

W500 *Wildlink* GPS Small Collar Logger/ W510 *Wildlink* GPS Glue-on Logger


User's Manual

IMPORTANT: Your W500 *Wildlink* Small Collar Loggers or W510 *Wildlink* Glue-on Loggers HAVE NOT BEEN PROGRAMMED for operation. You must program each unit in order for them to function.

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Section 1 Introduction

Thank you for purchasing an ATS W500 Series *Wildlink* Small Collar Logger or Glue-on Logger. The GPS model you have received has not had a fix schedule program downloaded to it. You will need to load a fix schedule program into the Logger to control its operation. The software you received with the GPS logger, *ATSFixes* for Loggers, guides you through this process. Complete *help* 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 Logger keeps it running at a lower current. When you are not using your logger, leave the magnet attached.

The GPS logger is supplied with a *Wildlink* model W100 communication module, PN 17621 (Figure 1). The *Wildlink* module enables the GPS logger to communicate with a PC for programming and data uploads via a wireless link.



Figure 1. ATS *Wildlink* model W100 communication module, PN 17621 (with USB cable)

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Section 2 Theory of Operation

The ATS W500 Series *Wildlink* models consist of five different assemblies:

- 1) the collar belting, or attachment mechanism, 2) an electronics housing, which is attached to the collar belting, 3) a VHF antenna, 4) a GPS antenna, and 5) a UHF antenna

The electronics housing consists of a battery pack, a VHF transmitter, like those found on traditional VHF beacon collars, a GPS receiver chipset and a UHF communications IC. Each has its own antenna, as noted above.

The logger is shipped with a magnet taped into place with yellow vinyl tape. While the magnet is attached to the logger, it is running at the lowest current drain possible. Removing the magnet from the logger starts a UHF communication attempt. The logger activates its wireless UHF communication mode and waits to receive wireless commands from the W100 for a period of 40 seconds. After the 40 seconds, an automatic 5 minutes of VHF double beeps regardless of the logger's program.

The GPS Logger stores all location data in the flash memory of its electronics. Location data may be retrieved wirelessly by PC via the *Wildlink* W100 module either downloaded nearby with a magnet swipe on the logger activating the communication link, or a time scheduled remote download (No magnet swipe used) if selected as an option when programming the logger.

The VHF transmitter is used to locate the animal in order to retrieve the logger. The logger may be refurbished at ATS's facility.

The W500 *Wildlink* Small Collar Logger does not come standard with a drop-off mechanism to break the collar off of an animal. However, the optional Sure-Drop mechanism may be purchased separately from ATS and attached to the collar to provide a drop off capability.

Section 3 Using ATSFixes for Loggers Software

Installing ATSFixes for Loggers Software

To install ATSFixes for Loggers Software, double click on the setup.exe file found on the CD supplied with your equipment. The software installs on your computer, and you can find it later under the programs list on your computer.

The installation for the ATSFixes for Loggers software creates some folders on the C: (hard) drive of your computer. Once you have created a program and uploaded it to a logger, two files are created and added to the folders. The files contain all the information for the program that was uploaded to a logger, including the serial number of the logger. If you ever have doubts about how you programmed a logger or what VHF frequency the logger is transmitting on, you can look up the information in these files. These files are stored in the C:/Advanced Telemetry Systems, Inc./GPS/GPS_LOGGER_PROGRAMS folder.

Wildlink W100 Module Setup

The *Wildlink* module driver must be installed prior to using ATSFixes for Loggers to program the W500 *Wildlink* Small Collar Logger/W510 *Wildlink* Glue-on Logger. To install the driver, double click on the executable found in the supplied CD that pertains to your PC:

- CP210xVCPIInstaller_x86 (Windows XP, Windows Vista, Windows 7, and Windows 8 32bit systems)
- CP210xVCPIInstaller_x64 (64 bit systems)
- CP210x_VCP_Win2K (Windows 2000)

Follow the instructions on the screen. Restart your computer if necessary.

Programming Your GPS Logger

The program you create for the GPS logger will control the GPS fix schedule, VHF transmitter operation and wireless communication which is tied to the VHF schedule if selected as an option in the programming. All settings are the same for each year i.e. different years cannot have unique program schedules.

Saving GPS Programs

If you have several loggers that need to be programmed using an identical program, you may compose and save a program, and load it into additional loggers. Once a program has been saved, it is listed under the GPS Logger Programs. Simply choose the program that you wish to load into the loggers.

Life Estimation

The ATSFixes for Loggers Programming Software estimates the life that you can expect from your GPS Logger. If you need more life from your GPS logger than what is estimated, you can go back and adjust the program to give your GPS logger a longer life. If adjustments are made, the life calculation is recalculated when the type of battery used is selected again. You might decide to take fewer fixes each day, or you might program the VHF beacon to operate on a limited basis, also called a transmitter duty cycle.

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

Steps to Start GPS Logger Programming

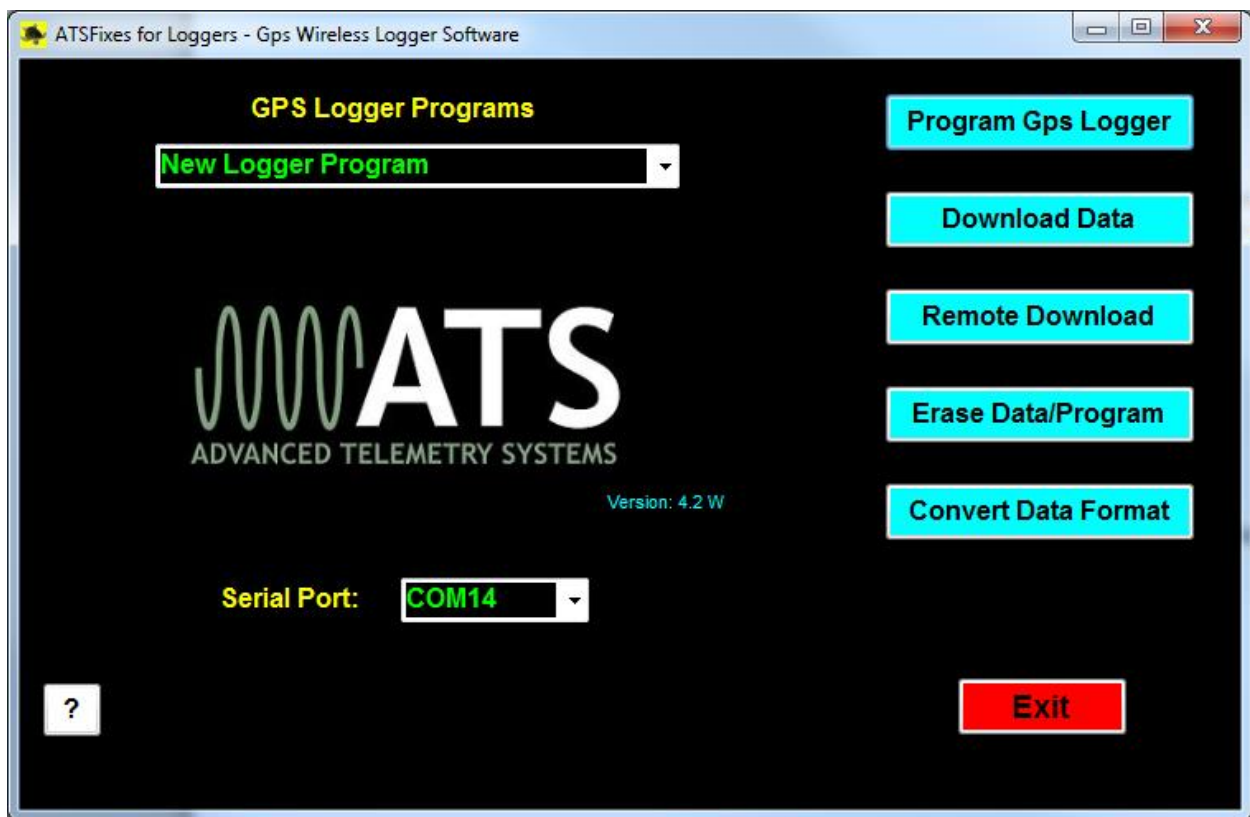


Figure 2. ATSFixes for Loggers

To load a program into the GPS logger, the *Wildlink* W100 module needs to be connected (via USB port) to the PC running the *ATSFixes* for Loggers software and the logger needs to be within one meter of the Wildlink module. If you are only creating a program to be saved for later

use, then having either/both device(s) is not necessary. Note: Remove magnet prior to programming.

1. Open the *ATSFixes* for Loggers Software. It will look similar to Figure 2. The software recognizes all serial ports available when starting. Note: The software will not proceed without an available COM port.
2. 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's 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's COM port is listed under.
3. Click on the Program GPS Logger button to start creating a program. If you are copying a previously stored program then you need to pick that program from the list of programs. Otherwise the GPS Logger Program should be New Logger Program for new loggers.
4. Fill in the information in each step of the *ATSFixes* for Loggers software. Each screen has a Help button, if needed. Note that no offset exists to distinguish between standard time and daylight savings time. Even if your study area has daylight savings time during all or part of your study, the resulting data results are without daylight savings time taken into account.
5. After the fix schedule program has been configured with the *ATSFixes* for Loggers Software, it needs to be loaded into the GPS Logger. To start this process, click on the Program Logger button in the Step 3: Life, Activity Data window. Click OK on the following dialog box and then touch the magnet to the logger at the location of the 2 white dots and remove. Touching the magnet to the logger tells the logger that the PC will be sending information to it.
6. When the GPS Logger is done loading up the user's program, there is a beep and a message to the PC's screen.

Reprogramming a GPS Logger

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

Section 4 Operating the GPS Logger

Interpreting the VHF Beacon Beep Patterns

The GPS logger includes a VHF transmitter that can be used to locate it and/or determine its status. The VHF transmitter can be scheduled to run continuously or only during certain hours of the day. It can be programmed to stay off for up to 23 hours each day in order to extend life. The VHF transmitter also has some obligatory beep patterns which you hear regardless of whether the transmitter was scheduled to be active or not.

The different beep patterns the VHF transmitter uses are based on either a 48 pulses per minute (ppm) rate, or a 27 ppm rate. To your ear, 48 ppm sounds like one beep per second. The 27 ppm rate sounds like one beep per every two seconds. Some beep patterns have double or triple pulses, which are used to indicate various operating conditions to the listener.

If the VHF transmitter is scheduled to operate, the logger operating condition is indicated by the beep patterns below:

Normal VHF = 48 ppm.

Mortality VHF = 27 ppm (double pulse and then single pulse, repeating).

Last GPS fix successful = Normal VHF (48 ppm) with a double pulse on the 6th pulse.

Last GPS fix failed = Normal VHF (48 ppm).

Obligatory beep patterns (do not follow the scheduled duty cycle) indicate the following operating conditions:

Reset/Startup/Not programmed = Slow triple pulse and then single pulse at 48ppm.

After pulling off magnet = Initially a 40 second period of no VHF, as the logger activates its UHF mode, and stays in that mode attempting for a UHF wireless communication link first, then after the 40 second period double pulse VHF at 48 ppm for a period of 5 minutes *only*. After the 5 minutes have elapsed, the logger reverts to its regularly scheduled VHF beep pattern.

Low Battery condition = triple pulse at 27 ppm, continuously (much slower than normal VHF beep pattern).

Note: The VHF transmitter does not operate while the logger is downloading a program, obtaining GPS fixes, or uploading data to a PC.

GPS Operation

During a GPS fix attempt, the VHF transmitter is silent. A GPS attempt may last as long as the setting that was selected during programming but may also be shorter depending on the logger's view of the sky. Whether the fix attempt was successful or not is 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.*

Mortality

If you choose to use mortality when you program the logger with the ATSFixes for Loggers software, the VHF will change to the Mortality VHF and, if a duty cycle was created during programming, follows the duty cycle until activity is detected or a higher priority event occurs (low battery).

In order for the GPS logger to exit mortality mode, the logger 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.)

Light Sensor

This is an optional sensor added to the logger. With this option selected and the optional light sensor installed on the logger, a low light condition prevents the logger from taking a scheduled GPS fix. This is for cases where it is known that the animal will be at times sheltered from a clear view of the sky (i.e. in a burrow). By not allowing a scheduled GPS fix in this condition, the battery life is extended from excluding unnecessary GPS fix attempts.

Section 5 Downloading Data from the GPS Logger

Once GPS position data have been stored in the GPS logger memory, they can be downloaded to your computer. Note that during data download, the VHF transmitter is silent even if it was scheduled to beep. There are two download buttons. "Download Data" is for downloading with the logger nearby and communication from the logger is activated with a magnet swipe. The "Remote Download" button is to download data in the field while the logger is still attached to the animal. This option needs to be selected in the programming to be activated. If remote downloading is not needed, deselect this option button, and more battery life will be available.

Steps for Downloading Data

A) Download Data Button

1. Connect the ATS *Wildlink* module to a USB port on the PC.
2. Open the ATSFixes for Loggers Programming Software.
3. Click the Download Data button.
4. Choose between Degrees, Decimal Minutes and Decimal Degrees for the data format of the GPS data.
5. Click the Continue button.
6. Touch the magnet to the GPS Logger to initiate communication.

B) Remote Download Button (note: the logger needs to have the remote download option selected when the logger was programmed)

1. Connect the ATS *Wildlink* module to a USB port on the PC.
2. Open the ATSFixes for Loggers Programming Software.
3. Click the Remote Download button.
4. Choose between Degrees, Decimal Minutes and Decimal Degrees for the data format of the GPS data.
5. Click the Continue button.
6. Wait for a download. The W100 continuously transmits a signal and waits for a reply from a logger. The logger attempts a wireless communication every 11 minutes after the hour.

If the Remote Download option was selected in the programming of the logger, the logger will activate the UHF mode every multiple of 11 minutes after the hour (i.e.:11,:22,:33,:44,:55) for a 2 second period. Every multiple of 11 minutes was chosen to prevent a wireless link interruption during a scheduled GPS fix. The UHF remote communication link is tied to the VHF schedule, and is not active if the VHF is not active. If the logger is in hand, and the VHF was scheduled to be off at the time, a magnet swipe still activates a wireless download via the Download Data button. After a download, the logger continues its programed schedule and prevents a UHF wake up for 20 minutes. This is to prevent re- downloading of the data if multiple loggers are in the same area. If there are other loggers in the same area, they all know a download attempt has been made. The loggers which did not get a download command will then go into a faster 1 minute interval to wake up for a UHF download for a 10 minute period. After the 10 minute

period, they then revert back to waking up UHF every multiple of 11 minutes after the hour. This is to help speed up download attempts with multiple loggers in the same area.

After Downloading Data

Data files downloaded from the GPS Logger are stored on your computer in the C:/Advanced Telemetry Systems, Inc/GPS/ folder. The filename is DxxxxxxByyyy_JJJ-HHmm.txt where xxxxxx is the serial number of the GPS Logger, yyyy is the starting block number of the data download, JJJ is the Julian date the data was downloaded, and HHmm is the hour and minutes data was downloaded. For instance, D030086B1_313-1134.txt represents a data file for logger with SN 030086 with datablock beginning at block 1. 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 DD.MMmmmm,N/S,DDD.MMmmmm,E/W

(D = deg, M = min, m = decimal min)

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

Cont.:

Alt	Speed	Hdop	#Sat	#sec	Dim
mmmm	n.n	oo.o	pp	qqq	r
286	0.2	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	+/-iiii.iiii	+/-kkkkk.kkkk
09	001	10	21	2	00	30	00001	-17.72968	-63.16497

Cont.:

Alt	Speed	Hdop	#Sat	#sec	Dim
mmmm	n.n	oo.o	pp	qqq	r
286	0.2	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, logger in low batt)

ff = Activity (00-99%)

gg = Temperature (degrees Celsius)

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

iii.iii = Latitude (DD.MMmmmm, Degrees, Minutes, decimal minutes) or (+/-dd.ddddd, Decimal degrees)

j = Direction of Latitude (N or S)

kkkkk.kkkk = Longitude (DD.MMmmmm, Degrees, Minutes, decimal minutes) or (+/-ddd.ddddd, Decimal degrees)

l = Direction of Longitude (E or W)

mmmm = Altitude. In meters above sea level

n.n = Speed. Speed over the ground in knots. 1 knot = 1.15078 miles/hour

oo.o = HDop

pp = Number of satellites used in achieving GPS fix

qqq = Number of seconds needed to achieve GPS fix

r = Dimension of GPS fix (2 or 3)

Section 6 Power-on Self Test

As explained in Section 4, Operating the GPS Logger, there is a special start-up beep pattern once the magnet is pulled off. First there is a 40 second period of no VHF as the logger UHF is active waiting for a wireless communication link. After the 40 second UHF mode, for five minutes, the logger emits a double pulse pattern at 48 ppm. This pattern occurs regardless of whether the logger is programmed to be actively emitting VHF pulses at that time.

Section 7 Data Conversion

ATSFixes for Loggers 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 is 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 Dayøand -Remove all non-successful fixes from datasetøoptions.
4. Under the -File Name:øprompt, enter the filename of the data file you wish to convert.
5. Click on Continue.

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

Section 8 Warranty and Service

The model W500 Wildlink Small Collar Logger /model W510 Wildlink Glue On Logger is warranted for one year from the time of shipment, and for one refurbishment cycle. The unit may be refurbished up to three cycles.

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