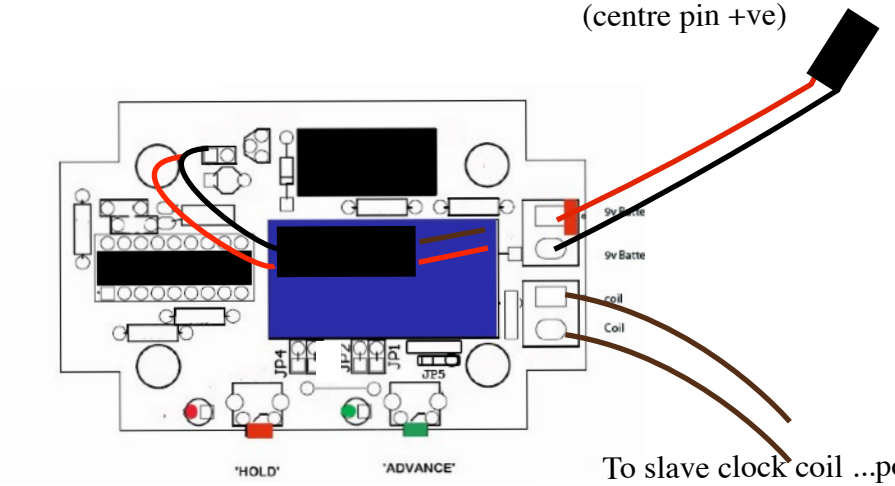
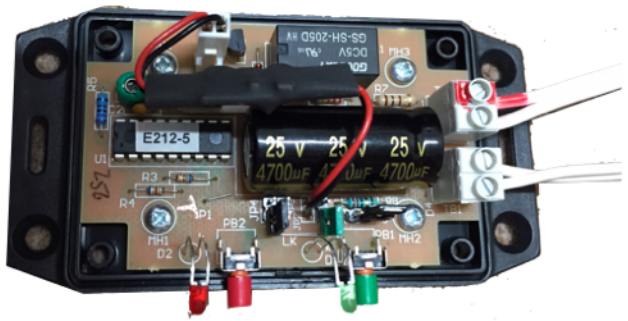
Mains PSU Powered Version

From Power Supply into
2.1mm inline socket
(centre pin +ve)



To slave clock coil ...polarity
not important



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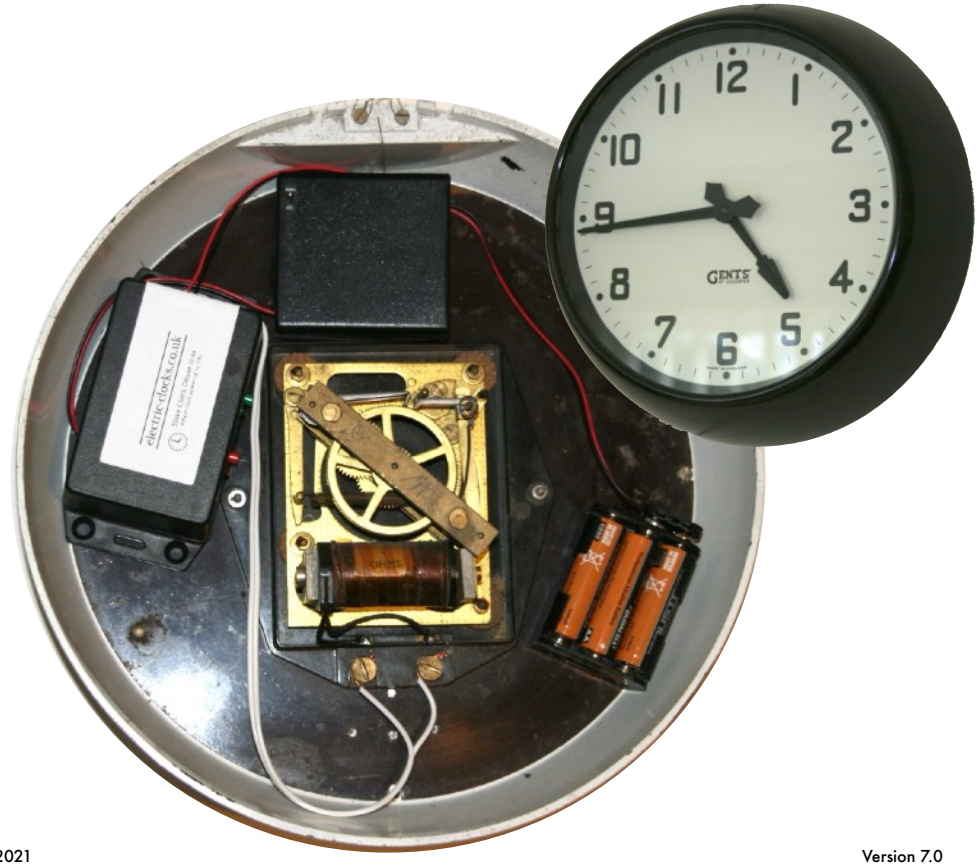
EC4A Slave Clock Impulse Driver

Set-Up and Operation Manual



2021

Version 7.0

Overview

Installing the Slave clock driver is straightforward. The power to drive the electronics is connected via a 2 pin plug from the battery box (4 x AA batteries needed) and it has a small switch to enable accurate starting of the driver's timing period.
Once started the timebase is set.

The battery pack(s) to drive the clock mechanism will need connecting to the battery terminal on the driver board (POLARITY SENSITIVE)

The mains PSU version has one connection to the board via a 2.1mm socket.

Both driver types come with a lead connected to go to the coil connections of the clock movement.

The pulse timing can be set at 30 seconds or 60 seconds using JP2.
The pulse length can be set using JP3/4 - see configuration
The output power can be adjusted using JP5

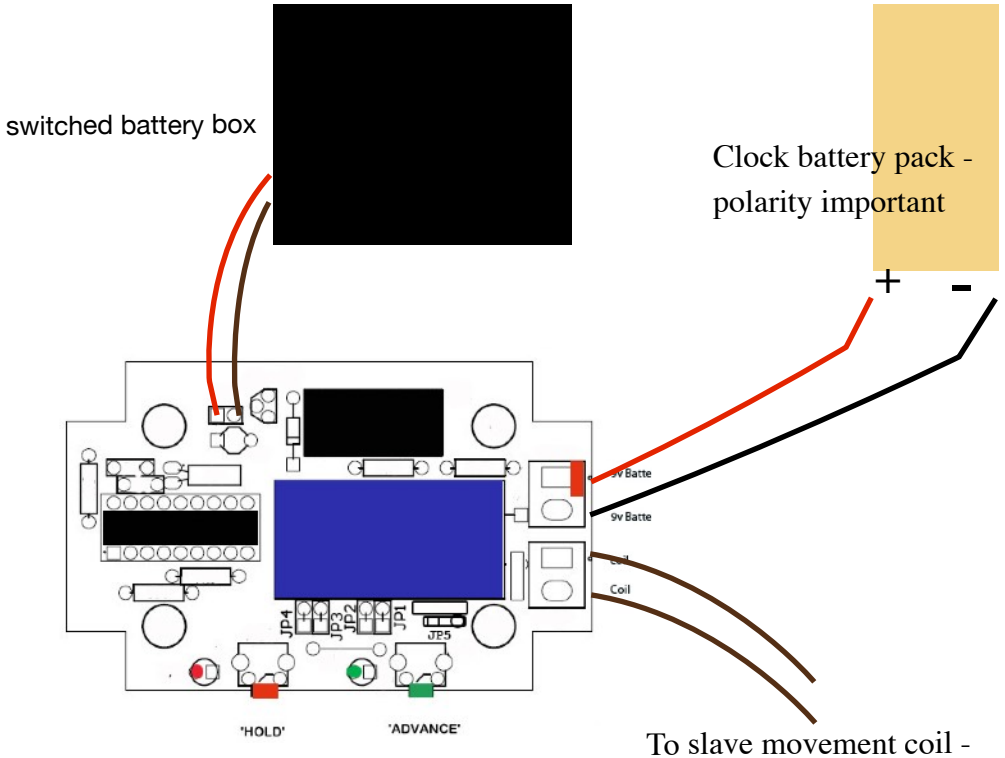
The driver board has a 22Ω resistor fitted to connect in circuit with the clock movement coil. In most cases this will set the resistance to around 30Ω which is an optimum for power to drive the coil and longevity of batteries. Some movements have a higher impedance coil and in that case the 22Ω resistor can be bypassed by fitting the link on JP5.

The driver will come preset to 30 second pulses unless I am asked to change the timing. If you have purchased the fully enclosed version then the screws will be included but not fitted.

All parts have double sided tape to assist in fixing.

No batteries are included

Battery Powered Version



Power

Expected Battery life for Impulse Driver

The battery life of the 4xAA switched box battery pack varies based on the length of the pulse and the pulse rate and is expected to be as below:-
This is the battery pack that drives the impulse driver electronics.

With a 62mS pulse length the batteries are expected to last 18-28 months. With 125mS and 250mS they will last approx 6-9 months

Attached Power for driving clock mechanism coil

The EC4A driver offers a Capacitor discharge system to power the clock mechanism coil. This is currently configured to accept a maximum power source of 24V.
A power source of between 6v and 24v can be attached

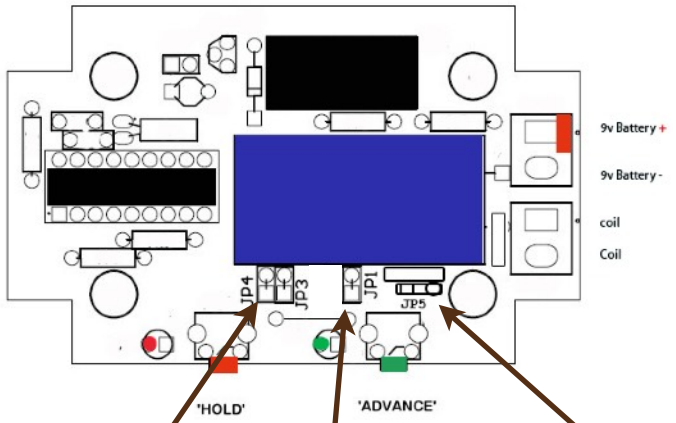
The voltage and current drawn by the mechanism coil will often be around 2v and about 200mA which works for many popular clocks.
But coil ratings vary considerably in different clocks and some testing may be needed with voltage and driver settings

It is **ESSENTIAL** that the power is connected the correct way around to the driver board and does not exceed 24v.

Error

When the driver batteries run flat the clock will start missing a step occasionally and then regularly.

Configuration



Jumper 5 (JP5) is used to include or exclude a 22Ω resistor to adjust the power output

Jumper 1 (JP1) is used to set **30/60** second pulse INTERVAL.
Fitted = 1 pulse every 60 seconds
Not fitted = 1 pulse every 30 seconds

Pulse LENGTH jumpers
There are 3 pulse length selections.
With no jumpers fitted the pulse length is approx 60mS
Jumper4 (JP4) fitted is approx 120mS
Jumper3 (JP3) fitted is approx 240mS

Push Button 1 (Green) is used to set the '**Advance**' mode.
Push Button 2 (Red) is used to set the '**Hold**' mode.

Set these before switching on the power at the battery box.

Operation

Changing the time and Daylight Saving Time changes

To advance the clock press the **Green** 'Advance' button
This function is 'latching' …. i.e. the first press will latch it on and the second press will turn it off. While it is in the 'Advance' mode the Green LED will blink once per second and the unit will output pulses.

If the unit is left in the 'Advance' mode it will pulse exactly the correct amount of pulses to advance the clock 1 hour, then revert to normal operation.

This can be used to fast forward the time when the clocks 'go forward' in the Spring.

To stop the output of pulses press the **Red** 'Hold' button
This function is 'latching' …. i.e. the first press will latch it on and the second press will turn it off. While it is in the 'Hold' mode the Red LED will blink once per second and the clock will not pulse

If the unit is left in the 'Hold' mode it will not pulse for exactly one hour and then revert back to normal operation

This can be used to set the clock back one hour when the clocks 'go back' in the Autumn.

Error

If both Green and Red buttons are pressed both LEDs will flash and the driver will go into error mode. Press both to get back to normal operation. The driver may need powering off to reset properly.

Accuracy

Accuracy

The driver is crystal controlled, and it is adjusted to be accurate to approximately 0.4 second per day and will be set very slightly fast rather than slow.
If the driver timing changes massively it can be sent back to electric-clocks to be adjusted.

Accuracy of the impulse driver is only affected by extreme temperature change and is initially adjusted to be accurate at normal room temperature; approx 21°
Variations in temperature above and below that may cause small timing changes, this is normal for crystal controlled timing devices.

Starting accuracy

You can start the timing cycle by switching on the battery pack at exactly '0' seconds on a known accurate clock. The driver will now pulse at 0 seconds and 30/60 seconds depending on JP1 setting.

Thereafter any advances are best made just after (a couple of seconds) the clock has impulsed at 0 seconds.

The switch on the battery box can be used to accurately start the clock on the second, and that will start the timebase and the relay will pulse at the selected time (30 or 60 seconds)

For the mains PSU version connecting the PSU will start the timing. Connect power about 1sec before the required start as you can expect about a 1 second delay due to electronics in the PSU.