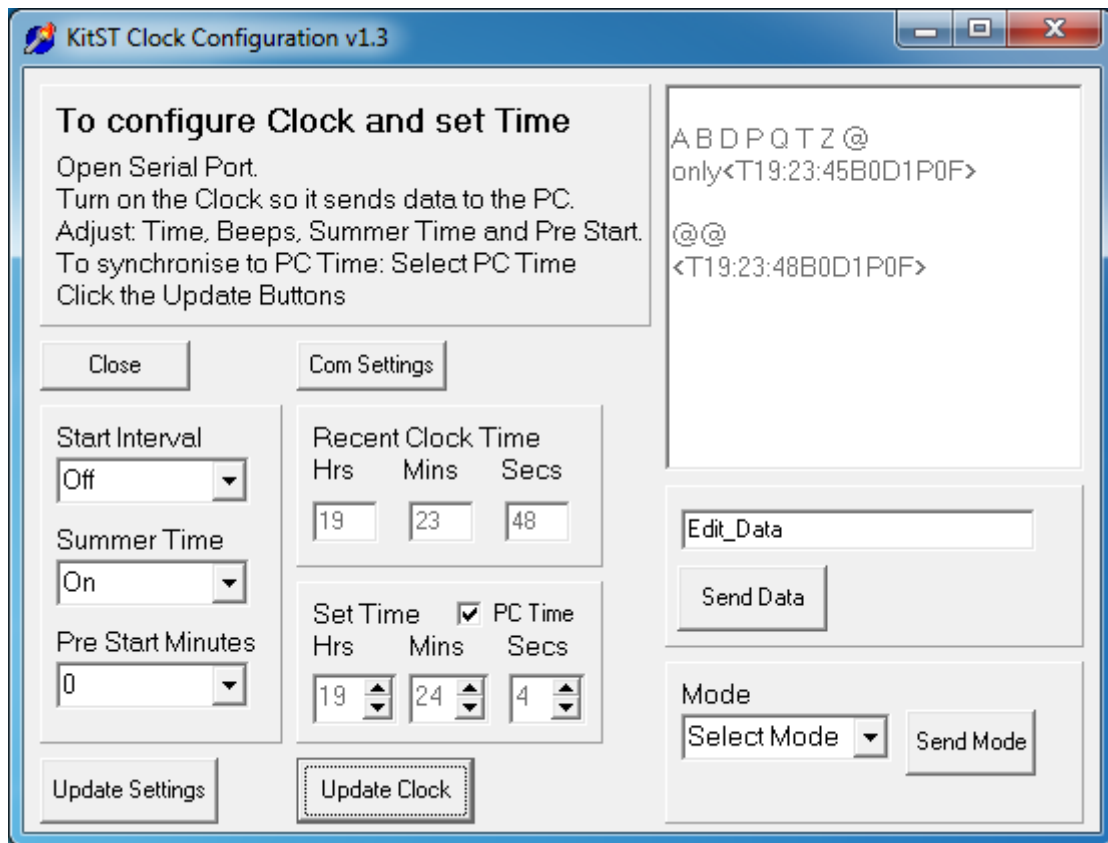|	
Port	Free Com port or USB adaptor port e.g. COM2
Baud Rate	**9600**
Data bits	**8**
Stop Bits	**1**
Parity	**None**
Flow Control	**None**

Press **OK** when done.

Press **Connect** to connect the software to the clock

The top right box shows the data received from the clock.

Normally only the two setting on the left need to be used.

Select Start Interval Off, 1, 2 etc., Select Summer Time On or Off and the Pre Start Minutes offset as required and Press **Update Settings**.

To set the clock time either select **PC Time** or manually set the required time then Press **Update Clock**.

To set the clock mode as a Start, Pre Start or Finish clock select the Mode and Press **Send Mode**.

• In Start mode the clock sounds the countdown beeps.

• In Pre Start mode the clock only sounds a beep each minute.

• In Finish Mode there are no beeps.

To manually synchronise the clock to another time source: De select the PC Time option and adjust the Hours, Minutes and Seconds using the scroll arrows and press **Update Time** when the reference clock changes.

To just synchronise set the seconds to Zero to synchronise the clock enter **Z** into the Send Data box and press **Send Data** when the reference clock changes. Note that clock minute will advance if the seconds had already reached 30 seconds.

A full list of all the message formats is given in a later section.

Quick Synchronisation *
* Available from March 2012

To synchronise two clocks: Decide which clock is the Master Clock. Turn off the two clocks. Connect the 'null modem' serial cable to the two clocks. Turn on the Master Clock. Wait for the master clock to show the time. Turn on the Slave clock. The Slave clock will synchronise to the Master clock. The cable can then be disconnected and the clocks set out as required.

SLOW the clock. *
* Available from August 2012

The time display can be delayed using a temporary Time Zone.

To delay the clock use the push button:

> Long Press to enter adjust mode – minute dot flashes.
> Short Press to delay by a minute. Repeat as required.
> Long Press to move to hour – hour dot flashes.
> Short press to delay by an hour. Repeat as required
> Long Press to complete.

Further adjustments can be made as required.

To reset Time Zone - turn off then turn on again.

Charging the battery

The main battery is a re-chargeable NiMH battery. Note that NiMH batteries do slowly lose their charge when stored for long periods so the clock should be re charged shortly before use. NiMH batteries can be 'topped up' and do not suffer the memory effect of NiCad batteries.

The charger comprises a transformer which is plugged into the mains and a small charging unit. The output from the charging unit should be connected to the charge socket on the clock and the power switch pushed to the right or OFF position.

Typically the light on the charger shows RED whilst charging and GREEN when charging is complete.

A 2600maH battery should give 6 hours use; a 3300maH battery should give about 7.5 hours of use. When the battery runs down the main display will dim leaving only the dots illuminated. The battery backed real time clock will retain the time when the main display is turned off. The back-up battery has an estimated life of 3 years before replacement is required. If the Real Time Clock time 'drifts' significantly then it is time to replace the back-up battery. Contact KitST for instructions.

Installing Software

Configuration Software
The installer KitST-setup.msi on the CD will install the application KitST_Configure.exe into C:\Program Files\KitST and place a short cut on the desktop.

# Installing the Serial/USB adaptor

On computers without the old style 9 pin serial port a USB to serial converter may be used.

The optional USB Serial adaptor will be supplied with driver software which creates a virtual serial or communication port. The following information is typical as adaptors vary in the software that is used.

Software installation for the Serial/USB adaptor will depend on the version of Windows used and the security settings. Software driver for adaptor is normally supplied on the CD (look for the USB folder) but may also be downloaded from the relevant manufacturer's web site.

To use the configuration software you need to verify which COM port has been allocated to the adaptor. To verify that the adaptor has been installed correctly and to locate the COM port assignment:

• Click **Start - Control Panel - System**.

• Inside **System Properties**, click on **Hardware** - **Device Manager**.

• Double-click on Ports (COM & LPT1). You should see the USB Serial adaptor device listed. Note the COM port e.g. COM3 for use with the KitST configuration software.

• You can allocate an alternative COM port by double-clicking on the device name to show **Properties**, select **Port Settings** then **Advanced**. In Advanced settings select **COM Port Number** and choose an unallocated number. If possible choose COM1, COM2, COM3 or COM4.
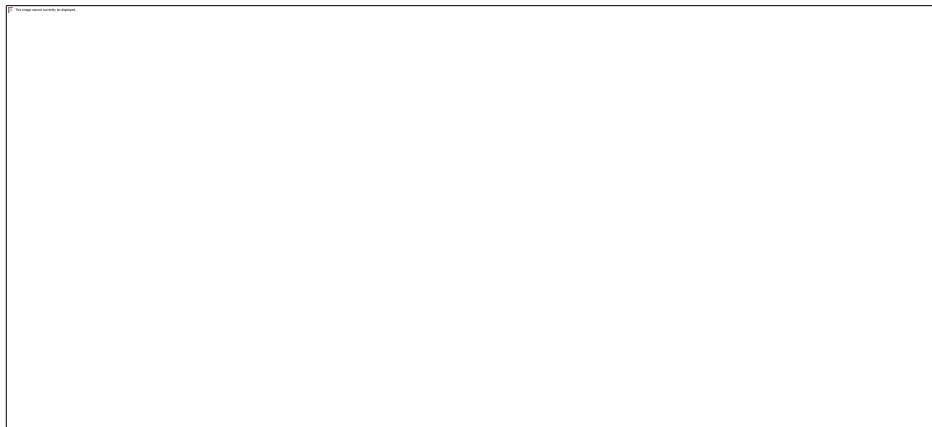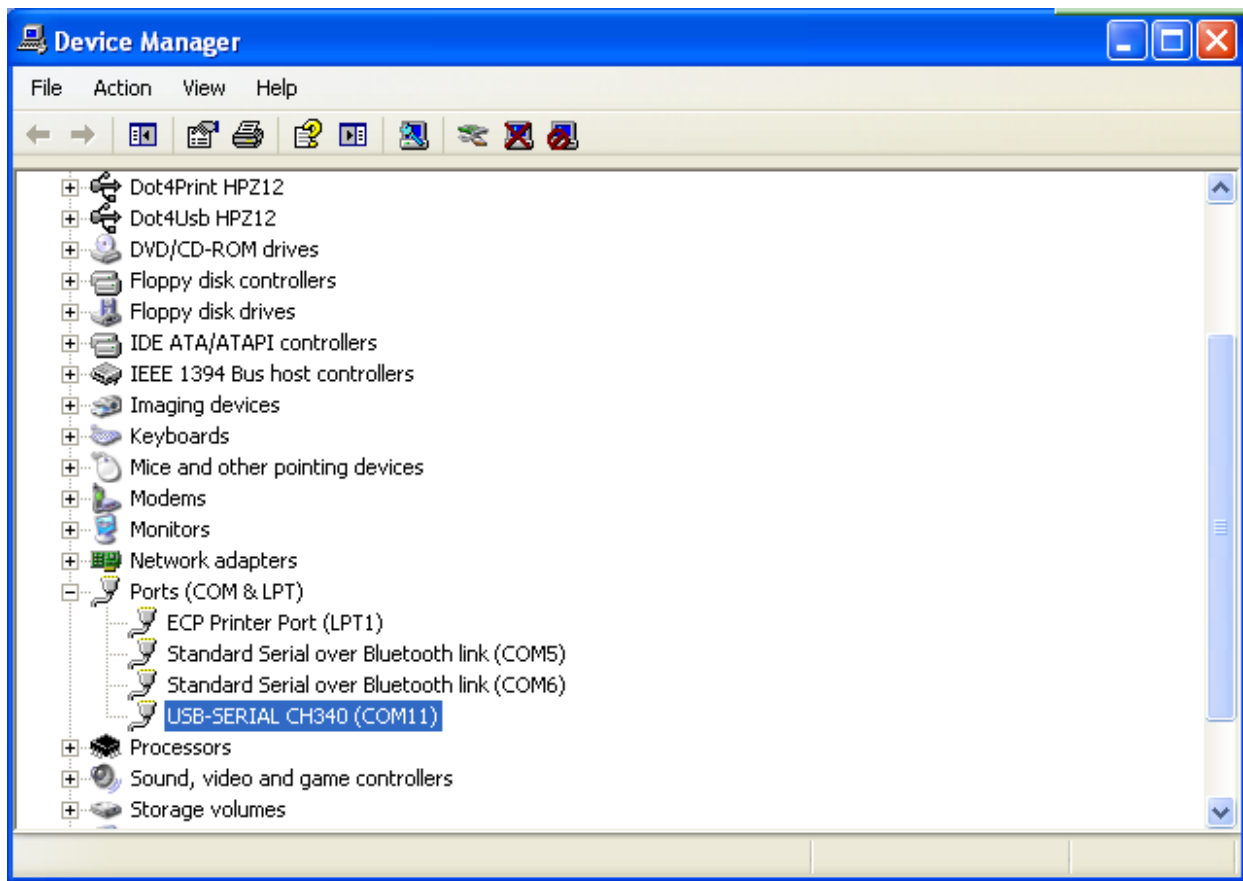
Serial Communication Messages

Any suitable terminal programme can be used to transmit data to the clock over a serial port as an alternative to the configuration software supplied. The clock transmits a Menu and will accept and respond to the following commands. The protocol is 9600 baud, 8 bit No parity.

Beep B0   Buzzer OFF
      B1   Buzzer every 1 Minute
      B2   Buzzer every 2 Minutes   ….
      B6   Buzzer every 6 Minutes
      B9   Buzzer every 30 Seconds

Daylight Saving Time (Summer Time)
      D0   DST OFF
      D1   DST ON

Pre Start Delay (This setting is only used when a clock is in Pre Start Mode)
      P0   No Pre Start Offset
      P1   1 Minute Offset   …
      P9   9 Minute Offset

Quit   Quits the Menu and enables transmission of the time each second. Normally only used for test purposes. Send again to quit the transmission of times and returns to the Menu.
      Q

Zero   Zero seconds to synchronise the clock. If seconds are 30 or more then the clock moves forward to the next minute.
      Z

Time   Time can be set by sending T followed by the Hours, Minutes and Seconds. The figures should be in 24 hour format with leading zeroes. e.g. T130745
      Thhmmss

Mode   The Clock Mode can be set by sending @ followed by F, P or S
      @F   Finish Mode: No Beeps. Use this mode for a Real Time Clock.
      @P   Pre Start Mode: Warning beep each start, adjusted by the Pre Start delay.
      @S   Start Mode: Count down beeps and **BEEP** each start.

The time and other settings are retained in battery backed memory and are retrieved when the clock is turned on.

Finisher or Lap Times

The data transmitted when the push button is pressed consists of a sequence number and the time of the button press. The two datum are separated by a TAB character. (0x09) and the record is terminated with a CR LF pair (0x13 0x10)

                nnnnn   **0x09** **hhmmss**   **0x13 0x10**

When the Timer is stopped with a long button press the stop time is transmitted.

                STOP   **0x09** **hhmmss**   **0x13 0x10**

The received data may be used by suitable software to create race results.