



# AUTOPOINTING ANTENNAS

RF FORMANCE AND POINTING  
CHARACTERISATION BY EUTELSAT

3 July 2018



eutelsat

# EARTH STATION ANTENNAS AUTO-POINTING CHARACTERISATION BY EUTELSAT

## GENERAL

This list aims at providing Eutelsat customers with guidance on the selection of the most appropriate earth station equipment capable of automatically point and peak the antenna to Eutelsat Fleet, without need of expert operators.

We underline that the auto-pointing systems which are listed in this document have been characterised in regard of the Eutelsat criteria, but that **the Earth station operations and space segment access remain subject to application of procedures as per ESOG 140.**

Prior an access to the Eutelsat Fleet, each Earth station using one of these systems has to be applied for to the Earth Station Approval Office, as per indicated in the ESOG 110, and individually approved.

### The criteria for inclusion are:

- Eutelsat is in possession of a full set of measured RF electrical characteristics,
- The antenna's RF performance fully meets the minimum Eutelsat requirements (EESS 502) at the characterisation's date.
- There is no known record of operational problems or interference issues related to this antenna,
- Auto-pointing performance has been validated repeatedly on at least three different satellites of the Eutelsat fleet.
- Use of VSAT reflectors is not encouraged, unless proven demonstration of manufacturing high quality processes and performance repeatability

Inclusion in the list is a decision which pertains uniquely and ultimately to Eutelsat alone. At any moment a given antenna may be removed from the list, should Eutelsat deem necessary to do so, for operational reasons.

### Notes:

- The characterisation's validity is subject to regular submission of patterns to confirm that the system remains compliant with the Eutelsat standard at the inspection date.
- Any change to the characterised configuration need to be notified to Eutelsat and may be subject to further tests.
- Transmissions in the 13.75 GHz to 14.00 GHz frequency band are subject to additional constraints imposed by the Radio Regulations. Antennas with diameters <1.2m are not supposed to operate in the 13.75 to 14.00 GHz frequency band.
- The information which is provided in this book is relative to the dynamic antenna systems performance. Their static performance are shown on the following links:

<http://www.eutelsat.com/files/contributed/satellites/pdf/typeapproval.pdf>

[http://www.eutelsat.com/files/contributed/support/pdf/RF\\_Characterisation.pdf](http://www.eutelsat.com/files/contributed/support/pdf/RF_Characterisation.pdf)

# Eutelsat s.A. Auto-Pointing Summary Sheet



C-COM Satellite Systems Inc.  
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**Antenna model:**  
C-COM iNetVu 1201

**Diameter:**  
1.2 m  
2-ports feed  
(See Remark 4)

**Standard:**  
M  
**Characterisation date:**  
03-05-2012

**Validity period:**  
See Remark 6

## System Description:

Auto-pointing antenna system based on the Skyware Global 125 single piece 1.2 m SMC reflector. Front fed offset configuration with mode generator and rotary joint. Two ports die-cast OMT, linear polarization.

HPA maximum permissible rating: 40 Watt.

## Maximum Allowed EIRP:

42.0 dBW / 40 KHz for an orbital separation of the adjacent satellite > 2.0°

37.1 dBW / 40 kHz for an orbital separation of the adjacent satellite > 1.5°

for digital carriers transmitted at the satellite receive contour of 0 dB/K (EESS 502 § 6.1 refers).

**Tx Frequency:**  
14.00-14.50 GHz

**Rx Frequency:**  
10.70-12.75 GHz

**Pointing error:**  
< 0.4°

**Polarization error:**  
< 1.4°

**Tx XPD:**  
>25 dB within -1 dB contour

**Rx XPD:**  
Not measured

## Remarks:

- 1 Tests have been performed via satellite with the ERS of Aflenz on the 26-27 March 2013.
- 2 The system has been validated with three different Eutelsat satellites, with angles of the polarization plane equal to 3.5°.
- 3 Transmission cannot be authorized until the peaking process is completed.
- 4 The physical dimensions of Skyware Global 125 antennas are H1.23m x V1.37m.
- 5 Installation of HPA with a power >40 W is not authorized.
- 6 The characterisation's validity is subject to regular submission of patterns to confirm that the system remains compliant with the Eutelsat standard at the inspection date.
- 7 Any change to the characterised configuration need to be notified to Eutelsat and may be subject to further tests.
- 8 The maximum tilt angle of the antenna when in operations is limited to angles <10°.

# Eutelsat s.A. Auto-Pointing Summary Sheet

**Manufacturer:**

Holkirk Communications Ltd  
Unit 17 Pulloxhill Business Park  
Greenfield Road  
Bedfordshire  
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Email [bob@holkirk.com](mailto:bob@holkirk.com)  
Web [www.holkirk.com](http://www.holkirk.com)

**Antenna model:**  
RM150

**Diameter:**  
1.5 m

**Standard:**  
M

**Characterisation date:**  
05-07-2012

**Validity period:**  
See Remark 5

**System Description:**

Auto-pointing antenna system based on the Holkirk single piece 1.5 m Ku reflector. Front fed offset configuration with mode generator and rotary joint.

For drive away applications with HPA maximum permissible rating of 400 Watt.

**Maximum Allowed EIRP:**

45.1 dBW / 40 KHz for an orbital separation of the adjacent satellite  $\geq 2.5^\circ$

41.6 dBW / 40 KHz for an orbital separation of the adjacent satellite  $\geq 2.0^\circ$

40.6 dBW / 40 kHz for an orbital separation of the adjacent satellite  $\geq 1.5^\circ$

for digital carriers transmitted at the satellite receive contour of 0 dB/K (EESS 502 § 6.1 refers).

**Tx Frequency:**  
13.75-14.50 GHz

**Rx Frequency:**  
10.70-12.75 GHz

**Pointing error:**  
< 0.2°

**Polarization error:**  
< 1.5°

**Tx XPD:**  
 $\geq 30$  dB within -1 dB contour

**Rx XPD:**  
Not measured

**Remarks:**

- 1 Tests have been performed via satellite with the ERS of Aflenz on the 21-22 May 2013.
- 2 The system has been validated with three different Eutelsat satellites, with angles of the polarization plane equal to 3.5°.
- 3 Transmission cannot be authorized until the peaking process is completed.
- 4 Installation of HPAs with a power up to 400 Watt is authorized.
- 5 The characterisation's validity is subject to regular submission of patterns to confirm that the system remains compliant with the Eutelsat standard at the inspection date.
- 6 Any change to the characterised configuration need to be notified to Eutelsat and may be subject to further tests.
- 7 The maximum tilt angle of the antenna when in operations is limited to angles  $\leq 10^\circ$ .

**Applicant:**

ND SatCom GmbH  
P.O. Box  
88039 Friedrichshafen  
GERMANY  
Tel : +49 7545 939 8725  
Fax : +49 7545 939 8866

Website : [www.ndsatcom.com](http://www.ndsatcom.com)  
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**Antenna model:**

SkyRAY Compact 1500  
SkyRAY Compact 1500 Plus  
SkyRAY MAS 1500

**Diameter:**

1.2 m  
(See Remark 4)

**Standard:**

M

**Characterisation date:**

01-06-2011

**Validity period:**

See Remark 6

**System Description:**

Auto-pointing system based on the ERA type approved EA-A017 one piece 1.2 m Ku diamond shape offset antenna with mode generator, vehicle mounted, working with ND SatCom antenna controller ACU 4100 or ACU 5020 series and either a ND SatCom SkyWAN modem or a commercial IRD Tandberg TT1260 or equivalent as pointing device.

**Maximum Allowed EIRP:**

35.2 dBW / 4 kHz for digital carriers transmitted at the satellite receive contour of 0 dB/K (EESS 502 § 6.1 refers)

**Tx Frequency:**

13.75 - 14.50 GHz

**Rx Frequency:**

10.95 - 12.75 GHz

**Pointing error:**

Azimuth and Elevation  $\leq 0.1^\circ$   
Polarisation  $\leq 2.1^\circ$

**Tx XPD:**

>27 dB within -1 dB contour

**Rx XPD:**

>27 dB within -1 dB contour

**Remarks:**

- 1 Tests have been performed via satellite with the ERS of Aflenz on the 23<sup>rd</sup> August 2010.
- 2 The system has been validated with two different Eutelsat satellites, both with an angle of the polarisation plane equal to 3.5°.
- 3 Transmission cannot be authorised until the peaking process is completed.
- 4 The dimensions of the Ku Diamond antennas are 1.5mx1.5m, the equivalent circular diameter is 1.2m
- 5 SkyRAY MAS/Compact 1500 is equipped with one HPA (400 Watt maximum), SkyRAY Compact 1500 Plus is equipped with two HPAs (400 Watt maximum for each).
- 6 The characterisation's validity is subject to regular submission of patterns to confirm that the system remains compliant with the Eutelsat standard at the inspection date.
- 7 Any change to the characterised configuration need to be notified to Eutelsat and may be subject to further tests.

**Applicant:**

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Email : [christian.hauff@ndsatcom.com](mailto:christian.hauff@ndsatcom.com)

**Antenna model:**

SkyRAY MAS 1900

**Diameter:**

1.5 m

(See Remark 4)

**Standard:**

M

**Characterisation date:**

01-08-2011

**Validity period:**

See Remark 6

**System Description:**

Auto-pointing system based on the ERA type approved EA-A004 one piece 1.5 m Ku diamond shape offset antenna with mode generator, vehicle mounted, working with ND SatCom antenna controller ACU 5020 series and either a ND SatCom SkyWAN modem or a commercial IRD Tandberg Rx1290 or equivalent as pointing device.

**Maximum Allowed EIRP:**

35.7 dBW / 4 kHz for digital carriers transmitted at the satellite receive contour of 0 dB/K (EESS 502 § 6.1 refers)

**Tx Frequency:**

13.75 - 14.50 GHz

**Rx Frequency:**

10.95 - 12.75 GHz

**Pointing error:**

Azimuth and Elevation  $\leq 0.16^\circ$

Polarisation  $\leq 2.0^\circ$

**G/T:**

23.9 dB/K @12.661 GHz for 35° Elevation

**Tx XPD:**

>27.8 dB within -1 dB contour

>30.0 dB within the de-pointing angle

**Rx XPD:**

Not measured

**Remarks:**

- 1 Tests have been performed via satellite with the ERS of Aflenz on the 30<sup>th</sup> June and 1<sup>st</sup> July 2011.
- 2 The system has been validated with three different Eutelsat satellites, with angles of the polarisation plane equal to either 0° or 3.5°.
- 3 Transmission cannot be authorized until the peaking process is completed.
- 4 The dimensions of the Ku Diamond antennas are 1.9mx1.9m; the equivalent circular diameter is 1.5m
- 5 SkyRAY MAS1900 can be equipped with one HPA (750 Watt maximum) or with two HPA's (750 Watt maximum for each). The tests were performed on a configuration with two HPAs of 400 W mounted on the back frame of the antenna.
- 6 The characterisation's validity is subject to regular submission of patterns to confirm that the system remains compliant with the Eutelsat standard at the inspection date.
- 7 Any change to the characterised configuration need to be notified to Eutelsat and may be subject to further tests.

**Applicant:**

VISLINK Communications Ltd  
27 Maylands Avenue  
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United Kingdom  
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Fax :+44 (0) 1442 431 301

Website : [www.vislink.com](http://www.vislink.com)  
Email : [Dave.melville@vislink.com](mailto:Dave.melville@vislink.com)

**Antenna model:**

FlyDrive 120

**Diameter:**  
1.2 m

**Standard:**  
M

**Characterization date:**  
23-11-2011

**Validity period:**  
See remark 5

**System Description:**

Auto-pointing system based on the Advent four segments 1.2 m Ku antenna with mode generator, for Fly away and Drive Away applications, working with Advent antenna controller ACU 5000 series and Advent Lynx 5100 Video Exciter/IRD.

**Maximum Allowed EIRP:**

45 dBW/40 kHz for digital carriers transmitted at the satellite receive contour of 0 dB/K (EESS 502 § 6.1 refers)

**Tx Frequency:**

13.75 - 14.50 GHz

**Rx Frequency:**

10.70 - 12.75 GHz

**Pointing error:**

Azimuth and Elevation  $\leq 0.3^\circ$   
Polarisation  $\leq 1.1^\circ$

**G/T:**

17.7 dB/K @11.121 GHz for 30° Elevation

**Tx XPD:**

>33.8 dB at boresight  
>32.0 dB within -1 dB contour

**Rx XPD:**

>23.4 dB within -1 dB contour

**Remarks:**

- 1 Tests have been performed via satellite with the ERS of Aflenz on the 22 and 23 August 2011.
- 2 The system has been validated with three different Eutelsat satellites, with angles of the polarisation plane equal to 3.5°.
- 3 Transmission cannot be authorized until the peaking process is completed.
- 4 FlyDrive 120 can be equipped with one HPA (400 Watt maximum).
- 5 The characterisation's validity is subject to regular submission of patterns to confirm that the system remains compliant with the Eutelsat standard at the inspection date.
- 6 Any change to the characterised configuration need to be notified to Eutelsat and may be subject to further tests.

# Eutelsat s.A. Auto-Pointing Summary Sheet



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**Applicant:**

SVS SATELLITE SYSTEMS  
Esenkent Mahallesi Baraj Yolu Caddesi  
Emirgan Sokak No:3  
34776 Umraniye/ISTANBUL  
TURKEY

Tel : +90 216 329 56 00  
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**Antenna model:**

SVS SDC120

**Diameter:**

1.2 m

(See Remark 4)

**Standard:**

M

**Characterisation date:**

20-04-2012

**Validity period:**

See Remark 6

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**System Description:**

Auto-pointing system based on the CTS ERA type approved EA-A017 one piece 1.2 m Ku Diamond shape front fed offset antenna with mode generator, vehicle mounted, working with SVS antenna controller AKS200A series.

**Maximum Allowed EIRP** for digital carriers transmitted at the satellite receive contour of 0 dB/K (EESS 502 § 6.1 refers):

45.6 dBW / 40 KHz for an orbital separation of the adjacent satellite  $\geq 2.0^\circ$

39.7 dBW / 40 KHz for an orbital separation of the adjacent satellite  $\geq 1.5^\circ$

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**Tx Frequency:**

13.75 - 14.50 GHz

**Rx Frequency:**

10.70 - 12.75 GHz

**Pointing error:**

Azimuth and Elevation  $\leq 0.2^\circ$

Polarisation  $\leq 0.7^\circ$

**G/T:**

22.0 dB/K @10.95 GHz for 42° Elevation

**Tx XPD:**

>35 dB within -1 dB contour

**Rx XPD:**

Not measured

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**Remarks:**

- 1 Tests have been performed via satellite with the ERS of Aflenz on the 1-2 March 2012.
- 2 The system has been validated with four different Eutelsat satellites, with angles of the polarisation plane equal to either  $0^\circ$  or  $3.5^\circ$ .
- 3 Transmission cannot be authorized until the peaking process is completed.
- 4 The physical dimensions of the Ku Diamond antennas are H1.52m x V1.36m.
- 5 SVS SDC 120 is equipped with one or two 1:1 redundant HPAs (400 Watt maximum).
- 6 The characterisation's validity is subject to regular submission of patterns to confirm that the system remains compliant with the Eutelsat standard at the inspection date.
- 7 Any change to the characterised configuration need to be notified to Eutelsat and may be subject to further tests.



# Eutelsat s.A. Auto-Pointing Summary Sheet



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**Applicant:**

SVS SATELLITE SYSTEMS  
Esenkent Mahallesi Baraj Yolu Caddesi  
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34776 Umraniye/ISTANBUL  
TURKEY

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Website : <http://www.svstelekom.com.tr>  
Email : [abdullah.saglam@svstelekom.com.tr](mailto:abdullah.saglam@svstelekom.com.tr)

**Antenna model:**

SVS SDC150

**Diameter:**

1.5 m

(See Remark 4)

**Standard:**

M

**Characterisation date:**

20-04-2012

**Validity period:**

See Remark 6

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**System Description:**

Auto-pointing system based on the CTS ERA type approved EA-A004 one piece 1.5 m Ku Diamond shape front fed offset antenna with mode generator, vehicle mounted, working with SVS antenna controller AKS200A series.

**Maximum Allowed EIRP** for digital carriers transmitted at the satellite receive contour of 0 dB/K (EESS 502 § 6.1 refers):

37.0 dBW / 4 KHz for an orbital separation of the adjacent satellite  $\geq 2.0^\circ$

44.9 dBW / 40 KHz for an orbital separation of the adjacent satellite  $\geq 1.5^\circ$

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**Tx Frequency:**

13.75 - 14.50 GHz

**Rx Frequency:**

10.70 - 12.75 GHz

**Pointing error:**

Azimuth and Elevation  $\leq 0.2^\circ$

Polarisation  $\leq 1.2^\circ$

**G/T:**

22.6 dB/K @10.95 GHz for 42° Elevation

**Tx XPD:**

>30 dB within -1 dB contour

**Rx XPD:**

Not measured

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**Remarks:**

- 1 Tests have been performed via satellite with the ERS of Aflenz on the 23-26 January 2012.
- 2 The system has been validated with three different Eutelsat satellites, with angles of the polarisation plane equal to 3.5°.
- 3 Transmission cannot be authorized until the peaking process is completed.
- 4 The physical dimensions of the Ku Diamond antennas are H1.89m x V1.695m.
- 5 SVS SDC 150 is equipped with one or two 1:1 redundant HPAs (400 Watt maximum).
- 6 The characterisation's validity is subject to regular submission of patterns to confirm that the system remains compliant with the Eutelsat standard at the inspection date.
- 7 Any change to the characterised configuration need to be notified to Eutelsat and may be subject to further tests.

# Eutelsat s.A. Auto-Pointing Summary Sheet



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**Applicant:**

PROSAT SOLUTIONS GMBH  
Alfred-Nobel-Str. 5  
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Tel : +49 (0)6721 4008-0  
Fax : +49 (0)6721 4008-27

Website : <http://www.prosat-solutions.de>  
Email : [Peter.Jakobsson@prosat-solutions.de](mailto:Peter.Jakobsson@prosat-solutions.de)

**Antenna model:**

D120M

**Diameter:**

1.2 m

(See Remark 4)

**Standard:**

M

**Characterisation date:**

20-04-2012

**Validity period:**

See Remark 6

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**System Description:**

Auto-pointing system based on the CTS ERA type approved EA-A017 one piece 1.2 m Ku Diamond shape front fed offset antenna with mode generator, vehicle mounted, working with ProSat antenna controller AKS200A series.

**Maximum Allowed EIRP** for digital carriers transmitted at the satellite receive contour of 0 dB/K (EESS 502 § 6.1 refers):

45.6 dBW / 40 KHz for an orbital separation of the adjacent satellite  $\geq 2.0^\circ$

39.7 dBW / 40 KHz for an orbital separation of the adjacent satellite  $\geq 1.5^\circ$

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**Tx Frequency:**

13.75 - 14.50 GHz

**Rx Frequency:**

10.70 - 12.75 GHz

**Pointing error:**

Azimuth and Elevation  $\leq 0.2^\circ$

Polarisation  $\leq 0.7^\circ$

**G/T:**

22.0 dB/K @10.95 GHz for 42° Elevation

**Tx XPD:**

>35 dB within -1 dB contour

**Rx XPD:**

Not measured

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**Remarks:**

- 1 Tests have been performed via satellite with the ERS of Aflenz on the 1-2 March 2012.
- 2 The system has been validated with four different Eutelsat satellites, with angles of the polarisation plane equal to either  $0^\circ$  or  $3.5^\circ$ .
- 3 Transmission cannot be authorized until the peaking process is completed.
- 4 The physical dimensions of the Ku Diamond antennas are H1.52m x V1.36m.
- 5 D120M is equipped with one or two 1:1 redundant HPAs (400 Watt maximum).
- 6 The characterisation's validity is subject to regular submission of patterns to confirm that the system remains compliant with the Eutelsat standard at the inspection date.
- 7 Any change to the characterised configuration need to be notified to Eutelsat and may be subject to further tests.

# Eutelsat s.A. Auto-Pointing Summary Sheet



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**Applicant:**

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Website : <http://www.prosat-solutions.de>  
Email : [Peter.Jakobsson@prosat-solutions.de](mailto:Peter.Jakobsson@prosat-solutions.de)

**Antenna model:**

D150M

**Diameter:**

1.5 m

(See Remark 4)

**Standard:**

M

**Characterisation date:**

20-04-2012

**Validity period:**

See Remark 6

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**System Description:**

Auto-pointing system based on the CTS ERA type approved EA-A004 one piece 1.5 m Ku Diamond shape front fed offset antenna with mode generator, vehicle mounted, working with ProSat antenna controller AKS200A series.

**Maximum Allowed EIRP** for digital carriers transmitted at the satellite receive contour of 0 dB/K (EESS 502 § 6.1 refers):

37.0 dBW / 4 KHz for an orbital separation of the adjacent satellite  $\geq 2.0^\circ$

44.9 dBW / 40 KHz for an orbital separation of the adjacent satellite  $\geq 1.5^\circ$

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**Tx Frequency:**

13.75 - 14.50 GHz

**Rx Frequency:**

10.70 - 12.75 GHz

**Pointing error:**

Azimuth and Elevation  $\leq 0.2^\circ$

Polarisation  $\leq 1.2^\circ$

**G/T:**

22.6 dB/K @10.95 GHz for 42° Elevation

**Tx XPD:**

>30 dB within -1 dB contour

**Rx XPD:**

Not measured

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**Remarks:**

- 1 Tests have been performed via satellite with the ERS of Aflenz on the 23-26 January 2012.
- 2 The system has been validated with three different Eutelsat satellites, with angles of the polarisation plane equal to 3.5°.
- 3 Transmission cannot be authorized until the peaking process is completed.
- 4 The physical dimensions of the Ku Diamond antennas are H1.89m x V1.695m.
- 5 D150M is equipped with one or two 1:1 redundant HPAs (400 Watt maximum).
- 6 The characterisation's validity is subject to regular submission of patterns to confirm that the system remains compliant with the Eutelsat standard at the inspection date.
- 7 Any change to the characterised configuration need to be notified to Eutelsat and may be subject to further tests.

# Eutelsat s.A. Auto-Pointing Summary Sheet



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**Manufacturer:**

TRACSTAR SYSTEMS INC.  
COBHAM ANTENNA SATCOM LAND SYSTEMS  
1551 College Park Business Center Rd.,  
Orlando, FL 32804 USA.

Tel: + 1 407 650 9054

Fax: + 1 407 650 9086

Website: <http://www.cobham.com/satcom>

mailto: [Narcis.Vila@cobham.com](mailto:Narcis.Vila@cobham.com) or

[Jackie.Rubie@cobham.com](mailto:Jackie.Rubie@cobham.com)

**Antenna model:**

Cobham EXPLORER 7100 MB KU

**Diameter:**

1 m

**Standard:**

M

**Characterisation date:**

18-02-2014

**Validity period:**

See Remark 5

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**System Description:**

Auto-pointing antenna system based on the AVL 1080KVH model, single piece 1.0 m reflector and TracStar controller. Front fed offset configuration.

For drive away applications with HPA maximum permissible rating of 40 W.

**Maximum Allowed EIRP:**

43.9 dBW / 40 KHz for an orbital separation of the adjacent satellite  $\geq 2.5^\circ$

42.4 dBW / 40 KHz for an orbital separation of the adjacent satellite  $\geq 2.0^\circ$

37.0 dBW / 40 KHz for an orbital separation of the adjacent satellite  $\geq 1.5^\circ$

for digital carriers transmitted at the satellite receive contour of 0 dB/K (EESS 502 § 6.1 refers)

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**Tx Frequency:**

13.75-14.50 GHz

**Rx Frequency:**

10.70-12.75 GHz

**Pointing error:**

$\leq 0.4^\circ$

**Polarisation error:**

$< 1.2^\circ$

**Tx XPD:**

$\geq 25$  dB within -1 dB contour

**Rx XPD:**

Not measured

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**Remarks:**

- 1 Tests have been performed via satellite with the ERS of Aflenz on the 18-19 November 2013.
- 2 The system has been validated with three different Eutelsat satellites, with angles of the polarisation plane equal to  $3.5^\circ$ . Satellite reference mode has been tested.
- 3 Transmission is not authorised until the peaking process is completed.
- 4 The Explorer 7100 is authorised for operations with one HPA up to 40 Watt maximum. Irrespective of their installed power rating, Cobham certifies that all HPAs being used with this antenna configuration are equipped with M&C and EIRP readout capabilities
- 5 The characterisation's validity is subject to regular submission of patterns to confirm that the system remains compliant with the Eutelsat standard at the inspection date.
- 6 Any change to the characterised configuration need to be notified to Eutelsat and may be subject to further tests.
- 7 The maximum tilt angle of the antenna when in operations is limited to angles  $< 10^\circ$ . To ensure successful operations in tilt conditions, a tilt calibration procedure has to be performed in factory for each unit manufactured.

# Eutelsat s.A. Auto-Pointing Summary Sheet

**Applicant:**

THRANE & THRANE A/S trading as COBHAM  
SATCOM  
Lundtoftegaardsvej 93D, 2800 Kgs.  
Lyngby  
DENMARK

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Website : [www.cobham.com](http://www.cobham.com)

Email : [info@cobham.com](mailto:info@cobham.com)

**Antenna model:**  
EXPLORER 8100

**Diameter:**  
1.0 m

**Standard:**  
M

**Characterization date:**  
23-02-2017

**Validity period:**  
See remark 5

**Last test data submitted on:**  
23-02-2017

**System Description:**

Antenna system based on a single piece carbon fibre reflector, front fed offset 1.0 m Ku antenna, with two port linear polarization feed, manufactured by Thrane & Thrane A/S trading as Cobham Satcom, for drive-away applications, with HPA maximum permissible rating as per remark 4.

**Maximum Allowed EIRP:** For digital carriers transmitted at the satellite receive contour of 0 dB/K (EESS 502 refers):

**In the 14.00 - 14.50 GHz band:**

36.1 dBW / 40 kHz for an orbital separation from the adjacent satellite  $\geq 1.5^\circ$

39.8 dBW / 40 kHz for an orbital separation from the adjacent satellite  $> 2.0^\circ$

43.4 dBW / 40 kHz for an orbital separation from the adjacent satellite  $> 2.5^\circ$

**In the 13.75 - 14.00 GHz band:**

34.2 dBW / 40 kHz for an orbital separation from the adjacent satellite  $\geq 1.5^\circ$

37.7 dBW / 40 kHz for an orbital separation from the adjacent satellite  $> 2.0^\circ$

41.0 dBW / 40 kHz for an orbital separation from the adjacent satellite  $> 2.5^\circ$

**Tx Frequency:**

13.75 - 14.50 GHz

**Rx Frequency:**

10.70 - 12.75 GHz

**Pointing error:**

$\leq 0.1^\circ$

**Polarization error:**

$< 1.2^\circ$

**Tx XPD:**

$\geq 30.1$  dB within  $\pm 0.1^\circ$  de-pointing angle

**Rx XPD:**

$\geq 23.6$  dB within -1 dB contour

$\geq 29.5$  dB within  $\pm 0.1^\circ$  de-pointing angle  
with auto-pointing option

**Remarks:**

- 1 Auto-pointing tests were performed via satellite from Lyngby with the ERS of Aflenz on the 25-27 January 2017. RF performance tests were performed on one antenna unit at the Thales Alenia Space test range of Cannes, France on the 20 February 2017.
- 2 The EXPLORER ACU auto-pointing system has been validated with three different Eutelsat satellites, with angles of the polarization plane equal to  $3.5^\circ$ .
- 3 Transmission is not authorized until the peaking process is completed.
- 4 The EXPLORER 8100 comes in three standard configurations: No BUC, 8 and 20W BUC. Installation of HPAs with a power  $>50$  W is not authorized
- 5 The characterisation's validity is subject to regular submission of patterns to confirm that the system remains compliant with the Eutelsat standard at the inspection date.
- 6 Any change to the characterised configuration need to be notified to Eutelsat and may be subject to further tests.

# Eutelsat s.A. Auto-Pointing Summary Sheet

**Applicant:**

THRANE & THRANE A/S trading as COBHAM  
SATCOM  
Lundtoftegaardsvej 93D, 2800 Kgs.  
Lyngby  
DENMARK

Tel : +45 39 55 89 59

Website : [www.cobham.com](http://www.cobham.com)

Email : [info@cobham.com](mailto:info@cobham.com)

**Antenna model:**  
EXPLORER 8120

**Diameter:**  
1.2 m

**Standard:**  
M

**Characterization date:**  
23-02-2017

**Validity period:**  
See remark 5

**Last test data submitted on:**  
23-02-2017

**System Description:**

Antenna system based on a single piece carbon fibre reflector, front fed offset 1.2 m Ku antenna, with two port linear polarization feed, manufactured by Thrane & Thrane A/S trading as Cobham Satcom, for drive-away applications, with HPA maximum permissible rating as per remark 4.

**Maximum Allowed EIRP:** For digital carriers transmitted at the satellite receive contour of 0 dB/K (EESS 502 refers):

**In the 14.00-14.50 GHz band:**

39.1 dBW / 40 kHz for an orbital separation from the adjacent satellite  $\geq 1.5^\circ$

34.6 dBW / 4 kHz (equivalent to 44.6 dBW/40 KHz) for an orbital separation from the adjacent satellite  $> 2.0^\circ$

**In the 13.75-14.00 GHz band:**

36.3 dBW / 40 kHz for an orbital separation from the adjacent satellite  $\geq 1.5^\circ$

42.4 dBW / 40 kHz for an orbital separation from the adjacent satellite  $> 2.0^\circ$

**Tx Frequency:**

13.75 - 14.50 GHz

**Rx Frequency:**

10.70 - 12.75 GHz

**Pointing error:**

$\leq 0.1^\circ$

**Polarization error:**

$< 1.0^\circ$

**Tx XPD:**

$\geq 32.6$  dB within +/-  $0.1^\circ$  de-pointing angle

**Rx XPD:**

$\geq 26.9$  dB within -1 dB contour

$\geq 37.9$  dB within +/-  $0.1^\circ$  de-pointing angle  
with auto-pointing option

**Remarks:**

- 1 Auto-pointing tests were performed via satellite from Lyngby with the ERS of Aflenz on the 25-27 January 2017. RF performance tests were performed on one antenna unit at the Thales Alenia Space test range of Cannes, France on the 21 February 2017.
- 2 The EXPLORER ACU system has been validated with three different Eutelsat satellites, with angles of the polarization plane equal to  $3.5^\circ$ .
- 3 Transmission is not authorized until the peaking process is completed.
- 4 The EXPLORER 8120 comes in three standard configurations: No BUC, 8 and 20W BUC. Installation of HPAs with a power  $>50$  W is not authorized
- 5 The characterisation's validity is subject to regular submission of patterns to confirm that the system remains compliant with the Eutelsat standard at the inspection date.
- 6 Any change to the characterised configuration need to be notified to Eutelsat and may be subject to further tests.

**Applicant:**

AKD Communication Technology Co.,Ltd  
3F, Building A, No. 7 Haiying Road, Fengtai Science  
City, Beijing 100070, China

Website : <http://www.akdtech.com.cn/en/>

Email : [kgao@akdtech.com.cn](mailto:kgao@akdtech.com.cn)

**Antenna model:**

AKD-V12U

**Antenna aperture dimensions:**

1.25m H x 1.35m V

**Standard:**

M

**Characterization date:**

11-04-2017

**Validity period:**

See remark 5

**Last test data submitted on:**

15-05-2017

**System Description:**

Antenna system based on a single piece SMC reflector, front fed offset, 1.25 m equivalent circular Ku antenna, with two port linear polarization feed, manufactured by AKD Communication Technology Co.,Ltd, for drive-away applications, with HPA maximum permissible rating as per remark 4. The detail of the characterization of the antenna system with an auto-pointing configuration is available via the following link: [http://www.eutelsat.com/files/contributed/satellites/pdf/Autopointing\\_Antennas.pdf](http://www.eutelsat.com/files/contributed/satellites/pdf/Autopointing_Antennas.pdf)

**Maximum Allowed EIRP:** For digital carriers transmitted at the satellite receive contour of 0 dB/K (EESS 502 refers):

**In the 14.00-14.50 GHz band:**

37.9 dBW / 40 kHz for an orbital separation from the adjacent satellite  $\geq 1.5^\circ$

42.5 dBW / 40 kHz for an orbital separation from the adjacent satellite  $> 2.0^\circ$

44.7 dBW / 40 kHz for an orbital separation from the adjacent satellite  $> 2.5^\circ$

**In the 13.75-14.00 GHz band:**

36.1 dBW / 40 kHz for an orbital separation from the adjacent satellite  $\geq 1.5^\circ$

40.6 dBW / 40 kHz for an orbital separation from the adjacent satellite  $> 2.0^\circ$

40.8 dBW / 40 kHz for an orbital separation from the adjacent satellite  $> 2.5^\circ$

**Tx Frequency:**

13.75 - 14.50 GHz

**Rx Frequency:**

10.70 - 12.75 GHz

**Tx Gain:**

43.6 dBi (average at 14.25 GHz)

**Rx Gain:**

41.2 dBi (average at 11.70 GHz)

**Tx XPD:**

$\geq 26.6$  dB within -1 dB contour

**Rx XPD:**

$\geq 23.7$  dB within -1 dB contour

**G/T:**

21.3 dB/K typ @ 11.70 GHz at  $30^\circ$  EI

**Restrictions and remarks:**

- 1 The authorization to operate the terminal is conditioned to the approval to access the Eutelsat S.A. Space Segment (ref. <http://www.eutelsat.com/files/contributed/satellites/pdf/esog110.pdf>, ESOG 110).
- 2 RF performance tests were performed on one antenna unit at the Catapult test range of Harwell, UK on 28 February and 1 March 2017.
- 3 Please refer to the following link for auto-pointing configuration details: [http://www.eutelsat.com/files/contributed/satellites/pdf/Autopointing\\_Antennas.pdf](http://www.eutelsat.com/files/contributed/satellites/pdf/Autopointing_Antennas.pdf)
- 4 Installation of HPAs with a power  $>50$  W is not authorized.
- 5 This Summary's validity is subject to regular submission of patterns to confirm that the system remains compliant with measured performance at the inspection date.
- 6 Any change to this configuration needs to be notified to Eutelsat and may be subject to further tests.
- 7 Wind load tests showed that the antenna can withstand wind speeds up to 72 Km/h.

# Eutelsat s.A. Auto-Pointing Summary Sheet

**Applicant:**

HITACHI KOKUSAI ELECTRIC TURKEY  
YAYINCILIK SİSTEMLERİ A.S.  
Istanbul Endüstri ve Ticaret Serbest Bölgesi  
Akif Kopuz Cad. No: 3 Tuzla Istanbul Turkey  
Tel :+ 90 216 394 84 84  
Fax :+90 216 394 84 82

Website : <http://www.hitachi-kokusai.com.tr/>  
Email : [Corporate.HKT@tr.hitachi-kokusai.com](mailto:Corporate.HKT@tr.hitachi-kokusai.com)

**Antenna model:**  
PDA 150 Drive News

**Diameter:**  
1.5 m x 1.35 m

**Standard:**  
M

**Characterization date:**  
23-05-2017

**Last test data submitted on:**  
21-11-2017

**System Description:**

Antenna system for drive-away applications. Dual offset Gregorian configuration. Single piece carbon fibre reflector 1.5 m x 1.35 m, with two port linear polarization feed manufactured by PALS trading as Hitachi Kokusai Electric Turkey Broadcasting Systems with HPA maximum permissible rating as per remark 4. ACU model: PAC 450.

**Maximum Allowed EIRP:** For digital carriers transmitted at the satellite receive contour of 0 dB/K (EESS 502 refers):

**In the 14.00 - 14.50 GHz band:**

39.9 dBW / 40 kHz for an orbital separation from the adjacent satellite  $\geq 1.5^\circ$   
44.9 dBW / 40 kHz for an orbital separation from the adjacent satellite  $> 2.0^\circ$

**In the 13.75 - 14.00 GHz band:**

37.2 dBW / 40 kHz for an orbital separation from the adjacent satellite  $\geq 1.5^\circ$   
42.4 dBW / 40 kHz for an orbital separation from the adjacent satellite  $> 2.0^\circ$

**Tx Frequency:**  
13.75 - 14.50 GHz

**Rx Frequency:**  
10.70 - 12.75 GHz

**Pointing error:**  
 $\leq 0.4^\circ$

**Polarization error:**  
 $\leq 2.0^\circ$

**Tx XPD:**  
 $\geq 30$  dB within -1 dB contour

**Rx XPD:**  
 $\geq 29$  dB within -1 dB contour

**Remarks:**

- 1 Auto-pointing tests were performed via satellite from Aflenz with the ERS of Aflenz on the 19-20 April 2017. RF performance tests were performed on three antenna unit at the at the CTS (Cobham Technical Services) test range in Leatherhead, UK, on the 24-27 November 2014.
- 2 The PDA 150 ACU auto-pointing system has been validated with three different Eutelsat satellites, with angles of the polarization plane equal to  $3.5^\circ$ .
- 3 Transmission is not authorized until the peaking process is completed.
- 4 The PDA 150 is authorized to operate with 1+1 HPAs with a power up to 400 W.
- 5 Any change to the characterized configuration need to be notified to Eutelsat and may be subject to further tests.



**Applicant:**

SATMISSION  
Bultenvägen 5  
952 61 Kalix,  
SWEDEN

Tel : +46 923 137 10  
Mob: +46 70 3206567  
Website : [www.satmission.com](http://www.satmission.com)  
Email : [urban.gustavsson@satmission.com](mailto:urban.gustavsson@satmission.com)

**Antenna model:**

SMP 155 DA

**Antenna aperture dimensions:**

1.54 m H x 1.39 m V

**Standard:**

M

**Characterization date:**

26-06-2018

**Validity period:**

See Remark 5

**Last test data submitted on:**

12-10-2017

**System Description:**

Antenna system for drive-away applications. Dual offset Gregorian configuration. Single piece carbon fibre reflector, with two port linear polarization feed, manufactured by Satmission with HPA maximum permissible rating as per remark 4. ACU manufactured by RCI model RC4000.

**Maximum Allowed EIRP:** For digital carriers transmitted at the satellite receive contour of 0 dB/K (EESS 502 refers):

**In the 14.00 - 14.50 GHz band:**

39.6 dBW / 40 kHz for an orbital separation from the adjacent satellite  $\geq 1.5^\circ$

36.1 dBW / 4 kHz (equivalent to 46.1 dBW/40 KHz) for an orbital separation from the adjacent satellite  $> 2.0^\circ$

**In the 13.75 - 14.00 GHz band:**

37.5 dBW / 40 kHz for an orbital separation from the adjacent satellite  $\geq 1.5^\circ$

44.7 dBW / 40 kHz for an orbital separation from the adjacent satellite  $> 2.0^\circ$

**Tx Frequency:**

13.75 - 14.50 GHz

**Rx Frequency:**

10.70 - 12.75 GHz

**Pointing error:**

$\leq 0.3^\circ$

**Polarization error:**

$\leq 0.75^\circ$

**Tx XPD:**

$\geq 30$  dB within -1 dB contour

**Rx XPD:**

$\geq 29$  dB within -1 dB contour

**Remarks:**

- 1 Auto-pointing tests were performed via satellite from Kalix with the ERS of Aflenz on the 9-10 May 2017 and the 12 October 2017. RF performance tests were performed on one antenna unit at the Thales Alenia Space test range of Cannes, France on the 10 March 2017.
- 2 The SMP 155 DA ACU auto-pointing system has been validated with four different Eutelsat satellites, with angles of the polarization plane equal to  $3.5^\circ$ .
- 3 Transmission is not authorized until the peaking process is completed.
- 4 The SMP 155 DA is authorized to operate with 1+1 HPAs with a power up to 400 W.
- 5 This Summary's validity is subject to regular submission of patterns to confirm that the system remains compliant with measured performance at the inspection date.
- 6 Any change to the characterised configuration need to be notified to Eutelsat and may be subject to further tests.
- 7 The test campaign was performed with the antenna using a built-in inclinometer; use of the 3-axis compass is not recommended.

**Applicant:**

SATMISSION  
Bultenvägen 5  
952 61 Kalix,  
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Website : [www.satmission.com](http://www.satmission.com)  
Email : [urban.gustavsson@satmission.com](mailto:urban.gustavsson@satmission.com)

**Antenna model:**

SMP 125 DA

**Antenna aperture dimensions:**

1.20 m H x 1.25 m V

**Standard:**

M

**Characterization date:**

26-06-2018

**Validity period:**

See Remark 5

**Last test data submitted on:**

07-12-2017

**System Description:**

Antenna system for drive-away applications. Dual offset Gregorian configuration. Single piece carbon fibre reflector, with two port linear polarization feed, manufactured by Satmission with HPA maximum permissible rating as per remark 4. ACU manufactured by RCI model RC4000. HPA model: Space Path.

**Maximum Allowed EIRP:** For digital carriers transmitted at the satellite receive contour of 0 dB/K (EESS 502 refers):

**In the 14.00 - 14.50 GHz band:**

36.7 dBW / 40 kHz for an orbital separation from the adjacent satellite  $\geq 1.5^\circ$

42.2 dBW / 40 kHz for an orbital separation from the adjacent satellite  $\geq 2.0^\circ$

45.3 dBW / 40 kHz for an orbital separation from the adjacent satellite  $\geq 3.0^\circ$

**In the 13.75 - 14.00 GHz band:**

34.3 dBW / 40 kHz for an orbital separation from the adjacent satellite  $\geq 1.5^\circ$

39.3 dBW / 40 kHz for an orbital separation from the adjacent satellite  $\geq 2.0^\circ$

40.0 dBW / 40 kHz for an orbital separation from the adjacent satellite  $\geq 2.5^\circ$

43.0 dBW / 40 kHz for an orbital separation from the adjacent satellite  $\geq 3.0^\circ$

**Tx Frequency:**

13.75 - 14.50 GHz

**Rx Frequency:**

10.70 - 12.75 GHz

**Pointing error:**

$\leq 0.35^\circ$

**Polarization error:**

$\leq 1.9^\circ$

**Tx XPD:**

$\geq 30$  dB within -1 dB contour

**Rx XPD:**

$\geq 27$  dB within -1 dB contour

**Remarks:**

- 1 Auto-pointing tests were performed via satellite from Kalix, Sweden with the ERS of Aflenz on the 6-7 December 2017. RF performance tests were performed on one antenna unit at the Politecnico di Torino Test Range on the 22-23 November 2017.
- 2 The SMP 125 DA ACU auto-pointing system has been validated with three different Eutelsat satellites, with angles of the polarization plane equal to  $3.5^\circ$ .
- 3 Transmission is not authorized until the peaking process is completed.
- 4 The SMP 125 DA is authorized to operate with 1+1 HPAs with a power up to 400 W.
- 5 This Summary's validity is subject to regular submission of patterns to confirm that the system remains compliant with measured performance at the inspection date.
- 6 Any change to the characterised configuration need to be notified to Eutelsat and may be subject to further tests.
- 7 The test campaign was performed with the antenna using a built-in inclinometer; use of the 3-axis compass is not recommended.

## ANNEX 1

### THE POLARISATION SKEW OF THE EUTELSAT SATELLITES USING DUAL LINEAR POLARISATION

#### GENERAL

The linear polarisation planes (defined as X and Y and orthogonal to each other) of most of the Eutelsat satellites are not parallel/orthogonal to the equatorial plane.

For historical reasons, the polarisation planes are inclined by an angle with respect to the equatorial plane. This angle is referenced as the polarisation skew.

This value is of fundamental importance for the following types of antennas, whenever the polarisation alignment is performed in open loop (calculated):

- Earth Stations on Vessels (ESVs)
- Satcom-On -The Move (SOTM)
- Auto-pointing antennas

If the pointing and polarisation alignment software of an antenna falling in the categories above did not take duly into account this value of skew, the polarisation discrimination achieved at the end of the alignment would suffer a major degradation with respect to the value which the antenna optics could theoretically yield, with a consequent high risk of interference to other services on the opposite polarisation and the achievable performance would not be met.

#### VALUE OF THE SKEW OF THE EUTELSAT SATELLITES

The reference X-polarisation is defined as that polarisation whose plane makes an angle of  $93.535^\circ$  in an anti-clockwise direction, looking towards the earth, about a reference vector with respect to a plane containing this vector and the pitch axis. The reference vector is defined as the vector from the satellite in the direction  $0.21^\circ$  towards west and  $6.07^\circ$  towards north in satellite coordinates.

The reference Y-polarisation is defined as that polarisation whose plane is orthogonal to the X-polarisation plane and the reference vector defined above.

In other words the skew of the Eutelsat satellites is  **$+3.535^\circ$ , clock-wise** when looking at the satellite from the earth, from anywhere on the meridian (**in the northern hemisphere**) corresponding to the orbital location of the satellite.

**In the southern hemisphere** the skew of the Eutelsat satellites is  **$+183.535^\circ$ , clock-wise**, from anywhere on the meridian corresponding to the orbital location of the satellite.

There are six satellites of the Eutelsat fleet using linear polarisation which make exception.

These are:

Sesat2,  
AB3,  
Express A3,  
Telstar 12.

for which the skew is  $0.0^\circ$

and

Telecom 2 C and Telecom 2 D

for which the skew is  $-22^\circ$ , when looking at the satellite from the earth.

## **EUTELSAT SATELLITES USING DUAL CIRCULAR POLARISATION**

To provide additional guidance to the development of automatic pointing and polarization alignment systems of antennas, it must be noted that Eutelsat operates part of the payload capacity of the following satellites:

AB3

W4

in dual circular polarisation

and part of the payload capacity of:

Telstar-12

in left hand circular polarisation