ALFA GPS-Pulser

Flash: Time Incorrect
RED: No Sig
YEL: 2D (Poor)
GRN: 3D (Good)
BLU: WAAS (Best)

GPS STATUS

MOTION

ALFA
GPS-Pulser

Owners Manual

Original issue May 2020

Introduction:

The *ALFA GPS-Pulser* is designed to take the place of a conventional wheel mounted sending unit. It plugs directly into the sending unit input of your rally computer or odometer, and provides exactly the same signal as a traditional wheel mounted device. Your computer may then use its standard odometer correction factor to match any course in the usual manner. All you do is toss it up on the dashboard, and drive! Also, because the *ALFA GPS-Pulser* uses a high precision GPS receiver, it always knows the exact time and can be used to sync the clocks in either ALFA or Timewise brand clocks.
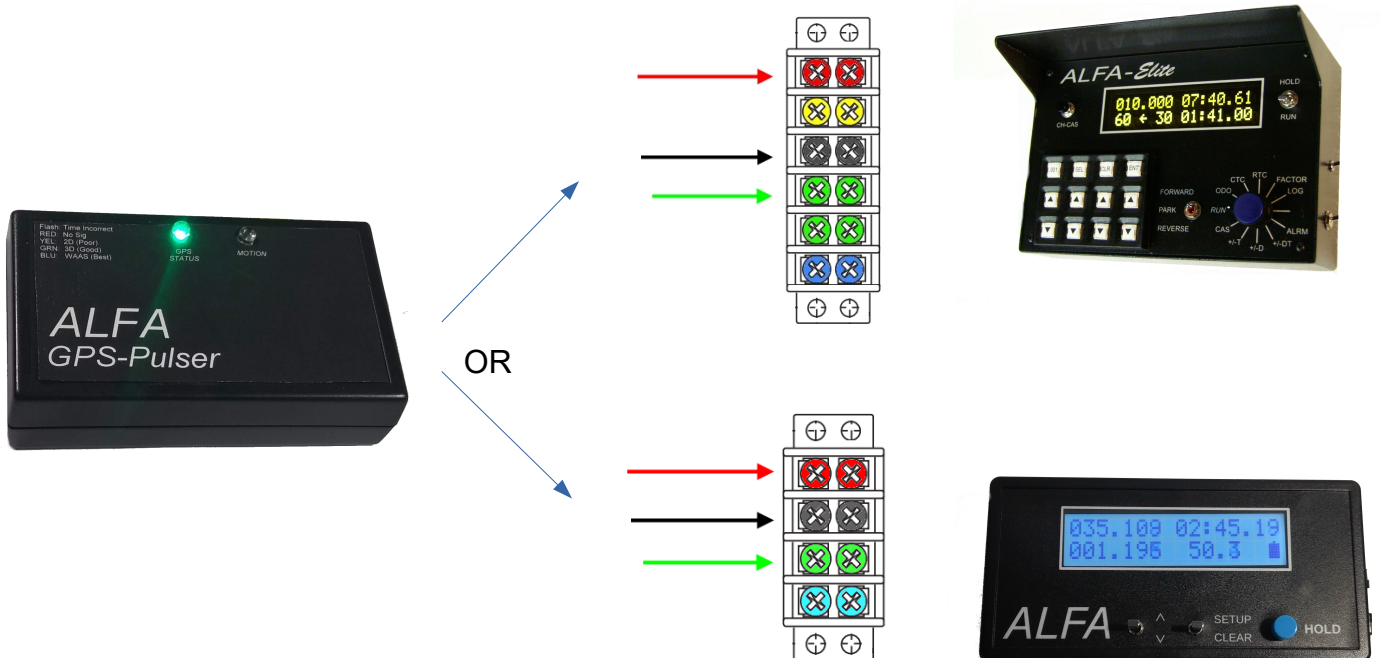
ALFA Installation:

The *ALFA GPS-Pulser* cable attaches to the terminal block included with your odometer or computer. There are three wires, Black, Red and Green, which screw into the similarly colored screws on the terminal block. The wire color code is:

RED: Power input. The *ALFA GPS-Pulser* will run on any voltage between 5 and 16 volts DC. You may connect this to the RED, 12 vold, terminal or the YELLOW, 5 volt terminal.

BLACK: Ground. Connect to the BLACK ground terminal.

GREEN: Odometer Pulse. Connect to any GREEN odometer input. Some ALFA equipment has two inputs, others only one.

Timewise Installation:

We have tested the *ALFA GPS-Pulser* with the Timewise 798A computer, and it was found to be 100% compatible. We have no reason to believe that it would be any less successful with other Timewise odometer products as well. Attaching the *ALFA GPS-Pulser* is as simple as plugging a standard RJ45 network jumper cable into both units.
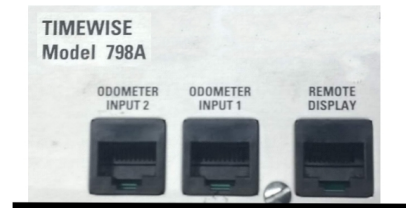
Using the *ALFA GPS-Pulser* :

The *ALFA GPS-Pulser* should be placed on the dashboard, as far forward as possible, in order to get the best view of the sky.The antenna is parallel to the top surface of the unit, and it should be placed parallel with the ground. You may not be able to directly see the two LEDs which light up on the top, but they are quite bright and usually easy to see reflected in the windshield. Use tape or velcro to secure the *ALFA GPS-Pulser* to the dashboard so it does not move around the inside of the car. An unsecured sending unit is both a hazzard and less accurate.

There are two indicators, GPS Status and Motion. The motion LED flashes in proportion to the speed of the vehicle. These flashes are NOT the pulses going to the odometer, but only an indication of movement. The GPS Status LED has the following indications:

RED: The GPS is not yet on-line or has failed. It is normal for the LED to flash RED for a few seconds after initially powering on.

MAGENTA: The GPS is functioning, but it is not yet receiving any usable signal. You may expect to see the MAGENTA indication for anywhere from 10 seconds to 2 minutes after powering on assuming there are strong GPS signals to receive.

YELLOW: The GPS is receiving only 3 satellites and providing a two dimensional position fix. This will provide less accurate mileage, but will have a good time sync. (See Time Sync section)

GREEN: The GPS is receiving 4 or more satellites and providing a good three dimensional fix. This will provide good mileage under most circumstances.

BLUE: Same as GREEN plus position enhancement from the WAAS system. This will provide the best mileage, but it is the most difficult signal to pick up. It is not unusual to see the indicator switch from BLUE to GREEN and back again as you drive, especially in mountainous or urban areas with limited sky view.

FLASHING: When you first power on the *ALFA GPS-Pulser* the status LED will be flashing, which indicates that the time of day has not been fully corrected. Use caution syncing a clock when ever the status LED is flashing. Once it is lit solidly, the time of day is corrected and ready to use.

The *ALFA GPS-Pulser* provides 2000 pulses per statute mile, which results in a factor of 5000.0 on your ALFA odometer. (Other brands may differ) You may calibrate your odometer using its usual method if this does not match course mileage during a rally. Follow the instructions from your odometer or computer to calibrate for kilometers or other distance standards.

Clock Synchronization:

The *ALFA GPS-Pulser* can sync the clock in any *ALFA-Club* built after 1999, or *ALFA-Pro* and *ALFA-Elite* built after 2012. You will need an ALFA Sync cable configured to for the particular device you'd like to sync, which are available on request. Simply plug the cable into both ends and insure the *ALFA GPS-Pulser* has a good GPS signal and the status indicator is not flashing. Sync is automatic as described in the owner's manual for your particular device.

To sync a Timewise device, use the standard Timewise sync cable plugged into both devices and sync as described in the Timewise owner's manual. Please note that the *ALFA GPS-Pulser* only sends a sync signal every 6 seconds (10 hundredths of a minute) so it will take a little longer than syncing from another Timewise clock. The time sync function has been tested on both a model 798A computer and a model 610 clock and found to work 100%. We have no reason to expect it will not work on other models equally well.

For either ALFA or Timewise sync operations, you may have the *ALFA GPS-Pulser* driving the odometer simultaneously.
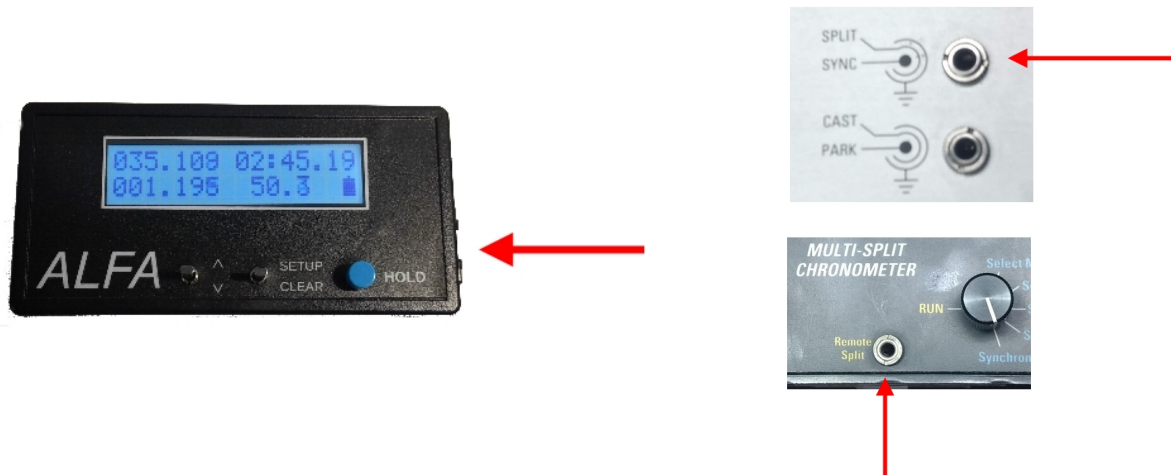
GPS Issues:

The GPS receiver used in your *ALFA GPS-Pulser* is high quality and extremely accurate. However, GPS works by receiving radio waves from space, so terrain, weather, and orbital geometry all conspire to distort or partially block ideal reception. This is not unique to your ALFA brand product, and is a limitation of the GPS system in general, especially for its use in creating rally mileages.

Using the *ALFA GPS-Pulser* with a traditional rally odometer or computer does have advantages over solutions offered which run on cell phones or tablets. These common devices, while popular and available, all run a very complex multitasking operating called Linux underneath the user interface which you see and interact with. Even if your "rally app" is the only user application seeming to be running, there are dozens of other background tasks being executed at the same time. Usually this does not cause problems, but there can be delays in processing your rally data which can last from insignificant milliseconds to score changing seconds. (Think about how often your screen scrolling studders, or times when you tap the touch screen and nothing happens for a moment) These events may seem insignificant overall, but in any given moment could cause real problems. Further, the GPS built into many phones or tablets may not have ideal antennas or provide high frequency updates. Using an external Bluetooth GPS may seem like a good answer, but wireless Bluetooth communications also has built in delays which can cause real grief when trying to zero in on a control in real-time. (Note: The Bluetooth delay problem does not affect GPS scoring apps since the data from the GPS is time stamped and there is no need for real-time response.

When using ALFA odometers and computers, there is no background operating system tossing seemingly random timing issues at the operator. Sometimes referred to as "Bare Metal Software", ALFA is in direct control of the hardware and is only running a single application dedicated to your getting the best possible rally score! All response times, delays, and other overhead are fully known and compensated for perfect real-time operation. We also have a direct connection to the GPS, so the position updates which occur only 100 milliseconds apart, are processed with no further delays.

While GPS positioning is not perfect, using our high precision receiver with dedicated rally specific equipment will always provide superior results. This is true for both a GPS-Pulser driven older computer, or a newer ALFA with the GPS built right into the box.

Connector Information:

This information is provided for the technically curious and otherwise insane user. There is no need for most users to read or understand this section. The manufacturer of this *ALFA* Clock/Odometer takes no responsibility for damage caused to or by, this or any other equipment, when created or wired by the user.

The 9 Pin DB9 male connector:
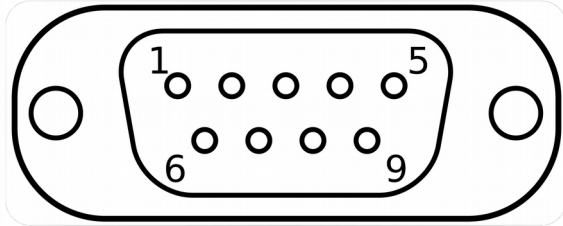
Female DB9 connector as viewed from the solder side

1. Power Input 5-16 vdc
2. Serial communications Output. (0-5v signal, idle high) ALFA Time Sync TX
3. Serial communications Input. (Accepts either 0-5v signal or RS-232) Configuration RX
4. No Connection
5. Ground.
6. Power Input 5-16 vdc
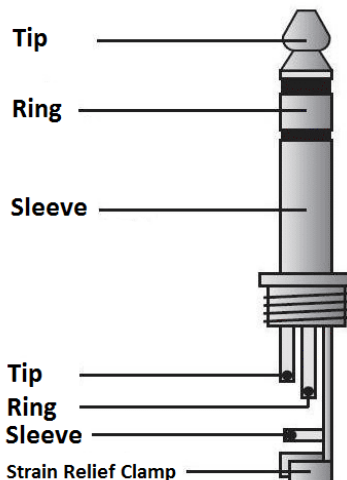7. Timewise Sync Output
8. Odometer Pulse Output
9. No Connection

RJ45 8 Pin Jack:

2. Power Input 5-16 vdc
4. Odometer Pulse Output
7. Ground
(Other pins not connected)
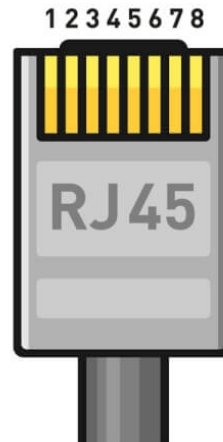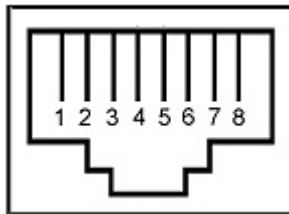
3.5mm 3 Conductor Jack:

Sleeve: Ground
Ring: No Connection
Tip: Timewise Sync Output

WARRANTY:

Your *ALFA* is warrantied against defects in material and workmanship for a period of one year from the original date of purchase. This warranty does not cover any parts broken due to abuse, neglect, normal wear or misuse of this product as determined by Small Systems Specialists.

The Liquid Crystal Display is warrantied against electrical failure for one year, but not against breakage of the glass enclosure.

Although every effort has been made to assure reliable and accurate operation, Small Systems Specialists is not responsible for any loss of money, property, time, or trophies due to the malfunction of this product. Good operating practice dictates that the user verify the product is in good working, and the operator has been trained in its use, order before it is relied upon in competition.

The ALFA, like many electronic clocks, may require periodic calibration. This function will be performed for the cost of shipping and handling only at any time during the life of the product.