HORIZON
HD-S2

HORIZON HD-S2

OUT

INPUT

OFF

MENU

ON

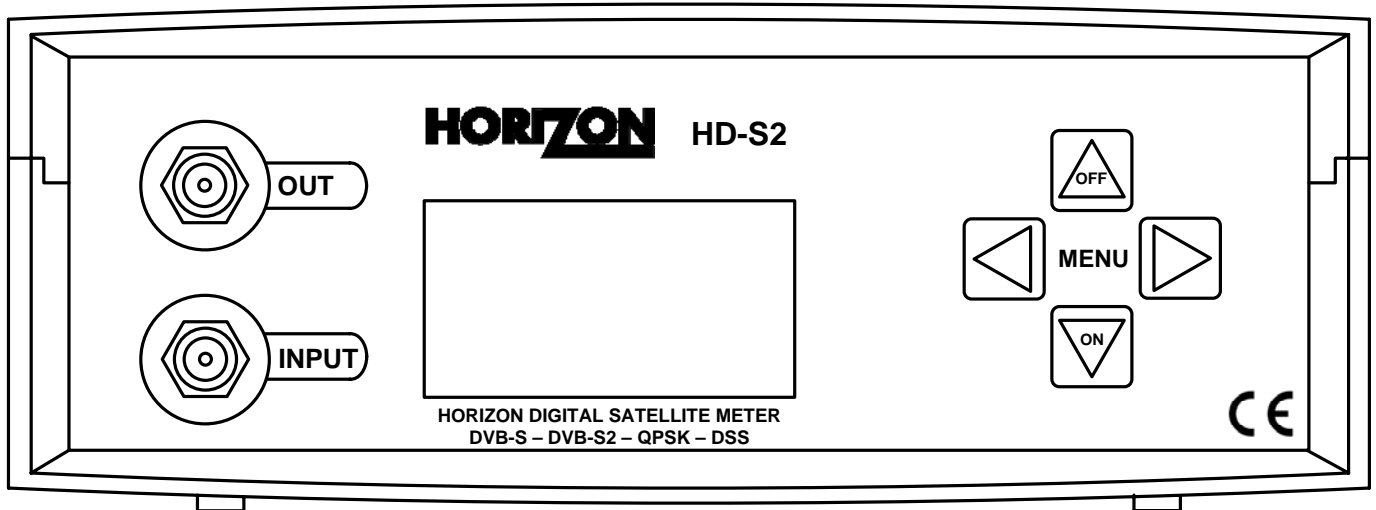HORIZON DIGITAL SATELLITE METER
DVB-S – DVB-S2 – QPSK – DSS

C E

User Guide

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HORIZON
For a reliable solution!

Horizon part number. KM137/1.2

Contents

Thank you for choosing to buy the HD-S2 satellite meter. Please read through the instructions carefully before using your meter to familiarize yourself with all of the features available.

The HD-S2 is a compact, lightweight and easy to use satellite installation meter featuring an easy to read display that shows signal strength and digital signal quality. Finding your satellite is easy: use the left or right arrow keys to scroll through the selections, and your HD-S2 will lock onto the satellite shown in the display when it is in range. Everything you need is supplied with your meter, which includes a A/C charger lead, in-car charger and USB lead. The rain cover and carry case are already fitted.

Spare Li-Po (Lithium-Polymer) battery packs are available directly from Horizon Global Electronics and authorised distributors, Batteries can be replaced without voiding your warranty. Replacement carry cases, rain covers, USB leads, A/C charging leads and in-car chargers are also available directly from Horizon Global Electronics Ltd. or an authorised distributor.

Safety

 This symbol is intended to alert users of possible hazard or damage in operating this unit.

- **WARNING! This device is capable of generating 21 Volts.**
- Do NOT expose this meter to rain or moisture!
- Clean only with a soft dry cloth.
- Always use the protective case and cover provided.
- Read the instructions carefully before operating your unit for the first time.
- Care should be exercised when using the carry strap as it can present a choking hazard; only use when slipping or falling is not a possibility.
- Do not disassemble your unit or interfere with the internal components; this will void your warranty and there is a possibility of electric shock.

"If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired".

 • Only use the provided battery, AC charger lead and DC car charger lead provided, as using other types may cause damage to your unit, which will void your warranty and may cause electric shock. Replacement charging leads and battery packs are available directly from Horizon Global Electronics Ltd.

Li-Po battery notes:

 A damaged battery represents a hazard and should be replaced. Always replace damaged battery packs with the correct type – **never attempt to repair them.**

Remember:

 Do not short-circuit the battery terminals
Do not dispose of in fire
Do not disassemble

Periodical maintenance of replaceable F barrel connectors

 Note: Your new HD-S2 meter features replaceable F barrel connectors. Periodically these may require replacement and inspection to insure continued reliable operation. For the removal of F barrels use a 7/16th or 11mm spanner.
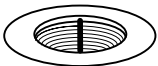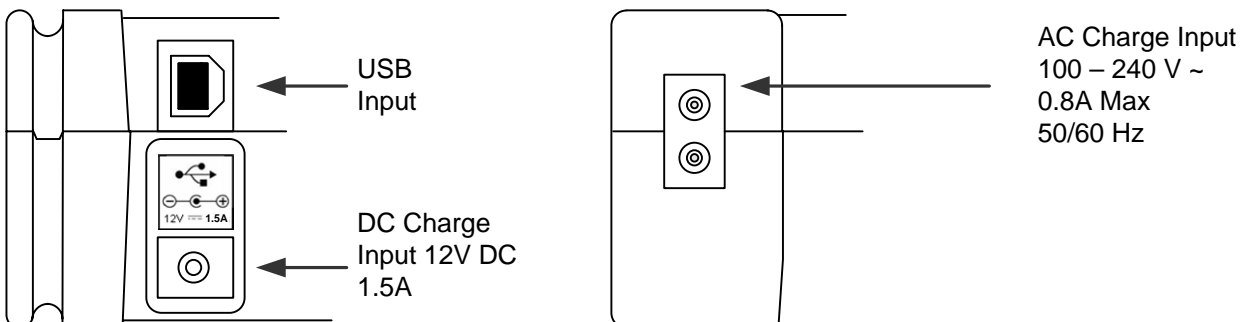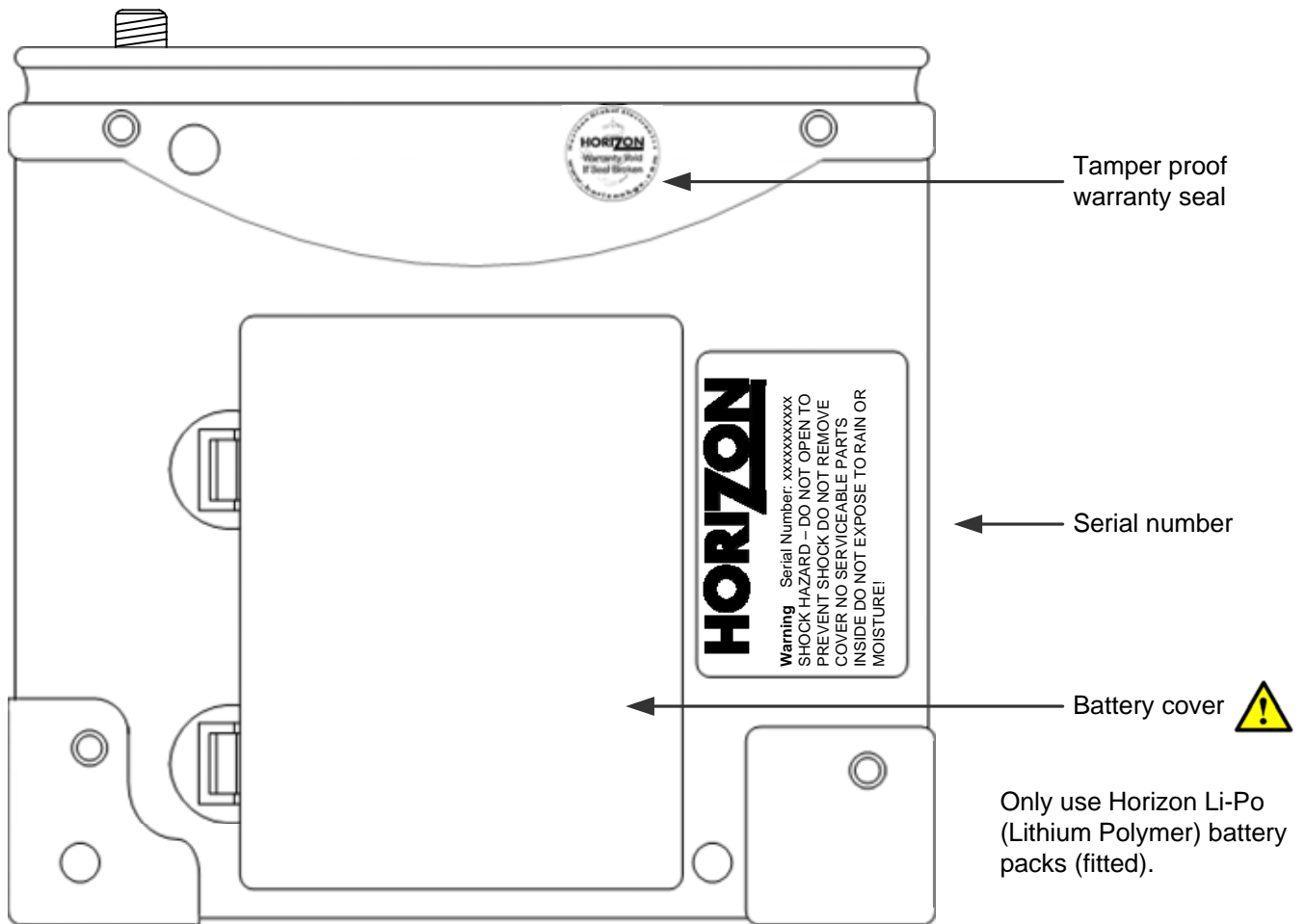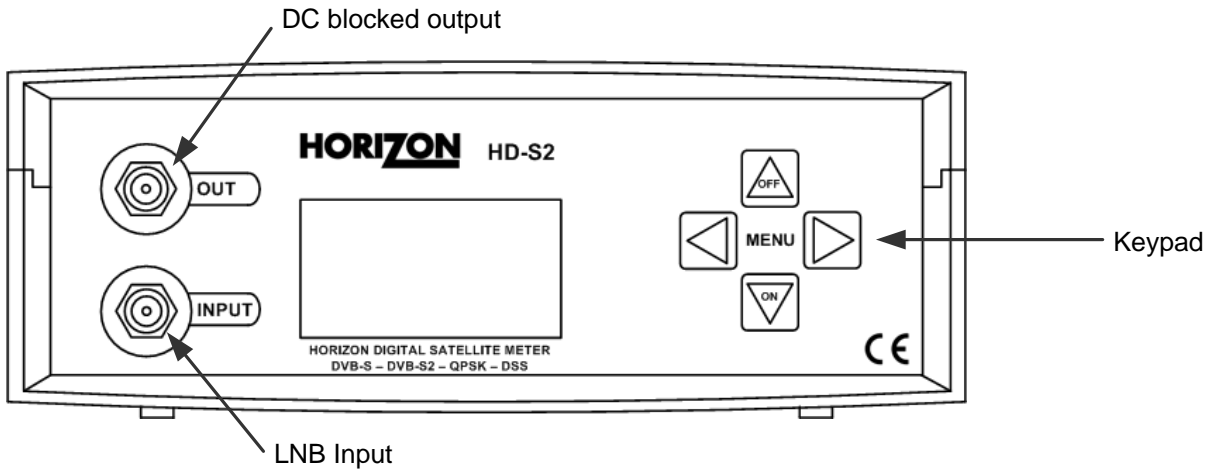
 Carefully clean the surrounding area with a dry lint free cloth to prevent debris falling into F male socket well.
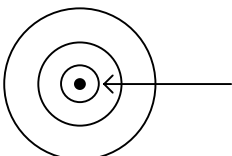
 Tip: Check for any copper fragments that may have gathered in the well of the F male socket on the meter. These can be removed with a dry cotton bud. When re-fitting F barrels only tighten enough to prevent the barrel being removed by hand.

Your Meter

DC blocked output

Keypad

HORIZON HD-S2

OUT

MENU

INPUT

HORIZON DIGITAL SATELLITE METER
DVB-S – DVB-S2 – QPSK – DSS

CE

LNB Input

Tamper proof
warranty seal

HORIZON

Warning Serial Number: xxxxxxxxx
SHOCK HAZARD – DO NOT OPEN TO
PREVENT SHOCK DO NOT REMOVE
COVER NO SERVICEABLE PARTS
INSIDE DO NOT EXPOSE TO RAIN OR
MOISTURE!

Serial number

Battery cover

Only use Horizon Li-Po
(Lithium Polymer) battery
packs (fitted).

USB
Input

12V   1.5A

DC Charge
Input 12V DC
1.5A

AC Charge Input
100 – 240 V ~
0.8A Max
50/60 Hz

Accessories

Your HD-S2 is supplied with this Instruction Manual and these items below. Please check if you have all the following. If any items are missing please contact your supplier.

⚠️ **Only manufacturer's replacement parts should be used, otherwise safety of the meter may be impaired**

⚠️ **DC Car Charger Lead Fitted with 2 Amp Fuse (AW992CIG)**

USB Lead (AW998USB)

⚠️ **AC Charger Lead (AW993UKP/EUR)**
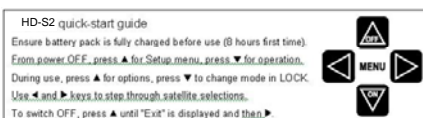
⚠️ **Li-Po Battery Pack (BP1524)**

⚠️ **Rain Cover (ARHDBDU) (should be fitted at all times)**

Carry case (AL006BK)

Quick Start Insert

HD-S2 quick-start guide
Ensure battery pack is fully charged before use (8 hours first time).
From power OFF, press ▲ for Setup menu, press ▼ for operation.
During use, press ▲ for options, press ▼ to change mode in LOCK.
Use ◄ and ► keys to step through satellite selections.
To switch OFF, press ▲ until "Exit" is displayed and then ►

Replaceable F barrel connectors x2 (fitted)

Note: The items shown above are subject to change without notice.

Battery Charging

The meter will NOT be fully charged when you receive it. We recommend you charge it for an initial 8 hours before use. If your meter is not being used for a long period of time, we recommend disconnecting the battery.

You can also top up your battery from your vehicle with the in car DC Adapter supplied. You should top up the charge every 2 weeks. The battery pack is replaceable, but it should only be removed or disconnected in the event of a failure.
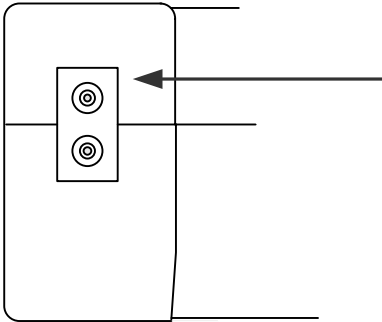
Charging with the AC lead

On the bottom of the case there is a small velcro flap which covers the AC input for charging.
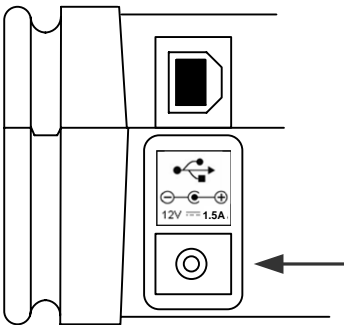
Charging from a vehicle

The vehicle 12V DC charge port is on the right side of the unit. Plug the car charger lead into the bottom socket and the other end to the vehicle's "aux" socket. Please note that on certain vehicles the aux socket is switched off unless the vehicle is running.

Note: Do not charge from a vehicle with a higher battery voltage or positive ground!

For in-vehicle charging only use the lead supplied. The use of another lead may damage the meter and will void the warranty. The HD-S2 can remain connected to either power source in *"Trickle"* charge state for an extended period of time. Once "**Charge Complete"** appears on the display the HD-S2 will be in a trickle charge state.

Note: When charging your battery HD-S2 Li-Po battery please ensure that the ambient temperature is above freezing point 0° C (32° F) and not above 40° C (100° F) this will prevent damage to your battery pack.

Note: The meter will not operate while the unit is being charged.

The Li-Po battery pack is replaceable. Always handle the battery with care avoiding shock or impact.

Battery removal and replacement:

Remove the HD-S2 from its carry case, and on the underside of the meter release the two catches and detach the battery door. Press the battery down at the end closest to the connector (this will cause the battery to pop up at the bottom). Now cover the battery with your hand and turn the meter over so that you catch the battery. Carefully detach the battery connector. You can now fit your replacement battery in the reverse order of removal.

Note: Avoid pulling the battery cable as it is short to ensure a snug fit.

> **Battery end of life disposal:** When your battery reaches the end of its life please take it to a local battery disposal point or return it to Horizon Global Electronics Ltd. Battery type **Li-Po** (Lithium Polymer).
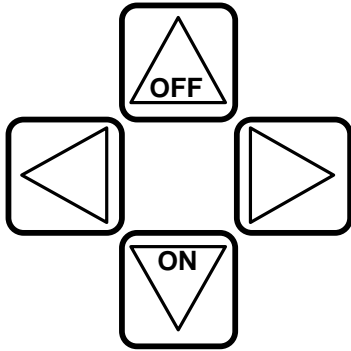
The HD-S2 keypad. All of the meter functions are accessed from here.
Once your dish mounting has been securely installed in a suitable direction connect the LNB to your HD-S2 meter with a short length of cable (1.5m or 4 feet being ideal): note that this cable is **not** supplied – you should use a high quality satellite cable.

Tip: Your dish clamp should be just nipping the metal work allowing you to adjust the dish position, and it should hold when you release.

To turn the meter on press the [ON] button once and the Horizon animation will appear.

The next screen will display the meter information, including model, version, satellite list selected and battery percentage.
**Note:** Satellites shown will be from the last used list, the list in use is shown on the 3rd line of the display.

```
HDSM-USB S2
(c) 2009 V1. 0A
DVB-S1
Battery          32%
```
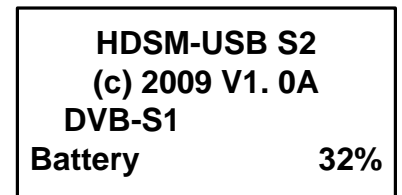
Use the LEFT or RIGHT arrow keys to cycle through the selections available until the desired one is shown.

Point the dish in the approximate direction of the required satellite, and slowly sweep the dish across the sky, adjusting your elevation at the end of each sweep. While you are sweeping the sky the rate of beeps will change as you pass each satellite; the scale on the meter will also change. If very low RF levels are found the dBuV value will show << dBuV. For extremely high levels >> dBuV will show.

```
V Astra 2A        28.2E
████████████░░░░░
RF          68.0dBµV
                  Searching
```
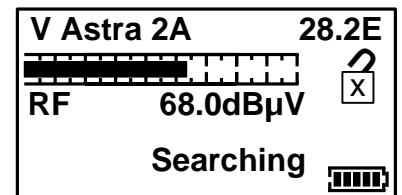
Once a lock has been acquired the second bar that is referencing MER is shown and this is directly relative to the quality of the signal. The padlock symbol is also shown locked confirming the signal lock. You can now use both of this displayed measurements to peak the antenna (ideally getting these levels as high as they will go).

```
V Astra 2A        28.2E
████████████░░░░░
RF          66.8dBµV
████████████░░░░░
MER         13.9dB
```
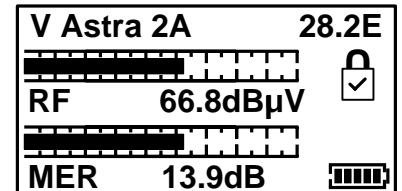
Now that you have acquired a good lock you can further tweak the pointing of your antenna to maximise the satellite system performance by pressing the **On** button once to access the RF and MER magnified display. This will provide you with a sensitive linear scale allowing you to make very fine adjustments.

```
V Astra 2A        28.2E
████████████░░░░░
RF        🔍 167
████████████░░░░░
MER       🔍  72
```
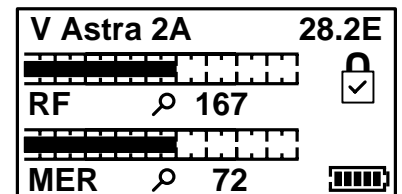
Shown on the right is a lock acquired on a DVB-S2 service the padlock symbol is showing locked condition and there is also an additional indication that the signal acquired is DVB-S2.

```
V Astra 2A  S2    28.2E
████████████░░░░░
RF          66.8dBµV
████████████░░░░░  S2
MER         13.9dB
```
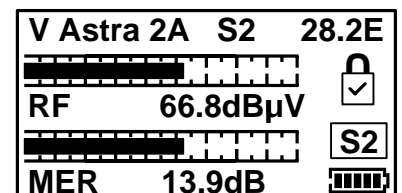
Pressing the On button again will also show the **BER B**it **E**rror **R**ate for DVB-S1 carriers this is shown as a numerical value.

```
V Astra 2A        28.2E
████████████░░░░░
RF          66.8dBµV

BER= 6.00E-8
```
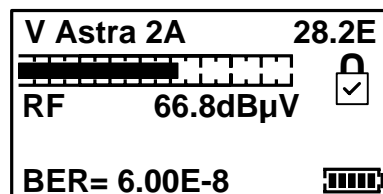
For DVB-S2 carriers **DER** is shown indicating a **D**erived **E**rror **R**ate.

```
V Astra 2A  S2    28.2E
████████████░░░░░
RF          66.8dBµV

                  S2
DER= 6.00E-8
```
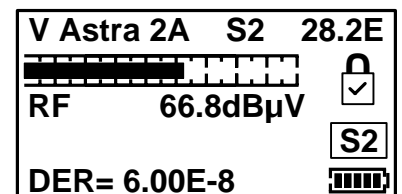
Setup Menu

To access the Setup Menu ensure your HD-S2 is off and press the UP (off) button once.
The following options are available from this menu.

Exit	
Backlight	**on**
Clicking	**on**
Brightness	**10**
Contrast	**20**
Sleep	**6M**
English	
RF dBuV	
LNB 13/18V	
Defaults	
Azimuth Mag	
1. 0Am-0012	
Eur. Cities V1. 0	

By using the keypad as cursor keys you can navigate through the set up menu using UP and DOWN, and change values by using LEFT and RIGHT keys. Once you have made your selections return to the top of the menu highlighting **Exit** and press the left or right key to apply the changes and switch the meter off.

You can also go back to the default setup by selecting **Defaults**. This operation will not affect any of the satellite settings stored in memory.

Note: The full menu is shown here, whereas only four options are visible at any one time on the LCD display.

The HD-S2 supports many languages, the default is English and other language packs are available as downloads.

The RF level measurement can be displayed as one of the following values dBuV, dBm or dBmV

LNB Voltage: This feature enables you to switch the LNB supply voltage off. While the LNB Voltage is set to 0 Volts the Satellite name on the top line of the display will alternate with "**LNB 0V**" to indicate that no LNB voltage is applied. This selection will remain active until it has been changed back to LNB 13V/18V even if the meter is switched off. Only set LNB Voltage to 0V if the LNB is being externally powered (see LNB/Cable Test).
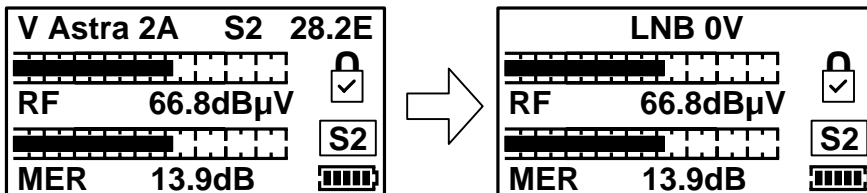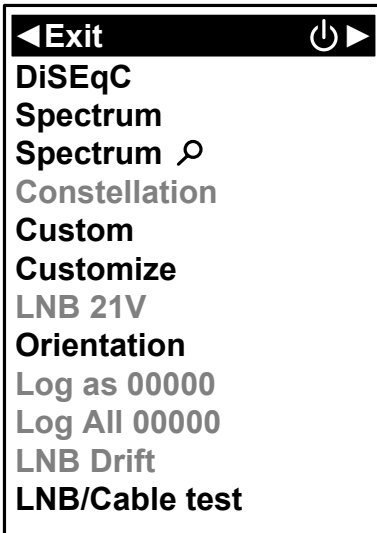

Note: While the LNB Voltage has been selected as 0V then the satellite name on top line of the display will alternate as illustrated above.

The **Azimuth** option allows you to select either **True** (relative to true North) or **Mag** (with magnetic offset applied). This option affects how the Orientation display is shown. See page 16 for more information.

Using the **Defaults** option will set your meter back to its default settings, the satellites stored in memory will remain unaffected including your custom carrier selections previously stored.

The version number information at the bottom of the Setup Menu "**1. 0Am-0012**" has no function other than to inform you which version of firmware is in use.

HD-S2 Sub Menu

```
◄Exit              ⏻►
DiSEqC
Spectrum
Spectrum ⌕
Constellation
Custom
Customize
LNB 21V
Orientation
Log as 00000
Log All 00000
LNB Drift
LNB/Cable test
```

Your HD-S2 has a range of features available from the **Sub Menu.**

To access the sub menu press the UP (off) button once from the searching screen. Using the keypad as cursor keys you can select the various options. At any time you can press and hold the UP button to switch the meter off. When **Exit** is highlighted, you can also use the RIGHT button to switch the meter off.

Note: The Constellation. Log, LNB 21V, Log As 00000, Log All 00000 and LNB Drift functions are only available once a satellite has been found and a lock acquired.

The full sub menu is shown on the left, only 4 selections visible, you may need to scroll up and down to access the function you require.

Sub Menu Overview

|	
DiSEqC:	Allows the sending of DiSEqC switch commands to select different LNB sources.
Spectrum:	Shows you a visual representation of the selected transponder.
Spectrum ⌕:	Lifts the signal amplitude so that weaker signals can be seen.
Constellation:	Shows a constellation diagram of the current locked transponder selection.
Custom:	A list of editable transponders (carriers) stored on your meter.
Customize:	The function allows you to edit the custom carriers.
LNB 21V:	To enable 21 Volts for Stacked LNB assemblies.
Orientation:	An aid to finding your satellite quickly that provides look angles.
Log as 00000:	A logging function for individual transponder measurements stored incrementally.
Log All 00000:	A logging function for all transponders associated with the satellite selected.
LNB Drift:	A measurement tool for testing LNB frequency drift relative to transponder centre frequency.
LNB/Cable Test:	Performs a LNB function test and displays voltage and current measurement.

DiSEqC

The following DiSEqC switch functions are available from the sub menu of the HD-S2 meter.

```
Exit
►DiSEqC
 Spectrum
 Spectrum 🔍
▼For more
```
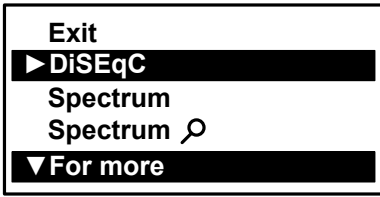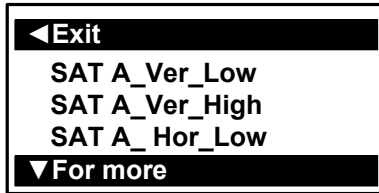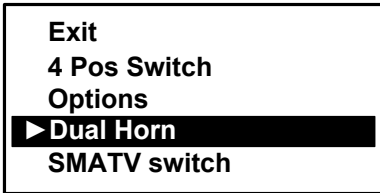
From the sub menu DiSEqC function shown here you can select a variety of DiSEqC switch commands to suit the needs of your installation. Press the right arrow button to access the the different options available. Once a DiSEqC command has been selected with the right arrow key the command will be sent and you will be returned to the last satellite selected.

```
Exit
►4 Pos Switch
 Options
 Dual Horn
 SMATV switch
```

```
◄Exit
 LNB A
 LNB B
 LNB C
 LNB D
```
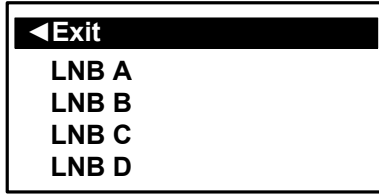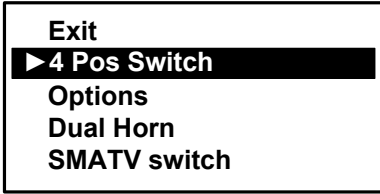
The 4 Position Switch option gives you the selections of A,B,C and D and these selections can be used with a conventional 4 way DiSEqC switch. Selecting **Exit** here will take you back to the sub menu.

```
Exit
 4 Pos Switch
►Options
 Dual Horn
 SMATV switch
```

```
◄Exit
 Option A
 Option B
```
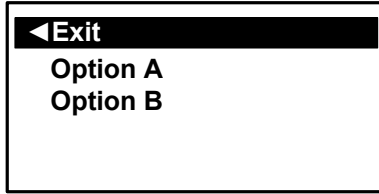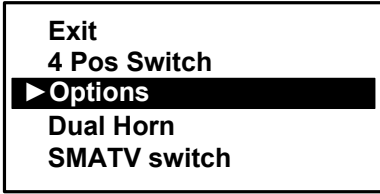
The Options selection enables you to send Tone Burst commands (A or B). Selecting **Exit** here will take you back to the sub menu.

```
Exit
 4 Pos Switch
 Options
►Dual Horn
 SMATV switch
```

```
◄Exit
 SAT A_Ver_Low
 SAT A_Ver_High
 SAT A_ Hor_Low
▼For more
```
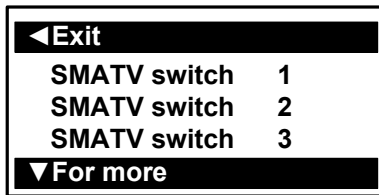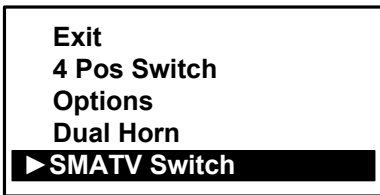
The Dual Horn option is for use with dual feed LNB assemblies enabling you to select the band and polarisation available individually. Selecting **Exit** here will take you back to the sub menu.

The following selections are available from the Dual Horn menu.

| Satellite A Vertical Low | Satellite A Horizontal Low | Satellite B Vertical Low | Satellite B Horizontal Low |
| Satellite A Vertical High | Satellite A Horizontal High | Satellite B Vertical High | Satellite B Horizontal High |

For SMATV switch systems the following DiSEqC command options are available.

```
Exit
 4 Pos Switch
 Options
 Dual Horn
►SMATV Switch
```

```
◄Exit
 SMATV switch    1
 SMATV switch    2
 SMATV switch    3
▼For more
```

The SMATV switch option is for use with systems with up to 16 inputs. Selecting **Exit** here will take you back to the sub menu.

Spectrum Display

Spectrum mode is available from the Sub-menu (press the UP arrow while the signal level or carrier/noise display is on screen). Scroll down to highlight "Spectrum", and press the RIGHT arrow. The screen will change to display the spectrum.

The graphic will be centred on the frequency of the selected transponder: in our example of a Low Band setting, the display is centred on 11840MHz. The span (range of frequencies displayed on screen) is set by default to 240MHz; which gives a display of 8 adjacent carriers at 30MHz spacing. By pressing the DOWN button, you can cycle through a range of spans from 60MHz (to zoom in on one carrier in particular) to 1200MHz.

Centre the chosen frequency on the display by pressing the LEFT and RIGHT buttons. Note that you will not be able to go beyond the limits for each band, which are indicated by arrows pointing right (lowest frequency) or left (highest). Note that the Low Band coverage extends from 10700MHz to 11600Mhz, and the High Band from 11550MHz to 12750MHz, so there is some overlap between the Low and High Band for Universal LNB's.

RF level is shown by a solid band at each sampled frequency (see image). There will be areas of low-level signal between the carriers, and the bigger the distance between peaks and valleys, the better the carrier-to-noise ratio. Good C/N ratio is important for trouble-free reception!

The top line of the screen alternates between "Centre" plus the selected frequency (shown at the dotted vertical line in the centre of the display) and "Span" plus the frequency span in MHz. In "Span" view, the polarization of the carrier (H)orizontal or (V)ertical is shown. If High Band is in use, and 22KHz is enabled, the tone symbol ⎍ will appear next to the Polarity.
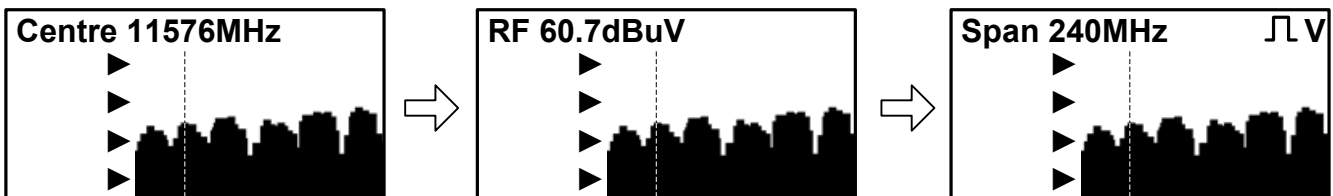
The Spectrum information bar at the top of this screen will alternate between the current frequency, span and RF.

Note: You can exit spectrum mode at any time by pressing the UP button once. This will return you to the searching screen on the selection that you made previously.

In low signal level conditions use the **▶ Spectrum ⌕** may be seen.

Tip: If you have defined a custom carrier you can view it in spectrum mode too (see **Customize** on page 12).

Constellation

Provided the meter is locked to a DVB-S QPSK, DVB-S2 QPSK / 8PSK / APSK or DSS modulated carrier the constellation mode is available from the Sub-menu (press the UP button while the signal level or carrier/ noise display is on screen). If there is no lock, the option will be "greyed out". This type of diagram is almost meaningless when it cannot display formatted data – as dots would appear randomly in each quadrant, and there would be no visible pattern.

In the Sub-menu, scroll down to highlight "Constellation", and press the RIGHT arrow. The screen will change to the QPSK constellation display and a listing of the current transponder settings.

The graphic displays the 4 quadrants of a QPSK signal. A "good" display will show a cluster of dots centred in each quadrant. The more concentrated the cluster, the better the quality of the received signal; dots "straying" from the cluster indicate noise on the signal, phase errors, and other unwanted artefacts.

The aim is to achieve the best result possible, which a thorough alignment of the LNB should achieve. With the constellation diagram, you get reassurance that the adjustments have been done well.

At the right side of the screen is a list of the parameters for the currently chosen transponder:

Frequency in MHz: this is the measured frequency after "pull-in" by the meter's Automatic Frequency Control (AFC), so the displayed value may differ slightly from the nominated value in the configuration file;

Symbol Rate in kilo Baud (Kilo Symbols / Second): the data rate is critical in identifying and locking to the selected carrier;

FEC (forward error correction) value: data on the selected carrier will conform to one of a short list of standard FEC values;

IQ Norm indicates that IQ Swap is not present. Pilots are shown if present.

Tip: The constellation diagram can be used down stream from the LNB to trace problems caused by faulty components that introduce noise and affect the quality of the digital signal.
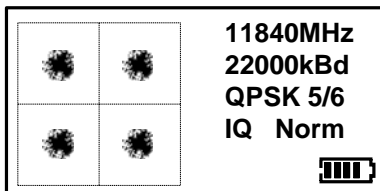
This illustration shows how a typical QPSK constellation diagram would be represented.
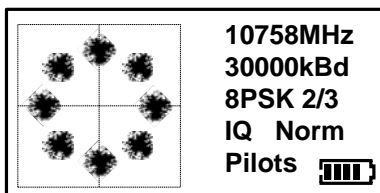
This illustration shows how a typical 8PSK constellation diagram would be represented.
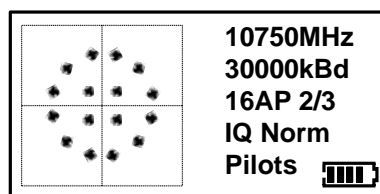
This illustration shows how a typical 16APSK constellation diagram would be represented.

32APSK Constellation display is also supported.

Customize

To edit the selections available from the custom carrier list select Custom and the selection you wish to edit then select **Customize** from the Sub Menu. You can now edit your chosen custom carrier to what you require.

There are default custom carriers available that you can choose to edit which are illustrated in the table below. DVB-S1 and DVB-S2, are supported. These default carriers can also be reconfigured from the HD-S2 support web site via **www.horizonhge.com**

Custom DVB-S 1	**Custom DVB-S2 1**
Custom DVB-S 2	**Custom DVB-S2 2**
Custom DVB-S 3	**Custom DVB-S2 3**
Custom DVB-S 4	**Custom DVB-S2 4**

```
LNB 9.75              ▲▼
■■■■■■■■■■□□□□□□        🗋
RF        68.0dBµV     □

        Searching    [▮▮▮▮]
```
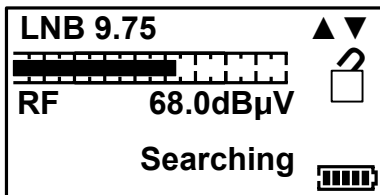
In this example we have chosen to edit "Custom DVB 1". Select your local oscillator first by using the UP and DOWN keys. Various local oscillators are available and some have 22KHz tone available also. Once you have chosen the require local oscillator press the right arrow button to set your frequency.

```
Carrier      ⬛0758MHz
■■■■■■■■■□□□□□□□        🗋
RF        68.0dBµV     □

        Searching    [▮▮▮▮]
```
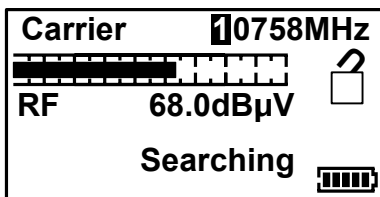
You can set the desired frequency by using the UP and DOWN arrow keys to change the highlighted number and LEFT and RIGHT to step to the next one. Once you have your desired frequency, press the right arrow to step on to the Symbol Rate screen. Note: You will not be able to select out-of-range values relative to the local oscillator. If you try to enter a number that is out of range, the meter will beep, and the number will not change. You may need to step left or right to adjust the value in the next column before stepping back to the current digit.

```
Symb         ⬛2000kBd
■■■■■■■■■□□□□□□□        🗋
RF        68.0dBµV     □

        Searching    [▮▮▮▮]
```
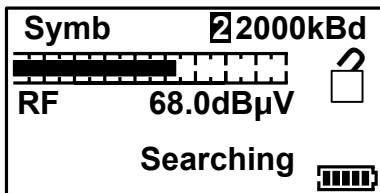
In much the same manner that you defined the frequency, set the Symbol Rate to match the wanted signal: highlight the numbers with the LEFT or RIGHT key and change the value with the UP and DOWN arrow keys. Symbol rates from 01000 to 45000 can be set. Once you have the desired symbol rate press the RIGHT arrow to step on to the FEC screen. The same applies here to values that are out of range – you may get a beep and a refusal to change the current digit.

```
FEC 3/4
■■■■■■■■■□□□□□□        🗋
RF        68.0dBµV     □

        Searching    [▮▮▮▮]
```
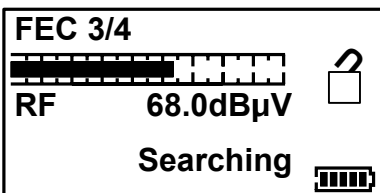
From this screen we can select the desired FEC. If the FEC is unknown then select **Unknown** and the HD-S2 will try them all when searching from the Custom Carrier. Use the up and down keys to cycle through FEC options. Press the RIGHT arrow to step on to the LNB voltage screen. See **FEC Notes** for more information on the next page.

```
LNB 13V
■■■■■■■■□□□□□□        🗋
RF        68.0dBµV     □

        Searching    [▮▮▮▮]
```
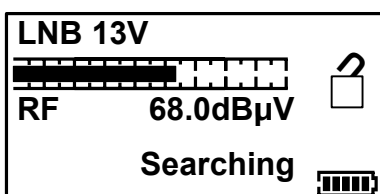
On this screen we can select the LNB voltage: 0, 13 and 18 volts. Press the RIGHT arrow button to step on to the IQ screen.

Note: If you are using a block type LNB for VSAT installation, 18 Volts is typically selected to power this kind of LNB, as the polarization is manually adjusted. Consult your LNB documentation for its operational requirements. 21 Volt supply selections are also available.

Customize

IQ Norm
RF   68.0dBμV
Searching
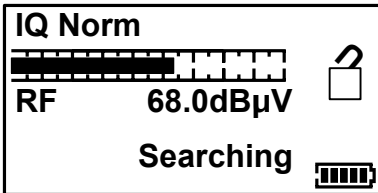
Here you can select IQ un-swapped (Norm) or swapped. Sometimes IQ Swap is required to obtain a lock but for most of the time this is left selected to Norm (Normal). Use the Swap selections if you failed to obtain a lock so far. There are three IQ options available Norm, Auto and Swap.

Use the Up and Down Arrow keys to select. Press the right arrow key to step onto the Save and Exit screen once you have made your selection. **Note:** IQ Swap is mostly applied to C-Band services.

Save and Exit ▼
RF   68.0dBμV
Searching
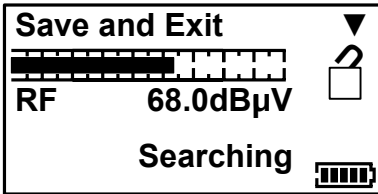
Pressing the down arrow key here will apply your changes to the custom carrier slot that you have just edited. Pressing the left arrow button will enable you to go back and make changes before saving if required.

Discard ▼
RF   68.0dBμV
Searching
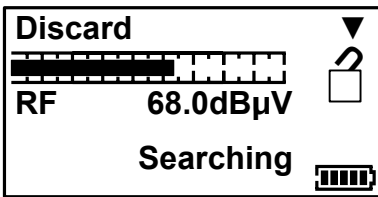
By pressing the DOWN arrow on this screen all of the values you have set will be discarded and the meter will return to searching mode on the last satellite selected before entering Custom Carrier mode. Alternatively, use the RIGHT button to cycle through the custom carrier options to change your settings.

Pilot mode (DVB-S2 Only)

Pilots Auto
RF   68.0dBμV
Searching
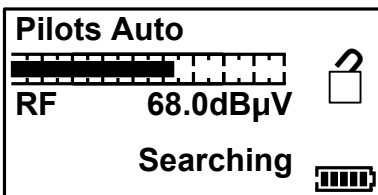
For DVB-S2 one more additional step is required. Pilots, Pilot Auto and No Pilots is a function that is only enabled when creating a DVB-S2 custom carrier, where you are uncertain if Pilots are required or not select **Pilots Auto**.

FEC Notes

Once you have selected the custom carrier options the following FEC's and modulation schemes are available. It is also possible to select "**Unknown**" so that the HD-S2 will scan the available FEC's relative to the custom carrier type.

Tip: Common carrier configurations can result in a multiple lock situation. For example, carriers that have an FEC of 3/4 and a Symbol Rate of 27500 may lock on multiple satellites. Where possible, look for unique Symbol Rates that are unlikely to be duplicated on other satellites at the defined frequency.

DVB-S1	DVB-S2	DSS
1/2	QPSK 1/4	1/2
2/3	QPSK 1/3	2/3
3/4	QPSK 2/5	3/4
5/6	QPSK 1/2	5/6
6/7	QPSK 3/5	6/7
7/8	QPSK 2/3	7/8
	QPSK 3/4	
	QPSK 4/5	
	QPSK 5/6	
	QPSK 8/9	
	QPSK 9/10	
	8PSK 3/5	
	8PSK 2/3	
	8PSK 3/4	
	8PSK 5/6	
	8PSK 8/9	
	8PSK 9/10	
	16APSK 2/3	
	16APSK 3/4	
	16APSK 4/5	
	16APSK 5/6	
	16APSK 8/9	
	16APSK 9/10	
	32APSK 3/4	
	32APSK 4/5	
	32APSK 5/6	
	32APSK 8/9	
	32APSK 9/10	

LNB Local Oscillators: (GHz)

Ku-Band

			C-Band	Ka-Band
9.75	10.7	11.25 +22KHz Tone	5.15 C-Band	17.25
10.6 +22KHz Tone	10.7 +22KHz Tone	11.3	5.76 C-Band	18.25
10.0	10.75	11.3 +22KHz Tone	5.95 C-Band	18.75
10.25	10.75 +22KHz Tone			19.25
10.5	11.25			19.75
				21.0

Data Logging

Before using the logging function acquire the satellite that you have chosen, ensuring that the received levels are as good as they can be. Then access the Sub-menu by pressing the UP button once; navigate down and highlight the "Log as 00000" line. By pressing the right arrow at this point the levels from your satellite selection will be stored in to the memory and numbered; this number will increment each time your store your measurements. Note this number down as you will need to refer to it later when downloading the log information from your meter later.

The logging software required to extract the stored values is available from the **www.horizonhge.com** web site.

Note: Before you start to use the logging program please ensure that the USB drivers have already been downloaded as described on pages 18 and 19.

To start the Log Reader program double click the HD-S2 Log Reader program icon (this will look like a target) a small program will appear as illustrated.

Connect your HD-S2 via the USB lead supplied to you PC. Wait for the HD-S2 to settle in **Program mode** and then click **Read**.
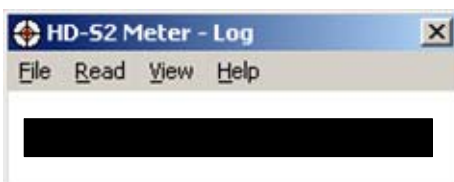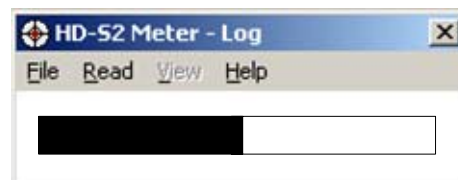
Once the file has been read a pop up will appear **"Log download complete"**

Once you click **OK** you will be presented with a table of your logged measurements. From here you can export this data in CSV (**C**omma **S**eparated **V**alues) format for use with other office programs.

ID	Name		Longitude	dBm	dBuV	dBmV	Locked	Pilots	IQ Swap	MER	QBER	Nominal Freq kHz	Measured Freq kHz	Nominal Sym. Rate	Measured Sym. Rate	Standard	Code Rate
00000-001	DVB-S QPSK	1	28.20E	> -51.95	> 56.8	> -3.20	Y			14.0	4.035300E-004	10728000	10729144	22000	21999	DVB-S1	QPSK 5/6
00000-002	DVB-S QPSK	2	28.20E	> -13.75	> 95.0	> 35.0	Y			15.3	3.464390E-003	10714000	10714394	22000	22000	DVB-S1	QPSK 5/6
00000-003	DVB-S2 QPSK	1	28.20E	> -11.15	> 97.6	> 37.60	Y			14.2	1.065400E-004	11856000	11858232	29500	29500	DVB-S2	QPSK 3/4
00000-004	DVB-S2 QPSK	2	28.20E	> 74.55	> 183.3	> 123.30	Y			14.1	1.167800E-004	11720000	11721725	29500	29500	DVB-S2	QPSK 3/4
00000-005	DSS QPSK	1	28.20E	> -197.55	> -88.8	> -148.80						12200000	12192098	27500	27533	DSS	QPSK 2/3
00000-006	DSS QPSK	2	28.20E	> -200.15	> -91.4	> -151.40						12200000	12229133	27500	27511	DSS	QPSK 2/3

Export (.csv)   Close

Remember: When you erase the meter log data the log counter on the meter will not be reset but the stored values will be cleared.

Tip: If you wish to erase the current log data within the HD-S2 select the File drop-down menu and click on **Erase Log**.

Note: The log functions take time to complete, please allow the meter to return to measurement mode before proceeding. The Log All function will scan a transponder group relative to the downloaded selection.

21 Volt supply

Future SCR systems are supported and can be installed using selections downloaded from the *www.horizonhge.com* web site. This will allow you to perform an installation even if the SCR is part of the LNB assembly. SCR selections will be clearly labelled on the HD-S2 download web page.

Some SCR LNB assemblies require the 21 Volt option available from the HD-S2 sub menu. The 21 Volt option is only enabled for Dual SCR and Histogram selections.

Note: To access the sub menu from the Dual SCR setting press the off button once and use the down arrow key to navigate to "►LNB 21V". You will be asked "**Are you sure?**"; press the right arrow button again, and the 21 Volts will be applied.

SCR Output Test (via downloads)

For the Future a **S**ingle **C**able **R**outer output can be quickly checked at the outlet plates of a distribution system using a new feature only available on the HD-S2. The SCR selection should be used to verify the presence of the required services after the antenna installation has been completed.
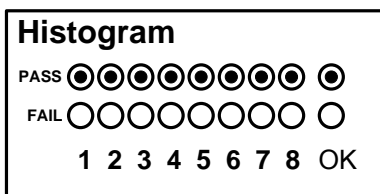
Histogram Function (via downloads)
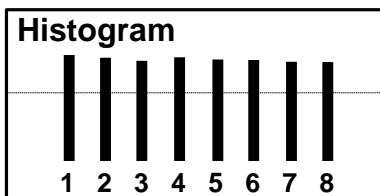
The illustration on the left shows the results found at the distribution points. In this case 8 simultaneous measurements in real time have been made. These 8 measurements reference the SCR translated output frequencies. This quick and easy check tells us that the satellite set top box should function fine as all of the services are available.
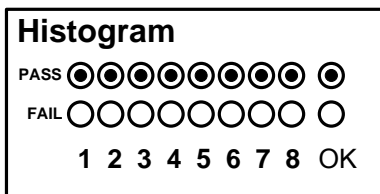
The SCR takes the satellite inputs and arranges them into a single continuous extended band. The Histogram displays the presence of these rearranged frequencies.

In this example the 8 frequencies are spaced at regular intervals across L-Band (950 to 2150 MHz).

The Histogram function also features a easy to use Pass / Fail indicator. Pressing the On button will switch to the Pass / Fail indicator as indicated on the left.

The Histogram function is also available for download as a setting in the future from the *www.horizonhge.com* web site.
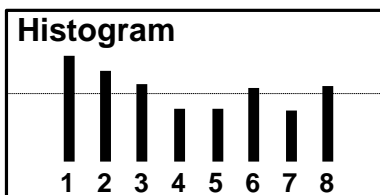
If the levels fail to reach the required level for a pass then this is indicated by levels under the pass line and a fail on the second display as shown.
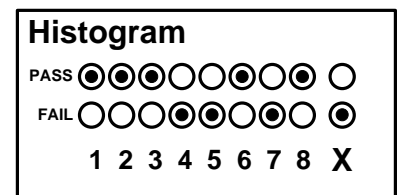
Failures can indicate that an existing cable run may not be suitable for re-use, or that investigation of connections is required.

Please note: The Dual and Histogram SCR features are optional downloads that are not available at this time.

SCR Dual Display (via downloads)

The HD-S2 has a SCR dual display capability which will be enabled by settings released to the HD-S2 download web site at a later date.

As manufacturers will be releasing various combinations of SCR LNB assemblies, downloads suitable for these requirements will be made available via the ***www.horizonhge.com*** web site.

LNB Drift

```
V Astra 2A        28.2E
Min      +0.880

Drift  +0.880MHz

Max      +0882    (IIII)
```

The LNB drift function illustrated on the left here will indicate how much the LNB Local Oscillator is offset against the calculated center ferquency after down-conversion to L-Band. Excessive drift (greater than 3 MHz would indicate that there could be a problem with the LNB in use.

LNB/Cable Test

The LNB / Cable test is a quick function to check for possible fault conditions and will indicate if there is a problem.

```
LNB / Cable test
Please wait...




◄Exit
```

The test results will appear after a few seconds as indicated in the table below.

> LNB / Cable OK
> LNB Fault
> LNB / Cable Fault

Note: The above function is for indicative purposes only and will not be suitable for SCR (Single Cable Router) type systems. This feature tests for an open or short circuit in the cable or LNB and checks RF level with the LNB powered and not powered. It may not indicate 'Fault' if a problem is otherwise related.

Additional feature:
If power is applied externally to the LNB then the LNB / Cable test will not go ahead. Instead, the voltage on the line is displayed on screen.

Orientation

To assist you with your satellite installations, an orientation function is available so that you can obtain azimuth, elevation and skew (polarisation) angles for your antenna alignment from a major town or city that is close to your installation site. This will save you time when looking to acquire the satellite you have chosen (in this example Astra 2 at 28.2º east).

```
Custom List
Customize
LNB 21V
►Orientation
▲▼For more
```
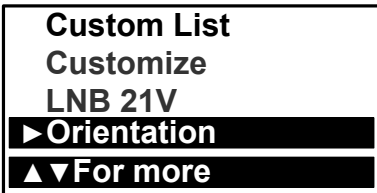
Once you have chosen the satellite you wish to find, enter the sub menu by pressing the **Off** button once. Then navigate down with the **On** button until the ►Orientation option is highlighted. Press the **right** arrow button to select this function.

```
London
UK
►Continue
Change city
Change country
```
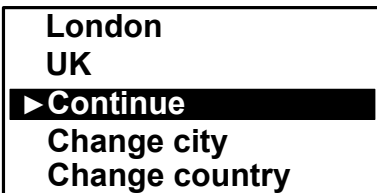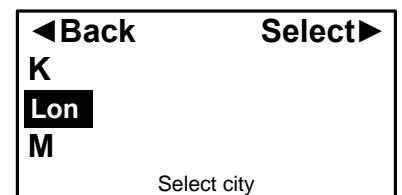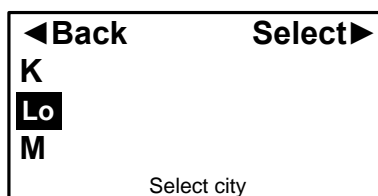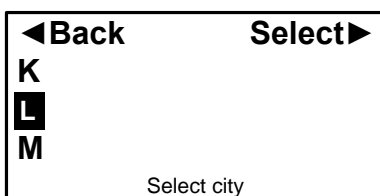
When you select Orientation, the last location set will be shown again (in this example it was London). There is the option to continue to the Azimuth, Elevation and Skew values for this location or change city or the country. The HD-S2 has the majority of European cities pre-loaded ready for use and these lists can be updated via the **www.horizonhge.com** web site in the future.

If we selected the option to continue, the look angles for Astra 2 from London would have been displayed. The skew has 2 values (A / B) where the polarisation (skew) scale on the back of some antennas has been offset by 90º. **Note:** The azimuth angle can be set to **Mag** (magnetic) to match your compass (relative to magnetic north) or **True** relative to true north from the setup menu.

```
London
Azimuth Mag      138.3
Elevation     +  21.9
Skew (A)      +  25.3
Skew (B)      +  64.7
```

We can now proceed to select a city within the UK by using the **Change city** option and in this example we will chose London.

```
◄Back          Select►
K
L
M
        Select city
```

```
◄Back          Select►
K
Lo
M
        Select city
```

```
◄Back          Select►
K
Lon
M
        Select city
```

```
◄Back          Select►
K
London
M
        Select city
```

```
London
Azimuth Mag      138.3
Elevation     +  21.9
Skew (A)      +  25.3
Skew (B)      +  64.7
```

Press the **right** arrow button to continue until you have reached your required city (you can also navigate to other locations within the selected country from here by alphabetical order). There is also a step back feature so that you can change your selection. Once you have selected your city the look angles will be displayed. Press any key on the look angle display to return to your satellite selection.

Note: The Zip Code lookup function will be provided via web site download on ***www.horizonhge.com***

USB Driver Installation

Ensure your PC has access to the internet before you proceed.

1)
Connect the meter for the first time to a PC equipped with
USB port(s), If the USB drivers don't automatically load,
then the "Found New Hardware Wizard" will appear.

Select "**Yes, this time only**".
Then click "**Next**"

2)

Select "Install the software automatically"

Then click "**Next**"

3) While your PC is searching for the
drivers a window like this will
appear.

4)

The first stage of the driver installation is now
complete; your computer will now proceed to
download the additional driver required.

Click the "**Finish**" Button.

5)

To complete the installation of the new additional driver for the USB Serial Port, click the "**Next**" Button.

6)   While your PC is searching for the drivers, a window like this will appear.

7)
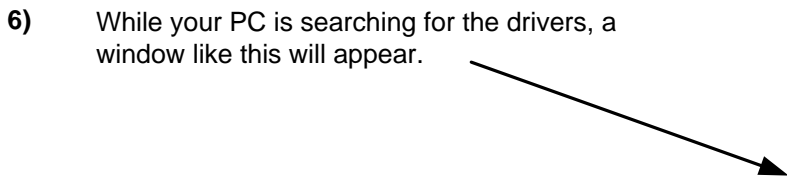
The HD-S2 driver installation is now complete. You can now visit the *www.horizonhge.com* website for downloads.

Click the "Finish" Button.

In the unlikely event of the driver download not automatically taking place the manual driver installation package is available for download from the *www.horizonhge.com* web site.

Downloads

The HD-S2 also supports web based downloads these will be configured to match the requirements for DirecTv services . The information below indicates how downloading new selections would function if required.

To change the satellite list in your HD-S2 go to the *www.horizonhge.com* web site and select "**Configure**". Scroll down to the bottom of the configure page until you see the pick list similar to that shown below.

Note: Satellite names and locations change quite often so do not expect what you see on the web site to be an exact duplicate of the illustration shown.

There are a number of ways you can download configuration files to your HD-S2 Meter and these are described on the next page.

Download

Super List

A factory predefined super list contains settings for all the various types of transponder that the meter can support. Note that selecting a super list will replace ALL transponder settings currently in the meter. This is the easiest and most commonly used option.

Predefined List

Selecting a list will replace just the transponders in that list type with those in the new list. Any existing transponders in the relevant list will first be erased.

Individual Transponders

You can select individual transponders for download to your meter. Only one type may be selected at a time so for instance if you select DVB-S2 you can create your own selection of DVB-S2 transponders. If you do not give your list a title then any transponders that you have selected will be added and any existing transponders already programmed in the meter will not be affected. If you give your list a title then your selection will replace all transponders of that type already in the meter.

Create your own list

If you have registered with Horizon Global Electronics (a free option) you can elect to save your own list for later use. Note that if a list is saved then when it is downloaded next time it will replace all transponders of that list type currently in your meter. You can call up an existing list and add an remove transponders as you wish to update your own list.

City codes

The city name database inside the meter can be updated using this option.

Once you have made your selection you can proceed to click "Generate" where you have the choice of having your file zipped and emailed to you or download to your desktop by leaving the Do not email box unchecked.

Once you have received your HD-S2 loading program from the HD-S2 download web site illustrated on page 20 you will be read to connect your HD-S2 to your PC via the provided USB lead and follow the steps on page 22.

Transferring Data

Now that your USB drivers are installed, you can download selections from the *www.horizonhge.com* website for updates or to create your own preferred list. Please follow the steps illustrated below to upload new selections to your meter.
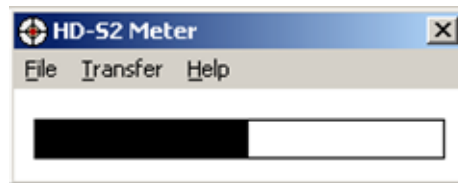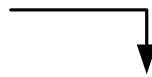
1)

Connect the USB Cable
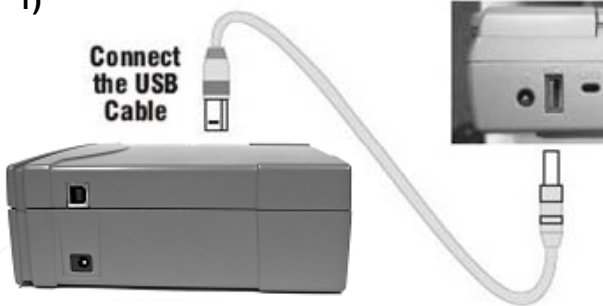
Wait for the HD-S2 to display "**Program Mode**"

HORIZON
DVB S2
Program mode

While establishing communication the display may flash and the sounder may beep. This is normal.

2)   Then click Transfer

HD-S2 Meter
File   Transfer   Help

After a few seconds a progress bar will appear...

3)   HD-S2 Meter
File   Transfer   Help
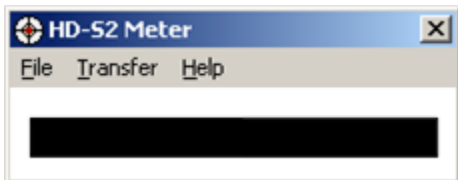
When complete you will see a popup window that says " Transfer Complete!". Click "OK" and close the program.

HD-S2 Meter
Transfer Complete!
OK

Disconnect the meter from the computer, power it up and it will be ready for use.

Trouble shooting file transfer problems.

If you get this error message "**USB Port Error**". Check that the USB interface connection is correctly made and that the USB cable is undamaged.

Downloads are not working and I am getting error messages

The HD-S2 is designed to operate with HD-S2 settings and downloads only and is not backwards compatible with previous models of HDSM. Always use the ***www.horizonhge.com*** web site for downloads.

USB Port Error

1) Drivers not found (drivers available from website).
2) Check that the USB Lead is connected correctly.
3) USB Lead may become damaged or a poor connection may cause communication errors.
4) USB Port Damaged.

Meter will not power up

Charge battery (see page 5).

Meter Shutting Down

1) Low Battery Charge.
2) Sleep timer – check timer setting in the Setup menu.
3) LNB short circuit or drawing excessive current (also see point 4 below).
4) In the event of errors occurring check the condition of the replaceable F barrel
   connectors as illustrated on page 2.

Meter does not show a lock.

Make sure you have a current download of files in your meter; if it's
been a while since you have downloaded you should do so again.

Meter will not power down

Disconnect battery for 1 minute (see page 5) and reconnect.

Apple Mac

The software, drivers and downloads are not Apple Mac compatible.

Storage

To keep your battery in good working order we recommend a full overnight charge at least once every two weeks for light usage. For every day usage we recommend to put your unit on overnight charge prior to the next working day to ensure maximum battery power is available.

Specifications

Charging

- Universal AC Battery Charger 100V~240V ~ 0.8A max. 50/60Hz. Intelligent charger .
- DC 12V Charger 1.5A max.
- Figure 8 A/C input connector.
- 2.1mm female plug for external charge via 12 Volt DC 2 Amp fused car charger.
- Run time with full charge, average 6 hours from 2.4Ah Li-Po (Lithium Polymer) battery

Connections

- LNB input via `F` type female connector. Impedance 75 ohms with short circuit protection - 750mA maximum current limiter
- Computer Interface: USB port for updating satellite settings

Operating Specifications

- RF input range 950-2150MHz 40dBuV to 110dBuV (approximate)
- LNB Supply Voltage: 13V for V and 18V for H @ 250 mA nominal. 21V SCR
- LNB Short circuit protection @ 900mA
- 4x255 Transponders or 127 Satellites, horizontal & vertical
- DVB-S QPSK,DSS QPSK, DVB-S2 QPSK, 8PSK, APSK, C, Ku and Ka-Band, VSAT compatible.
- Input dynamic range – 70dBm to 0dBm
- RF Level can be displayed in dBuV (general accuracy +/-1dB) or linear scale (256 steps).
- Input impedance 75 Ohms
- Symbol Frequency rate from 1Msps~45Msps
- MER (Modulation Error Rate) is displayed in dB
- The Quality indicator locks on faster making it easier to identify the satellite initially; typically locks in less than 100mS
- Audible and visual tune-in, with selectable and adjustable display backlight and contrast.

Notes

Notes

LIMITED WARRANTY

Horizon will, at our option, repair or replace any HORIZON HD-S2
found to be defective in manufacture within the warranty period (1 year).

The warranty period is determined by the date of HD-S2 purchase.
Keep your receipt as proof of purchase. Otherwise the warranty is determined
by date of manufacture.

This warranty does not apply to damage caused by accident, misuse, or
tampering with the unit or seals. This does not affect your statutory rights.

DECLARATION OF CONFORMITY

Manufacturer: Horizon Global Electronics Ltd

Address: First Floor Office, Allen House, Edinburgh Way, Harlow, Essex, CM20 2HJ

Declares that the Horizon HD-S2 complies with the following directives and standards.

Safety EN610 10-1:2001   EMC 61326:1997

FCC Part 15: Class A

All Horizon products are ROHS compliant.

Technical Department
 Horizon Global Electronics

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