

Reception Station Set-up

Overview of Reception Station Requirements

A single reception station can potentially receive all the data being transmitted from one communications satellite independent of the data provider. A typical EUMETCast reception station comprises a standard PC with DVB card inserted and a satellite off-set antenna fitted with a digital universal V/H LNB for Ku-band, or fitted with a circular polarisation feedhorn, bandpass filter and special LNB for C-band. To decode and decrypt the DVB signal, EUMETCast Client Software and in some instances, EUMETCast Key Unit (EKU) are also required.

The cost of EUMETCast reception stations is kept to a minimum by utilising industry open standards to the maximum extent possible thus resulting in an adaptable front-end solution to users' applications. For further information on purchasing station equipment, contact a [manufacturer](#).

In addition to the front-end equipment, EUMETCast Client Software and EKU, data processing software will be required. These software applications are commercially available — for further information, contact a relevant manufacturer or EUMETSAT.

Reception Station Components

The components listed are based upon trials performed by the telecommunications providers. EUMETSAT has successfully tested a configuration and the requirements given here reflect this configuration. The following is the minimum configuration required for the EUMETCast reception.

Satellite off-set antenna with

- universal V/H LNB in Ku-band;
- circular polarisation feedhorn, C-band LNB, bandpass filter recommended (in areas with radar interference);
- recommended antenna size:

Band	Location	Antenna Size
Europe (Ku-band)	within the "core" geographical footprint of the spacecraft, the area bounded by the 50 dBW contour depicted in the EUROBIRD™ 9 footprint	120cm or smaller (non-professional users 85 cm)
Europe (Ku-band)	within the "extended" geographical coverage (remote European islands, Turkey East of Ankara and Eastern European countries)	1.8m or larger
Africa (C-band)	within the "core" geographical footprint, the area bounded by the inner contour depicted in the Atlantic Bird™ 3 footprint	2.4m or larger
Africa (C-band)	within the "extended" geographical coverage (e.g. Madagascar, La Reunion, Mauritius and parts of North America)	3.7m or larger
South America (C-band)	within the area bounded by the 39 dBW contour depicted in the NSS806 footprint	2.4m or larger

South America (C-band) smaller antennas may be sufficient, depending upon individual location, for details for your location, please contact the EUMETSAT User Service 1.8m or larger

See the related EIRP value on the [coverage-map](#).

Ku band users can alternatively determine the antenna size based on their availability needs, or check if existing antennas are large enough. [This availability plot \(PDF, 1.7 MB\)](#) shows the clear sky link margin and rain fade availability for a number of antenna sizes.

Professional users should aim for a link margin of > 7 dB or availability of 99.98%. Other users can accept lower values, based on their needs.

The plots assume that antennas are correctly pointed, the LNB and reception equipment is state of the art, and the cables are not too long or low loss ones.

Please note that smaller antennas (e.g. used for TV reception) will still provide good reception at fair weather conditions, but will increasingly suffer under rain and snow. For widely used 60 cm antennas, subtract 2.5 dB from the link margin for 80 cm antennas, and check if it is still provides positive margin.

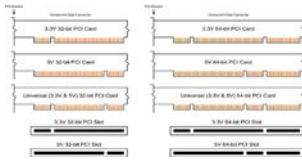
Reception PCs

2 x PC with minimum 2.0 GHz Pentium™ IV; 1Gb RAM, 36Gb internal disk (or more, depending on storage required); USB port for EKU; 5 volt PCI bus (compatible with recommended DVB PCI card); 100/10 base Ethernet card (if required). Microsoft Internet Explorer (web browser) version 5.5, or later version, or Mozilla, or similar, web browser, including JAVA RTE, (required for display of the TELLICAST monitoring information). Two PCs are recommended — one for the DVB acquisition and a second for processing applications. The recommended operating systems and DVB devices are:

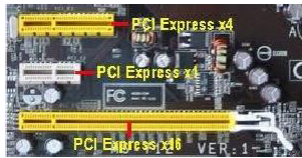
- Windows™ 2000 SP4 — with all recommended DVB PCI cards
- Windows™ XP SP2 — with all recommended DVB PCI cards
- Windows™ Vista-SP1 — with all recommended DVB PCI cards
- Windows™ 7 — with all recommended DVB PCI cards
- Linux Redhat 9 (Intel) — Pentamedia™ Pent@value
- Fedora (Core) 6, 7, 8, 9, 10, 11, 12, 13, 14 — Technisat SkyStar 2
- OpenSUSE 10.2, 10.3 — Technisat SkyStar 2
- Debian 4.0r3 (Etch) — Technisat SkyStar 2
- Ubuntu 8.04 and 10.04 — Technisat SkyStar 2

EUMETSAT recommends setting up the EUMETCast PC as a receiving station and ftp or file server only and not to install, and run, other application software on this PC. Peaks in disk and bus usage could interrupt DVB data reception. This has been observed during the automatic unpacking of compressed files on the DVB PC. It is, therefore, recommended that unpacking of compressed files is performed on the second computer.

Internal PCI DVB cards are available with following interfaces:



▶ [PCI slots \(Click to enlarge\)](#)



▶ [PCI Express \(Click to enlarge\)](#)

DVB 5V PCI Cards (5 volts, PCI 1.x and 2.x)

The following brands have been tested by EUMETSAT:

- TechniSat™ SkyStar2 (note NOT the SkyStar 2 HD card as this does not support Data);
- BroadLogic™ V@box 2030;
- Hauppauge WINTV (only older Technotrend based cards, new HR cards are still lacking data support);
- Pentamedia™ Pent@Value Card;
- Technotrend budget and premium cards. Note: Hauppauge Nexus ver.2.1 and TechnoTrend Premium S-2300 seem to have problems with data rates above about 10 Mbits/sec.

DVB 3V PCI Cards (3 volts, PCI 2.3 and above, PCI-X)

The following brands have been tested by EUMETSAT:

- TechniSat™ SkyStar2 (Rev2.8);
- Technotrend S2 budget and premium cards.

DVB PCI Express Cards (different slot sizes, and incompatible with PCI or PCI-X)

DVB cards with this interface are currently being tested.

DVB USB boxes

- DVB USB 1.1 boxes (up to 6 mbit/s only): TechniSat™ SkyStar2 USB; Hauppauge USB
- DVB USB 2.0 boxes (> 20 mbit/s): TechnoTrend TT-connect S-2400; Dexatek DK-5702 I-TEK Sphere DVB-S; TechniSat™ SkyStar USB 2; TechniSat™ SkyStar USB HD

DVB Routers (LAN connectivity)

- IPricot IPR-S500; IPR-S600

EUMETCast Client Software — used in conjunction with a username/password to decrypt the DVB signal. EUMETSAT is the only supplier of this type of client software licence package.

EUMETCast Key Unit (EKU) — used in association with the EUMETCast Client Software to access certain data services. The EKU is a USB device that controls the access to the multicast to allow only those stations fitted with the EKU to receive the restricted service. EUMETSAT is the sole supplier of the EKU and included in the delivery package is the EKU Run-Time-Environment, for both MS Windows and Linux systems.

Users reported problems with the following hardware:

- ASRock N68C-S UCC: Frequent EKU failures when using the onboard USB port on ASRock N68C-S UCC motherboard, and processor AMD Athlon 64X2 7550 combination. Was solved using a dedicated USB PCI card.
- Intel 6/C200 Series chipset and SkyStar 2 TV PCI cards: High error rate with SkyStar 2 TV PCI cards in motherboards using this chipset. The following stations are known to have this issue: Dell Optiplex 990, Dell Precision T1600.

Current Transponders

The current satellite transponder frequencies are as follows:

Ku-band Transponder EUROBIRD™ 9 (9° E), Europe

Parameter	Value
Name	EUROBIRD™ 9
Transponder	TP63
Down Link Frequency	11976.82 MHz
Symbol Rate	27500 kS/s
FEC	3/4
Polarisation	horizontal

C-band Transponder Atlantic Bird™ 3 (5° W)

Parameter	Value
Name	Atlantic Bird™ 3
Transponder	C02
Down Link Frequency	3731.7570 MHz
Symbol Rate	11.963 MS/s
FEC	2/3
Polarisation	Circular Left Hand

South America - C-band Transponder: NSS806 (40.5°W)

Parameter	Value
Name	NSS806
Transponder	22A
Down Link Frequency	3.803 GHz
Symbol Rate	27.500 MS/s
FEC	3/4
Polarisation	Circular Left Hand

Antenna size recommendations providing sufficient rain margin in C- and Ku-band, based on EUMETSAT experience, scaled from antenna sizes used at EUMETSAT (top value of each band).

How to use this table: read the satellite EIRP value from the coverage map and select the corresponding antenna size.

For antenna elevations below 15° use next lower EIRP value.

EIRP (dbW)	Ku-band antenna size (m)	C-band
53	0.85	-
52	0.95	-
51	1.07	-
50	1.20	-
49	1.35	-
48	1.51	-
47	1.70	-
46	1.90	-
45	2.14	-
44	2.40	-
43	2.69	-
42	3.02	-
41	3.38	-
40	3.80	-
39	4.26	2.40
38	4.78	2.69
37	5.36	3.02
36	-	3.39
35	-	3.80
34	-	4.27
33	-	4.79
32	-	5.37
31	-	6.03
30	-	6.76
29	-	7.59

Installation Tips

A step-by-step guide to setting up the EUMETCast Client Software and ECU is provided in the EUMETCast Technical Description. In addition, EUMETSAT provides with the delivery of the EUMETCast Client Software and ECU a Troubleshooting guide (Readme file) designed to support installation.