

**G2110E2, G2110E2A, G2110E2C,
G2110E2D, G2110E4D, G5-2D, G5-D, and
G5-2A GPS-Iridium Collars
Including *Neolink* (G2110E2 and G5-2D)**

User's Manual

IMPORTANT: Your G2110E2 series and G5 series Iridium/GPS Collar HAS NOT BEEN PROGRAMMED for operation. You must program it in order for it to function. In addition, for the model G210E2 ONLY, the Iridium Data Service HAS NOT been activated. Contact ATS to activate your data service by collar serial number prior to deployment.

For all other models, the data service HAS BEEN activated, prior to leaving the factory.

NOTE: Collars ARE NOT refurbishable (except model G2110E2). Do not return collars for refurbishment service or disposal.

Table of Contents

Section 1	Introduction.....	3
Section 2	Theory of Operation	4
Section 3	Programming the Collars via ATSFixes.....	4
Section 4	Collar Functionality	9
Section 5	Attaching the Collar	12
Section 6	Downloading Data from the Collar.....	13
Section 7	Receiving Data from the Deployed Collar	15
Section 8	Remote Commands	17
Section 9	Satellite Transmission Suppression	17
Section 10	Diagnostics.....	18
Section 11	Data Conversion.....	20
Section 12	Neolink VIT System	21
Section 13	Neolink Fawn Collar System	26
Section 14	Programming a <i>Neolink</i> Device	31
Section 15	Geofencing System	33
Section 16	Warranty and Service	35


Section 1 Introduction

Thank you for purchasing ATS Iridium/GPS Collars.

Please note that this manual applies to the complete line of G2110E2 Collars and G5 series collar models. Although there are differences in the collar models, e.g. remote release capability, battery type, etc., all models are programmed and operated in essentially the same manner. When a difference exists between model operation, this manual will highlight that difference like this: **(G2110E2 and G5-2D ONLY) Otherwise, please remember that models G2110E2, G2110E2A, G2110E2D, G2110E4D, G5-2D, G5-D, and G5-2A are being referenced.**

The collar you have received has not been programmed. You will need to load a fix schedule program into the Collar(s) to control the collar's operation. The software to program is called *ATSFixes* for Satellite Collars, and it can be downloaded from www.atstrack.com.

ATSFixes for Satellite Collars will guide you through the programming process.

Complete documentation is available within the different software pages, indicated by the  icon. Click on the icon for *help* details.

The magnet you see attached to the collar keeps it running at a lower power. While you are not using your Collar(s), leave the magnet attached.

The ATS Iridium//GPS Collar requires use of a PC/GPS *Wildlink* module, PN 17621 (Figure 1). The *Wildlink* module enables the Collar(s) to communicate with a PC for programming and data uploads.



Figure 1. ATS PC/GPS *Wildlink* module, PN 17621 (with USB cable)

IMPORTANT: Your Collar(s) HAS NOT BEEN PROGRAMMED for operation. You must program it to function.

***(G2110E2 Collar(s) ONLY)*: The Iridium data service HAS NOT been activated for the model G2110E2 model. Contact ATS to activate your data service by collar serial number prior to deployment.**

Data service HAS BEEN activated for models G2110E2A/C/D/4D and all G5 series Collars.

Section 2 Theory of Operation

The ATS Iridium/GPS Collar models consist of the following different assemblies:

1) the collar belting, or attachment mechanism, 2) an electronics assembly which is attached to the collar belting, 3) various antennas for VHF, GPS and Iridium systems, 4) a battery supply.

The electronics housing consists of a VHF transmitter, like those found on traditional VHF beacon collars, a GPS receiver chipset, and an Iridium satellite modem. Each has its own antenna, as noted above.

The collar has a magnetic on/off switch indicated by two dots. When a magnet is placed at or near this location VHF, GPS, and satellite transmissions are disabled so that the collar stays in its lowest power state.

The Collar(s) stores all location data in the flash memory of the collar's electronics. Location data is sent periodically to the Iridium satellite system according to the schedule selected for the Collar(s). The data is then down-linked automatically to the Iridium's ground based reception and processing center, thence sent via the web to ATS's Hosting Computer. After the data is processed, it is automatically uploaded to the ATS Iridium web database. The data may also be retrieved by PC via the *Wildlink* module.

The VHF transmitter is used to locate the animal in order to retrieve the collar.

Section 3 Programming the Collars via ATSFixes

Installing ATSFixes for Satellite Collars Software

To install ATSFixes for Satellite Collars, double click on the setup file located in the installation package. The software will be installed on your computer, and you can find it later under the programs list on your computer.

The installation for the *ATSFixes* for Satellite Collars software will create some folders on the C: (hard) drive of your computer.

Wildlink Module Setup

The *Wildlink* module driver must be installed prior to using *ATSFixes* for Satellite Collars to program the Collar(s) collar. (Administrative rights may be required to install the driver.) To install the driver, double click on the executable that pertains to your PC's operating system and bit size (path as indicated):

- CP210xVCPInstaller_x64.exe (Windows 10; 64-bit; \W100 Driver Windows 10\CP210x_Windows_Drivers)
- CP210xVCPInstaller_x86.exe (Windows 10; 32-bit; \W100 Driver Windows 10\CP210x_Windows_Drivers)
- - CP210xVCPInstaller_x64.exe (Windows XP, 7, 8; 64-bit; \W100 Driver Windows XP_7_8\CP210x_VCP_Windows)
- CP210xVCPInstaller_x86.exe (Windows 10; 32-bit; \W100 Driver Windows XP_7_8\CP210x_VCP_Windows)

Follow the instructions on the screen.

Programming Your Collar(s)

The collar program you create for the Collar(s) will control the GPS fix schedule, VHF transmitter operation, and satellite transmission schedule. All settings are the same for each year i.e. different years cannot have unique program schedules.

Life Estimation

The *ATSFixes* for Satellite Collars Programming Software will estimate the life that you can expect from your Collar(s). If you need more life from your Collar(s) than what is estimated, you can go back and adjust the program to give your Collar(s) a longer life. You might decide to take fewer fixes each day, or you might program the VHF beacon to operate on a limited basis, i.e. place the VHF on a duty cycle.

Note: Calculations for life estimates assume that the batteries are new.

Steps to Start Collar(s) Programming

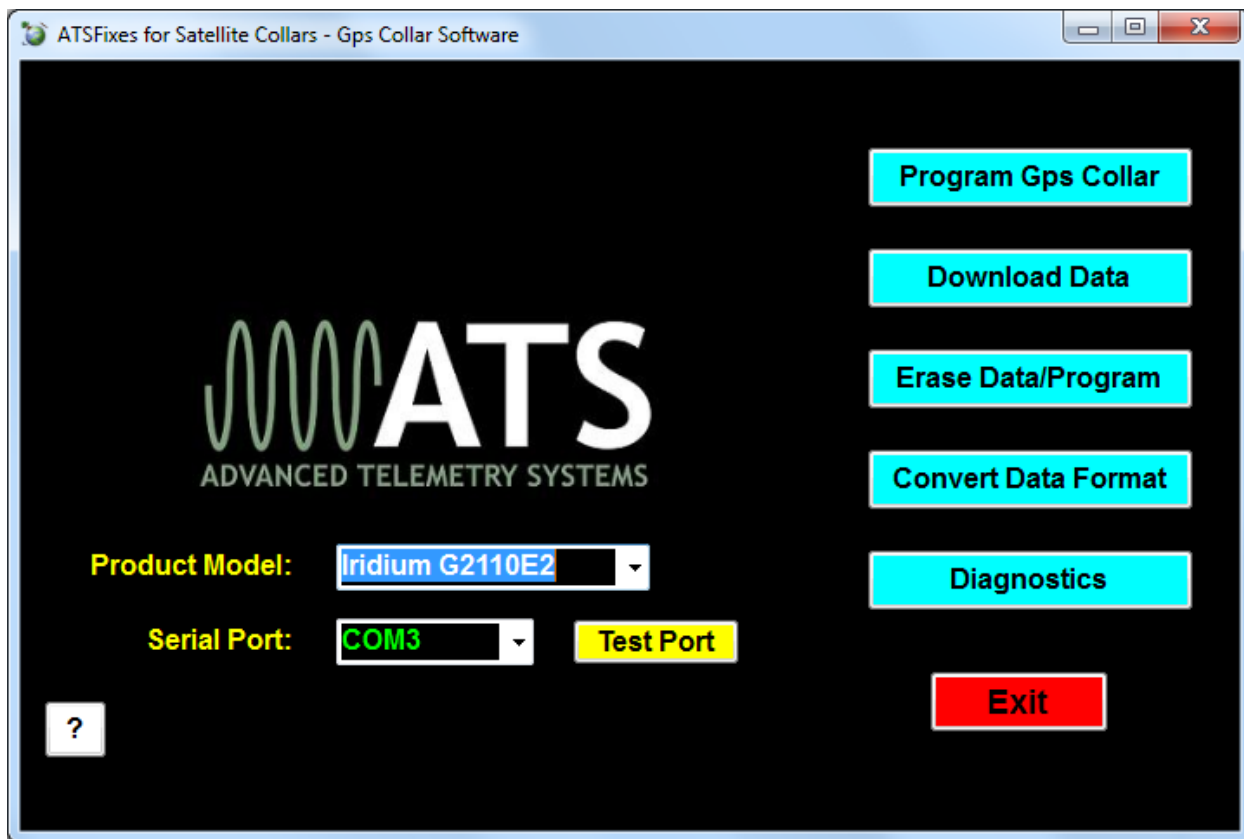


Figure 2. ATSFixes for Satellite Collars – Main Page

To load a program into the Collar(s), the *Wildlink* module will need to be connected (via USB port) to the PC running the ATSFixes for Satellite Collars software. Connect the *Wildlink* prior to starting ATSFixes and allow the PC time to detect the *Wildlink* if necessary. Also, the collar will need to be in range of the *Wildlink* module (about 200 mm) to successfully upload a fix schedule to the collar. Note: Remove magnet prior to programming.

1. Open the ATSFixes for Satellite Collars Software. It should look similar to Figure 2. The software will recognize all serial ports available when starting.
2. From the Product Model listing, select the Iridium Collar(s) option, or other model that you are using.
3. For the Serial Port option select the COM port associated with the *Wildlink* module. A guess and check may be used to determine the correct COM port to use (not preferred) or Windows' Device Manager tool can be used to determine which COM port should be selected. The *Wildlink* module will be associated with whichever port the 'Silicon Labs CP210x' COM port is listed under. If the *Wildlink* module was not connected to the PC before ATSFixes was started, the correct COM port will not show up. Be sure to connect the *Wildlink* module before starting ATSFixes.

4. Click on the “Program GPS Collar” button to start creating a program for the Collar(s).
5. After clicking “Program GPS Collar,” you will get the following page (see Figure 3). Select options for each programming section. Each section has a help button [?] that goes over further details related to the section. Note that no offset exists to distinguish between standard time and daylight savings time. Click Next when finished with the page.

Programming GPS Collar: Step 1 - Study Area, VHF Transmitter, and Satellite Transmission

Study Area Terrain and Time Zone ?

- ☐ Open Field or Low Brush (60 sec)
- ☐ Forest (120 sec)
- ☐ Heavy Canopy (180 sec)

Fix times depend on the collar having line of sight with the satellites and time between fixes.

Expect longer gps fix times (resulting in shorter life) for study areas with heavy canopy. Expect shorter gps fix times (resulting in longer life) for study areas that are open.

Satellite Transmission Interval ?

- ☐ 4 hour (00, 04, 08, 12, 16 GMT)
- ☐ 6 hour (00, 06, 12, 18 GMT)
- ☐ 8 hour (00, 08, 16 GMT)
- ☒ 12 hour (00, 12 GMT)
- ☐ 24 hour (00 GMT every day)
- ☐ 48 hour (00 GMT every 2 days)
- ☐ 72 hour (00 GMT every 3 days)
- ☐ 96 hour (00 GMT every 4 days)
- ☐ 120 hour (00 GMT every 5 days)
- ☐ 144 hour (00 GMT every 6 days)
- ☐ 168 hour (00 GMT every 7 days)

The Collar will transmit fixes to the satellite at this interval, regardless of the number of successful fixes accumulated.

If the Collar accumulates 22 successful fixes, it will transmit them to the satellite immediately.

VHF Transmitter ?

☐ On 24 Hours/Day

VHF transmitter can be turned on and off to conserve battery life.

Time On: Time Off:

Make certain VHF is on during all hours when you will be searching for animals. Minimum 1 hour per day.

☒ Activate Mortality ☐ Fast pulse rate ☒ Slow pulse rate

☐ 4 hour ☐ 6 hour ☐ 8 hour ☐ 10 hour ☐ 12 hour

Iridium G2110E2

New Collar Program

Previous Next

Figure 3. Programming GPS Collar: Step 1.

6. Next, the Fix Schedule, Options, Estimated Life window should appear (see Figure 4). This page contains the GPS fix schedule options. You can also set up alarm options on this page for the *Neolink* system (see Section 12, 13 and 14 for more details). Lastly, a life estimate can be obtained using the life calculator. When the schedule is ready to be uploaded to the collar, click on the Program Collar button. Then touch the magnet to the collar where the magnet stays during off mode and remove the magnet. If done correctly the PC will begin uploading a schedule to the collar.

Fix Schedule, Options, Estimated Life: Step 2

Fix Schedules	Options	Estimated Life
<p>Beginning Julian Day: 001 <small>Note: If this is the only schedule entered, it will be used for ALL days.</small></p> <p>first fix of the day at [] and last fix at [] fix every []</p> <p>Beginning Julian Day: [] 8/10/2017 []</p> <p>first fix of the day at [] and last fix at [] fix every []</p> <p>Beginning Julian Day: [] 8/10/2017 []</p> <p>first fix of the day at [] and last fix at [] fix every []</p>	<p>Options</p> <p><input checked="" type="radio"/> None</p> <p><input type="radio"/> Vit / Fawn Events</p> <p><input type="radio"/> Use Geofencing</p> <p><small>Choosing events will require more information.</small></p> <p><small>Geofencing requires polygon coordinates in Google .kml or ESRI .shp format.</small></p>	<p>Estimated Life</p> <p>Typical Case: [] Days</p> <p>Worst Case: [] Days</p> <p>Calculate Life</p>
<p>Cancel</p>	<p>Program Collar</p>	

Figure 4. Fix Schedule, Options, Estimated Life.

- When *ATSFixes* is done uploading the program, there will be a message to the PC's screen. If it is a success message, programming is complete. If it is an error message, repeat programming.

Once *ATSFixes* successfully programs a collar, a configuration file will be created and added to the folders. The file contains all the information for the program that was uploaded to a collar, including the serial number of the collar. If you ever have doubts about how you programmed a collar or what VHF frequency the collar is transmitting on, you can look up the information in this file. This file is stored in the C:/Advanced Telemetry Systems, Inc./GPS/GPS_COLLAR_PROGRAMS folder.

Reprogramming a Collar(s)

If you want to change the program of a Collar(s), you will need to first erase the current program (and any stored data). Use the Erase Data/Program button to erase the Collar(s) program and data before reprogramming it. **Be sure that you have first downloaded any stored data you wish to keep.**

If there is any concern whether or not a collar is programmed, you can use *ATSFixes* to determine if a collar is programmed or not. See section 10 Diagnostics for details.

Section 4 Collar Functionality

VHF Beacon Beep Patterns

The Collar(s) includes a VHF transmitter that can be used to locate the collar. The VHF transmitter can be scheduled to run continuously or only during a certain period of hours each day. The VHF transmitter can beep, or pulse, at 48 pulses per minute and 30 pulses per minute (ppm), or 80 ppm depending on the rate selected for mortality. There are different beep patterns to alert you to the status of the collar. Some beep patterns have double or triple pulses, which are used to indicate various operating conditions to the listener. The VHF transmitter will not be operating while the collar is obtaining GPS Fixes, downloading data, or if you are loading a program into the collar.

The VHF transmitter can be programmed to stay off for up to 23 hours each day in order to extend Collar(s) life. The VHF transmitter also has some obligatory beep patterns which you will hear regardless of whether the transmitter was scheduled to be active.

The different operating modes of the collar and the associated VHF patterns are as follows:

Normal operation (with unsuccessful last fix) = 48 ppm single, duty cycle applies

Normal operation (with successful last fix) = 48 ppm single with double every 6th, duty cycle applies

Mortality mode with slow rate enabled = 30 ppm, duty cycle override

Mortality mode with fast rate enabled = 80 ppm, duty cycle override

Collar released successfully = Mortality VHF, if enabled. If mortality is not enabled, 30 ppm. Duty cycle override.

Low Battery = Mortality VHF, if enabled. If mortality not enabled, 30 ppm. Duty cycle override.

After erasing program and data = no VHF.

After removing magnet = After a silent period of up to 30 seconds, VHF pattern will be pattern that was emitted prior to magnet going on to the collar

VIT not synced (if applicable) – triple pulse within a 10 second period.

GPS Operation

During a GPS fix attempt, the VHF transmitter will be silent. A GPS attempt may last as long as the setting that was selected during programming but may also be shorter depending on the

collar's view of the sky. Whether the fix attempt was successful or not will be indicated by the VHF beep pattern that follows the attempt. *You will only hear these beep patterns if the VHF transmitter was scheduled to beep during this time.*

Satellite Transmission Operation

During a satellite data transmission attempt, the VHF transmitter will be silent for up to 30 seconds. If the transmission was successful, data will be transmitted to the ATS server for processing. If the transmission is not successful, the collar will attempt another transmission in twelve minutes (provided that the transmission attempt does not conflict with a GPS fix attempt). If the collar fails to transmit data for ten consecutive attempts, the collar will enter **Satellite Transmission Suppression** (see Section 9 Satellite Transmission Suppression for more details).

Remote Commands

The GPS fix schedule of your Collar(s) can be adjusted remotely via satellite to a regular interval. Available intervals are (in minutes): 10, 20, 30, 90, 120, 360, 480, 720, and 1440. The schedule can also be adjusted from these intervals back to the original schedule. Note: Adjusting the fix schedule may interfere with the programmed frequency of the email transmissions.

The GPS fix attempt duration can be adjusted remotely via satellite to one of three options: 60 seconds, 120 seconds, or 180 seconds.

The mortality setting of the Collar(s) can be adjusted remotely. Available settings are four hours, six hours, eight hours, ten hours, twelve hours, and mortality disabled. The satellite email schedule can be changed remotely. Available intervals are every 4, 6, 8, 12, 24, 48, 72, 96, 120, 144, or 168 hours.

Finally, the collar can be released remotely with a command as well ***(G2110E2 ONLY)***.

NOTE: *(G2110E2 ONLY)* The Collar is automatically configured to release when the main battery voltage is low.

For all remote requests, the changes will take place after the next email transmission, not when the remote command is issued. See Section 8 Remote Commands for more details regarding remote programming.

Mortality

If you choose to use mortality when you program the collar with the *ATSFixes* for Satellite Collars software, the collar will immediately initiate an email transmission sequence if the collar goes into mortality. If successful, you will receive an email to let you know that the collar is in mortality. In the event of a false mortality, it is possible that the collar may get out of mortality before a successful transmission takes place. The email transmission will still be attempted until ten attempts are reached and if successful will indicate mortality was *not* reached. Also, if the

satellite antennas do not have an adequate view of the sky, as may potentially occur with a true mortality, no email may be received immediately following a mortality.

In addition to the mortality email, the VHF will change to the Mortality VHF. The mortality VHF will override a duty cycle if one has been set up.

In order for the Collar(s) to exit mortality mode, the collar must undergo thirty seconds of activity. (The thirty seconds of activity does not have to be consecutive but should be within the mortality period chosen.)

Neolink* Events *(G2110E2 and G5-2D Collars ONLY)

If your Collar(s) collar is part of a *Neolink* system and is programmed to detect *Neolink* devices, it will regularly attempt to detect the presence of a *Neolink* device such as the M3930U (VIT) or the M4230U (expandable fawn collar). If certain conditions are met for the *Neolink* devices, the Collar(s) will transmit an alarm to the customer to signify the event. See Sections 12, 13, and 14 for more details. If the *Neolink* system is not necessary, it should not be enabled in order to save battery life.

Geofencing System *(G2110E2 and G5 series Collars ONLY)*

If your G2110E collar is programmed with Geofencing capability, it will transmit alerts when it determines that it has entered/exited specific areas. See Section 15 for more details.

Section 5 Attaching the Collar



Figure 5. Collar attachment

Your Collar(s) has been optimized according to the collar dimensions specified during ordering. The size of the collar is determined by the collar adjustment bracket and the main collar holes (see Figure 5). To adjust the collar and/or attach the collar to an animal, the procedure is as follows (some differences may exist between models):

1. First remove the collar adjustment bracket nuts and plate from the collar adjustment bracket and remove the collar adjustment bracket from the main collar.
2. Wrap the collar around the animal's neck so that the extra length (if any) of the main collar is tucked inside the main collar end with the VHF antenna. The extra length can also be cut if desired.
3. Observe where the set of holes on the VHF antenna end of the main collar line up with the holes on the other end of the main collar such as to maintain a desired tension level on the animal's neck.

4. Place the collar attachment bracket through both sets of holes and through the brass bracket and tighten the collar adjustment bracket nuts using the provided nut driver. Do not over-tighten as this may damage the collar adjustment bracket.
5. Finally ensure that the case nuts have been tightened before releasing the animal.

Section 6 Downloading Data from the Collar

Once GPS position data has been stored in the Collar(s) memory, e.g. after testing or field retrieval, it can be downloaded to your computer. Data is grouped into two categories: Fix Data and Event Data. All models will have Fix Data. This is the GPS data and corresponding data that the collar acquires. The other data is Event Data. Only collars used for *Neolink* or Geofencing have data in this category. You may only download one group of data at a time. Note that during data download, the VHF transmitter will be silent even if it was scheduled to beep.

Steps for Downloading Data

1. Connect the ATS *Wildlink* module to a USB port on the PC.
2. Open the *ATSFixes* for Satellite Collars Programming Software.
3. Select the appropriate Product Model.
4. Select the appropriate COM port. See Section 3 to determine the correct COM port, if necessary.
5. Click the Download Data button.
6. Choose between Degrees, Decimal Minutes and Decimal Degrees for the data format of the GPS data.
7. Click the Continue button.
8. Touch the magnet to the Collar(s) on/off position to initiate communication.

After Downloading Data

Data files downloaded from the Collar(s) are stored on your computer in the C:/Advanced Telemetry Systems, Inc/GPS/ folder. The filename is Dxxxxxx_dd_JJJ-HHmm.txt where xxxxxx is the serial number of the Collar(s), dd indicates whether the data is originally programmed schedule data (FS) or email adjusted schedule data (VS), JJJ is the Julian date the data was downloaded, and HHmm is the hour and minutes data was downloaded. For instance, D030086_FS_313-1134.txt represents a data file for collar with SN 030086 for originally programmed schedule data. The date and time of download was on the 313th day of the year at 11:34 local computer time.

Data Block Formats

Degrees, Decimal Minutes ddmm.mmmm,N/S,dddmm.mmm,E/W (d = deg, m = min)

Yr	Day	Hr	Mn	St	Act	T	Blk	Lat	N/S	Long	E/W
aa	bbb	cc	dd	e	ff	gg	hhhhh	ii.iiiiii	j	Kkk.kkkkkk	l
09	001	10	21	2	00	30	00001	17.437810	S	063.098980	W

Cont:

Hdop	#Sat	#sec	Dim
mm.m	nn	ooo	p
11.9	3	23	2

Decimal Degrees +/-dd.ddddd,+/-ddd.ddddd (d = degrees)

Yr	Day	Hr	Mn	St	Act	T	Blk	Lat	Long
aa	bbb	cc	dd	e	ff	gg	hhhhh	+/-ii.iiiiii	+/-kkk.kkkkkk
09	001	10	21	2	00	30	00001	-17.72968	-63.16497

Cont.:

Hdop	#Sat	#sec	Dim
mm.m	nn	ooo	p
11.9	3	23	2

Where:

aa = Year

bbb = Julian day (001-365, or 366 for leap year)

cc = Hour (00-23)

dd = Minute (00-59)

e = GPS fix status (0 = will never be logged, 1 = attempted but timed out, 2 = attempted and successful, 3 = next fix that will be taken, 4 = fix not taken, collar in low batt)

ff = Activity (00-99%). The activity value indicates the percentage of seconds that the collar detected significant movement during the period between the previous fix until the current fix. Every second the collar examines an onboard accelerometer to see if the accelerometer detected movement that exceeds a specific threshold. If the accelerometer detected enough movement during that second, the second in question increases the activity percentage. For example, if the period between GPS fix acquisitions is 1 hour and there were 360 seconds where activity was registered, the activity value would be 10%.

gg = Temperature (degrees Celsius)

hhhhh = Block Number of Data Stored (00000-16381)

iiii.iiii = Latitude (DDmm.mmmm, Degrees, minutes, decimal minutes) or (+/-dd.ddddd, Decimal degrees)

j = Direction of Latitude (N or S)

kkkkk.kkkk = Longitude (DDmm.mmmm, Degrees, minutes, decimal minutes) or (+/-ddd.ddddd, Decimal degrees)

l = Direction of Longitude (E or W)

mm.m = HDop

nn = Number of satellites used in achieving GPS fix

ooo = Number of seconds needed to achieve GPS fix

p = Dimension of GPS fix (2 or 3)

Section 7 Receiving Data from the Deployed Collar

While the Collar(s) is active (contact ATS to activate or determine activation status), a programmed Collar(s) will transmit data to ATS via the Iridium satellite system. The transmission interval is determined during collar programming (options include 4 hours to 7 days). Only successful GPS fix acquisitions are transmitted.

Forced full buffer transmissions

Successful GPS fixes are placed into a data transmission buffer. The data transmission buffer only allows 22 *Fixes* to be stored. To prevent data from being lost, if the buffer reaches 22 Fixes before a scheduled data transmission, the collar will immediately transmit the data buffer. On the other hand, if it is a scheduled transmission time and the collar has no successful fixes to send, the collar will still transmit on schedule.

Note: If a collar transmits data containing GPS fix locations more than 9 days apart, the Julian day and hour of the later data in the email may be incorrect. However, the data stored on the collar will be correct and the next email should have correct data. This situation may arise if you wish to test the collar and wait more than nine days after initial testing before deploying the collar. If this is a concern, deploy the collar as soon as possible after programming/ reprogramming the collar.

Data Access

The Collar(s) is assigned to a specific web account email address. When the collar transmits data, that data is uploaded to the web account. An email will only be sent to the email address if

the collar has experienced an alarm-type event (mortality, VIT event, fawn event, low battery, collar release). The email will provide more details on the status of the collar.

NOTE: The email will come from iridium@atsidaq.net. It is an automatically generated email so it is possible that the email will be interpreted as spam. Please allow emails from this address if you wish to view data via emails and check your spam folders when you are not receiving data since security options are constantly updated.

The web account for the collar can be accessed at www.atsidaq.net. If you do not have a username and password, please contact ATS to obtain one. There are multiple features of the web account. The main interface for a Collar(s) collar is shown in Figure 6.

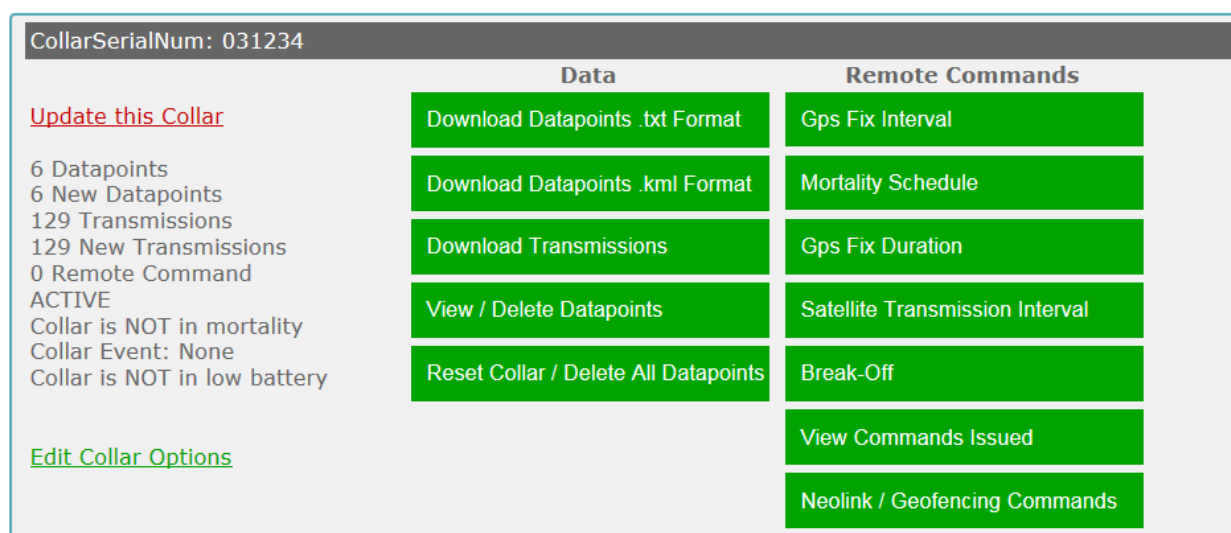


Figure 6. Collar(s) collar interface

You can download GPS data, Google Earth kml files, quickly determine if there are collars that need immediate attention, and request schedule changes. For more information on schedule changes, see Section 8, Remote Commands.

The web account was designed to be self-explanatory. Please contact ATS if you have any questions regarding the web account.

NOTE: ATS does not generally store data older than 1.5 years old. Please make arrangements to store data older than this as necessary.

Section 8 Remote Commands

There are several scheduling options for the Collar(s) that can be changed remotely. To change any of these settings, go to www.atsidaq.net and log in to the web account corresponding to the Collar(s). If you do not know the username and password for the account, please contact ATS to obtain the information.

In the box for the Collar(s), under the options for Remote Commands, possible changes include GPS fix schedule, satellite transmission schedule, maximum GPS fix duration, mortality period (see Figure 6). Each has its own buttons. Click on a button and follow the instructions to issue a remote change.

***(G2110E2 ONLY)*:** There is also a command to release the collar. If a release is desired, click on the “Break-Off” button and then confirm the release. If enabled, there are *Neolink* and Geofencing commands that can be issued for those features as well.

For any remote commands that are requested, you should receive an email indicating whether or not ATS successfully received the request. If you receive an error email or no email and need further assistance, please contact ATS. A log of all remote command requests that have been made for a collar can also be viewed on the web account by clicking the “View Commands Issued” button for the collar.

Once ATS receives the remote command, the command is held in a buffer by the Iridium satellite system until **EITHER** the Collar(s) performs a data transmission, in which case the command will be delivered **OR** until five days elapses, in which case the command is erased from the satellite data buffer per Iridium protocol, whichever comes first. If the latter is likely to occur, issue the command within five days of the expected data transmission.

The Collar(s) will change its schedule after it receives the remote command, not after the command is issued. Only one remote command may be executed per data transmission. If you wish, you may send multiple remote commands to be processed later by the collar but you must wait until you receive a confirmation email for each request before you send another request. NOTE: Any remote commands not delivered within 5 days will be discarded by the Iridium Satellite System.

Section 9 Satellite Transmission Suppression

Sometimes a satellite transmission cannot be completed at the scheduled time due to satellite positioning and/or the current environment. In this case, the collar will keep attempting a

transmission every 12 minutes. If a transmission cannot be completed for 10 consecutive attempts, the collar will enter Satellite Transmission Suppression (STS). In STS, normal satellite transmission attempts will not be performed. This includes the current scheduled attempt, future scheduled attempts, attempts due to full data buffers, and mortality transmissions (if applicable).

There are two ways a collar can exit STS. First, during STS, GPS fix attempts are still allowed. If a GPS fix is successful, then the collar will return to normal operation including resuming normal satellite transmission attempts. That is the primary mechanism and should work in most cases. If GPS is not functioning, a second method for exiting STS is via a satellite transmission: if the collar is currently in STS and the Julian Day is a multiple of thirty (e.g. Jan 30, Mar 1, Mar 30, etc.), the collar will attempt a satellite transmission to determine if the collar's current environment has become more favorable. It will try a maximum of 10 times with attempts spaced 12 minutes apart. If it is successful, normal collar operation will resume, and if it is not, the collar will return to STS.

Note: The first email transmitted after the collar exits STS may contain GPS fix data points with an incorrect Julian day and hour. However the data is stored correctly on the collar and the next transmission should contain correct data. This error is a result of GPS data points in the transmission buffer that are more than nine days apart as may be the case with prolonged STS periods.

Section 10 Diagnostics

ATSFixes for Satellite collars has a diagnostic function to determine the status of the Collar(s). To perform the check:

1. Connect the *Wildlink* to the PC.
2. Open ATSFixes.
3. Click on the "Diagnostic" button on the main page.
4. Swipe the magnet across the two white dots on the collar.
5. Wait for the tests to complete.

Upon completion, a window will appear detailing relevant functionality measurements and values. For a successful diagnostic, one of two different windows will appear.

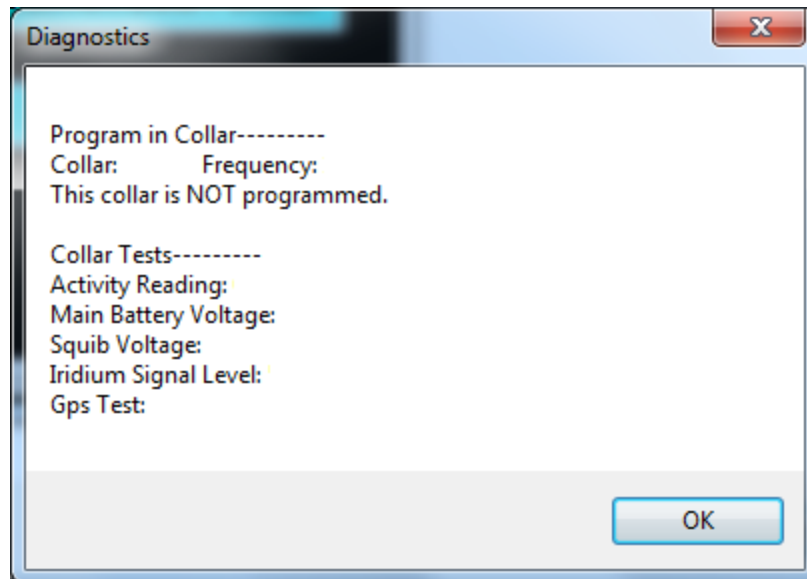


Figure 7. Diagnostic for a Collar(s) without a program

Figure 7 shows the window for a diagnostic assessment of a collar that has not been programmed. For a programmed Collar(s), the collar serial number, frequency, battery voltage, etc. will be filled out accordingly. Note that the squib voltage data will not be included for collars other than the Collar(s) model.

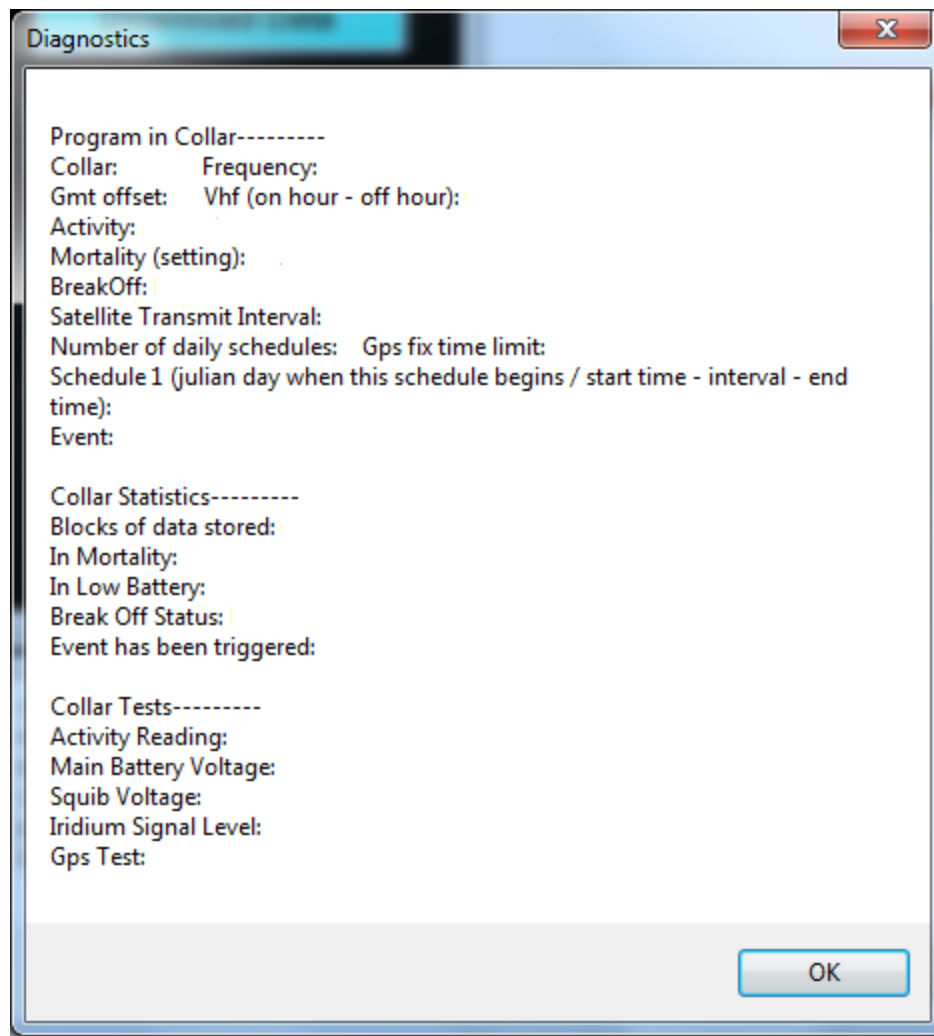


Figure 8. Diagnostic for a programmed Collar(s)

Figure 8 shows the diagnostic for a collar with a program. The diagnostic in this case reveals specific details of the program in the collar. Again, for an actual collar, the form will be filled out with valid information. Note that for collars other than the model Collar(s), Break off and Squib voltage information will not be included.

Section 11 Data Conversion

ATSFixes for Satellite Collars provides two data conversion processes for users. One is a Julian day to month/day conversion. This conversion converts the format of the data from Julian day to the month (number) and day of the GPS data. The other conversion ATSFixes provides is an unsuccessful Fixes removal from the data. In this conversion, all data for unsuccessful Fixes will be removed from the data. In both conversions, the actual data file is not modified. Instead, a

new file is generated with the filename of OUTPUTjjj-tttt where jjj is the Julian day when the file was created and tttt is the 24 hour time when the file was created.

To perform either of these conversions:

1. Save the file to be converted under the C:\Advanced Telemetry Systems, Inc\GPS folder.
2. From the ATSFixes home screen click on Convert Data Format.
3. Choose the conversion type between the 'Convert from Julian Day to Month and Day' and 'Remove all non-successful Fixes from dataset' options.
4. Under the 'File Name:' prompt, enter the filename of the data file you wish to convert.
5. Click on Continue.

A new file will be generated with the filename described above under the C:\Advanced Telemetry Systems, Inc\GPS folder.

Section 12 Neolink VIT System ***(G2110E2 and G5-2D Collars ONLY)***

The ATS *Neolink* VIT system is designed to provide an event/alert message when a birth event occurs. It consists of a Collar(s) host and an ATS *Neolink* Vaginal Implant Transmitter (VIT). The Collar(s) monitors an implanted *Neolink* VIT that periodically broadcasts a wireless message regarding its current temperature (internal doe temperature) and light level to the Collar(s) host. When the *Neolink* VIT transmitter is expelled during a birth, it will broadcast a birth message to the Collar(s) host when its temperature drops below a predetermined threshold temperature (default 32C) and/or it detects light. Upon reception of this birth message, the Collar(s) host takes a GPS fix and will attempt to transmit a birth alarm satellite message to let the user know of the birth event. In addition to a temperature or light trigger, the Collar(s) host will also send a birth alarm if it fails to receive a message from the VIT for one hour.

Each *Neolink* VIT must be programmed with a serial number that corresponds with the host Collar(s). The host Collar(s) will listen every 20 mins for a maximum of about 300 seconds for a message from a *Neolink* VIT (i.e. messages from other *Neolink* VITs will be ignored) The serial number of the *Neolink* VIT must be the same number as the serial number of the host for the Collar(s) to detect it and its alarms. For example, a Collar(s) with serial number 031234 will only listen to a *Neolink* VIT with serial number 031234.

The *Neolink* VIT's VHF normal beep pattern is a 30ppm pulse. Once the *Neolink* VIT temperature drops below a temperature threshold, the VHF beep pattern will change to a 60 ppm pattern.

The *Neolink* VIT uses a VHF duty cycle to increase its life. After the magnet is removed from a *Neolink* VIT, the VHF will be on for 24 hours per day for 2 days. The next 28 days, the VIT VHF duty cycle will stay on for 8 hours only per day. The 8 hours start the count when the

magnet is removed. After these first 30 days, the VHF will once again be on for 24 hours per day.

A *Neolink* VIT birth alarm can be reset by swiping a magnet across the on/off location of the *Neolink* VIT. Whenever a magnet is swiped across or removed from the on/off location, the VIT will hold off on broadcasting a birth alarm for 24 hours.

Neolink* VIT Initialization *(G2110E2 and G5-2D Collars ONLY)

The *Neolink* system must be properly initialized prior to deployment. Initialization involves programming a *Neolink* VIT with the correct serial number (SN) and synchronizing the *Neolink* VIT to the Collar(s) to make sure they are properly communicating. The following are the key steps in making sure the system is setup to detect a birth event:

1. Program the Collar(s) for VIT/Fawn Events.
 - i. Begin programming the Collar(s) according to Section 3, but do not select “Program Collar” button yet.
 - ii. On the “Fix Schedule, Options, Estimate Life: 2” page, click on the VIT/Fawn Events in the Options box. This will take you to the following screen:

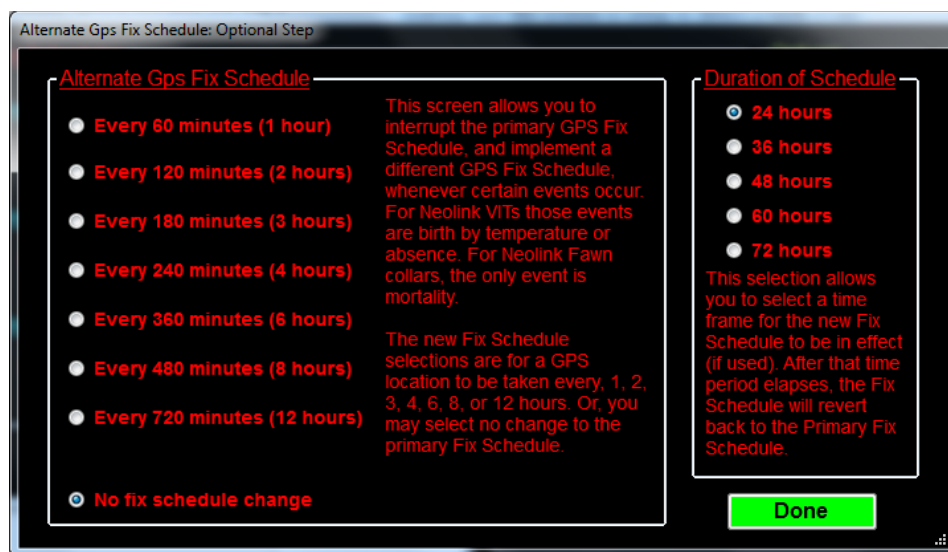


Figure 9. Events – Alternate schedule setup options

- iii. Select options for GPS fix interval and duration and click Done. These selections indicate if the Collar(s) will switch to a different schedule if an event (birth) occurs and if so, what and how long the schedule will be.
 - iv. Finally, click on the “Program Collar” button and follow the onscreen instructions.
2. Place a magnet on the Collar(s) at the magnet location until collar and VIT are ready to be deployed.
3. Upload a SN into the ATS *Neolink* device. See Section 14 for details.

4. Shortly before deploying, remove magnet from the Collar(s). This forces the collar to listen for a VIT sync communication.
5. Then remove magnet from the *Neolink* VIT. This forces the VIT to send a sync transmission to the Collar(s).
6. With a receiver, verify that the VIT is emitting VHF beeps. (If it does not emit VHF beeps within 10 seconds, consider tapping the VIT against a hard surface to open the magnetic on/off switch.)
7. Once the VIT is emitting VHF (single pulse at 30 ppm), listen to the Collar(s) VHF. The Collar(s) should begin emitting VHF soon after the VIT emits VHF. If the Collar(s) does not begin emitting VHF within five seconds of the VIT being heard, place a magnet on the VIT, then repeat steps 4-6. Repeat until VHF beeps are audible from both units.

IMPORTANT:

- If the Collar(s) VHF emits a triple beep within a span of ten seconds, then synchronization was not successful. Steps 2-6 must be repeated until no triple beeps are detected.
- If the Collar(s) VHF emits only single or double beeps, then synchronization was successful. Keep the Collar(s) and *Neolink* Fawn within range of each other (<2 m) to maintain synchronization prior to deployment (if they can't sync it will be an absence birth event in one hour's time).
- **IMPORTANT: VIT deployment must occur within 24 hours of removing the magnet from the VIT unit. If the units are not deployed within 24 hours, the VIT may emit a birth event signal since the temperature of the unit will likely drop below the threshold temperature (32 degrees C).**
- The current VIT temperature and light data can be read by using the Read Fawn/VIT button (see Figure 11) to make sure the VIT is functioning properly.

Neolink VIT Alerts and Status

To summarize, *Neolink* birth alerts may occur for the following reasons:

1. The *Neolink* VIT temperature drops below the predefined *Neolink* VIT threshold temperature and broadcasts the alert successfully to the Collar(s).
2. The *Neolink* VIT detects light levels higher than expected for an implanted environment and broadcasts the alert successfully to the Collar(s).
3. The Collar(s) does not detect its *Neolink* VIT for approximately one hour (e.g. the *Neolink* VIT has been expelled but the Collar(s) is too far from the VIT to receive its broadcasts).

The alerts may happen any number of times and are not limited by any sequence. However additional alerts only happen when the status changes (e.g. staying in low temperature mode will create only one alert but going from a low temp to high light to low temp mode will create three separate alerts). Alerts are sent to the email address registered in the ATS Collar(s) database.

The birth status of the *Neolink* VIT is always contained in the associated Collar(s) transmissions but is also available on the www.atsidaq.net collar interface box under the Collar Event status.

The possible statuses for *Neolink* VIT events are the following:

1. “Birth not yet triggered” – the Collar(s) is detecting the *Neolink* VIT and no alarms have been detect
2. “Birth-triggered by temperature” – the Collar(s) is detecting the *Neolink* VIT but the *Neolink* VIT is reporting a temperature lower than the birth threshold temperature
3. “Birth-triggered by light” – the Collar(s) is detecting the *Neolink* VIT but the *Neolink* VIT is reporting higher than expected light levels for an implant environment
4. “Birth – triggered by light and temperature” – the Collar(s) is detecting the *Neolink* VIT but the *Neolink* VIT is reporting both a low temperature and a high light level.
5. “Birth-triggered by lack of comm” – the Collar(s) is not detecting its *Neolink* VIT
6. “Unknown-No Sync” – the collar is programmed for *Neolink* capability but has never detected any communication from an appropriate *Neolink* device.

Transmitted *Neolink* VIT Data *(G2110E2 and G5-2D Collars ONLY)*

A Collar(s) paired with a *Neolink* VIT will transmit GPS datasets that are different than a normal Collar(s). The normal data file downloadable from the www.atsidaq.net website has data columns indicated by the column headers. However, the datasets for Collar(s) collars communicating a *Neolink* VIT will contain several substitutions that provide feedback regarding the *Neolink* communications and the *Neolink* VIT itself.

Instead of fix dimension data that is normally available in the “2D/3D” column, the data in this column will show how many times the Collar(s) received a message from the *Neolink* VIT since the previous fix. For example, the Collar(s) will listen for a *Neolink* VIT broadcast every 20 minutes. If GPS fixes are scheduled for every 3 hours, then a 100% reception rate would produce

a ‘9’ in the dimension column. A ‘0’ would mean no messages were received since the last GPS fix.

Another substitution that occurs is data in the “Temperature” column. Normally this information is the approximate temperature of the Collar(s) collar but in a *Neolink* VIT system, this temperature is the last received temperature reading (in degrees Celsius) from the *Neolink* VIT. A low last received temperature may, for example, confirm a birth event.

Instead of GPS on time data being displayed in the “FixTime” column, this column contains the *Neolink* VIT light data. The light value is between 0-102 where a value of 102 means that the *Neolink* VIT is not detecting any light and lower values indicate that high light levels are being detected. Lower light values may confirm a birth.

Finally, the transmitted datasets for a Collar(s) collar communicating with a *Neolink* VIT will show ‘0’ values for the “HDOP” and “NumSats” column. Those columns are reserved for *Neolink* Fawn use (see section XX for more details.)

When the Collar(s) collar no longer receives its corresponding *Neolink* VIT broadcasts, the datasets will revert back to the standard datasets i.e. dimension column represents dimension of the fix, temperature represents the temperature of the collar, etc.

Also, the data substitutions mentioned above only pertain to transmitted datasets. Recovering a Collar(s) that was programmed with *Neolink* VIT capability and downloading the datasets will lead to data with the formats described in section 6.

***Neolink* VIT Remote commands**

When possible, the *Neolink* system should be disabled to conserve battery life especially when the Collar(s) is no longer detecting its *Neolink* VIT i.e. the collar transmissions indicate a “lack of comm” status. (However, if a *Neolink* Fawn will be deployed for the Collar(s) collar shortly after a birth, disabling the *Neolink* system may not be necessary.) The *Neolink* system can be disabled remotely. To do so, from the Collar(s) web interface (see Figure 6) click on the *Neolink*/Geofencing Commands button to access the *Neolink* and Geofencing options (see Figure 10).

CollarSerialNum: 031234
Neolink / Geofencing Commands

☒ Add a second fawn
SN: 131234

☐ Add additional fawns
SN: 131234,231234

Add Fawns

☒ Remove Fawn 031234

☐ Remove Fawn 131234

☐ Remove Fawn 231234

☐ Remove All Fawns

Remove Fawns

☒ 24 hour Fawn Absence

☐ 12 hour Fawn Absence

Apply Fawn Absence

Neolink Start Communication

Neolink Stop Communication

Stop Geofencing

Figure 10. Neolink/Geofencing Commands

Click on the *Neolink* Stop Communication button and confirm that the option will be disabled for the Collar(s) collar.

Upon receipt of the command, the collar will no longer listen for a *Neolink* device including *Neolink* VIT. If for any reason, the *Neolink* capability must be activated again, a remote command can be sent to the Collar(s) collar to re-enable *Neolink* communication attempts. To do so, go to the *Neolink*/Geofencing commands and select the “*Neolink* Start Communication” option to enable *Neolink* communications.

Neolink VIT Event Data

When programmed with *Neolink* capability, the Collar(s) contains an event log for *Neolink* device message receptions. The event log shows the times the Collar(s) received *Neolink* VIT broadcasts as well as the data that the *Neolink* VIT broadcasted. To download the data, from ATSFixes for Satellite Collars:

1. Select the Collar(s) product model.
2. Click on the Download Data box.
3. In the “Choose Download Data” box, enable the Event Data button.
4. Swipe a magnet across the magnetic on/off switch position.

Section 13 Neolink Fawn Collar System

(G2110E2 and G5-2D Collars ONLY)

The *Neolink* Fawn system is designed to provide the proximity and mortality status of a *Neolink* fawn collar to a Collar(s) host collar in a doe-fawn(s) pair. Specifically, it is designed to let the user know the following information about a *Neolink* Fawn collar: 1) whether it is in the general

area of its corresponding Collar(s) host or not, and 2) whether the *Neolink* Fawn collar has gone into mortality due to inactivity or not.

In order to accomplish this, the *Neolink* Fawn collar periodically broadcasts either a presence message, or an alarm message. A presence message is intended to let a Collar(s) collar know that the *Neolink* fawn collar is nearby. An alarm message lets the Collar(s) collar know that the *Neolink* Fawn collar is nearby, but has also gone into mortality. If the Collar(s) collar is close enough to the *Neolink* fawn collar when it listens for incoming broadcasts, the E2 will register the broadcast, and may or may not transmit the collar status, depending on the actual status of the fawn collar, and what the previous status was. When the Collar(s) determines that the status of a *Neolink* Fawn collar has changed, it will transmit a satellite message to let the user know.

The normal VHF pattern for the *Neolink* Fawn collar is a 30 ppm single beep. Once the *Neolink* fawn collar goes into mortality and begins broadcasting a mortality message, the VHF pattern will be a 60 ppm single beep. Also, after going into mortality, the *Neolink* Fawn collar will stay locked in mortality mode for a preprogrammed lock period. Mortality can be reset sooner than the lock period by swiping a magnet across the designated magnetic on/off position.

Each Collar(s) host may have up to three different *Neolink* Fawn collars that it registers information from. All *Neolink* fawns must be given a six digit serial number (SN) that corresponds to an E2 host. The first fawn MUST be given a SN beginning with a 0. A second fawn MUST be given a SN beginning with a 1. A third fawn MUST be given a SN beginning with a 2. For all three possible fawns, the next five digits will be the same as the last five digits of the host. For example: the possible fawn SN's for E2 host 031234 are: 031234, 131234, and 231234.

Neolink* Fawn Collar initialization *(G2110E2 and G5-2D Collar ONLY)

Neolink Fawn collars can be deployed with or without access to the Collar(s). The following are steps to make sure the *Neolink* Fawn system works correctly.

1. Program the G2110E2 collar host for VIT/Fawn Events. See Section 14 for details. NOTE: If the Collar(s) was previously programmed for VIT/Fawn Events for use with a *Neolink* VIT, the programming will carry over, as long as the *Neolink* system has not been disabled with a remote command. For operation with *Neolink* Fawns, the Collar(s) collar will start out listening for any *Neolink* device (VIT or Fawn) every twenty minutes for approximately five minutes but will revert to looking every twenty minutes for approximately twenty seconds when it determines that associated *Neolink* Fawn collars are broadcasting messages. Note: the Alternate GPS Fix schedule will apply if the Collar(s) detects a new message that a *Neolink* Fawn collar is in mortality.
2. If deploying the Collar(s) collar host at the same time as the fawn collars, place a magnet on the Collar(s) collar until ready for deployment. Otherwise, no further action is necessary with the Collar(s).
3. Upload a SN into the *Neolink* Fawn collar(s). See Section 14 for details.

4. If deploying two or three *Neolink* Fawn collars, they should be synchronized together before deploying. Fawn collar '0', which is the fawn that has serial number starting with '0', is the lead fawn. The other fawns will synchronize to it.

To synchronize them, remove or swipe the magnet on a *Neolink* Fawn with the serial number that begins with a '0'. Leave the collar turned on by keeping the magnet off of fawn '0' until deployment.

Next, listen to the VHF beep pattern of 'fawn1', the *Neolink* Fawn with serial number beginning with '1'. Swipe the magnet of 'fawn1'. There will be silence until it synchronizes. When it synchronizes, there will be a very long beep. If you do not hear this very long beep, repeat the process. Listen to 'fawn1', swipe the magnet on 'fawn1', and again, listen for the long beep. Once the long beep is heard, 'fawn1' is synchronized. Make sure 'fawn1' remains turned on by keeping the magnet off of the collar until deployment.

If there is third *Neolink* Fawn which will be the fawn that has its serial number beginning with a '2', remove the magnet at this time. The process is the same. Listen to the VHF of 'fawn2', then swipe the magnet on 'fawn2'. Listen for the long beep that tells you 'fawn2' is also synchronized. Make sure 'fawn2' is not turned off by leaving the magnet off until deployment.

Fawns broadcast every 20 seconds, so listening to a synchronization attempt should only take approximately 20 seconds. Remember, if you have troubles hearing the VHF beeps, consider tapping the potted part of the fawn collar against a hard surface to open the magnetic on/off switch, and then reattempt synchronization. This step will set the *Neolink* Fawn broadcasts so that there will be no initial interference issues.

After synchronizing the devices, in order to maintain synchronization, DO NOT apply magnet(s) to the *Neolink* Fawn Collar(s). **IMPORTANT: Be sure to deploy the collar before the mortality period is reached. Otherwise, the collars will go into mortality mode, and will stay locked in mortality for the Mortality lock period or until it is reset with a magnet swipe.**

5. When ready to deploy the system: if deploying a Collar(s) collar at the same time as the *Neolink* Fawn collar(s), remove the magnet from the Collar(s) collar in the presence of the Fawn Collar(s) and verify that in 20 seconds, the VHF for the collar comes on.
 - If VHF comes on, the *Neolink* system is ready to be deployed.
 - If the VHF does not come on, then consider tapping the Collar(s) against a hard surface to open the magnetic on/off switch on the Collar(s).

If deploying the *Neolink* Fawn collar(s) without access to the Collar(s) collar, simply deploy the Fawn collar(s), preferably before the mortality period is reached. When the

already deployed Collar(s) collar hears the *Neolink* Fawn collar(s), it will immediately recognize the changeover to *Neolink* Fawn communication.

***Neolink* Fawn Alerts and Status**

When used in a *Neolink* fawn system, the Collar(s) will transmit an alert when:

1. The Collar(s) detects a *Neolink* Fawn after not detecting the *Neolink* Fawn for a certain period. This period is known as the absence period and it is defaulted to 12 hours. (e.g. the Collar(s) is now close to the *Neolink* Fawn collar but for the past 12 or more hours, the Collar(s) was too far from the *Neolink* Fawn collar to detect the *Neolink* Fawn broadcast). This is declared as a “Comm” event in the email alert.
2. The Collar(s) receives a new broadcast message from the *Neolink* Fawn collar that it is now in mortality. This is declared as a “Mortality” event in the email alert.
3. The Collar(s) has not detected a *Neolink* Fawn collar for a certain period but the *Neolink* Fawn collar was previously detected. The period is defaulted to 12 hours but can be changed to 24 hours. For example, the Collar(s) collar detected fawn ‘0’ 12 hours ago but has not detected the fawn since that time – it will transmit an alert to indicate the absence of fawn ‘0’. This is declared as an “Absence” event in the email alert.

Alerts will be sent to the email address registered in the ATS Collar(s) database. The status of the *Neolink* Fawns is always contained in the transmitted datasets of the Collar(s) collar. In addition to those Collar(s)-originated transmissions, email alerts generated by the ATS data server may also be sent when the status (presence and/or mortality) of the *Neolink* Fawn collar(s) has changed since the last transmission.

The status of the *Neolink* Fawn collar(s) is available on the www.atsidaq.net interface box for the Collar(s) collar under the Collar Event status. The status will look like the following

“Collar Event: Fawn0-[status],Fawn1-[status] (if available),Fawn2-[status] (if available)”

Similar to the email alerts, the possible status messages available from the website are:

1. Comm – the Collar(s) detected the *Neolink* Fawn prior to transmitting its most recent satellite data packet and no mortality for the fawn collar was been detected
2. Absence – the Collar(s) did not detect the *Neolink* Fawn prior to transmitting its most recent satellite data packet
3. Mortality – the Collar(s) detected the *Neolink* Fawn prior to transmitting its most recent satellite data packet but the *Neolink* Fawn broadcasted a mortality message.
4. Not yet triggered – the Collar(s) is looking for a fawn but it has not been detected yet.

Status indications for fawn 1 and fawn 2 will only be available if the Collar(s) collar has detected them OR if the Collar(s) has been remotely commanded to look for them.

Lastly, the ATS data server may generate an email alert when the Collar(s) collar is no longer detecting any *Neolink* Fawn broadcasts. This alert typically coincides with a potential Absence.

Transmitted *Neolink* Fawn Data *(G2110E2 and G5-2D Collars ONLY)*

Similar to the *Neolink* VIT system, a Collar(s) collar paired with a *Neolink* Fawn will deliver data messages containing data substitutions. When data is downloaded from the website for a Collar(s) collar in a *Neolink* Fawn system, the data shows how many times the Collar(s) has received broadcasts from any corresponding *Neolink* Fawns between GPS fixes.

The number of detections from Fawn 0 are substituted into the “2D/3D” column. The number of detections from Fawn 1 are substituted into the “NumSats” column. Finally the number of detections from Fawn 2 are substituted into the “HDOP” column. For example, if the Collar(s) takes a GPS fix every 3 hours, a 100% detection rate would show a value of ‘9’ for a *Neolink* Fawn collar.

The Collar(s) data does not have any other substitutions besides those mentioned.

The data will revert back to data defined by the normal headers once the Collar(s) does not detect ANY *Neolink* broadcasts for the absence period (default of 12 hours).

Similar to its usage in a *Neolink* VIT system, the Collar(s) does not make the data substitutions above in the onboard memory. If the Collar(s) data is downloaded using ATSFixes, the data will be as specified in section 6.

***Neolink* Fawn Remote Commands**

The *Neolink* Fawn system has several remote commands from the www.atsidaq.net website that may be used to enable and disable it. To access these remote commands, go to the Collar(s) web interface (see Figure 6) click on the *Neolink*/Geofencing Commands button to access the *Neolink* and Geofencing options (see Figure 10).

From there, the following options are applicable to the *Neolink* Fawn system:

1. *Neolink* Start Communication- use this command if *Neolink* communication was disabled temporarily. Upon receiving this command, the Collar(s) will begin listening for a *Neolink* broadcast
2. “Add a second fawn” and “Add additional fawns” – use this command when there is more than one fawn to listen for. Upon receiving these commands, the Collar(s) will listen specifically for additional fawns.
3. “Remove Fawn 0xxxxx”, “Remove Fawn 1xxxxx”, “Remove Fawn 2xxxxx”, “Remove All Fawns” – use these commands to disable searches for Fawns. Upon receiving these commands, the Collar(s) will cease listening for the fawns indicated.
4. *Neolink* Stop Communication – use this command to disable *Neolink* detections. Upon receiving this command, the Collar(s) will no longer listen for *Neolink* message broadcasts.

***Neolink* Fawn Event Data**

When programmed with *Neolink* capability, the Collar(s) contains an event log for *Neolink* device message receptions. For *Neolink* Fawns, the event log shows the times the Collar(s) received *Neolink* Fawn broadcasts and indicates which fawn, if there is more than one being used, broadcasted the message. To download the data, from ATSFixes for Satellite Collars:

1. Select the Collar(s) product model.
2. Click on the Download Data box.
3. In the “Choose Download Data” box, enable the Event Data button.
4. Swipe a magnet across the magnetic on/off switch position.

Section 14 Programming a *Neolink* Device

(G2110E2 and G5-2D Collars ONLY)

Any transmitter device operating as part of a *Neolink* system must be programmed with a valid serial number before being used. The following are the steps necessary to program a serial number into a device. When possible, place magnets on all *Neolink* devices not currently being programmed to prevent issues with programming.

1. Connect *Wildlink* Comm module to a Windows PC.
2. Run ATSFixes for Satellites software.
3. From the Product Model drop-down pick list, select “Fawn or VIT”.
4. For Serial Port, select the COM port associated with the *Wildlink* Comm module.
5. Click on the “Fawn or VIT” button. The following screen should appear:

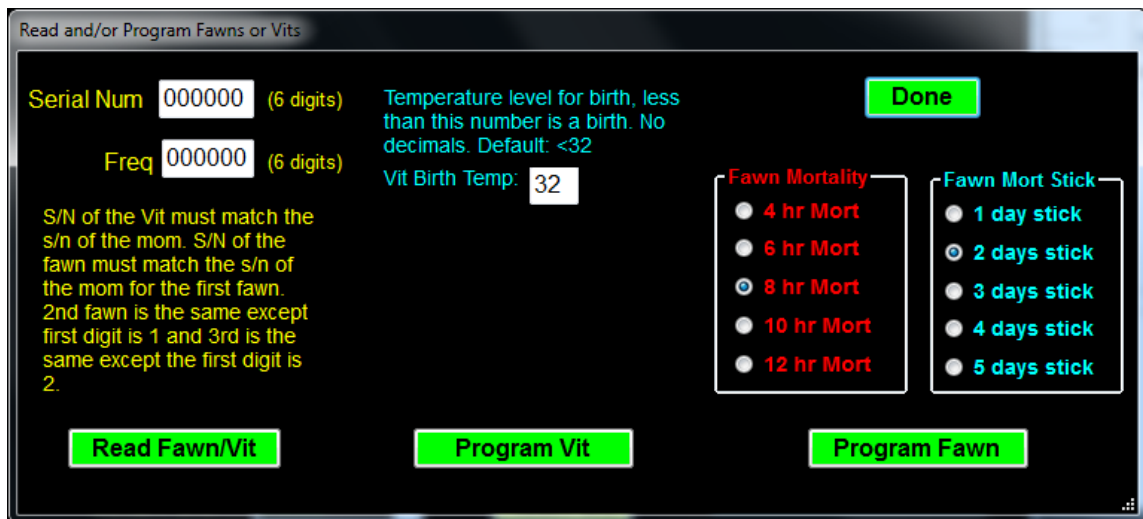


Figure 11. Neolink Programming

6. Enter in a six digit serial number in the “Serial Num” field. For *Neolink* VITs, this number will be the same as the Collar(s) collar that it will be paired with. For *Neolink* Fawns, this number will contain a first digit of 0, 1, or 2, and the remaining 5 digits will be the same as the last five digits of the Collar(s) host collar.
7. For a *Neolink* Fawn, select the desired options for the Fawn mortality period, and also the fawn mortality lock (“Mort Stick”) period. These settings do not apply to the *Neolink* VIT.
8. For VIT programming, click on the “Program VIT” button, and for fawn programming, click on the “Program Fawn” button.
9. Swipe the magnet over the designated on/off magnet location on the *Neolink* device and wait for a “Success” response from the software. If an error message appears, e.g. “Error in setting up Fawn!!” recycle power on the *Wildlink* device by removing the USB cable from the device, and plugging it back in. Once you hear VHF beeps being emitted from the *Neolink* device, click on the appropriate button to reprogram the unit again. Repeat this process as necessary to program remaining devices.
10. Click on the ‘Read’ option under ‘Model VIT/Fawn and swipe the magnet over the on/off location again.
11. Verify that a window appears with the information that was just entered. If the information displayed is not correct, repeat steps 6 through 10.
12. Place and tape a magnet on to the designated on/off location of the device.

Section 15 Geofencing System

(G2110E2 and G5 Series Collars ONLY)

The ATS Geofencing System is on-collar system designed to provide an event/alert message when a collar enters or exits a fenced polygon (i.e. bounded area). The alert message will indicate what polygon the collar has entered or if the collar is outside all polygons, if enabled. The polygon is uploaded into the collar during ATSFixes programming.

Each collar may be programmed with up to 4 polygons, with each polygon having up to 20 distinct latitude/longitude points. The polygon can be imported as a Google Earth .kml file or as an ESRI shapefile. In addition to providing an alert when the Collar(s) collar enters/exits a polygon, the collar can also autonomously adjust its GPS fix schedule to a different schedule when it determines it has entered or exited a polygon. Setting up Geofencing

To enable Geofencing:

1. Begin programming the Collar(s) according to section 3, but do not select the “Program Collar” button yet.
2. On the “Fix Schedule, Options, Estimate Life: 2” page, click on the Use Geofencing bubble in the Options box. This will take you to the following screen:

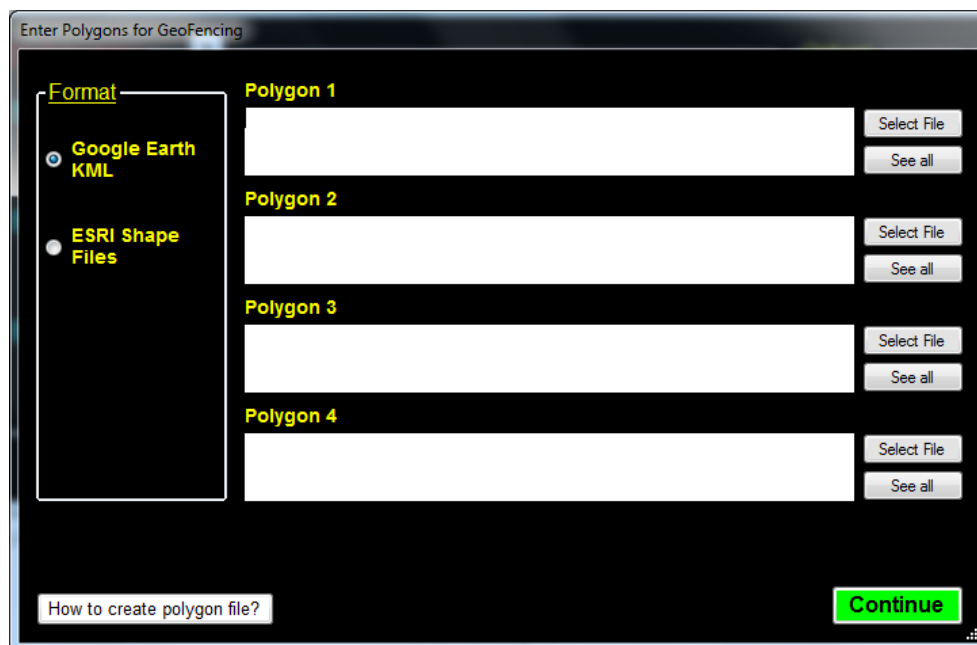


Figure 12. Enter Polygons for Geofencing window

3. Next, fill in the polygons that the Collar(s) collar will be using beginning with Polygon 1. Before clicking on the “Select file” button, select the type of format the file will be using under the Format box on the left hand side. A “How to create polygon file?” button exists to provide assistance with generating an acceptable kml file for ATSFixes uses. Please

consult the ESRI shapefile software for assistance with generating a shapefile if shapefiles will be used.

4. Once all applicable polygons are imported (NOTE: Four polygons are not required for Geofencing), click on the green Continue button. The following Geofencing options window will be displayed next:

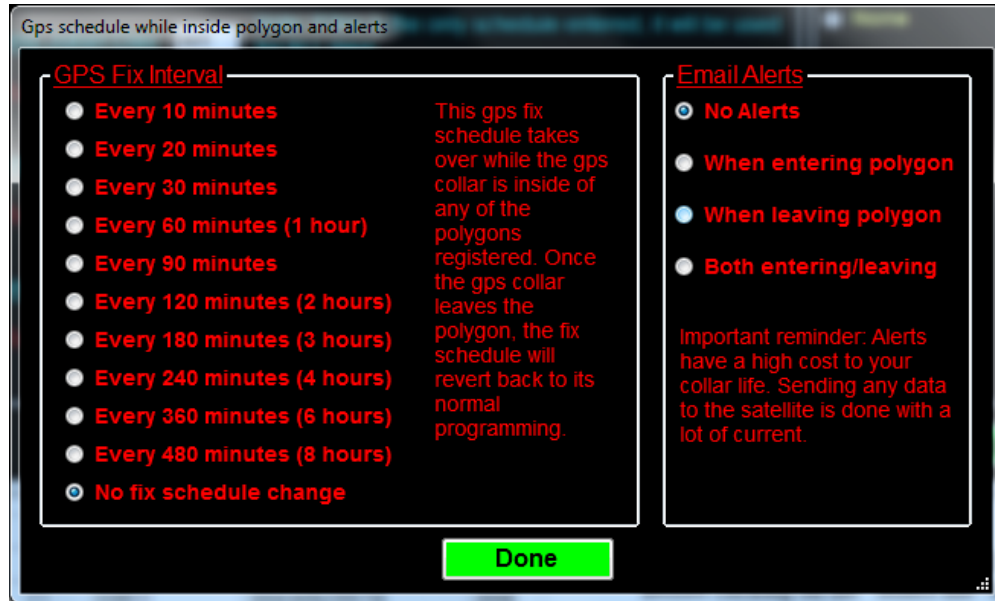


Figure 13. Gps schedule while inside polygon and alerts window

5. The GPS Fix Interval box provides options for an alternate schedule when the collar determines that it is in a polygon. Select a desired polygon GPS schedule or select No fix schedule change if not change is desired.
6. The Email Alerts box provides options for alerts when the collar enters and exits a polygon. Select the desired alert option.
7. Click on the green Done button when all Geofencing options have been made to return to the main programming window.
8. Click on the green Program Collar button when ready to upload the program to the collar and follow the onscreen instructions.

Disabling Geofencing

Geofencing can be remotely disabled for a Collar(s) collar from the www.atsidaq.net website. From the Collar(s) web interface (see Figure 6) click on the *Neolink*/Geofencing Commands button to access the *Neolink* and Geofencing options (see Figure 10). Click on the Stop Geofencing button and confirm that the option will be disabled for the Collar(s) collar. **NOTE: Once disabled remotely, Geofencing cannot be re-enabled without reprogramming the collar.**

Section 16 Warranty and Service

The model Collar(s) series collars are warranted for one year from the time of shipment.

NOTE: Collars ARE NOT refurbishable (except G2110E2). Do not return collars for refurbishment or disposal.

Should you encounter any difficulty during programming or operation of your collars, please contact ATS Sales and Service at 763.444.9267 during normal business hours. This and other ATS User Manuals, as well as software, are available for download from the ATS website, at www.atstrack.com.

