SPECIFICATION

Serial port 1	HANDSET - 9 pin male RS232C Rx Tx RTS GND
Serial port 2	COMPUTER - 9 pin female RS232C Rx Tx Gnd
Serial parameters	9600 baud, 8 data, 1 stop, no handshakes
Power connector	DC power inlet 2.1mm, centre positive
Power supply	12V to 24V DC at 200mA max
Operating range	-20 to +40 deg C
Size	190 x 70 x 140mm (w x h x d)
Digits	20mm high x 7 red LED
Weight	0.57Kg
CE marked	

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

Designed and manufactured in the UK by AWR Technology

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AWR TECHNOLOGY: Your source for innovative electronic products for astronomy.
www.awr.tech.dial.pipex.com

AD100 Handbook V1.0 Feb 2004

ASTRO DISPLAY UNITS
AD100 MANUAL

CONTENTS

1 x AD100
1 x Power supply or Distribution board (per consignment)
1 x Serial cable of your choice

The latest handbook and further user notes are on the web page reached through
www.awr.tech.dial.pipex.com

INTRODUCTION

The ASTRO DISPLAY unit from AWR TECHNOLOGY provides observatory style large illuminated readouts from AWR, MEADE, VIXEN and other drive systems fitted with a computer connector. The display is selectable from one of seven parameters (**RA, DEC, ALT, AZ, HA, LST, UT)** indicating where the telescope is pointing. It connects in series between the handset and a computer which would be running a planetarium programme to control the telescope. It is transparent to serial data flow and so does not interrupt the control. Multiple units can be connected in series up to five units.

CONNECTIONS

The ASTRO DISPLAY units have through serial connections and so serial leads must loop between all the devices. From the drivebox / handset end you need a specific lead to make connection to the first AD100 (plugs into rear connector marked HANDSET). A PC extender serial lead then connects from the rear COMPUTER connector to the next AD100 (or PC) into the rear connector marked HANDSET. Repeat for additional units and finally a PC extender lead from the rear connector marked COMPUTER to the computer serial port (RS232). If the computer only has USB then you need to attach and install a USB to Serial converter.

Power is required 12V to 24V DC at up to 0.2 amps per unit, typically 0.1 amps at 12V. Connection is by standard 2.1mm power plug (centre positive) on the rear of the unit.

DATA SOURCES

Data is fetched according to the parameter selected from the HANDSET direction. Each box looks after itself and refreshes its own data, whilst passing any other commands or data straight through to the next unit. If a planetarium programme is running it is completely transparent to serial data flow so that control of the telescope is maintained from the PC. The protocol in use must be a Meade format, so all telescope drive boxes and handsets that emulate this protocol are suitable for connecting to ASTRO DISPLAY units.

Under heavy traffic conditions it is possible for a parameter to time out and become stale before it is refreshed. In this case the display will show horizontal bars. If this persists, turn off the Display Unit(s) and power back up again. It is also the case that not all the parameters may be supported by the Handset. In particular, HOUR ANGLE (HA) is present only on the AWR Intelligent Handset.

Full precision displays are present when using the Meade LONG format as is present on AWR equipment and Vixen equipment, and selectable on some Meade equipment. Please refer to your telescope handbook to determine which type you have. The Meade SHORT format gives reduced precision displays. If you are running SKY MAP PRO then select Vixen to get full precision, otherwise it only works in short format if LX200 is selected.

BUTTONS

The ASTRO DISPLAY has the following controls:

POWER ON	Plug in power to the rear.
O/I	Turns off or on the display. The unit is still operating in either mode.
FN	Change displayed parameter.
<	Increase display brightness level.
>	Decrease display brightness level.

When the unit is powered up, the first display is the software version number. The previous level of BRIGHTNESS and the display PARAMETER is fetched from non-volatile memory and the unit then fetches data from the handset. Data is fetched once per second. If the data source is not present then the data becomes stale and is replaced by horizontal bars.

THE PARAMETERS

RA	The **Right Ascension** coordinate (celestial longitude) of the star. Range 0hr to 23hr59m59s
DEC	The **Declination** (celestial latitude) of the star. Range +90 to 90 degrees
ALT	The **Altitude** of where the telescope is pointing in your horizon coordinates. Range +90 to 90 degrees
AZ	The **Azimuth** of where the telescope is pointing in your horizon coordinates. It is a bearing: 0 degrees in the North through East (90) through to 360 degrees.
HA	The **Hour Angle** being the distance in hours to or from the central meridian (due South). It is defined in the British Astronomical Association Handbook as HA = LST RA It is negative when the star is in the East. Range +12 hours to 12 hours
LST	**Local Sidereal Time** being the RA of a star due south at that instant. Range 0hr to 23hr59m59s
UT	**Universal Time**. Greenwich Mean Time beginning at midnight. Range 0hr to 23hr59m59s

ACCESSORIES

The unit is supplied with 1 power supply or power distribution board and one serial lead.

Here is the complete list of extras:

12V DC 0.4 amp plug top power supply (UK 13A PLUG) sufficient to power 4 units
4 way distribution panel for low voltage routing up to 4 units.
Serial lead to AWR Intelligent Handset 6 pin RJ11 (**SERIAL**)
Serial lead to MEADE equipment 6 pin RJ11 (**SERIAL/M**)
Serial lead to VIXEN SS2K handset mini Din (**SERIAL/VX**)
Serial extender lead to PC 9 pin D (**PCEXTEND**) planetarium programme use.

Other special options can be supplied