

# Release Notes for Eggtimer Quantum Software 1.09G (2/2024)

## Internal Changes

### Validation Code Change

Previously, the Validation Code that is used to verify submission of the Arming, Disarming, and Deployment Test pages was generated with a pseudo-random algorithm, the numbers were generally random but they repeated after power-on. Because of this, there was the possibility of a “replay” of submitted browser pages, if the user “swiped” the page instead of closing them. For this to happen, the Validation Code imbedded in the swiped page would have to match the active Validation Code. In particular, if the user performed a deployment test immediately after power-on, swiped the test-submission page, powered off the Quantum, refreshed the test-submission page to resubmit the request (with the Quantum off), powered on the Quantum, connected to the Quantum’s SSID, then put the swiped page into the foreground it would repeat the deployment test. Yes, that’s a lot of things to happen to make the deployment test repeat, but we’ve had two reports of people actually doing this out in the field, basically because they performed a deployment test on their worktable and swiped the page instead of closing it, then restored the swiped page on the pad.

So, to prevent this from happening, we have changed the Validation Code routine to be based on the number of milliseconds since power-on, rather than being a pseudo-random sequence. It is extremely unlikely that any swiped or cached pages would have the same Validation Code imbedded in as the active code, so this change essentially prevents swiped/cached pages from causing a “replay”. The Validation Code will no longer repeat after power-on.

Note that the best practice is still to CLOSE THE BROWSER PAGE AFTER ARMING, DISARMING, OR PERFORMING A DEPLOYMENT TEST. We have updated the documentation to “remind” the user of this.

## **Release Notes for Eggtimer Quantum Software 1.09F (5/2023)**

### **Bug Fixes**

#### **Auto-Arm Failure with Servos**

If the Quantum was set to Auto-Arm and one of the deployment channels was set to Servo output, the auto-arm would fail because it was checking for continuity on the outputs. Auto-Arm has now been changed to ignore continuity checking regardless of the output type.

## **Release Notes for Eggtimer Quantum Software 1.09C (8/2022)**

### **New Features**

#### **Internal Temperature/Altitude Improvements**

Internal changes have been made to improve the accuracy of temperature readings, and the short-term stability of unfiltered pressure/altitude readings.

## **Release Notes for Eggtimer Quantum Software 1.09B (7/2022)**

### **New Features**

#### **Browser Page Improvements**

Internal changes have been made to improve the stability of the browser pages, and prevent processor resets during certain browser operations.

## **Release Notes for Eggtimer Quantum Software 1.09A (5/2022)**

### **New Features**

#### **Board Rev B1 Support**

The firmware has been changed slightly to support the B1 revision of the Quantum. These are internal changes to the firmware only, no functional changes have been made.

# Release Notes for Eggtimer Quantum Software 1.08Q (11/2021)

## New Features

### Armed Status Output

The pad for the Breakwire input function, which is rarely used, can now be reconfigured to go to a logic “high” (+3.3V) level when the Quantum is armed (it will be at 0V, “low” when disarmed). A new option (“BW Function”, options “Breakwire” {default} or “Status”) has been added to the Global Settings menu to support this function. This is to support a future product. It can also drive an external LED as a visual “Armed” indicator. If you do so, we recommend adding a 330 to 1000 ohm resistor in series with the LED for current-limiting.

### Additional Telemetry Support

A “Not Ready” code is now sent to the ETM (if used) whenever the Status menu on the Quantum is refreshed, when it is not armed. This will display as status “NR” on the Eggfinder LCD screen in Quantum mode.

### Nose Over Detect Changes

The Nose Over detect mechanism has been changed to be much more immune to baro pressure noise. Instead of being qualified only by the Low Velocity detection, it can also be triggered if one second of continuous samples with an altitude below apogee and with a velocity under abs(400 fps) occurs. This allows for huge amount of baro noise, without compromising the mach-protect deployment routine.

# Release Notes for Eggtimer Quantum Software 1.08K (5/2021)

## New Features

### Custom SSID

Previously, the Quantum broadcast a WiFi SSID that was “Quantum\_” plus the last six digits from the MAC address. Beginning with this version, you can now select your own custom SSID. This is very useful if you’re out in the field and there are a number of other Eggtimer Quantum users, it helps you find “your” Quantum. It’s also very useful if you have a rocket with more than one Quantum so you can tell which one is which.

This field has been added to the Hardware Setup menu (192.168.4.1/hsetup). It takes effect after the Quantum is power-cycled, so if you change it you should close the window and power cycle your Quantum. Since it’s a new connection you will have to re-enter the passkey (which does NOT change), if you forgot it you’ll need to connect to the serial data connector and recover the passkey per the procedure at the end of the Eggtimer Quantum User’s Guide.

### Enhanced Telemetry

The Quantum now sends out real-time telemetry data for use with the Eggtimer Telemetry Module and the Eggfinder LCD receiver. Among other things, it sends out real-time altitude, velocity, flight status, channel status, and apogee. Full details are in the Eggtimer Telemetry Module User’s Guide.

### Change to “I’m Armed” Sound

The sound that the Quantum makes when armed has been changed to the same “chirping” sound as other Eggtimer altimeters, from the short beep every second. It was pointed out to us that the short beep sound was too much like the beeps for “other” altimeters, and was difficult to pick out of the sound of multiple altimeters.

If you’re not familiar with that sound, we recommend that after updating the firmware you turn both channels OFF and arm the Quantum so you can hear what it sounds like. It’s very distinctive... you’re not going to mistake it for anything else.

## Bug Fixes

### Altitude Display Bug Fixed

Previously, altitudes over about 32,000’ may have been reported as a very large negative altitude. This issue has been resolved and altitudes up to a bit over 60,000’ will now display properly.

### Extraneous LF’s Removed from Flight Detail

Depending on the platform, extra line feeds may have been inserted when downloading the flight detail data. That issue has been resolved.

# Release Notes for Eggtimer Quantum Software 1.07C

## New Features

### Auto-Arming

An auto-arming feature has been added, when enabled from the Global Settings menu it causes the Quantum to arm for flight after a 60-second waiting period from power-on (assuming that all enabled output channels pass the continuity check). This will make it easier on users with multiple electronic devices in their AV bays, in which the Quantum's remote arming procedure may be significantly different than the "other" altimeters.

### Changes to LDA Altitude

By popular demand, the minimum LDA altitude has been changed from 100' to 50'. This will help pick up launch detect earlier for high-thrust motors, and also for water rockets.

# Release Notes for Eggtimer Quantum Software 1.07A

## New Features

### Drogue/Airstart Delays and Main Deploy Altitudes Extended

By popular demand, the maximum delays for the airstart delay (from Start of Flight) has been extended from 10 seconds to 30 seconds. Similarly, the maximum delay from nose-over to drogue (or whatever you're using it for...) has been extended from 9.9 seconds to 30 seconds. The Main Deployment Altitude has also been increased from a maximum of 2,000' to 3,000'.

### Change in Landing Detection Code

The landing detection code has been changed, instead of being AGL < 30' for 5 seconds it is now detected if your altitude is under half of the apogee, and the rocket's altitude has not changed by more than 10' for 5 seconds. This is more accurate, and properly handles situations in which you land on a small hill (or ugh, a tree...).

### Startup Diagnostics

If you connect the USB-Serial cable at startup, you will see hardware status displayed as it starts up. Each of the startup beeps represents a hardware check (it beeps if it's OK), with the long beep being the "I'm ready" indicator.

### Internal Code Cleanup

Some internal code changes and cleanups were made to improve the reliability, and manageability of the code.

# Release Notes for Eggtimer Quantum Software 1.06Q

## New Features

### Hardware Setup/Voltage Offset Menu

Because of hardware differences in the Rev A18 board and the older versions, the battery voltage display on the Main Status page is not correct with the default settings. To fix this, the difference between the voltage offset between the A12/A12f's full-wave bridge and the A18's rectifiers needs to be subtracted, that's about 1.0V.

A new screen at <http://192.168.4.1/hsetup> has been added to allow you to change the voltage offset so that the battery voltage is reported correctly. For the A12/A12f boards, it should be about 1.2V (the default); for the A18 board it should be about 0.2V.

# Release Notes for Eggtimer Quantum Software 1.06P

## New Features

### Failsafe-Only Mode for Main

It is now possible to have the Main channel (in Deployment mode only) set so that it will only fire if the Failsafe is triggered, without having it fire when the rocket descends below a minimum altitude. This was a user-requested enhancement, in order to use the Quantum as a backup altimeter only.

## Bug Fixes

### Incorrect Main & Failsafe Time Written to Memory

The routine that handles the Main & Failsafe deployments was overwriting the “start” of the deployment cycle at each interval until the cycle was finished, instead of only at the beginning. This meant that the reported Main or Failsafe triggered time was late by the length of the triggered time. The actual trigger was not affected, only the reporting.



# Release Notes for Eggtimer Quantum Software 1.06N

## New Features

### Airstart Code

Airstart timer capabilities have been added to the Quantum software. You select the Quantum to be either a standard deployment controller (its default mode) or an airstart controller with a special URL. Once selected, the menus change to reflect the differences in options. Airstarts are timed from launch detect (not the LDA, the actual launch) and can be qualified with altitude@time, velocity@time, and/or breakwire detect. Due to the complexity of electronic airstarts, there is a new manual, Eggtimer Quantum Airstart Manual, that discusses the functions and some of the things you need to know when planning an airstart.

## Bug Fixes

### Low Velocity Routine Change

It was discovered that under some very rare circumstances (most likely only occurring with airstarts) that the low velocity routine may not pick up apogee properly, and may keep deployments from occurring. The Low Velocity routine has been changed to keep this from happening. Note that we have no reports of this actually occurring in the field; we made it happen while testing the airstart code (yes, big ouch...)

# Release Notes for Eggtimer Quantum Software 1.05

## Bug Fixes

### Low Temperature Fix for Altitude

It was discovered in early morning Fall flight testing that the barometric pressure (and therefore, the reported altitude) became wildly inaccurate at temperatures below approximately 60 F, and caused a hardware fault at power-up. After some diagnostic work, we found that there was an error in the temperature compensation route for the baro sensor, it has been fixed, and we have confirmed that it works accurately from 0 F all the way to 150 F.

# Release Notes for Eggtimer Quantum Software 1.04a

## Bug Fixes

### Improvements to WiFi Connection Reliability

The WiFi code has been changed to make it more reliable and persistent. Previously, it was possible that a strong outside WiFi signal on Channel 1 might prevent the Quantum from sending out a WiFi “beacon”, and make it unconnectible. This is much less likely with this release.

# Release Notes for Eggtimer Quantum Software 1.03

## Bug Fixes

### Page Change for Deployment Test

Previously, it was possible to resubmit a deployment test that had been completed if the validation code had not been changed, and the page URL with the previous validation code was resubmitted. This was possible in some browsers if you hit the back button from the browser, or picked the validated URL, immediately after reconnecting to the Quantum's WiFi interface after having previously disconnected from it right after the deployment test.

While the chance of this happening seems remote, it has happened out in the field. A flyer with two Quantums in their rocket tested both at their work table, put it back together, and attached to the second Quantum on the pad to arm it. When he launched his browser, it was from the last cached setting, which was the validated test URL. He put the phone down for a few seconds, and didn't notice that the deployment countdown was going on, and... pop.

To prevent this, when a deployment test is completed a new random validation code is generated. This prevents a cached page from launching a test, because it will fail the validation; instead, you'll get the test home page.

# Release Notes for Eggtimer Quantum Software 1.02b

## Bug Fixes

### Changes to Servo Routines

The servo routines “sometimes” caused the Quantum’s processor to reset. In addition, the pulse widths were not always consistent with R/C standards. The servo routines have been rewritten from scratch and carefully checked so that they will no longer cause a processor reset, and they are as close to the standard (1.0 ms – 2.0 ms “on” in a 20 ms cycle) as we can get them.

### Continuous Firing-Time in Igniter Mode

The continuous firing time has been fixed, previously it did not work properly. If you select this option, the channel will be held “on” until landing. Do NOT use this with high-current loads (such as a hotwire line-cutter) or you may damage the output transistors and/or reset the Quantum (if you’re using a single battery). Also, note that if you select this option and do a deployment test it will fire for 9 seconds, it will not stay on forever.

### Large Values of Drogue Delay Saved Incorrectly

Drogue delays over 2500 ms were being changed to zero, this has been fixed.

### Continuity Check

The continuity check for the Main channel sometimes showed a false “OFF” reading when there was actually continuity, preventing you from arming the Quantum for flight. It’s been fixed.

## Features/Changes

### Page Changes

The servo Direction/Skew setting in the Global Settings page has been changed to be in percent of travel rather than degrees, since many servos do not rotate a full 180 degrees. For example, if you had previously selected “CCW 90 Degrees” the new value will be “CCW 100%”.

The Deployment Test page now shows the current deployment channel settings as well as the deployment channel continuity status.

The Flight Select page now shows an empty memory location as “No Flt”, and the link to “More” is suppressed.

We’ve added a selection to the Main deployment channel to fire at Nose-Over, at the request of an ARLISS mentor. This allows you to fire the Main near apogee, then use the Drogue channel to deploy

the CanSats at apogee + 6 secs. by selecting a delay of 5.0 secs. If you don't know what we're talking about, you should check out [arliss.org](http://arliss.org)... it's really cool stuff.

All of the HTML pages now tell the browser to not cache any of the pages. Whether or not the browser listens is up to the browser. Note that you can still get a "dirty" page by clicking the Back button on your browser, there's no way to disable that. Don't do it.

## **Documentation Changes**

### **Servo-Related Changes**

We are now recommending that if you use servos larger than the "micro" type that you use a separate battery to power them. The chance of a large servo causing a power sag that resets the processor is there, so it's prudent to avoid that scenario.

We are also recommending that you add a .1 uF and a 220uF-470uF electrolytic capacitor to any servos to filter the power and signal noise. Details are in the Eggtimer Quantum User's Guide.

### **Screen Changes**

The Status Page screen shot was changed to reflect the version change from 1.01 to 1.02.

The Deployment Test screen shot was changed to reflect the version change from 1.01 to 1.02.