



# **Sidus F1C**

## **Quick Reference Manual**

Version 4.1 – December 2010 - © M.U. 2007/2010

This system replaces a clockwork timer by recreating the disc rotation through a micro servo. Key advantages are accurate timings and remotely controlled dethermalization (RDT). The disc rotates of one step and releases an arm when the time for a programmed function expires. The stepping is controlled by a tiny electronic board which retains the programmed timing and data. Only one pushbutton is used to set, start, cancel, stop and reset the timing. A pocket sized programmer is used to change the timing, dethermalize the model, and accurately adjust the micro servo positioning. The devices communicate through optical and radio links therefore no cables are needed.

## Getting started

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Refer to the pictures of next page to recognize the system components

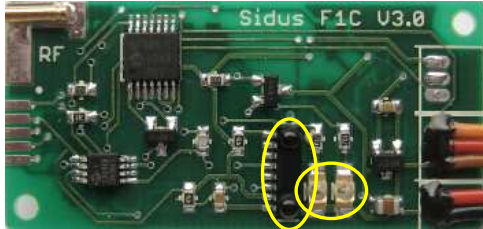
- On the *Timer* control board ❶ locate the connectors, the IR sensor, the leds and the RDT antenna socket
- Locate the Hall sensor ❸ at the end of the longest cable on the *Timer* control board. Insert the sensor fully inside the radial hole on the bottom of the magnetic start switch ❹. Later the sensor will have to be permanently glued to the start switch as detailed in the *Installation Notes*
- Connect the *Timer* control board to the battery ❷ and to the micro servo. The *Timer* comes with a pre-programmed timing sequence that can be easily changed as described later. If idle for over 120 seconds the control board will go to “sleep” (leds OFF). It will wake up by shortly pressing the start switch
- Switch on the *Programmer* ❺. The buzzer beeps and the display becomes active. The switch is accessible by removing the slide cover on the bottom of the case. After about 120 seconds of inactivity the *Programmer* will turn OFF. It will wake up by shortly pressing one of the keys
- The *LiPo Charger* ❻ comes with bare wires by the 12V side to allow the connection of a proper plug depending on the power source used to charge the battery packs.

# System components

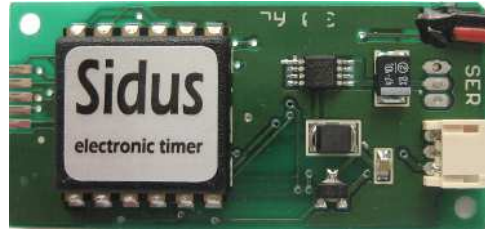
RDT antenna socket



1 Timer Control Board



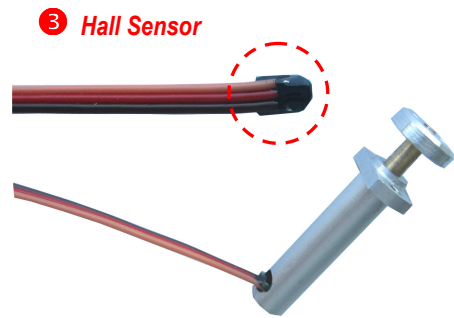
IR sensor  
Red & Green leds



BOTTOM VIEW



2 Timer Battery



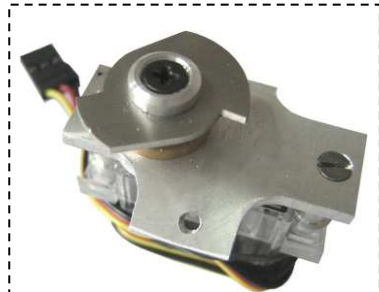
3 Hall Sensor

4 MAGNETIC START SWITCH

5 PROGRAMMER



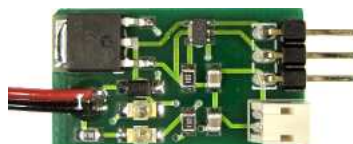
"SE" MECHANICAL ASSEMBLY OPTION



"VE" MECHANICAL ASSEMBLY OPTION

6 LIPO CHARGER

9-12Vdc



# Timer

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## **Duration and resolution of the functions**

Each of the 6 available functions (F1 to F6) has a programmable time interval. The range for F1 and F2 is 0.01 to 9.99 sec. The range for F3 to F5 is 0.1 to 99.9 sec. and the range for F6 (DT time) is 1 to 720 sec.

## **States of the Timer**



The pair of colored leds on the *Timer* board shows the current state of the *Timer* according to the following scheme:

1. **Leds OFF:** *Timer* sleeping. Press the start switch to wake it up: the *Timer* beeps and the leds (RED or GREEN) turn ON
2. **RED ON:** *Timer* charged – disc at the beginning of its travel
3. **GREEN ON:** *Timer* discharged – disc at the end of its travel
4. **Blinking RED (fast):** *Timer* armed, the timing sequence will start at start switch release
5. **Blinking RED (slow):** timing sequence in progress
6. **Blinking GREEN:** disc repositioning in progress
7. **Blinking RED and GREEN (3 flashes):** *Timer* battery to be recharged

## **Using the Timer**

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Starting from a discharged *Timer* (GREEN led ON, disc at end of its travel) the functions are:

- **RESET** - bring all the arms down, press the start switch until the GREEN led flashes and then release it. The disc quickly turns back to the beginning of its travel and the RED led turns ON
- **START** - press the start switch until the RED led blinks fast. The *Timer* is armed and the timing sequence will start as soon as the start switch is released. During timing the RED led blinks slow and the disc rotates of one step to release an arm at the end of each programmed function until it reaches the end of its travel and the *Timer* turns off 
- **STOP** The timing sequence can be early terminated by pressing the start switch: all the pending functions are executed in steps and the disc returns to the end of its travel 

## **Automatic switch off of the Timer**

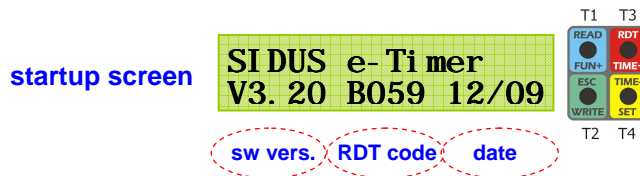


The *Timer* automatically goes to “sleep” to save power if inactive for about 120 sec. While sleeping the state of the *Timer* and all the internal data are retained. The *Timer* wakes up by pressing the start switch

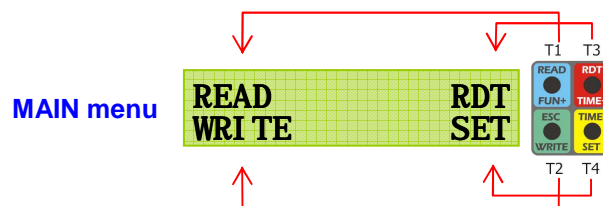
# Programming the Timer

The *Programmer* is needed to modify the timing sequence and dethermalize the model. It also allows to calibrate the servo positioning and set other functions.

Each time the *Programmer* is started, it briefly displays the following startup screen



then it switches to the **MAIN** menu



For each menu the possible options are displaced at the corners of the rectangular display window: an option is selected through the button (T1 to T4) located at the same corner of the rectangle made up of the 4 buttons (see drawing).



A long or short button pressure may be required according to the following rule: choices displayed all in upper case (e.g. **READ**, **RDT**) require a long pressure (press and hold), choices displayed in lower case except the first character (e.g. **Exit**, **Servo**,..) require a short pressure (press and release).

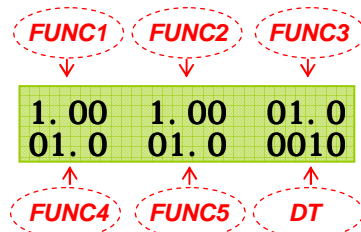


To allow *Programmer* <> *Timer* communications, aim the *Programmer* at the *Timer* (make sure it is ON !) closer than 20 cm. with the IR sensors mutually visible. In case of communication failure, the message **ERR!** is displayed

## Modify the timing sequence

After power on, the *Programmer* displays the **MAIN** menu. Before modifying the timing sequence, read it from the *Timer*.

1. aim the *Programmer* at the *Timer* (make sure it is ON)
2. press and hold **T1 (READ)** until the intervals programmed for the 6 functions appear on the display:



3. press and release **T1**: an asterisk '\*' appears close to the time of the first function (**FUNC1**). Press and release **T1** again to move the asterisk close to the function to be

modified, then press and hold **T1** until the asterisk turns into 'w' (write): the function is ready to be modified

- press and release **T3/T4** to increase/decrease the time of one step or press and hold **T3/T4** to have faster increments/decrements. When the wished value is reached, press and release **T2 (ESC)** to end modifications or press and release again **T1** to choose another function to modify
- The modified values must now be written onto the *Timer* for permanent storing. Press and hold **T2 (WRITE)** until the message "Writing" is displayed. The modified values are then read back from the *Timer* and shown again on the display

### Remote dethermalization (RDT)

Press and hold **T3 (RDT)** (> 1 sec) while the timing is in progress to dethermalize the model (RDT). The message 'RDT/RMC Transmitti ng...' will be displayed.



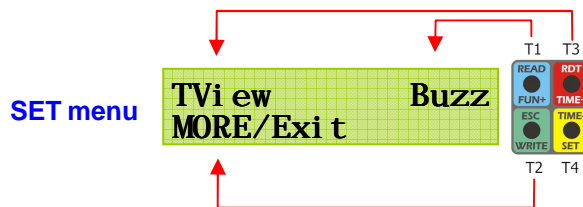
The effect of the command depends on the value chosen for the intermediate **JUMP2** function (see following).

- if the **JUMP2** function is not yet executed, the *Timer* will jump to it. By pressing and holding **T3** again (RDT) the *Timer* will dethermalize the model
- if the **JUMP2** function is already executed, the command will produce immediate model dethermalization

## Advanced settings

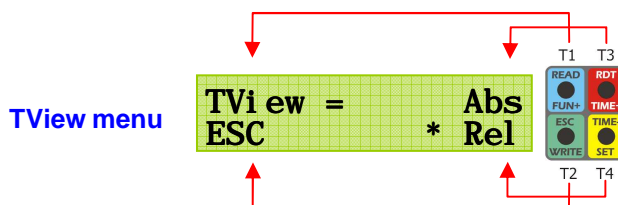


All the advanced settings are accessible under the **Set** menu. From the **MAIN** press and hold **T4 (Set)** (> 3 sec) until entering the **Set** menu



### Change the timing visualization: Absolute or Relative

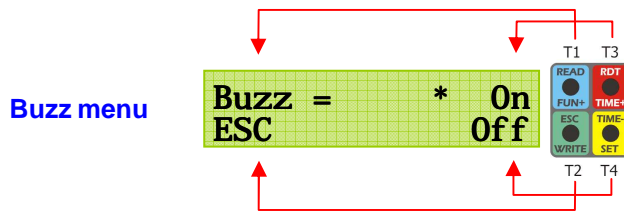
- Press and release **T1 (TView)** to enter the **TView** menu:



- Press and release **T3 (Abs)** for absolute visualization. Press and release **T4 (Rel)** for relative visualization
- When finished press and release **T2 (ESC)** to go back to the **Set** menu and press and release again **T2 (ESC)** to end modifications

## Enable or Disable the Programmer buzzer

1. From the **Set** menu press and release **T3 (Buzz)** to enter the **Buzz** menu:

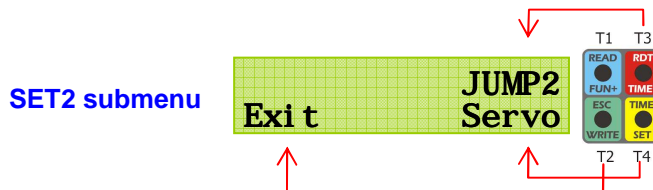


2. Press and release **T3 (On)** to enable the buzzer. Press and release **T4 (Off)** to disable the buzzer
3. When finished press and release **T2 (ESC)** to go back to the **Set** menu and press and release again **T2 (ESC)** to end modifications

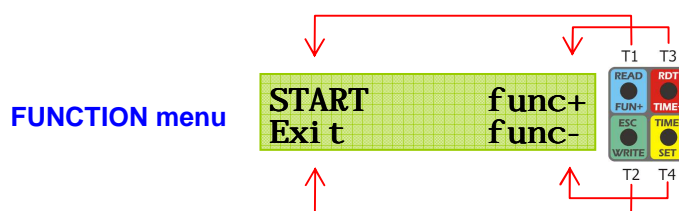
## Modify the disc positioning defaults

The *Timer* comes with default settings that usually do not need to be modified, however the *Programmer* allows changing the positioning of the disc, should it become necessary (e.g. micro servo replacement).

1. aim the *Programmer* at the *Timer* (make sure it is ON)
2. from the **Set** menu press and hold T2 (> 3 sec) until entering the **SET2** submenu:

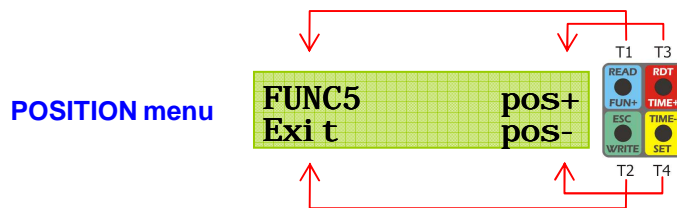


3. press and release **T4 (Servo)** to enter the **FUNCTION** menu. The disc moves to the start position



4. Press and release **T3 (func+)** or **T4 (func-)** to increase or decrease the current function and step the disc to the related position. The disc steps to 7 different positions (**START** → **FUNC1** → **FUNC2** → **FUNC3** → **FUNC4** → **FUNC5** → **DT**). The positions for **START** and **DT** correspond to the initial and final disc position respectively

5. Press and release **T3** or **T4** to reach the wished function (e.g. **FUNC5**), then press and hold **T1** until the **POSITION** menu is displayed:



6. Press and release **T3** (**pos+**) or **T4** (**pos-**) to accurately adjust the disc position for the current function (Keep **T3** or **T4** pressed to have a faster movement). The new positions are permanently stored
7. Press **T2** (**ESC**) to go back to the **FUNCTION** menu and repeat the steps above to adjust the disc position of another function or press again **T2** (**ESC**) go back to the **SET** menu.

### Intermediate step in case of early radio DT

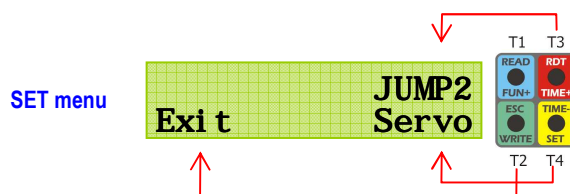
When the RDT is activated (e.g. while the engine is running) it is possible set the *Timer* to have the disc jumping to an intermediate function (**JUMP2** function) safer than DT, helpful to prevent model damage. If the RDT is activated again (or if it is activated after the **JUMP2** function), the disc will immediately jump to DT (see the example below).

Example: engine stop is **FUNC1**, bunt is **FUNC2**, rudder is **FUNC3**, first glide is **FUNC4**, **JUMP2** function is set to **FUNC2**

- In case of **RDT** during **FUNC1**, the *Timer* terminates **FUNC1** and jumps to **FUNC2**. The timing continues. In case of further **RDT** activation the model is instantly dethermalized
- In case of **RDT** later than **FUNC1** the model is instantly dethermalized

### JUMP2 function setting

1. Aim the *Programmer* at the *Timer* (make sure it is ON)
2. Through the **FUNCTION** menu (see "**Disc positioning modification**") move the disc to the function the disc must jump to (**JUMP2** function) in case of early **DT**
3. Press and release **T2** (**Exit**) to exit the **FUNCTION** menu and enter the **SET** menu:



4. Keep **T3** (**JUMP2**) pressed until getting the message "**Writing...**"
5. Double check the settings: start the timer, push the **RDT** button once during the function(s) before **JUMP2** function and check that the disc jumps to **JUMP2**. Push the **RDT** button again and check that the discs jumps to **DT** (end of travel)



# Charging the batteries

A micro LiPo battery field *Charger* is supplied with the system. The red / black cable must be connected to any 9-12 Vdc power source (for example to the car lighter socket). The same *Charger* is used to charge both the *Timer* and the *Programmer* LiPo batteries separately. Full recharge of a battery will take about 2 hours.



Use only the battery charger supplied with the system. Discard a LiPo battery if it shows bulges or scratches. Never leave a LiPo battery unattended while charging. Charge must take place in a safe place and always far from flammable materials.

## Status of the charger leds

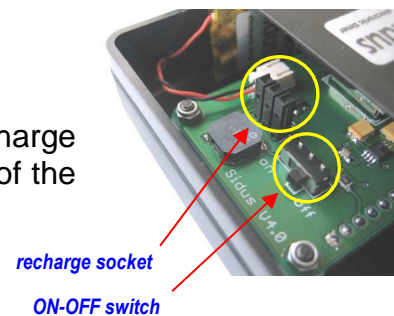
- 9-12Vdc power connected, no LiPo battery connected: Green ON, Red ON
- Charge in progress: Red ON, Green OFF
- Charge complete: Red OFF, Green ON

## Charging the Timer battery

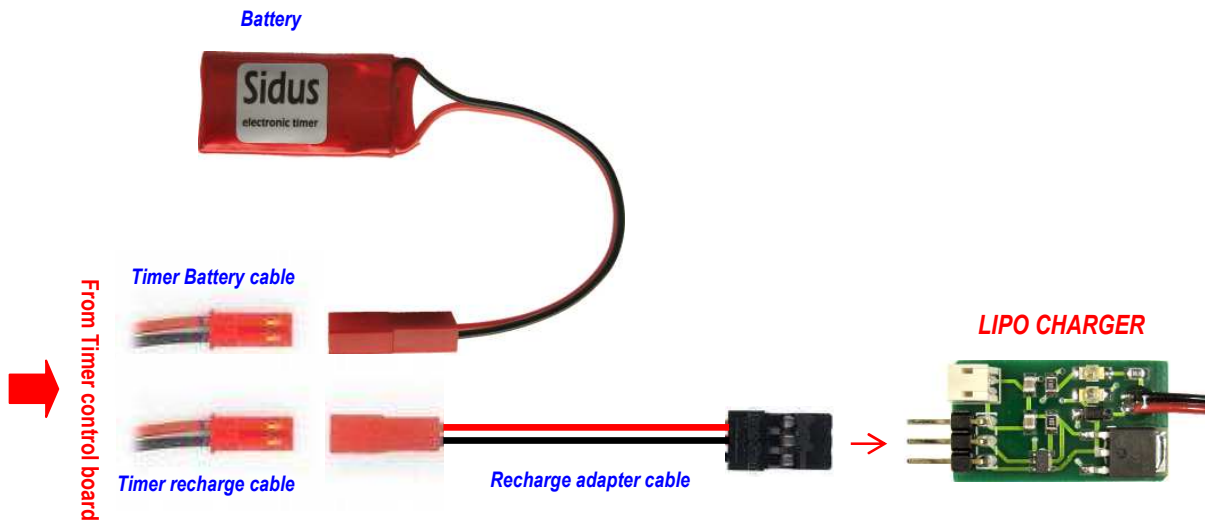
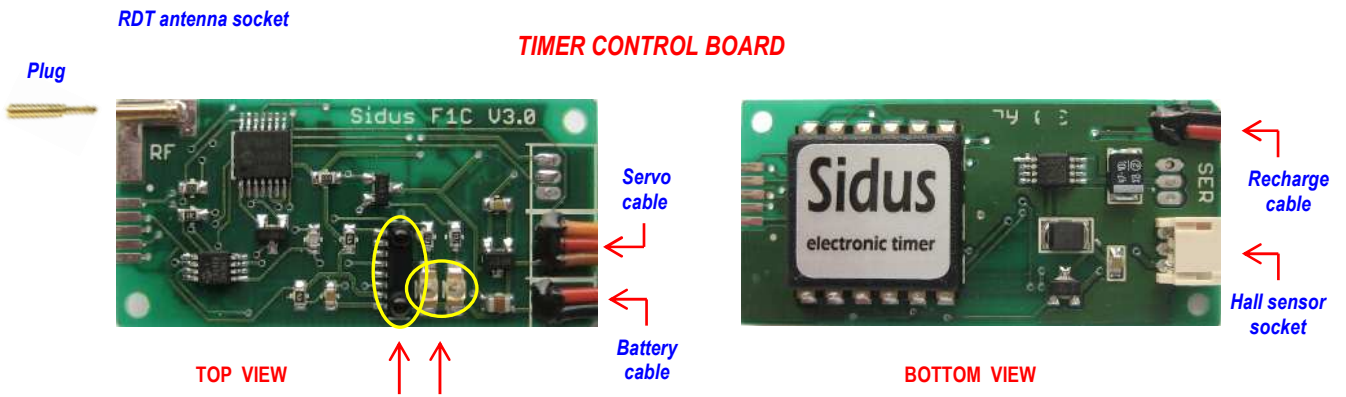
Use the provided charger adapter cable connected between the charger 3-pin plug and the female red JST socket at the end of the recharge cable of the Timer control board: the battery remains connected to the *Timer*.

## Charging the Programmer battery

Connect the charger 3-pin plug to the *Programmer* recharge socket, accessible by removing the slide cover on the bottom of the case. the battery remains connected to the *Programmer*.



# Wiring



⚠ the battery may remain permanently connected for months (sleep current is a few microA)

# Installing the Timer on multiple models

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One additional *Timer* control board with the same RDT code is required to provide another model with the **Sidus** electronic timer. The RDT code is unique for each modeller to allow all his *Timer* control boards to be used with a single *Programmer*. In addition it makes it possible to use the **Sidus** system simultaneously with other modellers having the same or other systems.

## Recommendations

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### Battery and recharge socket



Provide easy access to the battery pack and to the recharge connector anytime to disconnect or recharge the battery when needed. The batteries guarantee about 60 flights of 180 seconds each and about 200 DT's. If you are not going to fly the model in a few weeks, just disconnect the *Timer* battery and switch the *Programmer* off.

### RDT antenna

The RDT antenna (the thin green twisted steel wire supplied) must come out of the top of the pylon. It must be electrically insulated from carbon or metal parts through a plastic spacer. Connect the antenna to the RDT antenna socket placed on the *Timer* control board ❶ through the small plug supplied with the system. Failure to follow the above will result in a poor range of the whole RDT system.

### Control board

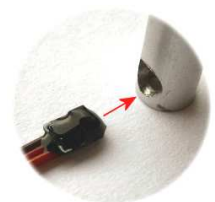


Place the control board with the IR sensor and the leds close to the front-end side to have them clearly visible through a small clear plastic transparent window. All wires and connectors must be laid in a clean way with no mechanical tension. Avoid firm fastening of the *Timer* control board to the fuselage. Use foam rubber in order to minimize possible malfunction caused by high frequency vibrations.

### Hall sensor



Insert the sensor in the hole located in the bottom of the magnetic start switch as shown in the picture. Do not put it upside down. Glue it to the start switch with silicon sealant or epoxy.



Should it be necessary to extract the plug at the other end of the sensor cable, do not pull it through the wire. The connector plug has small protruding edges that must be grabbed with tweezers (or with the finger nails) to gently pull the plug out of the socket

### Mechanical assembly



For the “SE” type assembly use a thin rubber gasket under the faceplate to fasten the mechanical assembly to the fuselage. It is also recommended to use a rubber gasket (O-ring) between the faceplate and the bottom of the head of the fastening screws. For the “VE” type assembly refer to the specific instructions