



312 File Number: **SATAMD2023040600075**

Filing Description

Question	Response
Description	Tomorrow.io Weather Monitoring Constellation

Satellite
Information

Question	Response
Select Orbit Type	NGSO
Space Station or Satellite Network Name	Tomorrow.io
Estimated Lifetime of Satellite(s) From Date of Launch	5 Years
Will the space station(s) operate on a Common Carrier basis?	No

Operating
Frequency
Bands (2)

Nature of service	Description	Frequency Band(s)	Mode Type
Earth Exploration-Satellite Service		2025.0 MHz -2110.0 MHz	Receive
Earth Exploration-Satellite Service		8025.0 MHz -8400.0 MHz	Transmit

**Orbital
Information For
Non-
Geostationary
Satellites**

Question	Response
Total Number of Satellites in the active constellation	18
Orbit Epoch Date	01/01/2023
Celestial Reference Body	Earth

Orbital Plane 1:

Question	Response
Number of Satellites in Plane	2
Inclination Angle	97.7 degrees
Right Ascension of Ascending Node	176.2 degrees
Argument of Perigee	0.0 degrees
Orbital Period	5739.0 seconds
Apogee	550.0 km
Perigee	550.0 km
Active Service Arc Begin Angle with respect to Ascending Node	-90.0 degrees
Active Service Arc End Angle with respect to Ascending Node	90.0 degrees

Mean Anomaly For Each Satellite

Satellite Number	Mean Anomaly (degrees) at the Orbit Epoch Date
1	0.0
2	180.0

Orbital Plane 2:

Question	Response
Number of Satellites in Plane	2
Inclination Angle	97.7 degrees
Right Ascension of Ascending Node	356.2 degrees
Argument of Perigee	0.0 degrees
Orbital Period	5739.0 seconds
Apogee	550.0 km
Perigee	550.0 km
Active Service Arc Begin Angle with respect to Ascending Node	-90.0 degrees
Active Service Arc End Angle with respect to Ascending Node	90.0 degrees

Mean Anomaly For Each Satellite

Satellite Number	Mean Anomaly (degrees) at the Orbit Epoch Date
1	0.0
2	180.0

Orbital Plane 3:

Question	Response
Number of Satellites in Plane	2
Inclination Angle	97.7 degrees
Right Ascension of Ascending Node	266.2 degrees
Argument of Perigee	0.0 degrees
Orbital Period	5739.0 seconds
Apogee	550.0 km
Perigee	550.0 km
Active Service Arc Begin Angle with respect to Ascending Node	-90.0 degrees
Active Service Arc End Angle with respect to Ascending Node	90.0 degrees

Mean Anomaly For Each Satellite

Satellite Number	Mean Anomaly (degrees) at the Orbit Epoch Date
1	180.0
2	0.0

Orbital Plane 4:

Question	Response
Number of Satellites in Plane	2
Inclination Angle	45.0 degrees
Right Ascension of Ascending Node	210.0 degrees

Argument of Perigee	0.0 degrees
Orbital Period	5739.0 seconds
Apogee	550.0 km
Perigee	550.0 km
Active Service Arc Begin Angle with respect to Ascending Node	-45.0 degrees
Active Service Arc End Angle with respect to Ascending Node	45.0 degrees

Mean Anomaly For Each Satellite

Satellite Number	Mean Anomaly (degrees) at the Orbit Epoch Date
1	0.0
2	180.0

Orbital Plane 5:

Question	Response
Number of Satellites in Plane	2
Inclination Angle	45.0 degrees
Right Ascension of Ascending Node	300.0 degrees
Argument of Perigee	0.0 degrees
Orbital Period	5739.0 seconds
Apogee	550.0 km
Perigee	550.0 km
Active Service Arc Begin Angle with respect to Ascending Node	-45.0 degrees
Active Service Arc End Angle with respect to Ascending Node	45.0 degrees

Mean Anomaly For Each Satellite

Satellite Number	Mean Anomaly (degrees) at the Orbit Epoch Date
1	0.0

2	180.0
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Orbital Plane 6:

Question	Response
Number of Satellites in Plane	2
Inclination Angle	45.0 degrees
Right Ascension of Ascending Node	120.0 degrees
Argument of Perigee	0.0 degrees
Orbital Period	5739.0 seconds
Apogee	550.0 km
Perigee	550.0 km
Active Service Arc Begin Angle with respect to Ascending Node	-45.0 degrees
Active Service Arc End Angle with respect to Ascending Node	45.0 degrees

Mean Anomaly For Each Satellite

Satellite Number	Mean Anomaly (degrees) at the Orbit Epoch Date
1	0.0
2	180.0

Orbital Plane 7:

Question	Response
Number of Satellites in Plane	2
Inclination Angle	45.0 degrees
Right Ascension of Ascending Node	30.0 degrees
Argument of Perigee	0.0 degrees
Orbital Period	5739.0 seconds
Apogee	550.0 km
Perigee	550.0 km

Active Service Arc Begin Angle with respect to Ascending Node	-45.0 degrees
Active Service Arc End Angle with respect to Ascending Node	45.0 degrees

Mean Anomaly For Each Satellite

Satellite Number	Mean Anomaly (degrees) at the Orbit Epoch Date
1	0.0
2	180.0

Orbital Plane 8:

Question	Response
Number of Satellites in Plane	2
Inclination Angle	97.7 degrees
Right Ascension of Ascending Node	191.2 degrees
Argument of Perigee	0.0 degrees
Orbital Period	5739.0 seconds
Apogee	550.0 km
Perigee	550.0 km
Active Service Arc Begin Angle with respect to Ascending Node	-90.0 degrees
Active Service Arc End Angle with respect to Ascending Node	90.0 degrees

Mean Anomaly For Each Satellite

Satellite Number	Mean Anomaly (degrees) at the Orbit Epoch Date
1	180.0
2	0.0

Orbital Plane 9:

Question	Response
Number of Satellites in Plane	2

Inclination Angle	97.7 degrees
Right Ascension of Ascending Node	86.2 degrees
Argument of Perigee	0.0 degrees
Orbital Period	5739.0 seconds
Apogee	550.0 km
Perigee	550.0 km
Active Service Arc Begin Angle with respect to Ascending Node	-90.0 degrees
Active Service Arc End Angle with respect to Ascending Node	90.0 degrees

Mean Anomaly For Each Satellite

Satellite Number	Mean Anomaly (degrees) at the Orbit Epoch Date
1	0.0
2	180.0

Receiving
Beams 1:

Question	Response
Beam ID	SRX
Receive Beam Frequency	2025.0 MHz -2110.0 MHz
Beam Type	Steerable
Polarization	RHCP
Peak Gain	5.6 dBi
Antenna Pointing Error	0.0 degrees
Antenna Rotational Error	0.0 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-26.5 dB/K
Min. Saturation Flux Density	-114.8 dBW/m2
Max. Saturation Flux Density	-81.0 dBW/m2
Co- or Cross Polar Mode	X
Service Area Description	Visible Earth

Receiving
Channels (32)

Channel ID	Channel Bandwidth (MHz)	Center Frequency s (MHz)	Feeder Link, Service Link or TT&C
SU26	0.01	2054.375	TT&C
SU25	0.01	2054.125	TT&C
SU24	0.01	2053.875	TT&C
SU23	0.01	2053.625	TT&C
SU22	0.01	2053.375	TT&C
SU21	0.01	2053.125	TT&C
SU20	0.01	2052.875	TT&C
SU19	0.01	2052.625	TT&C
SU18	0.01	2052.375	TT&C
SU17	0.01	2052.125	TT&C
SU15	0.2	2055.625	TT&C
SU16	0.2	2055.875	TT&C
SU14	0.2	2055.375	TT&C
SU13	0.2	2055.125	TT&C
SU8	0.2	2053.875	TT&C
SU2	0.2	2052.375	TT&C
SU3	0.2	2052.625	TT&C
SU4	0.2	2052.875	TT&C
SU5	0.2	2053.125	TT&C
SU10	0.2	2054.375	TT&C
SU11	0.2	2054.625	TT&C
SU12	0.2	2054.875	TT&C
SU1	0.2	2052.125	TT&C
SU9	0.2	2054.125	TT&C

SU7	0.2	2053.625	TT&C
SU6	0.2	2053.375	TT&C
SU27	0.01	2054.625	TT&C
SU28	0.01	2054.875	TT&C
SU29	0.01	2055.125	TT&C
SU30	0.01	2055.375	TT&C
SU31	0.01	2055.625	TT&C
SU32	0.01	2055.875	TT&C

Transmitting
Beams 1:

Question	Response
Beam ID	XTX
Transmit Beam Frequency	8025.0 MHz -8400.0 MHz
Beam Type	Steerable
Polarization	RHCP
Peak Gain	6.0 dBi
Antenna Pointing Error	0.0 degrees
Antenna Rotational Error	0.0 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-53.0 dBW/Hz
Max. Transmit EIRP	9.0 dBW
Co- or Cross Polar Mode	X
Service Area Description	Visible Earth

Max. Power Flux Density

	* 0° - 5°	* 5° - 10°	* 10° - 15°	* 15° - 20°	* 20° - 25°	* 25° - 90°
* (dBW/m ² /BW):	(dBW/m ² /BW):	(dBW/m ² /BW):	(dBW/m ² /BW):	(dBW/m ² /BW):	(dBW/m ² /BW):	(dBW/m ² /BW):
4.0 kHz	-154.3	-152.6	-151.0	-149.5	-148.3	-142.0

Transmitting
Channels (4)

Channel ID	Channel Bandwidth (MHz)	Center Frequency s (MHz)	Feeder Link, Service Link or TT&C
XD11	8.0	8030.0	TT&C
XD21	0.8	8030.0	TT&C
XD22	0.8	8080.0	TT&C
XD12	8.0	8080.0	TT&C

Certification Questions

Question	Response
Are the applicable service area coverage requirements of 25.143(b)(2) (ii) and (iii), or 25.144(a)(3)(i), or 25.145 (c)(1) and (2), or 25.146(i)(1) and (2), or 25.148(c), or 25.225 met?	N/A
Are the applicable frequency tolerances of 25.202(e) and out-of-band emission limits of 25.202(f)(1),(2), and (3) met?	Yes
Are the cessation of emissions requirements of 25.207 met?	Yes
Are the applicable power-flux-density limits of 25.208 met, and is the appropriate technical showing provided within the application?	Yes
For NGSO applications, are the applicable equivalent-power-flux-density limits of 25.208 met, and is the appropriate technical showing provided within the application?	Yes
Are the applicable full-frequency-reuse requirements of 25.210 met?	
If the application is for a 17/24 GHz BSS space station, will it be operated at an offset location with full power and interference protection in accordance with 25.262(b)?	

Attachments

File Name	Beam	Field	Attachment Type	Description
<u>TOMS GIMS FCC.mdb</u>		NGSO Antenna Gain Data	GIMS file (*. mdb)	Beam Projections for all Beams in Filing