



# SkyRAY

MOBILE SATELLITE SOLUTIONS

/ PRODUCTS & TECHNOLOGY

ND SatCom 

# // Mobile Satellite Solutions //

## Innovative solutions for mobile IP VSAT and SNG applications

Mobile satellite communications are of major significance for broadcasting companies, governmental institutions and relief organizations requiring fast, easy to use and reliable data transmission around the world. The bandwidth demand for such requirements can vary from low Mbit/s needs with VSAT systems used mainly for IP communications up to a full transponder transmit chain for live TV transmissions with HDTV quality. Our solutions are independent of fixed infrastructure and include VoIP, MPEG-2, MPEG-4, IPTV and HDTV with fully automatic satellite pointing, line-up and satellite capacity management.



## SkyRAY Antenna Subsystems

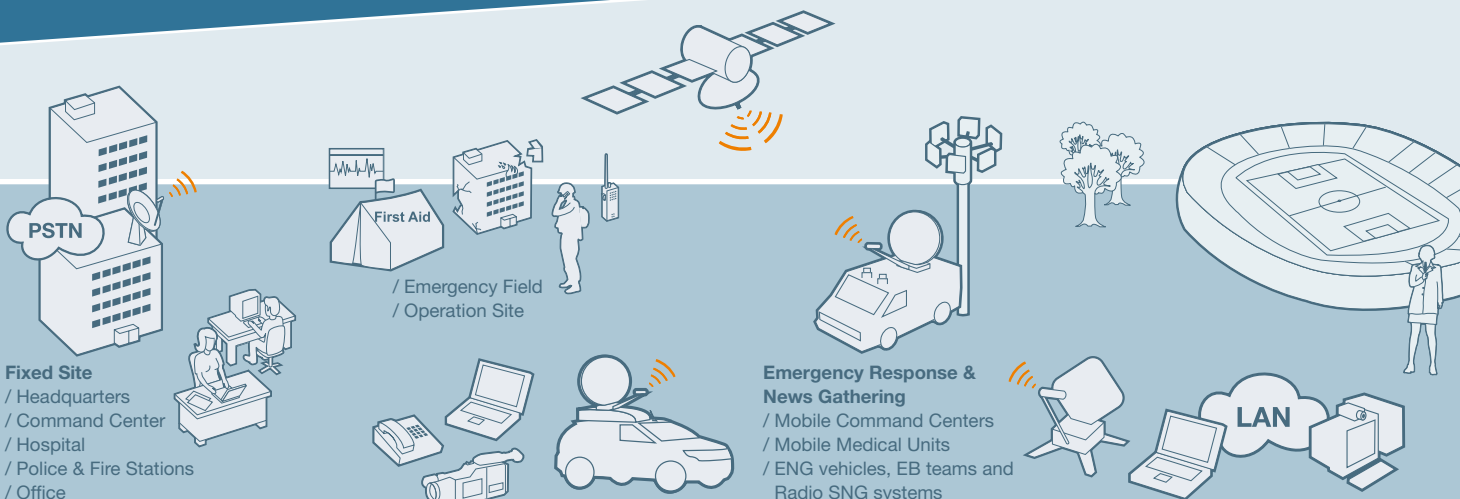
The SkyRAY series responds to the demand for reliable and automatically pointing transmit and receive antenna systems for mobile VSAT and SNG applications. The high-end antenna systems have gained an outstanding international reputation for their innovative engineering.

With a choice of antenna sizes from 1.2 m to 1.9 m, the SkyRAY family offers a complete array of mobile antenna systems for vehicle mounted applications, starting from the lower SSPA power range and moving through to high power SNG applications.

The antenna systems feature a high performance antenna reflector and a rugged tri-axis positioner enabling full antenna rotation and polarization optimization. All antenna systems can be equipped with an Automatic Pointing System (APS) for high precision automatic satellite pointing worldwide. It maintains superior RF performance and is backlash free in elevation and azimuth. For each system the carrier vehicles only require a minimum or even no modification.

ND SatCom SkyRAY Antenna Subsystems comprise three production series:

- / **SkyRAY Light 1200** – for typical VSAT applications at IP level from 2 W to 20 W SSPA Ku-Band transmission power
- / **SkyRAY Compact series**
  - / SkyRAY Compact 1500 & SkyRAY Compact 1500plus – for high-performance VSAT and SNG applications (20 W to 400 W Ku-Band) in redundant or non-redundant configurations
- / **SkyRAY MAS series**
  - / SkyRAY MAS 1300/1500/1900 – for special vehicle construction and harsh conditions as well as extremely high power classes (up to 700 W Ku-, DBS- and C-Band) in redundant or non-redundant configurations



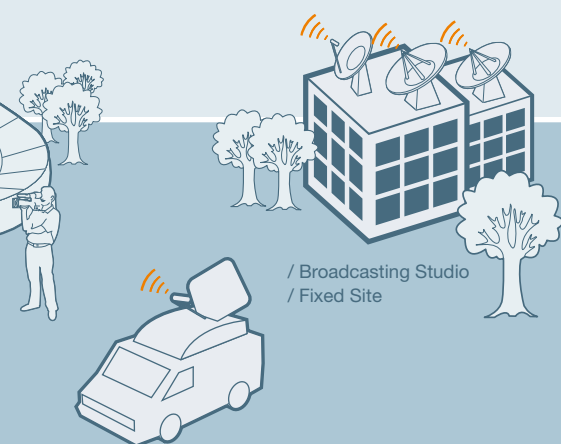
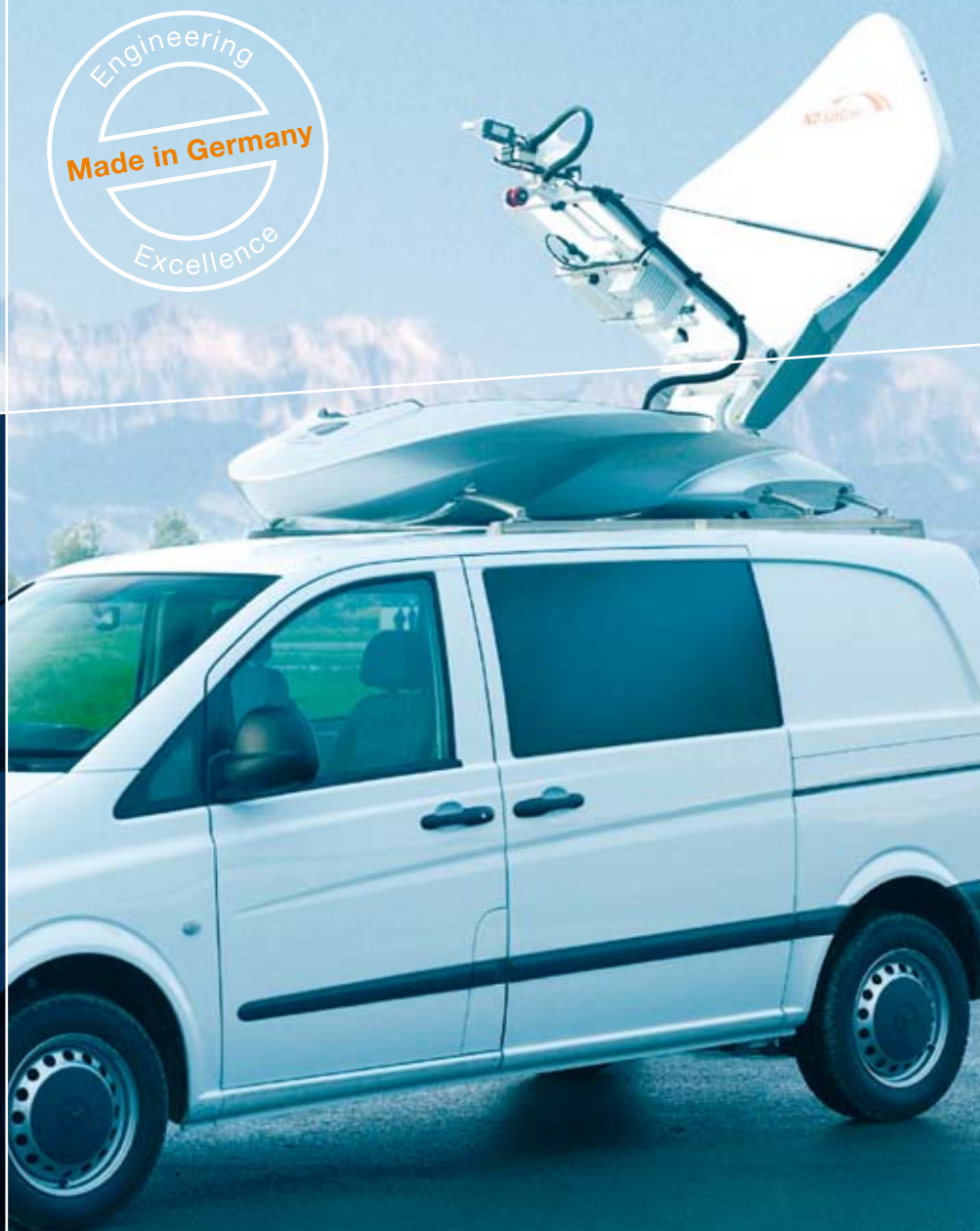


## Key Features:

- / Easy and cost-effective vehicle integration
- / Standard vehicle mounting components
- / Elegant & aerodynamic design for SkyRAY Light and SkyRAY Compact series
- / Robust & highly flexible
- / Modular and upgradeable
- / Individually configurable
- / Easy to operate by non-technical users

## Options:

- / Redundancy (for larger systems)
- / Automatic Pointing System
- / Antenna Pointing Assistant
- / Available as vehicle upgrade kit
- / Choice of colors



// From IPTV to HDTV –  
the best package for all  
your applications //





## SkyRAY for Broadcast & Media

Designed to meet the precise needs of customers such as broadcasters, media companies, telecoms and service providers, ND SatCom offers the most technologically advanced and comprehensive mobile satellite systems available on the market: the **SkyRAY** series. Customers worldwide rely on us to provide immediate, reliable and easy to use satellite communication systems for mobile **SNG** and **ENG** applications.

One main component of the vehicles is the complete antenna system we provide for mobile broadcasting solutions. Our services include all aspects of the conversion, including sourcing the base vehicle, selecting and installing the power generation system, mains distribution and lighting, air conditioning, and the installation of all baseband equipment supplied either by ND SatCom or our customers. As one of the important components for satellite transmission, the SkyRAY antenna system provides robust, high transmission power capability even for HDTV applications as well as DVB-S2 support.

### Solution Features:

- / Ku-Band support for standard distribution satellites
- / Higher power TWT amplifier for even HDTV transmissions
- / Flexible set-up
- / Automatic Pointing Assistant for easy usage
- / Easy combination with any satellite modem

// **ND SatCom –**  
**Europe's #1 for**  
**Satellite News Gathering //**



// **Reliable and secure  
real-time IP-based  
communication  
via satellite //**

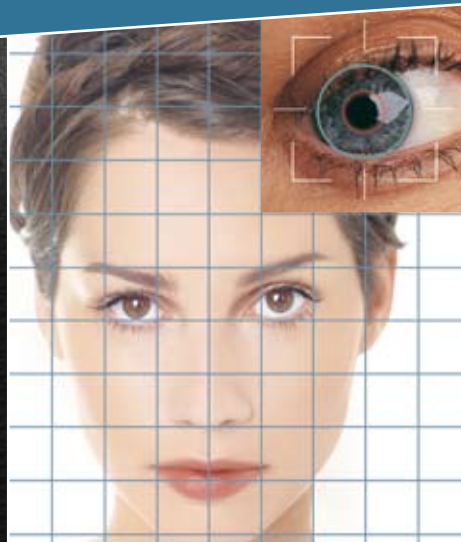
## SkyRAY for Government & Enterprise

Many governmental and commercial applications require a mobile satellite system. Next to a narrow band system like satellite phone or L-Band modem, **VSAT connectivity in Ku-Band for mainly IP data communication provides higher data rates not only in the receive path, but also for the return link.**

In this sector the requirement is for an easy to handle, light antenna system that can be quickly installed on different vehicles as well as fast automatic pointing to a dedicated satellite, ideally with a direct logon onto the VSAT network. SkyRAY Light 1200 is the ideal solution for such requirements. It provides connectivity for applications such as disaster recovery requirements, video transmissions or IPTV, enhanced communication capabilities for pico-cellular cells or WiMax/WiFi, or for other typical applications such as telemedicine, homeland security and border control projects.

### Solution Features:

- / Ku-Band support for most common satellites
- / Flexible setup on nearly each car – only standard roof bars required
- / Very light system in this class (only 75 kg)
- / Low power consumption (normally below 150 W)
- / Manually stowable
- / Automatic Pointing Assistant for easy usage with ND SatCom modems
- / Also usable as stand-alone system (boxed motorized antenna system)





# // SkyRAY Product Family //

## SkyRAY Light 1200

SkyRAY Light 1200 is ND SatCom's response to the demand for lightweight, yet robust automatically pointing transmit and receive antennas for mobile IP VSAT and SNG applications. The system is easy to operate and provides an affordable communication infrastructure – anytime – anywhere – within minutes.

The ND SatCom SkyRAY Light 1200 is the perfect solution for mobile corporate communications, governmental institutions, relief organizations and broadcasters requiring reliable and secure real-time IP-based communication via satellite.

Integrated in a stylish aerodynamic carbon fiber casing, the antenna system can be quickly mounted on any vehicle. The system features a high performance 1.2 m antenna reflector, a rugged tri-axis positioner, GPS receiver and compass enabling auto-pointing and auto-network acquisition.

// **SkyRAY Light 1200 –**  
**Lightweight, quick to**  
**deploy and easy to operate //**

## Key Features:

- / Extremely lightweight – easy to lift and use on any passenger car
- / Easy to install – only one cable required
- / Patented technology for the highest levels of reliability, robustness and precision
- / Easy to operate by non-technical users: automatic pointing and network acquisition
- / Complete SkyWAN® or SkyARCS IP set of features: affordable, always-on, broadband field communications
- / Aerodynamic casing for high travel speeds

In order to match the color of your vehicle, the ND SatCom SkyRAY Light and Compact series are available in any color.



## SkyRAY Compact 1500 & SkyRAY Compact 1500*plus*

The ND SatCom SkyRAY Compact series is the latest generation of SNG antenna subsystems on the market. Designed as a fashionable aerodynamic car-box, it can be easily and quickly roof-mounted on most van or all-terrain vehicle models. One news gathering mission might require a 4-wheel drive vehicle, another a spacious van – the SkyRAY Compact series will always meet your ever-changing requirements.



The ND SatCom SkyRAY Compact 1500 combines the need for a powerful uplink with the smart dimensions of a roof-top-box. The device fits to the standard mounting kits of most of the standard vehicles on the road.

The sleek design of the carbon fiber casing projects barely 55 cm above the vehicle roof. It accommodates a high performance 1.5 m antenna and, for example, a state-of-the-art ND SatCom 400 W high power TWT amplifier or a redundant SSPA configuration.

For redundant TWTA combinations (2x400 W) the SkyRAY Compact 1500*plus* is available with an enhanced height of 73 cm to cover also the second amplifier.

In addition to catering for your communication needs, our engineers have designed this package to create the greatest optical impact.

### Key Features:

- / Easy and cost-effective vehicle integration
- / Standard vehicle mounting components
- / Highly flexible
- / Modular and upgradeable
- / Individually configurable for Tx power 20 W SSPA – 400 W TWTA
- / Aerodynamic casing for high travel speeds

### Options:

- / Redundancy
- / Automatic Satellite Access
- / Available as SNG vehicle upgrade kit
- / Choice of colors





# TECHNICAL SPECIFICATIONS

SkyRAY Light 1200 / SkyRAY Compact 1500 / SkyRAY Compact 1500*plus*

## SkyRAY Light 1200

### ELECTRICAL

Frequency (GHz)	<b>Rx:</b> 10.70 – 12.75 GHz
	<b>Tx:</b> 13.75 – 14.50 GHz
Antenna Gain at midband, dBi	<b>Rx:</b> 41.8 dBi @ 11.95 GHz
	<b>Tx:</b> 43.3 dBi @ 14.25 GHz
Antenna Noise Temperature	24°K @ 30° Elevation
G/T with 70°K LNA	–
VSWR	<b>Rx:</b> 1.5:1
	<b>Tx:</b> 1.3:1
Waveguide Interface Flange	WR75/UBR120
Total Power Handling Capability	Approval related

### MECHANICAL

Azimuth Travel	± 200°
Elevation Travel	5° to 65°
Polarization Travel	± 130°
Antenna Pointing	Automatic
Antenna Backup System	Manually stowable
Drive Rates	Variable drive speed up to 6°/sec
Reflector	Single piece, Prime Focus, Offset Feed, OEM Product
Weight (w/o RF equipment)	62 kg (without case)
Weight (w. ODU, cable + case)	72 kg
Antenna Size	Diameter: 1.2 m
Operation Temperature	-25°C to +55°C
Height	49 cm





SkyRAY Compact 1500		SkyRAY Compact 1500plus	
	<b>Rx:</b> 10.7 – 12.75 GHz		<b>Rx:</b> 10.7 – 12.75 GHz
	<b>Tx:</b> 13.75 – 14.5 GHz		<b>Tx:</b> 13.75 – 14.5 GHz
	<b>Rx:</b> 43 dBi (typical), 42.2 dBi (min) @ 11.7 GHz		<b>Rx:</b> 43 dBi (typical), 42.2 dBi (min) @ 11.7 GHz
	<b>Tx:</b> 44.5 dBi (typical), 43.6 dBi (min) @ 14 GHz		<b>Tx:</b> 44.5 dBi (typical), 43.6 dBi (min) @ 14 GHz
	25K @ 30° Elevation		25K @ 30° Elevation
	22.3 dB/K @ 30° Elevation		22.3 dB/K @ 30° Elevation
	<b>Rx:</b> <1.3:1 (Rx port 10.95 – 12.75 GHz)		<b>Rx:</b> <1.3:1 (Rx port 10.95 – 12.75 GHz)
	<b>Tx:</b> <1.3:1 (Tx port 13.75 – 14.5 GHz)		<b>Tx:</b> <1.3:1 (Tx port 13.75 – 14.5 GHz)
	WG17/UBR 120		WG17/UBR 120
	74.5 dBW		74.5 dBW
	± 177°		± 177°
	5° to +90° continuous		5° to +90° continuous
	-45° to +135° continuous		-45° to +135° continuous
	Automatic (option), Manual Jog		Automatic (option), Manual Jog
	Car Battery Emergency Control for motors via ACU Optional manual hand cranks for driving Az/El		Car Battery Emergency Control for motors via ACU Optional manual hand cranks for driving Az/El
	High Speed: 2°/sec; Slow Speed: 1°/sec		High Speed: 2°/sec; Slow Speed: 1°/sec
	Single piece diamond shaped reflector		Single piece diamond shaped reflector
	115 kg (with case)		118 kg (with case)
	145 kg		148 kg
	Diagonal: 1.5 m; across flats: 1.2 m		Diagonal: 1.5 m; across flats: 1.2 m
	-30° to +55°C		-30° to +55°C
	55 cm		73 cm

## // SkyRAY MAS series //

These mobile antenna subsystems can be mounted on any appropriate vehicle. The high performance antenna reflector teamed with the robust motorized mount create the ideal combination to serve the needs for reliable SNG transmissions. The system is fully waterproof and designed for continuous operation even under harsh environmental conditions.

With the choice of sizes from 1.3m to 1.9m a broad range of applications in C-, Ku- and DBS-Band can be optimally covered.

Additional datasheets about technical specifications are available on request.



### SkyRAY MAS 1300

#### ELECTRICAL:

- / Frequency (GHz) : Rx: 10.7 – 12.75 GHz  
Tx: 13.75 – 14.5 GHz
- / Antenna Gain at midband, dBi: Rx: 41 dBi (typical), 40.5 dBi (min) @ 11.7 GHz  
Tx: 42.5 dBi (typical), 42 dBi (min) @ 14 GHz
- / G/T with 70° K LNA: 20.6 dB/K @ 30° Elevation
- / Total Power Handling Capability: 70.8 dBW

#### MECHANICAL:

- / Weight (w/o RF equipm.): 76 kg
- / Weight (w. ODU + cable): 102 kg
- / Antenna Size: Diagonal: 1.3 m; across flats: 1.0 m



### SkyRAY MAS 1500

#### ELECTRICAL:

- / Frequency (GHz) : Rx: 10.7 – 12.75 GHz  
Tx: 13.75 – 14.5 GHz
- / Antenna Gain at midband, dBi: Rx: 43 dBi (typical), 42.2 dBi (min) @ 11.7 GHz  
Tx: 44.5 dBi (typical), 43.6 dBi (min) @ 14 GHz
- / G/T with 70° K LNA: 22.3 dB/K @ 30° Elevation
- / Total Power Handling Capability: 74.5 dBW

#### MECHANICAL:

- / Weight (w/o RF equipm.): 86 kg
- / Weight (w. ODU + cable): 112 kg
- / Antenna Size: Diagonal: 1.5 m; across flats: 1.2 m



### SkyRAY MAS 1900

#### ELECTRICAL:

- / Frequency (GHz) : Rx: 10.7 – 12.75 GHz  
Tx: 13.75 – 14.5 GHz
- / Antenna Gain at midband, dBi: Rx: 44 dBi (typical), 43.7 dBi (min) @ 11.7 GHz  
Tx: 46 dBi (typical), 45.5 dBi (min) @ 14 GHz
- / G/T with 70° K LNA: 23.8 dB/K @ 30° Elevation
- / Total Power Handling Capability: 77.5 dBW

#### MECHANICAL:

- / Weight (w/o RF equipm.): 95 kg
- / Weight (w. ODU + cable): 122 kg
- / Antenna Size: Diagonal: 1.9 m; across flats: 1.5 m





# TECHNICAL SPECIFICATIONS

SkyRAY MAS 1300 / SkyRAY MAS 1500 / SkyRAY MAS 1900

## ELECTRICAL

<b>Antenna Noise Temperature</b>	25K @ 30° Elevation
<b>VSWR</b>	<b>Rx:</b> <1.3:1 (Rx port 10.95 – 12.75 GHz)
	<b>Tx:</b> <1.3:1 (Tx port 13.75 – 14.5 GHz)
<b>Waveguide Interface Flange</b>	WG17/UBR 120

## MECHANICAL

<b>Azimuth Travel</b>	± 177°
<b>Elevation Travel</b>	5° to +90° continuous
<b>Polarization Travel</b>	-45° to +135° continuous
<b>Antenna Pointing</b>	Automatic (option), Manual Jog
<b>Antenna Backup System</b>	Car Battery Emergency Control for motors via ACU Optional manual hand cranks for driving Az/EI
<b>Drive Rates</b>	High Speed: 2°/sec; Slow Speed: 1°/sec
<b>Reflector</b>	Single piece diamond shaped reflector
<b>Operation Temperature</b>	-30° to +55°C

## ENVIRONMENTAL

<b>Operational Winds</b>	100 km/h
<b>Survival Winds</b>	140 km/h
<b>Ambient Temperature</b>	Survival -40° to +60°C
<b>Rain</b>	Survival in heavy rainstorm
<b>Relative Humidity</b>	0% to 100% with condensation
<b>Solar Radiation</b>	1000 W/m <sup>2</sup>
<b>Radial Ice</b>	2.5 cm on all surfaces
<b>Automatic Satellite Access</b>	1. Based on SkyWAN® TDMA carrier / 2. Based compass and GPS data
<b>4 Polarization</b>	Linear polarized TX/RX
<b>ACU Model</b>	ACU 4100A
<b>GPS</b>	GPS 35 HVS
<b>Beacon Rx</b>	N.A.
<b>Operation Temperature</b>	Operational -30° to +55°C



ND SatCom, an SES ASTRA company, is a leading global supplier of satellite-based broadband VSAT, broadcast, government and defence communication network and ground station solutions. ND SatCom's innovative technologies are deployed in government and defence, broadcast & media, enterprise and telecom environments worldwide. As a global company with more than 25 years of experience in the satellite networks and systems businesses, ND SatCom is a reliable source of comprehensive and secure turnkey and tailored system engineered solutions.

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