PULSE ANALYSER PA2

www.awrtech.co.uk/pulsetest.htm

This electronic device monitors the signals from the camera to the autoguiding socket on your telescope. It also monitors signals from the PC if a remote relay box like a GPUSB adapter is fitted, also controlling autoguiding on the telescope. It does not affect the control of the telescope even if not turned on.

SET UP

Put in the PP3 9V (transistor Radio) battery inside the compartment of the **Pulse Analyser**, connecting to the battery clips. There is no current drain in extended periods of storage without use.

Take out the RJ12 cable in your autoguider input on the telescope and put it into either socket on the **Pulse Analyser**. Use the supplied cable to connect the other socket on the **Pulse Analyser** to the telescope autoguider input socket.

OPERATION

MODE – Press to turn it on. Power LED turns on, top right.
MODE – Change operation mode. Toggles between
      REAL TIME MODE – 4 horizontal LEDs illuminated
      PULSE STRETCH MODE – 5 vertical LEDs illuminated.
MODE – Press and HOLD to turn it off. Power LED goes out.

Pulse length measurement is in bands as shown on the vertical LEDs. All pulses are displayed in order of finishing, a direction and a duration are shown together. Up to 10 results are stored in a buffer for display in turn.

DIAGNOSTICS

Look at the pattern of pulses it is producing in both modes of operation. If you are looking for periodic error the cycle is up to 10 minutes.

PERIODIC ERROR – Pulses will be all to the LEFT then flickering LEFT and RIGHT then all to the RIGHT and back to flickering between the directions. Real time mode suggested. It may be possible to alter it by re-alignment of the worm and wheel mesh.

BACKLASH – Look at the UP and DOWN lamps in the pulse stretched mode. You will have very long pulses alternating between the directions as the motor is reversing direction and taking up the backlash. You can correct this defect by adjusting the mesh of the worm with the wheel. See website for helpful articles.

CAMERA SETTINGS – In the pulse stretch mode if you have extremely short pulses the telescope cannot possibly respond. The scaling of the corrections is not matching the errors measured. The 'aggressiveness setting' needs to change.

TELESCOPE GUIDE SETTINGS – In the pulse stretch mode if you can change the guide adjust speed along with the camera settings then the ideal pulse lengths for adjustment would be around 0.2 seconds to 0.5 seconds. If GUIDE was 20% of sidereal rate then it would move 3 arc seconds in 1 second adjust (pulse) length

DRIFT ALIGNMENT – By selecting a star in the EAST (WEST) most of the DEC drift is caused by polar ALTITUDE error. By selecting a star in the SOUTH most of the DEC drift is caused by polar AZIMUTH error. The autoguiding camera is very sensitive to these changes and you will see them immediately. Use the real time mode. See the error, move the mount slowly to cause the error to disappear.

**TABLE 1.   PINOUT OF TELESCOPE AUTOGUIDER SOCKET**

	1	2	3	4	5	6	ACTIVE
LX50/LX200	-	0V	LEFT	DOWN	UP	RIGHT	LOW
AWR	+5V	0V	E	S	N	W	LOW
QEI	W	E	S	N	-	0V	LOW
SS2K	-Y	+Y	0V	-X	0V	+X	LOW

TABLE 2.   PINOUT OF CAMERA AUTOGUIDER SOCKET

	1	2	3	4	5	6	TYPE	ACTIVE
STAR2000 STD	-	0V	E	S	N	W	OPTO	LOW
ST7/8/9/…	-	0V	LEFT	DOWN	UP	RIGHT	TTL	LOW
PICTOR	+5V	0V	LEFT	DOWN	UP	RIGHT	TTL	LOW

TABLE3.   ALTERNATIVE NAMES

UP	N	DEC +	+Y
DOWN	S	DEC -	-Y
LEFT	E	RA +	+X
RIGHT	W	RA -	-X

AUTOGUIDER SOCKET
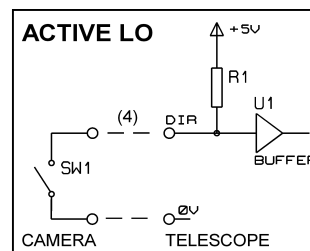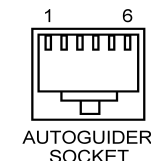
ACTIVE LO

HOW AUTOGUIDERS COMMUNICATE

The camera switches each direction line to a hard LOW or lets it float HIGH. Typical camera setups are shown in TABLE 2. The diagram shows a typical circuit for the ACTIVE LO condition. This has become the 'de-facto' standard for autoguiders. Resistor R1 will let a few milliamps to flow when it is connected to 0V via the camera and this voltage level is measured in the telescope causing the direction button to be pushed.

The **Pulse Analyser** PA2 fits in the middle, connecting to both ends. The signals are just looped through, so you just need an extra RJ12 cable (supplied) to be able to monitor the signals.

SPECIFICATION

Signals	Active LOW
Operation	20 hours of use from a PP3
Standby	No current drain
Battery	PP3, alkaline type recommended
Temperature range	-20 to +50 deg C
Sockets	6 pin RJ12 x 2
CE marked	

FURTHER INFORMATION ON THE WEBSITE!

www.awrtech.co.uk

Units are guaranteed for 1 year from purchase against defective materials and assembly.