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Please carefully read these instructions completely, especially Annex 1: SAFETY INSTRUCTIONS before using GliderTimer

1. Introduction.



GliderTimer-PRO is the final step for the integrated electronic management of a F5J competition

Please read this manual completely. After you are familiar with the contents you will be using Annex 2 and later to follow the routine of preparing competitions and training persons to use the collecting units.

A GliderTimer PRO unit can perform anything that a (mini) unit can do. In addition, it will also drive the audio system with the appropriate countdowns and can drive a timing display panel. Everything is accurately synchronised with the competition timing.

GliderTimer-Pro consists of the same M5 Stack Core platform which has been enhanced with the audio, panel comm and battery power circuits. It also features a Master Power switch that removes the undesirable self-discharging effect that the original platform experienced.

Organising a competition involves several aspects that have to be addressed properly. There are configuration settings in GliderTimer PRO that the user has to understand and with which he must be familiar.

As well, the user needs to be familiar with:

- configuration and setting of GliderScore (<http://gliderscore.com/>)
- the operation of GliderKeeper, GKSync and GliderTimer (mini)
- the Wi-Fi concepts STA and AP modes as well as the IP numbers that they use(<https://www.gliderkeeper.com/downloads>).
- the other equipment used in your competition, that is your panel and audio equipment, power supplies etc..

Integrating all these and all the crew in a contest will require some training, practise and careful planning. Those that have organised an F5J contest will understand.



- 1.- I2C port (not used in Fw 4.15)
- 2.- Serial communication: Field Panel Terminals
- 3.- USB charge
- 4.- Power/Reset Button
- 5.- Master Power Switch
- 6.- DC input Hx10 (3S batt balance)
- 7.- Micro SD card
- 8.- Local 3W Speaker out Terminal
- 9.- DC input jack 5,5/ 2 external pin ground
- 10.- 3.5 mm Stereo Minijack output for P.A. System
- 11.- Control Buttons

Power Sequence.

-To start GliderTimer-PRO:

- A) Slide Master Power (5) to the right (ON position)
- B) Press once Power/Reset button (4) (in the left side of the screen).

If you want to use the Audio Drive System, make sure you have connected an external DC power supply in either DC power socket beforehand.

-To stop GliderTimer-PRO: Slide Master Power to the left (OFF position).

Now you can remove the external DC power

-To reset GliderTimer. Press once Power/Reset button.

Charging.

GliderTimer-PRO internal battery is a 1000 mAh single LiPO cell. It gives around 5 hours operating time after full charging. The internal battery will be charged either from the same method the GliderTimer(mini) uses by plugging USB type C cable connected to a 5v USB power source as a PC or phone charger or a battery pack. Nominal charge rate in this condition is around 300 mA. For charging from the USB, Master Power Switch must be ON.

But, most likely, you will be using one of the external DC sockets. They are 6,5 to 28vDC capable, they will charge with an approximate rate of 1000 mA in either Master Power switch position, normally your internal battery will be automatically charged when running a competition from the external DC.

Note that you can have both DC input lines connected simultaneously. The one with the higher voltage will be powering the system. This is useful when running the competition from batteries and a battery pack swap is to be performed: power from both connections, replace the discharged pack and go back to the original configuration.



How to browse in Menu.

All through the menu pages the structure is very much the same. You have an indication of the menu you are in, and the current competition number and round number.

The “>” symbol will highlight which option you are about to select. If you see a double chevron in the menu line “>>” this means there still are options available in this menu, continue scrolling down to access them.

Press Scroll (mid button) to change the option downwards.

Press Select (right button) to activate selected option.

Press Menu (left button) to exit this menu level to come back to the Main Menu.

Press Power/Reset to reset the machine. This will be necessary to exit from “Pick Data” selected menu options (see below).

In hardware, GliderTimer is a customisation of the widely spread M5Stack core unit. That features a 320x240 pixel TFT screen and three control buttons (see <https://m5stack.com/>).

2. Getting data from GliderKeeper

As soon as it powers up, GliderTimer will accept Flight data from a GliderKeeper. Despite the competition status, GliderTimer will always display whatever Flight Data pack is received. This data pack can be accepted to update a record in the competition data base if the data conforms to expected info, for instance, it will not accept for recording after the competition is closed or if the pilot is not expected to fly in this group.

Getting data from GliderKeeper is very easy: Just enter your GliderKeeper in Wi-Fi mode (by holding it vertical for 3 seconds, see GliderKeeper manual), if a GliderTimer is nearby GliderKeeper will transmit its last flight data immediately into it.



If after 15 seconds the data was not transmitted, you will hear a “bleep”(two immediate different tones) when data starts, you can try again. Reset GliderTimer and then switch GliderKeeper OFF and power it ON in vertical position, to directly go to Wi-Fi mode as many times as necessary. Failed transmissions can be due GliderTimer being too far away, or more likely, the pilot’s radio transmitter is too close, causing interference. If you suspect the radio transmitter is too close, move it so that it is 4-5 meters away from the GliderKeeper and GliderTimer and try again.

If you were not using a GKSyn you may want to go to “Pick Data” in GliderTimer before cycling the power. This will maintain the landing time reference. See Section 6 in GliderTimer (mini) manual.



3. A competition overview.

With GliderTimer-PRO you have a choice of different competition setups you may want to perform.

a) Small competition.

A small competition is one having one group per round. In this case competition data is locally held inside of GliderTimer. Only one GliderTimer can be used to collect the data from the different GliderKeepers involved. Up to nine GliderKeeper/pilots can be used in a 6-round competition. This is more or less what previous Fw 4.06 was doing.

This will be the case in local competitions or training sessions. The pilot list (up to 16) is maintained inside the GliderTimer unit.

The results and scores can be monitored real time in the collecting GliderTimer unit. A GliderTimer PRO can perform this task as well as driving the audio tracks and collect the data. This may be a little uncomfortable so the system can be configured so one PRO unit can play audio and another (PRO or mini) can collect the data.

b) Full Competition.

The competition scores and data will reside in GliderScore. Several groups can be used (up to 12). Several Rounds (up to 12) can be drawn. A maximum of 150 pilots can be in the draw.

In particular 1 group may be drawn and a "Small competition" may be run in GliderScore. No limit of GliderTimer units can be used to collect flight data.

A Full Competition is for GliderTimer a set of 3 files that have to be uploaded to all the units for working properly together.

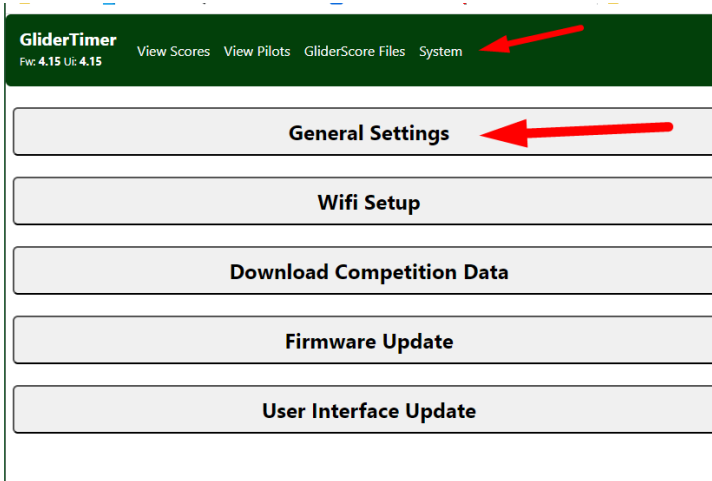
-The Pilot List, which includes the ID of the different GliderKeeper units used by the pilot, used to identify the pilot owner of the incoming datasets.

-The Draw Table, which is the sorting that GliderScore did for the pilots to fly in the different groups, this circumstance will be checked by GliderTimer.

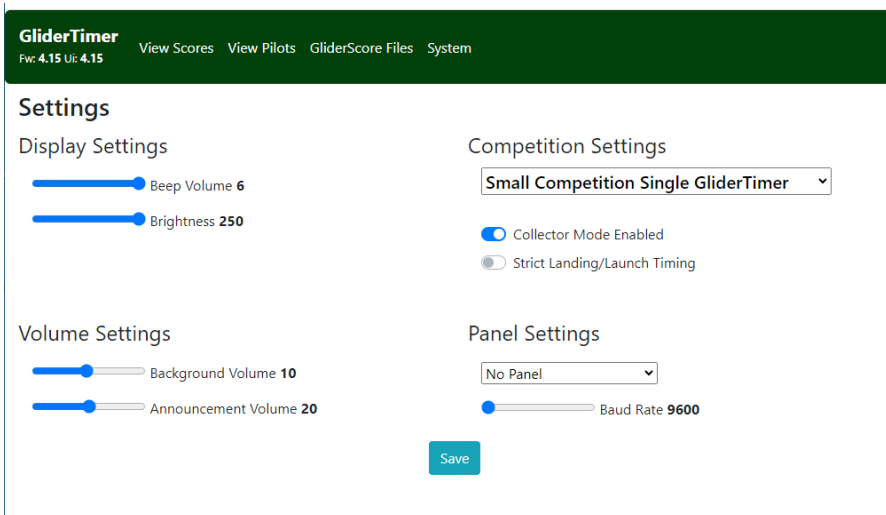
-The Launch Times (scheduled_rounds). This is a list of the exact time (hour, minute and second) at which the different groups will launch. This information will be compared with the incoming data from GliderKeepers to check that the flight was done within Working Time.

4. The General Settings.

The former Fw 4.06 had some of the settings already built into its menu. These settings are sufficient for the "Small Competition", However since using groups does need a more intensive data transfer, all the settings, new and old, are now in a UI screen which is more visual, but requires a terminal, very probably available when running a "Full Competition".



You will access the General Settings, by clicking into the System Menu: System/ General Settings.



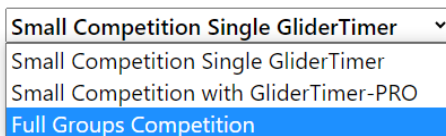
In the left column you have:

Display settings: Beep Volume intensities of the GliderTimer internal speaker (0-6) and Display Brightness (50-250 in 5 steps).

Volume Settings: You can change the countdown voice volume (Announcement Volume (10-30) and the Background Volume (0-20). The Background, nowadays, will loop play the soundtracks stored in the folders 01, 02, 03. From Minute -5 to minute -1 from the launch moment. Some music with free rights is already provided in those folders, you can replace them with your favourite music or a nice 5 minutes "Silence track".

Competition Settings will unfold into this Selections:

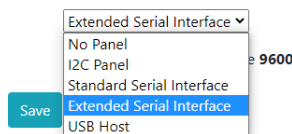
Competition Settings



Panel Settings will unfold:



Panel Settings



At the moment the only suitable options are: No Panel, Standard Serial Interface and Extended Serial Interface. I2C panel and USB Host will require special hardware. These options are kept for future enhancements.

Baud Rate: can be selected to 9600 and 19200 bits per seconds.

Collector Mode: In case you select this mode GliderTimer display background color will be green, this is the normal operation mode for the field units to collect flight data.

If Collector is not selected, display background will show in dark blue, the main difference is that the AP mode of this unit will generate a Wi-Fi name called **GliderTmain** this will make:

- a) GliderKeeper units will not send data to this unit.
- b) The other GliderTimers, in collector mode will find this “GliderTmain” Wi-Fi ssid. Useful when downloading scheduled_rounds for being in “on schedule” all the units. Being this “main” unit the master. Useful in case of “small competition” with 2 GliderTimer units or to expedite the schedule download when several GliderTimers need update.

Strict Landing/Launch Timing:

When this flag is selected GliderTimer will ascertain that the flight data coming from a GliderKeeper, equipped with a GKSync, was done within the working time to apply the landing bonus. The flight score will be cancelled if the landing was one minute later than the end of working time (as per F5J rules).

Unselect this flag to enable human input. This may be the desired circumstance in informal competitions when the launch schedule might be done manually.

We would recommend:

Format Data in GliderTimer before any competition change and make your setting from this screen in case you are using a “Full Competition”.

5. GliderScore files.

As mentioned above the “full competition” information needed for GliderTimer to operate will be in the form of 3 datafiles in .csv format we call them GliderScore files. In brackets the internal name inside GliderTimer.

- Pilot list (pilot_master_file.csv)
- Draw table (draw_table.csv)
- Launch schedule table (scheduled_rounds.csv).

See Annex 3 for creating these files.

To perform an effective “full competition” you will need several GliderTimer units to gather the information from the model in a reasonable time.

These 3 files must be identical in all the units involved in the competition.



In the UI there is a tab to easily upload these 3 files together for each unit.

We recommend that when you generate those files, in the different moments of preparing the competition in GliderScore, you make your own folder on purpose to have these files easily identified. And further more change their names into something like this:

Nombre	Fecha de modificación	Tipo	Tamaño
1.-480A2400289c_PilotMasterFile.csv	06/06/2023 19:42	Archivo de valores...	2 KB
2.-draw_table.csv	07/06/2023 23:14	Archivo de valores...	10 KB
3.-480A2400289c_Schedule.csv	08/06/2023 17:22	Archivo de valores...	2 KB

By “prepending” 1, 2 and 3 to the names generated by GliderScore, the sequence will correspond to the order they are asked to be uploaded by GliderTimer.

GliderTimer View Scores View Pilots GliderScore Files System
Fw: 4.15 Ui: --

Upload GliderScore files to GliderTimer

Pilot Master File

Ninguno archivo selec.

→ This text will be in your operating system configured language. It says "Select File" and to the right "No file selected"

Draw Table

Ninguno archivo selec.

Rounds Schedule

Ninguno archivo selec.

Create a Schedule File

Use the following button to create the schedule file.

When the competition progresses, you may have desired and/or non-desired competition interruptions. The Scheduled Launch sequence can be changed for a variable separation between launch instants (epochs) and the full competition is scheduled in that manner. When an interruption happens, this rhythm is no longer valid and a new scheduled_rounds.csv must be generated, and loaded in every involved unit.

WARNING: When a competition stoppage occurs, and a new schedule will have to be uploaded, all GliderTimer units must be powered OFF before the time of the next interrupted launch occurs, otherwise the units that “saw” this (now cancelled) launch will record it in memory giving false results in case they are used for collecting data of that group.



When restoring power, there will some 60 seconds available (at the worst) for updating this schedule and reset the unit to make it follow the new schedule. If this update takes too long, the unit may engage in its initial schedule table.

The bottom part of this GliderScore Files page is related to regenerating this schedule file. There are 3 ways for regenerating this schedule file. Ignore this part of the page for the moment we will explain it below.

6. Input the Data into the Competition.

Please, follow GliderTimer (mini) manual for collecting data into a single GliderTimer in case of a “Small Competition”.

For a “Full Competition” the individual Flight data Collection from a GliderKeeper is the same, but the following peculiarities are applicable here.

We know there will be several units collecting data.

We recommend some 3 to 5 landing spots per collector GliderTimer. The number depends on your timing, the experience of persons using this collector GliderTimers and the pilots involved. Start giving 7 minutes or more between launch events. This time gap can be reduced with practice.

When all the flight data, assigned to this unit, is collected and in the GliderTimer memory, each GliderTimer has to upload their results to GliderScore. This is to be done before the next launch instant.

NOTE: More flights may be recorded and then uploaded after first upload, the unit will repeat upload of all recorded flight in this group inclusive the previously uploaded flights, GliderScore will reject any data previously loaded and previously uploaded flights will show as a “failed” (this repeat attempt) upload.

NOTE: It is possible to upload after next launch instant, the unit will block in the Timing Panel screen. Reset the unit, upload and reset again. The Timing Panel will not show in this unit for the rest of this flight, but provided it has recorded this launch it will be able to collect new flight data. This feature is possible until a flight data for this subsequent group is recorded. After this moment only the flight in this new group will be uploaded.

(Note of the author: You may want just to omit these last notes, since they may be seen confusing, when training the operators of collector units depending on their experience and just keep this facility at competition management level).

7. The Pick Data menu.

We are taking advantage of the Pick Data feature to upload our flights into GliderScore.

When we call “Pick Data”, we are changing the working mode of GliderTimer from AP mode to STA mode.

- In AP mode GliderTimer acts as the collector with a Wi-Fi ssid name “GliderTimer”.

- In STA mode GliderKeeper is able to push the collected data to GliderScore.com via an existing AP (for example a smartphone with Mobile Hotspot turned on).

We obviously need internet access to be able to upload this information into GliderScore.

Note:



Access Point (AP) mode.

With GliderTimer in this (collector) mode, wireless clients such as GliderKeepers, laptops, desktops, PDAs can send data to the Access Point. In this case AP is GliderTimer and the clients are the various GliderKeepers sending their flight data.

Station (STA) Mode.

Station Mode is what most people would consider the normal mode for a WiFi device. A device uses Station Mode to join a network that already exists, exactly like your smartphone does when it connects to your Wi-Fi network at home.

GliderTimer in STA mode is able to connect to your mobile hotspot (the AP here). In this way GliderTimer gains access to the internet and can send data to GliderScore cloud.

Before the competition starts, appoint one or two mobile phones to prepare their hotspot for doing this. We, in Escalona del Prado competition, made two mobiles to have a hotspot ssid called "Escalona1" with a password "123456789". Once this plan is in place then you have to configure all your GliderTimers involved to connect to this Wi-Fi (Escalona1 / 123456789). This is done in the UI: System/WiFi Setup.

After each round has been collected, go to vicinity of one of these hotspots and use the buttons Menu/PickData. Wait for your selected ssid to appear and select it.

You will see a screen like this, press select:



Wait for the unit to synchronise, "Full Sync!" to make the data transfer more reliable (some 20 secs) and then press "SEND->" button.

The recorded flights will be sent in backwards sequence from the recorded sequence and a Beep will be heard per successful flight sent and a Boop when something went wrong with a specific flight. A total of 'successful flights sent' and a



total of 'flights sent' will be displayed. If a flight's data was not sent, the data for that flight should be entered manually in GliderScore.

In this example, the two flights recorded in this round, none of them succeeded to upload.



NOTE: When you see a “Calibrated” message it means that the clock coefficients of GliderTimer were updated, this will only happen if more than 8 hours were elapsed since last Synchronisation.

NOTE: The only way of exiting after a Pick Data selection is by resetting (Power/Reset) the unit.

NOTE, IMPORTANT: Recorded competition data WILL NOT BE LOST when resetting the GliderTimer unit. So reset GliderTimer without any worry. This reset may be useful if all pilot’s data is already recorded and some flight time is still remaining, to upload data to GliderScore.

8. Updating the Schedule Table

We spoke of regenerating schedule tables in Section 5. There are 3 ways for regenerating this table, and subsequently upload to the GliderTimer units involved.

a) Use GliderScore (Recommended).

When GliderScore is used to generate this file it will be automatically saved in the eScoring cloud. It is then available for all units.

Go to your configured Hotspot. Select it and after synchronising push “Get Table”. After downloading the table, it will prompt you to save it indicating which is the next group to be flown. Save it.



In this example the collector unit (green) failed to get the scheduled rounds file, while the non-collector did receive a table which indicated that the next flight will be Round 8, Group 1.

Failing to get the table is related to a wrong Pilots_Master_File or due to no Internet access.



b) Manual Force to re-generate in a Non-collector Unit (GliderTmain).

When doing “Small Competition” with one non-collector (in the audio and panel) and one collector you may not want to prepare anything in GliderScore.

Select “Run Flight” from the Menu. It will warn you the unit is running in scheduled mode. Press “Overwrite Y”. Now select the prep time for the next launch. The table will be internally generated until the end of the competition. Reset the unit.

Now in the collector unit, near the non-collector to connect into it, go to Pick Data, select GliderTmain Wi-Fi and “get table” to download this newly generated table and save it, reset the units. Now your 2 units will have the same table with no need of any hotspot or internet access.

c) Use the Facility in UI/ GliderScore files.

Used in “Small competition” Click “Generate Schedule File” and you will see this screen.



GliderTimer

Create a Schedule File

Use next input to plan the schedule file.

This action will output a file named **scheduled_rounds.csv** that must be uploaded to other GliderTimer units

# Rounds	Grps/Rnd	Total Pilots	
<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="11"/>	
Start Date	Start Time		
<input type="text" value="28/06/2023"/>	<input type="text" value="14:50"/>		
Next Round	Next Group	Final Round	Final Group
<input type="text"/>	<input type="text"/>	<input type="text" value="1"/>	<input type="text" value="1"/>
All times must be specified in seconds			
Duration	Preparation Time	Additional Time	
<input type="text" value="600"/>	<input type="text" value="300"/>	<input type="text" value="60"/>	
<input type="button" value="Generate and Upload Schedule File"/>			

Fill the values as required and then click “Generate and Upload Schedule File”. Now you will have this file in the GliderTimer that was connected. To avoid error, the best way is to download this file to your PC in the “GliderScore Files” Screen. Then, upload the 3 files together again into the rest of GliderTimers involved. Alternatively if you configured the non-Collector unit, use method on b) to get the table.

9. GliderThrow screens

Due to memory space Fw 4.15 cannot support “Picking Data” from a GliderThrow. If you want to use this unit to visualize GliderThrow you can de-update Fw to existing 4.06. No need to change UI.

10. UTC Synchronisation. General requirements.

Before you start a competition, you have to make sure every GliderKeeper and GliderTimer were synchronised to UTC, you have seen in this document how to do with GliderTimers (this happens when you connect to the hotspot, see section 7, wait until “Full Sync!” appears), follow GliderKeeper manual for the GliderKeepers and GKSyncs involved.

Also, it is paramount every GliderTimer is formatted (memory cleaned) and competition is started, after the formatting: Menu/ Management/ Format Data and after Menu/Management/ New Compet. In each GliderTimer involved.





11. Panel Interface

Connector 2 is a removable screw terminal 4 pins. Only Tx, pin 1 (the more external one, bottom in above picture) and GND, pin 4 (the more internal, on top of the picture) have a connection., see the wiring in the back of the unit.

Tx pin is an UART 3,3v terminal, this configuration has been tested successfully with a 6m AWG22 servo wire cable. But depending on cable quality, configuration and environmental conditions may well work for longer distances.

Also depending on your receiver unit, you may need to install a voltage level shifter to either 5 or 12 volts.

Baud rate is configurable in General Settings screen to 9600 or 19200 bauds.

Protocol can be also configured to be the “Standard” protocol or the “Extended” protocol. As per the Embedded Ability (<https://www.embedded-ability.com/gliderscore-display-interface/>) panel driver manual.

Here in Gliderscore you have a very detailed information about protocols and ways of building your own panel <http://gliderscore.com/Audio.aspx>.

Since GliderTimer works in UTC without local time corrections (your PC or mobile will have them for their screens) GliderTimer, at the moment they will not show the local time during “Sleep Times”.

Please contact us if you have any pinout necessity or protocol change and we will try to help you.

I2C and USB Host options will, by the moment not work.

12. Audio Output

You can drive your own speaker from terminal (8) we recommend an 8 Ohms speaker.

The most of the cases you will be using 3,5 mm minijack output for an amplified system.

Supplied MicroSD card contains the soundtracks that are managed by GliderTimer.

We recommend you Backup this content as soon as you receive the unit.

In this MicroSD there are 4 folders: ADVERT, 01, 02, 03 and 37.

In the ADVERT folder you have the material to organise countdown and any other announcements played.

At the moment only the English language is supported for the announcements. Yes, we are working on providing other languages..

Place in folder 01, 02, 03 ambient music that will be played sequentially during prep time until a minute before the launch. Or replace these folders with the content of folder 37 which is a “silence” track that is played during the working time.

Try with different “Announcement Volume” and “Background Volume” to suit your audio system.



13. Manual Input Into GliderScore

GliderTimer uses the eScoring system provided by GliderScore, so you may want to print the standard score cards with a QR code. If necessary, you can use these QR codes to upload flights. For instance, a competitor who is not using a GliderKeeper altimeter, a specific GliderKeeper who refuses to engage GliderTimer, or the Competition Director may want to upload a specific flight.

Remember: eScoring only allows for one upload per pilot and round. After one upload has been done, either GliderTimer or manual, following changes to these flights must be done in the control desk.

14. Using GliderScore PC to drive Panel and Audio

Some users will find useful to use GliderScore PC using GliderScoreDigitalTimer that comes with GliderScore.

There are some requirements to make sure your PC clock is running within 50 msec from UTC during all the competition time.

Click on this link now:

<https://time.is/>

And you will notice why we are asking you all the things in Annex 6.

Apart of this consideration on PC clock some other cautions must be taken when running GliderScoreDigitalTimer:

- Use a sufficiently capable PC that is not overloaded running GliderScoreDigitalTimer.
- Do not move the mouse near the count downs moment.
- Do not upload/ download data near the count downs.

To start a competition, we recommend your clock offset is less than 10 milliseconds. Use the NTP monitor to check (Annex 6).

Operational method:

Create and upload the scheduled rounds to GliderScore cloud as per Annex 2.

Update and get_table as per Section 8 a) into all GliderTimer units involved.

Keep GliderScoreDigitalTimer running and it will manage Audio and Panel. Follow GliderScore manual.

When the competition sequence has to be interrupted, power down GliderTimers, as per Sections 5 and 8

Close GliderScoreDigitalTimer and create the new table as per this operational method, remember to create a new play list with the desired round and group.

Requirements:

GliderScoreDigitalTimer V1.15 or later

GliderScore V6.70 or later

NTP offset less than 10 milliseconds.

In the moment of publishing this manual V01(July 23) there are some areas in GliderScoreDigitalTimer that are in progress, being such that some 300 milliseconds, the audio signal may come late, so advise the



pilots to land with sufficient margin. Alternatively, you can use **Strict_Landing/Launch_Timing** to OFF (Section 4) to perform a manual confirmation for the flight are within working time.

We encourage user to check status of both GliderTimer and GliderScore versions to be in the latest standard as this is an area where improvements are expected.

By the moment to overcome the actual scatter of media player from machine to machine we are recommending to prepare a tailor-made correction in the .timer file in GliderScore such this correction is performed at the sound track level (.wav files).

-5	0:05	PT	<input type="checkbox"/>		5.wav	0	0	▶	<input type="checkbox"/>
-4	0:04	PT	<input type="checkbox"/>		4.wav	0	0	▶	<input type="checkbox"/>
-3	0:03	PT	<input type="checkbox"/>		3.wav	0	0	▶	<input type="checkbox"/>
-2	0:02	PT	<input type="checkbox"/>		2.wav	0	0	▶	<input type="checkbox"/>
-1	10:01	WT	<input type="checkbox"/>		1 with Start Horn and bells at 3.wav	0	0	▶	<input type="checkbox"/>
300	5:00	WT	<input type="checkbox"/>	5 minutes remaining	Remaining-5Mins.wav	0	0	▶	<input type="checkbox"/>

Note: "0" timer event has been removed

The 0 time event has been removed. The final count down StartHorn is already built in the .wav file

“1 with Start Horn and bells at 3.wav”

In this .wav file the lag that the PC shows has been corrected by reducing the time in between “one” speech and the horn by the amount we are expecting on a typical installation.

Edit your own file with a sound editor like Audacity, this editor is free and much more powerful than your need here. Download it:

<https://www.audacityteam.org/download/>

You can make this delay longer or shorter to make absolutely accurate Horn plays so pilots will have the best info for their flights.

15.Support

If you need some help, have a suggestion, something to improve, you think you found a bug or just want to share your opinion or pictures, please send us an email to support@gliderkeeper.com with as much detail you have available. Please send us details like ID#, SW version, captured screens, FlightData.bin of your flight and, if available, picture of the model or the airfield... in those questions that having this info can help to diagnose.

We always welcome your contact and will come back to you as soon as possible. It is our understanding that listening Customer Voice is the best way for us to improve.



16. Specifications

GliderTimer-PRO

Dimensions: 54 x 135 x 228 mm.

Weight: 155 gr.

External Speaker: 3W.

Screen: 320x240 RGB TFT.

Power Supply: 6,5-28v dual DC input; 5 V USB charger type C connector.

Current consumption: Approx. 200mA.

Battery: 1000 mAh 1S1P lipo.

Memory storage: Full Competition: 1 Competition 12 Rounds and 150 pilots

Small competition: 9 Competitions and 15 pilots (max 9 in each competition).

Panel Supported: 3.3v Serial 9600/19200 baud; Standard or Extended protocol **

Wi-Fi: 802.11 b/g/n WPA/2

Time Drift: Better than 2 parts per million.



Annex 1: SAFETY INSTRUCTIONS

By following the safety instructions below, and using common sense, will ensure your enjoyment of using your GliderTimer together with your model with no surprises. The following instructions are not essentially different to the ones that a responsible hobbyist should follow:

1. Read instructions.

All the safety and operating instructions should be read before GliderKeeper is operated.

2. Retain instructions.

The safety and operating instructions should be retained for future reference (for inst.: file it in your mobile).

3. Follow instructions.

Operating manual should be followed.

4. Persons.

GliderTimer can generate Radio Electric signals and is not a wearable. Use at more than 20 cm from human body. Special care should be taken for those that use an implanted medical device like a pacemaker (the same cautions you already take with a Radio Control transmitter).

5. Children

GliderTimer is not a toy and should be used by adults. Younger pilots under the direct supervision of an adult can also use GliderTimer but it is not recommended.

6. Commercial Aviation.

As Wi-Fi equipment, always follow instructions from the crew when using inside a commercial airplane cabin.

7. Water and Moisture.

GliderTimer is not water resistant. It should not be used in condensing environments.

8. Charging.

Always use USB type C cable and power from a 5v USB charger outlet or appropriate DC input in their suitable sockets.

9. Ventilation and cooling.

Do not leave GliderTimer powered inside a non-ventilated enclosure.

10. Installation.

Always install GliderTimer in such way that accidental drops are avoided.

11. Damage Requiring Service.

Disconnect GliderTimer and take to qualified service personnel under the following conditions:

- a) When signal and power connector is damaged
- b) If liquid has been spilled inside the device.



- c) If the product has been exposed to rain or water.
- d) If the product has been dropped or damaged in any manner.
- e) When GliderTimer does not work as expected.

12. Servicing.

The user should not attempt to service this product beyond that described in the operating instruction. There are no user serviceable parts inside GliderTimer.

13. Firmware Updates.

Always update GliderTimer firmware and User Interface with firmware coming from GliderKeeper.com.

NOTE: Do not try to update system via USB data cable. It requires advanced specialised skills. If not properly done, severe misconfiguration may occur and unit may not be operational anymore. Normally those misconfigured units would require servicing. Apart from shipping costs, reconfiguration service may incur additional charges.

14. Disposal.

When your GliderTimer has reached the end of its useful life do not dispose in regular waste. Contact your local authorities for disposing in an approved electronic equipment recycling container. Note there are LiPo batteries inside.



Annex 2: Competition Generation Executive Process.

This is the check list to follow when generation and uploading contest configuration files in all the involved GliderTimer units.

Competition Generation			
	Where	What	How
201	GliderScore	Prepare Competition In Gliderscore, pilots, rounds groups...	Use GliderScore manual
202	GliderScore	Every pilot to use Automatic TimeKeeping MUST have his/her GliderKeeper ID/ID's entered in GliderScore	When Setting the competition tick "Use Models", then input the GliderKeeper ID's in the "Device Serial Number". Serial number must be eleven characters long inclusive of the ":". you can Edit the pilot's Models in "Entry Pilot Menu". The models will be copied from the last competition of teach P
203	Gliderscore	Perform the draw	Use GliderScore manual
204	GliderScore	Export Pilots .csv file	Prepare a suitable folder in your computer. Select you competition. Reports. Pilot Master File. Check "QR Code string". Save as file (to your folder), take note of the file you gave (proposed file name: 1_competition name_pilot_master_file.csv).
205	GliderScore	Export Draw .csv file	eScoring. Electronic Scoring Inteface. Create file (proposed file name: 2_Draw_table.csv). Close
206	GliderScore	Open competition in eScoring	eScoring. Electronic Scoring Inteface. Upload to Server (public or private). Upload. Close
207	GliderScore	Generate schedule file	Open competition/ Audio & Timer(Digital Timer)/ Select your Playlist Settings/ Select starting Round and Group/ (make sure "Anounce next group AFTER prep time starts is ticked)Create Playlist/ Open Timer/ right Click on "Start" / select the appropрте moment for the prep time starts/ Click "Start Count Down". <i>NOTE: in this case generate a table of lauch times which is far away from your actual time since this inital upload is just for having confirmation the 3 files were successfully uploaded.</i>
208	PC file Browser	Copy Schedule file	Scheduled_rounds file will be in the Folder ...GliderScore6\Audio\GliderTimerSchedule. Copy this file and paste it in your competition folder (proposed file name: 3_competition name_Schedule.csv)
209	GliderTimer PRO	Format Data (if required)	Menu.Management. Format Data. Select. Reset the unit. Format is required at the begining of the competition before any launch time has happened.



210	GliderTimer PRO	New Competition (if required)	Menu.Management. New Compet. C# 1 (Classifying Flights). Repeat Management. New Competition for C# 2 (FLYOFF). Reset after the desired comp has been selected. We recommend "format" before Flyoff.
211	GliderTimer PRO	Confirm settings	Power ON. Menu. Pick Data. <i>Scroll to your AP.</i> Select.
212	PC Browser	Confirm settings	192.168.xx.yy [your IP]. System. General Setting. Confirm " Full Competition " is selected. Also confirm the type of annunciator panel is used. Revise Audio Volume settings. Confirm " Collector " is OFF (for themain unit and ON for the rest). Confirm " Strict Timing " is ON (if this is your plan):
213	PC Browser	Upload competition files	192.168.xx.yy [your IP]. GliderScore Files. Select the three previous files from your folder. Send Files.
214	PC Browser	Download schedule file	Now Click Dowload Schedule File in the previous browser tap. Select your folder and download.
215	GliderTimer (mini)	Format Data (if required)	Menu.Management. Format Data. Select. Format is required at the begining of the competition before any launch time has happened.
216	GliderTimer (mini)	New Competition (if required)	Menu.Management. New Compet. C# 1 (Classifying Flights). Repeat Managment. New Competition for C# 2 (FLYOFF). Reset after the desired comp has been selected. We recommend "format" before Flyoff.
217	GliderTimer (mini)	Confirm settings	Power ON. Menu. Pick Data. <i>Scroll to your AP.</i> Select.
218	PC Browser	Confirm settings	192.168.xx.yy [your IP]. System. General Setting. Confirm Goups is enabled and that Scheduled is enabled. KEEP COMPETTION STEP to 0.
219	PC Browser	Upload competition files	192.168.xx.yy [your IP]. GliderScore Files. Select the(now 3) three previous flies from your folder. Send Files.
220	GliderTimer (mini)	Repeat 109- 119 for each involved GliderTimer (mini) or PRO involved, Set thir collector	Take precaution when creating the scheduled flights hour to have enough time to perform these operations in all the units. Take care of their duty, normally these ones will be " Collector ON ".
221	Competition will now automatically develop according to the scheduled timetable.		



Annex 3: Competition Data Gathering.

This is the process to follow to gather Flight data once pilots with a GliderKeeper has landed in the landing spot.

Competition data gathering			
	Where	What	How
401	Landing Spot	Note landing distance	With a metric tape measure distance from landing spot to model's nose.
402	GliderKeeper	Enter Wi-Fi Mode	Hold vertically GliderKeeper or all the airplane in "nosedown". Keep RC transmitter as far and at ground level as viable.
403	GliderTimer (mini) or PRO	Capture Flight data	Hold both units within 20cm distance, GliderKeeper will enagare GliderTimer AP, a "BLEEP" will be heard on connection.
404	Landing Spot	Record in paper Flight Data	If requested record in Pilot's Score Card received data and landing distance
405	GliderTimer (mini) or PRO	Enter landing distance	Follow GliderTimer display instructions for the different circumstances as per F5J rules. Scroll landing distance wthih middle button. Store the flight pressing "select button" (right). Proceed to next pilot.
406	GliderTimer (mini) or PRO	Take next Pilot's flight data	Repeat 401- 405 until all assigned pilots have loaded their data. In each round.
407	Wi-Fi Area (Control Desk?)	Upload Flights to GliderScore	In the designated Wi-Fi Area. Reset. Menu. Pick Data. <i>Select the I-net enabled Wi-Fi.</i> When IP# is shown, Wait for Full Sync Message, push stored flight into GliderScore by pressing the right button (SEND->). A loop of as many flights as recorded in the round will be diplayed. Note the number of failed upload if any an report to CD. Flights wich would score 0 will be rejected (and a fail will be seen) by GliderScore in this: Emergency used, Too Early Launch or Landing time. All this upload MUST BE DONE BEFORE next launch horn is heard!!! If this is not possible: POWER GLIDERTIMER OFF and hand this unit to CD BEFORE the horn.
408	Landing Spot	Return to TimeKeeper duties	Reset unit BEFORE next launch horn and return to landing spots
409	GliderScore	Update competition	Score Entry. Press the download (Downward arrow). Make any manual corrections as needed. Press the upload key (Upwards arrow)



Annex 4: Repeat Data Gathering when GliderKeeper data Connection failed

Sometimes the link between a model's GliderKeeper does not work, normally it is because the noise generated by a RC transmitter made connection not possible.

Repeating After Failed Data Gathering			
	Where	What	How
501	GliderKeeper	Confirm failed connection	If GliderKeeper is already blue blinking and no transmission happened: FAILED
502	Landing Spot	Make sure transmitter is more than 4 meters from GliderTimer	Ask Kindly pilot to leave her/his transmitter on ground more than 4 meters away GliderTimer and model
503	GliderTimer (mini) or PRO	Reset unit	Reset unit by pressing red button in left side of the unit. Wait until GliderTimer picture appears.
504	GliderKeeper	Reset GliderKeeper being vertical	While the model is kept "nosedown" (or canopy vertical) disconnect model battery OFF and then connect it again.
505	Go to operation 403		

Annex 5: Schedule File Update in the GliderTimer units.

When the sequence of flights is interrupted you have to refresh the new table in all units to resume the competition.

Schedule File Update			
	Where	What	How
301	GliderTimer (mini) or PRO	Reset	Reset unit by pressing red button in left side of the unit. Wait until GliderTimer picture appears.
302	Wi-Fi Area (Control Desk?)	Update Schedule File	In the designated Wi-Fi Area. Menu. Pick Data. <i>Select the I-net enabled Wi-Fi.</i> When IP# is shown, Wait for Full Sync Message. Get Schedule table from GliderScore by pressing the middle button (get_table).
303	GliderTimer (mini) or PRO	Confirm the Table Received	After receiving the table Next Round and Group will be shown in the display. Confirm these values are the desired ones with Competition Director. If correct press (:Save). Pres Cancel if not correct.
304	GliderTimer (mini) or PRO	Reset unit	Reset unit by pressing red button in left side of the unit. Wait until GliderTimer picture appears. The unit is ready for subsequent data gathering. All this update MUST BE DONE BEFORE next launch horn is heard!!! If this is not possible: POWER GLIDERTIMER OFF and hand this unit to CD BEFORE the horn.



Annex 6: Installation of NTP client in your PC.

Some users will find useful to use GliderScore PC using GliderScoreDigitalTimer that comes with GliderScore.

There are some requirements to make sure your PC clock is running within 50 msec from UTC.

Click on this link now:

<https://time.is/>

And you will notice why we are asking you all the things below.

Time.windows.co does ask for an astronomic bandwidth and latencies to claim to be near this 50 msec accuracy so we recommend you install Meinberg NTP client.

In your Windows configuration Date and Time disable “automatic time update”.

Install Meinberg client with administrator rights (normally domestic PC will have users with administrator right, if this is not the case, contact with your administrator), from here:

<https://www.meinbergglobal.com/english/sw/ntp.htm>

Look for:

“NTP for current Windows versions (Windows XP and later), with IPv6 support” ...

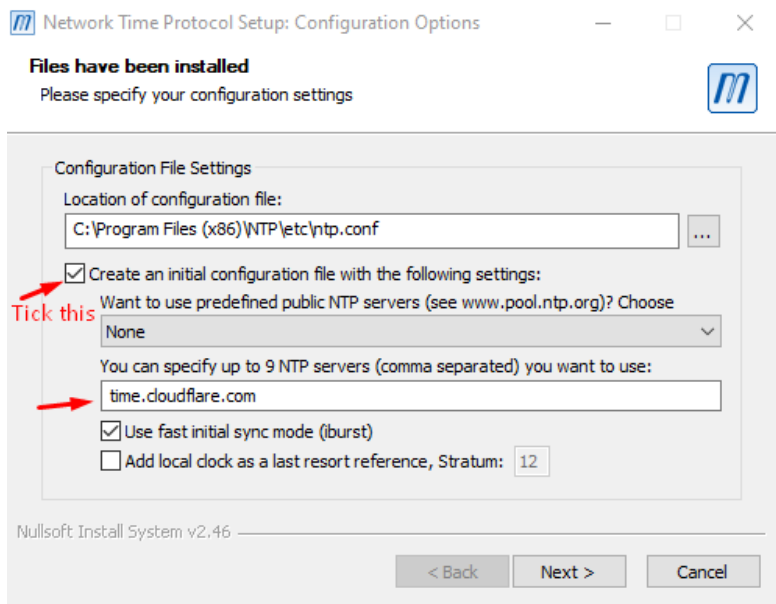
...in the page, and download installer program (by the time or release of this manual it was “ **ntp-4.2.8p15a-win32-setup.exe** (4.25 MB)” by clicking on the link, wait for download, and run it.

During installation

Specify the NTP server I used for GliderTimer and GKSync.

time.cloudflare.com

Like in this example



Cloudflare is a big global IT company doing Internet services and has this free of charge service.

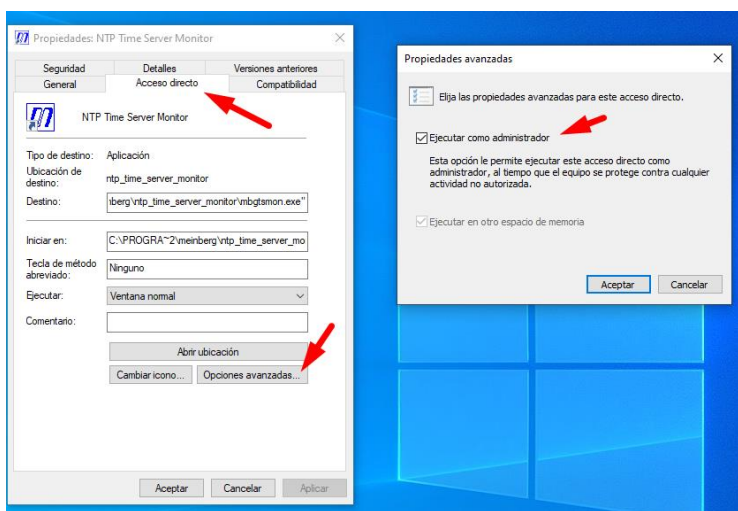


Also install “Windows NTP server monitor”:

<https://www.meinbergglobal.com/english/sw/ntp-server-monitor.htm>

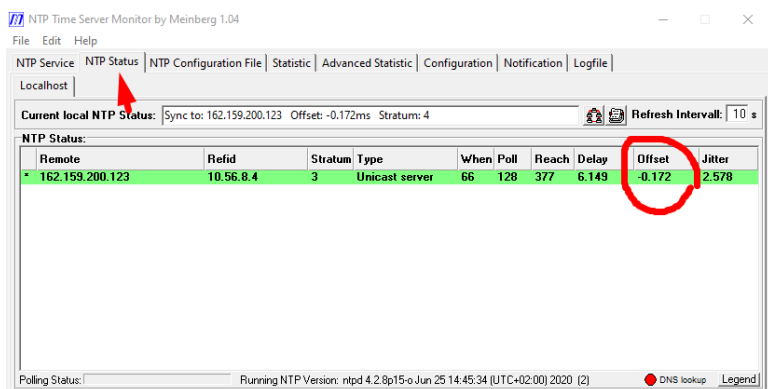
After installing the monitor create a direct access in your desktop:

Right click on the Direct Access, Click “Properties”, “Advanced options”, and once there, enable “Run as administrator”

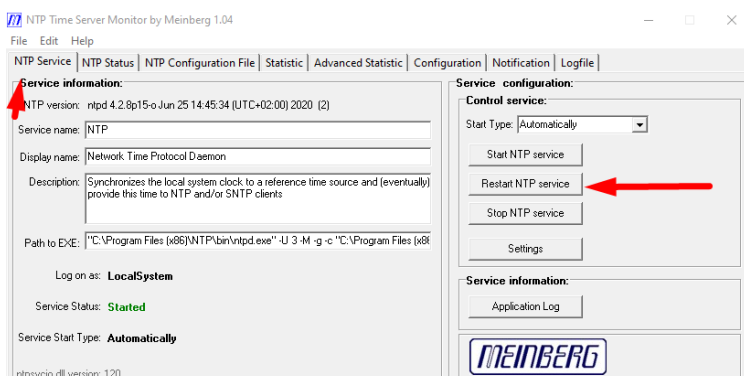


Every time when you run this “Windows NTP server monitor” you will be prompted something like “Do you allow this application to make changes in your PC” (normally in your system language), click yes.

From this monitor you will be able to see the status of the clock of your machine. Double click the direct access:



Also, you can restart the service:





If your system is out of tolerance.

Meinberg will not only change your clock to be updated to UTC but also will tune your PC internal clock to have a drift as low as possible.

Tuning your PC to be absolutely accurate is a kind of craftsmanship, you will have to tame your PC.

It will take several days until the clock is appropriately tuned and, like being in diet: forget saving battery.

-Disable suspension of your PC. Not only during competitions but a few weeks before, and have your PC with internet quite a few hours in these days before the competition.

With the experience we have right now suspension will cause jumps in the offset of your PC and subsequently it will confuse the fine tuning of your PC clock.

Annex 7: How to improve Wi-Fi link in some noisy environments.

If Wi-Fi connection is slow or it is lost, this could be because some other 2.4 GHz signals are present. Recommendations are given for a mobile Phone trying to connect in an airfield

1.- Carbon fibre fuselages can work as a shield for RF signals, install your GliderKeeper in a position where it can have direct line of sight to your terminal or GliderTimer.

2.- Avoid nearby transmitters. Leave your transmitter on ground 4-5 m away or switch off your radio.

3.- Get both units close together. Communications are best if both devices are close each other in the range of 0,5 to 1 m.

4.- Shield the devices from interferences. Your own body can work as an effective shield from a nearby noise source. A nice carbon wing is also a shield to try.

5.- Procure a better environment. Sometimes by moving just a couple of meters changes stationary waves that might be causing trouble. Something that always works is to go far enough away from noise sources.



Declaration of Conformity:



Konformitätserklärung
Declaration of Conformity
Déclaration de conformité
Dichiarazione di conformità
Declaración de conformidad

Hersteller / Verantwortliche Person
Manufacturer / responsible person
Fabricant / Personne responsable
Fabbricante / Persona responsabile
Fabricante / Persona responsable

Marta Lopez Lopez/ GliderKeeper.com

erklärt, dass das Produkt
declares that the product
déclare que le produit
dichiara, che il prodotto
declara que el product

GliderTimer Model 402

folgenden Normen entspricht:
complies following standards:
correspond aux suivantes norms:
corrisponde alle seguenti norme:
cumple las siguientes normas:

2014/53/UE
2014/30/UE
2011/65/UE
2001/95/CE

Draft EN 301 489-1	Mar, 2017
Draft EN 301 489-17	Mar, 2017
EN 300 328	Nov, 2016
EN 55024	Nov, 2010
EN 55032	Aug, 2015
EN 60950-1	2006
EN 60950-1/A1	Mar, 2010
EN 60950-1/A11	Mar, 2009
EN 60950-1/A12	Feb, 2011
EN 60950-1/A2	Aug, 2013
EN 62311	Jan, 2008

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Ort, Datum / Place and date of issue / Lieu et Date / Data e luogo / Fecha y lugar
Madrid, 20 , May 2021