

G.P.S.CLOCK

The Advanced Time Source
For Arcom Controllers RC210 Repeater Controller™

Supports **all** processor generations

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Interface's and connections



To the right hand side of the main display are located 3 push buttons. From top to bottom these are [UP], [DOWN] and [ENTER].

These buttons are used for entering and setting the system configuration and moving to and returning from the “transparent” pass-through mode.

Located above and centre to the display is the bi-colour indicator.

In normal use the LED will flash blue once a second.

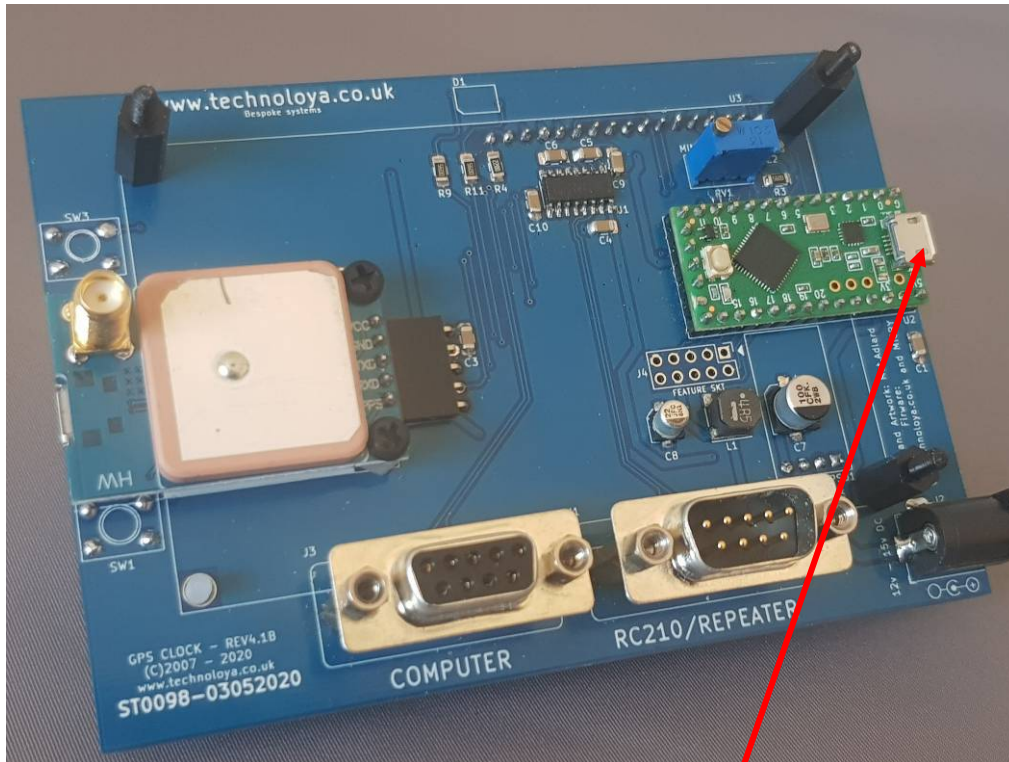
A solid blue then purple LED is displayed just before and during the saving of user clock settings.

A solid red LED indicates that the G.P.S.CLOCK is transmitting time information to the RC210 controller.

When the clock is in transparent mode, a flickering red LED indicates data flow



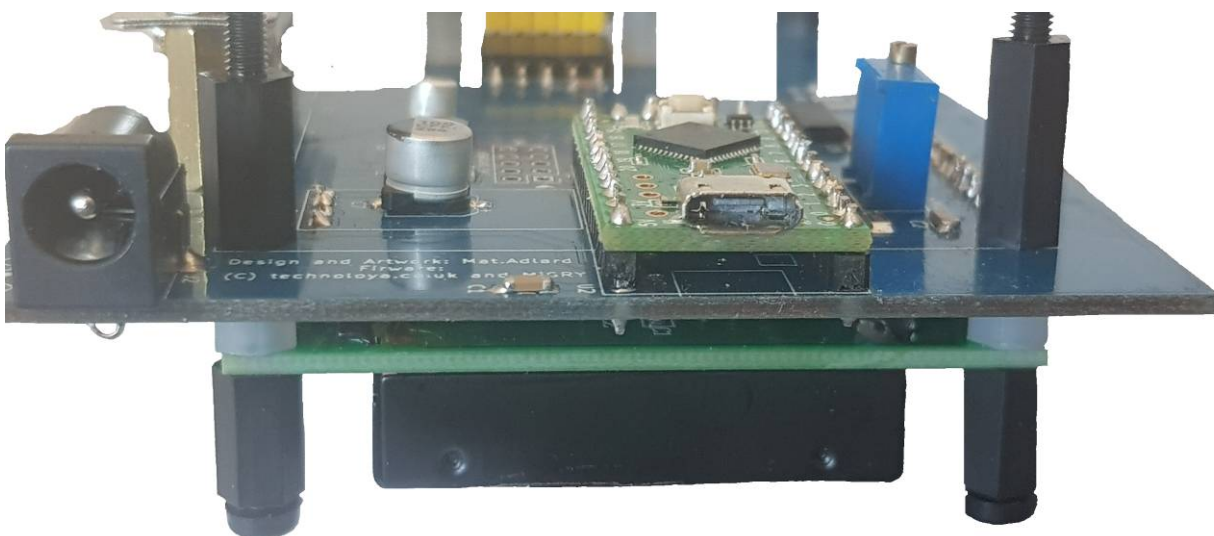
On the rear of the G.P.S.CLOCK is located the SMA connection to allow an external G.P.S. Antenna to be fitted (recommended). Also are two 9-Pin D-Type connectors. The left (female) connector is for connection to the computer and RCP. The right connector is for connection to the RC210 repeater controller. Also on the rear is a small pin hole. This is for access to the programming activation button used for future firmware updates.



On the right hand side as viewed from the rear (indicated above) is located a USB socket and a 2.1mm DC Jack plug.

The G.P.S.CLOCK can be powered from either a 12Vdc supply or via a 5V USB supply. The USB socket is also the interface for uploading any future firmware revisions.

The full specifications of these supplies are listed in the specification guide.



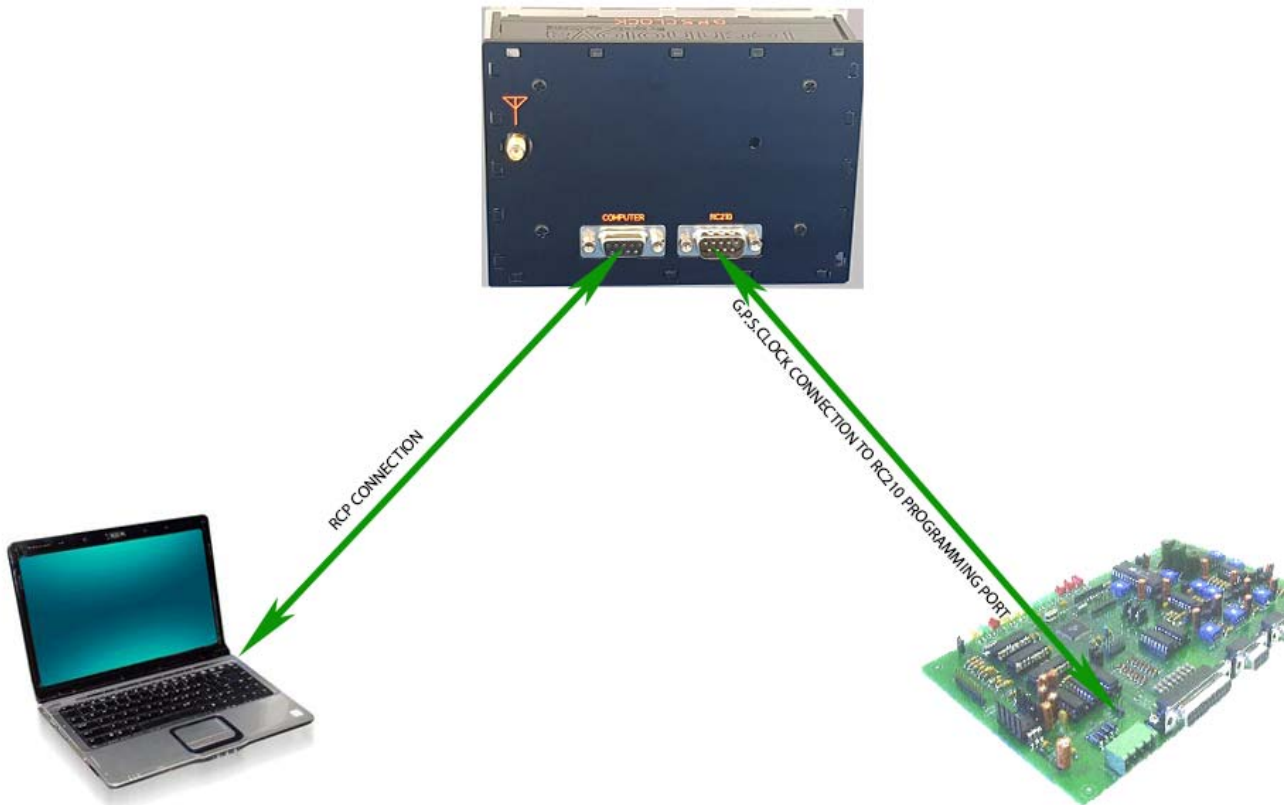
System parameters and defaults

Technical Parameter	Value
USB power supply voltage.	5V DC @ 100ma max
DC Jack power supply voltage.	7.5 – 25V DC @ 50ma max
Approximate *Power consumption.	USB@5V DC 0.5W 13.8V DC 0.70W
G.P.S System.	
Time to first fix.	cold= 30s, warm= 28s, hot= 2s
Antenna type supported.	Built in Patch antenna (no data) Supports both active and passive (not supplied)
Display data.	
Time display.	UTC and +/- 12hrs offset EU and US Daylight Saving (DLS) All programmable.
Date display.	Date display EU and US format Auto support for leap years.
1 P.P.S indicator.	2. One under the G.P.S. Module and a BLUE LED indicator above display.
RC210 Interaction.	
RC210/RCP Communication speed.	9600 baud and 57600 baud
Transparent Mode.	Pass-through introduces 1ms delay So allowing RCP delay to be set to 0. Data flow is indicated by flashing RED LED.
Communication cables.	Straight through Pin to Pin
G.P.S.CLOCK boot time.	44 seconds to allow RC210 to boot and go "Ready".
Scheduler start.	On completion of G.P.S.CLOCK boot time the RC210 scheduler is automatically started.
G.P.S. Time updates.	<ul style="list-style-type: none"> • 29 Minutes past and 59 Minutes past each hour. • Immediately the G.P.S.CLOCK acquires 3d navigation lock. • After recovery from signal loss. • On return from transparent mode.
RC210 Data write.	Indicated by solid RED LED, and message on screen.

System parameters and defaults

Configuration Parameters	Factory Defaults.
U.T.C. Offset value.	0 hrs
Daylight Saving (DLS).	Off
Region location for DLS time change.	EU
Baud Rate.	9600

Connecting the G.P.S.CLOCK



Configuration guide

To access the configuration menu press **ENTER** while the hardware version information is being displayed, at clock boot up.



Using the **UP** and **DOWN** buttons to move around the menu screen. The current item is highlighted with the > Cursor. Once you arrive at the required item you wish to adjust simply press **ENTER**.

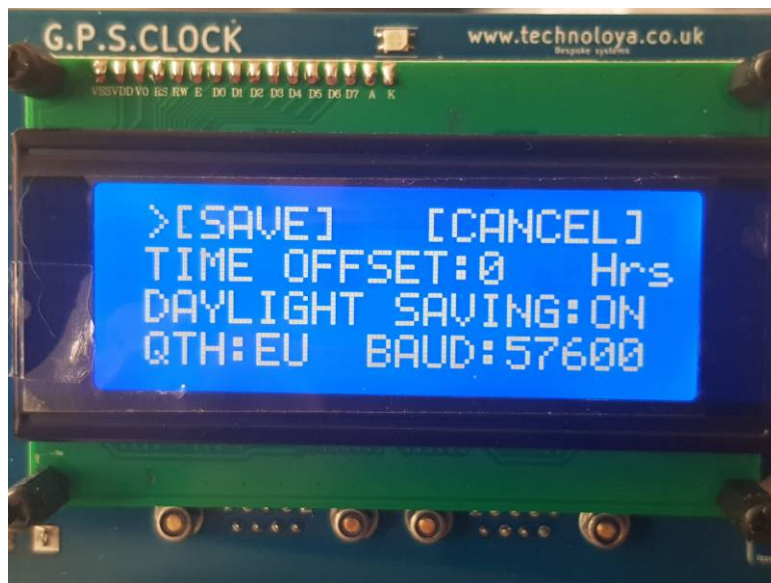


The Cursor changes to a →. At this point the **UP** and **DOWN** buttons change the value show. Press **ENTER** to set the value.

- Time offset can be set between: -12hr and +12hrs of UTC (0=UTC).
- Daylight Saving: Turn ON/OFF DLS start end dates tracking based on regional setting (QTH). Typically in Europe this DLS starts last Sunday of March and ends last Sunday of October.
- QTH: Sets Region for use in DLS calculations.
- Baud(rate): RS232 communication speeds. 9600 typically for older RC210 processors (Pre version 7.0 F/W). 57600 Newer 7.0 upwards. Please refer to Arcom Controllers documentation for more information on firmware releases.



Once the value is set, you are returned to the cursor movement screen. You will also note that at the top of the screen has appeared a **[SAVE]** & **[CANCEL]** option.

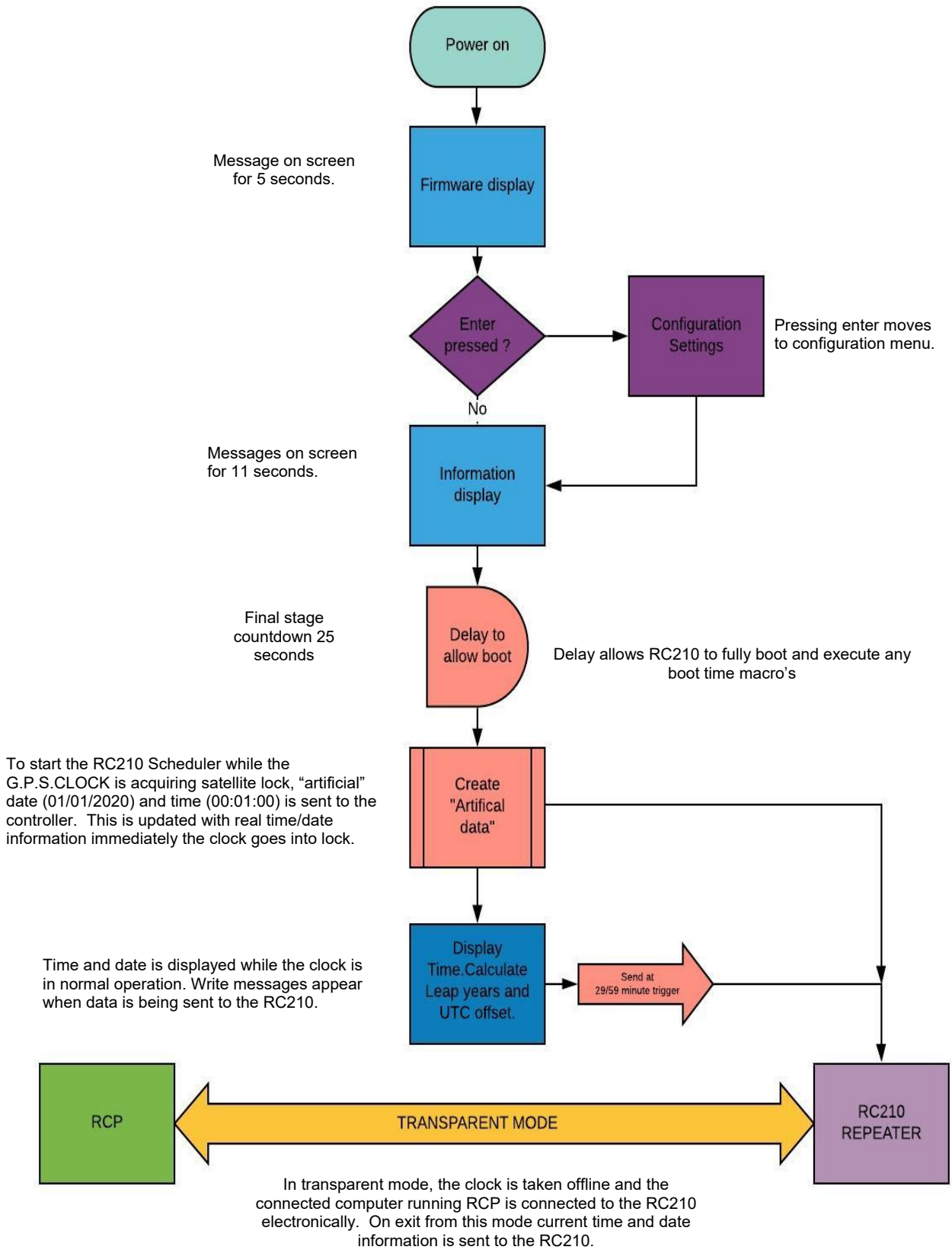


Selecting **[CANCEL]** will exit the settings menu without saving your changes. However, selecting **[SAVE]** will store your changes which will be available immediately and post reboot.

SAVE is confirmed by the blue LED changing to purple.

Once the configuration menu is exited, the G.P.S.CLOCK will continue to boot.

System flow chart



System boot and normal operation

On initial power-on the current hardware and firmware release is displayed. During the 5 seconds this screen is being displayed pressing [ENTER] moves to the configuration screen.



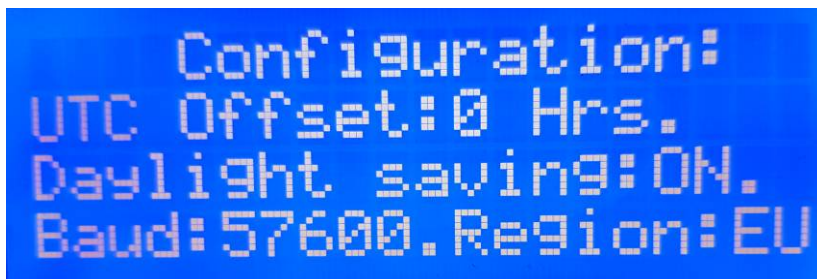
```
G.P.S. CLOCK  
H/W:4.1A F/W:9.5  
(C) 2008 - 2020  
www.technoloya.co.uk
```



```
HARDWARE: Mat Adlard  
FIRMWARE by:  
Mat Adlard & migry
```

After 5 seconds the boot sequence moves onto displaying the development team
This screen is displayed for 3 seconds.

The next display shows the currently stored configuration. This page is displayed for 8 seconds and is worth checking to make sure the G.P.S.CLOCK has been configured correctly for your system. If adjustments are required, simply power cycle the clock and press [ENTER] on the first screen to enter configuration.

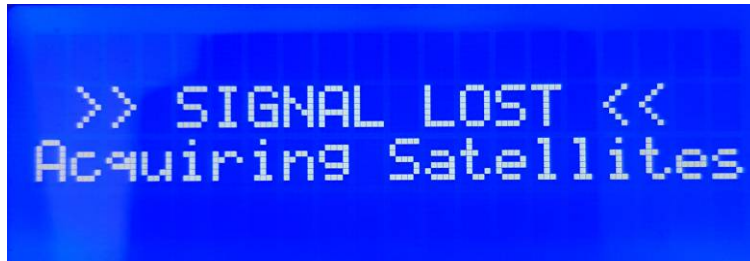


```
Configuration:  
UTC Offset:0 Hrs.  
Daylight saving:ON.  
Baud:57600.Region:EU
```

After 8 seconds the G.P.S.CLOCK starts a 25 second countdown.

The total boot time to this point is also designed to allow the RC210 repeater controller

to fully boot and execute any macro 1 calls you may have configured. This assumes you have the G.P.S.CLOCK and the repeater controller connected to a common supply. This delay also allows time for the G.P.S. system to boot, start the acquisition process and if needed download the latest almanac. At the end of the countdown "Artificial time" is uploaded to the repeater controller to start the onboard scheduler. Please note: The time/date information is a preset default and not real GPS time.



If on completion of the boot sequence the G.P.S.CLOCK has not been able to lock onto the satellite constellation or during normal operations the satellite signals are lost you may see the above message. Please check your antenna installation has a clear un-obstructed view of the sky. On reception of a valid signal the current time and date are uploaded to the RC210 repeater controller and the display returns to the normal running clock screen similar to the picture below.



There are pre-determined times when the G.P.S.CLOCK sends real time updates to the RC210 repeater controller these are:

- At initial G.P.S. acquisition.
- At 29 minutes past the hour.
- At 1 minute to the hour.
- On return from "Transparent mode".
- On re-acquisition of G.P.S. Signal (following loss of signal).

Data write is confirmed by a message on the display.

Transparent Mode

Transparent mode is the name given to the G.P.S.CLOCK function of electronically disconnecting the G.P.S.CLOCK from your RC210 repeater controller and replacing it with a connection to your computer running the RCP programming software thus eliminating the requirement to change cables around.

To move the G.P.S.CLOCK into Transparent Mode simply press both the [UP] and [DOWN] buttons together.



```
TRANSPARENT MODE.  
Clock Function Off!  
RCP <<--> RC210
```

The above display will confirm the clock has moved to Transparent Mode. Although the clock is still receiving G.P.S. Information no updates are passed to the RC210 repeater controller. To exit this mode simply press [ENTER], The G.P.S.CLOCK will immediately update the RC210 with current G.P.S. Time.

It is recommended once program or firmware updating the RC210 repeater controller is complete you wait for the RC210 to reboot (if needed) before moving the G.P.S.CLOCK back into running mode. This way you do not miss the immediate real time update and have to wait until the next automatic update.

Appendix 1

Power considerations

The G.P.S.CLOCK power can be provided either by the USB socket or by the DC Jack both on the side of the unit.

The USB supply requirements fall well within the specifications outlined in the USB 1.0 standard (5V @ 500mA Maximum).

The DC Jack is not polarisation protected. Extra attention must be given to polarisation when connecting to this jack plug.

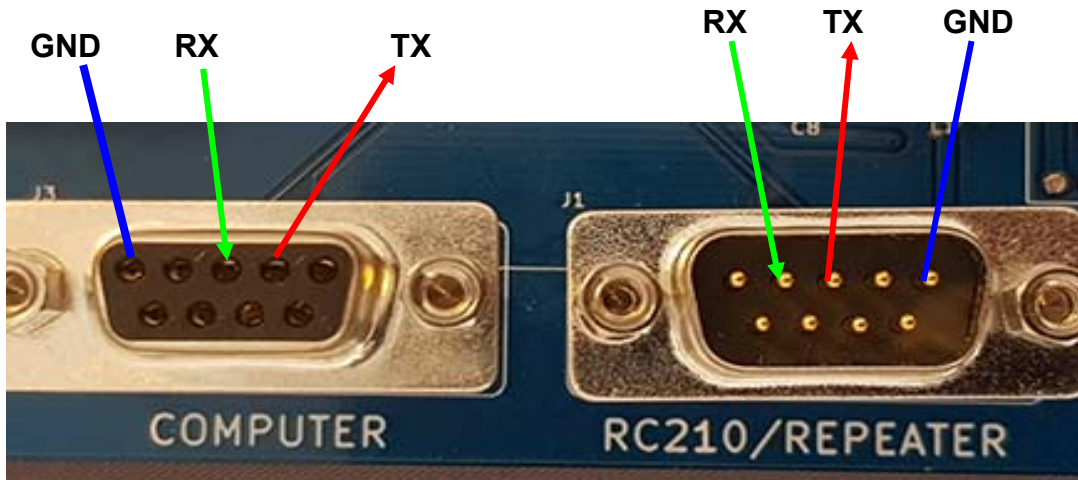
Although the G.P.S.CLOCK has an internal self resetting fuse it is strongly recommended the supply is independently fused. (100mA suggested).

RS232 considerations

It is recommended keeping the **total** cable length to 12 meters or less (computer via the G.P.S.CLOCK to the RC210 that repeater controller) this becomes more critical if you are using the new Arcom CPU and firmware version 7 onwards which implements a higher baud rate.

While in Transparent mode, the clock introduces a 1ms delay in the transfer data rate, this was to aid in reliability of data transfer. If in your RCP you are using the 1ms Delay option (Configure RCP > Use Serial Port > Delay time) you may wish to experiment removing this delay within the RCP.

Rear connection pinout



The RS232 cables need to be made up as direct connections, ie Pin 1 to Pin 1, Pin 2 to Pin 2 etc. This assumes the connection within the RC210 is as per its default orientation when shipped.

COMPUTER RUNNING RCP to G.P.S.CLOCK

PC / RCP		G.P.S.CLOCK	
1	NC	NC	1
2	RXD	TXD	2
3	TXD	RXD	3
4	NC	NC	4
5	GND	GND	5
6	NC	NC	6
7	NC	NC	7
8	NC	NC	8
9	NC	NC	9

G.P.S.CLOCK to RC210 (25w)

G.P.S.CLOCK		RC210 (25 pin programming)	
1	NC	NC	1
2	RXD	TXD	2
3	TXD	RXD	3
4	NC	NC	4
5	GND	NC	5
6	NC	NC	6
7	NC	GND	7
8	NC	NC	8
9	NC	NC	9 - 25

Appendix 2

There are a small number of considerations you have to make around operational setups between the old 9600 baud processors and the new 57600 processor. These are:-

OLD CPU (9600)

The GPS clock brings to this system the ability to track Daylight Saving and automatically change the time on the RC210 accordingly. For this feature to work, simply set DLS to "ON" in the configuration menu of the G.P.S.CLOCK.

NEW CPU (57600)

As DLS has been added to the RCP (scheduler/Clock tab) you will need to turn this feature off to allow the G.P.S.CLOCK to manage DLS for you as well as leap years etc.

In both CPU cases, if you have the Arcom RTC module fitted, this can be removed as it is not required as the G.P.S.CLOCK takes over as primary time source.

Mechanical drawing

