Norsat International Inc.

WAYFARER™ SERIES

RUGGED, ULTRA-PORTABLE HIGH-PERFORMANCE SATELLITE TERMINALS FOR COMMERCIAL APPLICATIONS

WAYFARER SERIES OF KA-BAND AND KU-BAND COMMERCIAL SATELLITE TERMINALS

	FLY AWAY						DRIVE AWAY		FIXED
									
SPECIFICATIONS	**WFA120KA**	**WFA120KU**	**WFA180KU**	**WFM090KU**	**WFM120KU**	**WFM180KU**	**WDA120KU**	**WDA180KU**	**WFX120KU**
ELECTRICAL									
Reflector aperture	1.2 m	1.2 m	1.8 m	0.9 m	1.2 m	1.8 m	1.2 m	1.8 m	1.2m
Acquisition	Auto	Auto	Auto	Manual	Manual	Manual	Auto	Auto	Manual
Reflector material	Carbon Fiber	Carbon Fiber	Carbon Fiber	Carbon Fiber	Carbon fiber	Carbon Fiber	Carbon Fiber	Carbon Fiber	Glass Fiber Reinforced Polyester SMC
Tx Frequency	29.0 to 31.0 GHz	13.75 to 14.50 GHz	13.75 to 14.50 GHz	13.75 to 14.50 GHz	13.75 to 14.5 GHz	13.75 to 14.50 GHz	13.75 to 14.50 GHz	13.75 to 14.50 GHz	12.75 to 14.50 GHz
Rx Frequency	18.7 to 21.2 GHz	10.70 to 12.75 GHz	10.70 to 12.75 GHz	10.70 to 12.75 GHz	10.70 to 12.75 GHz	10.70 to 12.75 GHz	10.70 to 12.75 GHz	10.70 to 12.75 GHz	10.70 to 11.70 GHz
Tx Gain	46.4 dBi	42.8 dBi	46.3 dBi	40.0 dBi	42.5 dBi	46.3 dBi	42.8 dBi	46.3 dBi	43 dBi
Rx Gain	43.3 dBi @ 18.7 GHz	41.5+20log (f/11.85) dBi	45.3+20log(f/12.5) dBi	38.8+20log(f/12.5) dBi	41.5+20log(f/12.5) dBi	45.3+20log(f/12.50) dBi	41.5+20log(f/12.50) dBi	45.0+20log(f/12.50) dBi	41 dBi
BUC Options	12W, 25W, 50W	2W, 3W, 4W, 6W, 8W, 10W, 16W, 20W, 40W	8W, 20W, 40W, 80W	2W, 3W, 4W, 6W, 8W, 10W, 16W 20W, 40W	2W, 3W, 4W, 6W, 8W, 10W, 16W 20W, 40W	8W, 20W, 40W, 80W	2W, 3W, 4W, 6W, 8W, 10W, 16W, 20W, 40W	8W, 20W, 40W, 80W	2W, 3W, 4W, 6W, 8W, 10W, 16W, 20W, 40W
Cross Polarization (On-Axis)	≥ 23.5 dB	≥ 35 dB	≥ 35 dB	≥ 35 dB	≥ 35 dB	≥ 35 dB	≥ 35 dB	≥ 35 dB	-
Rx/Tx Isolation	Tx ≥ 100 dB	Tx: ≥ 85 dB; Rx: ≥ 40 dB	Rx > 35dB Tx > 85dB	Rx > 35 dB; Tx ≥ 85 dB	Rx > 35dB Tx > 85dB	Rx ≥ 35dB; Tx ≥ 85 dB	Rx ≥ 40dB; Tx ≥ 85 dB	Rx ≥ 40dB; Tx ≥ 85 dB	-
Sidelobe	First sidelobe -14 dB	First sidelobe -14 dB	First sidelobe < -14 dBi	First sidelobe < -14 dB	First sidelobe < -14 dBi	First sidelobe < -14 dBi	First sidelobe ≤ -14 dB	First sidelobe ≤ -14 dB	48° < q -10 dBi (averaged)
Azimuth Range	±200˚	±200˚	±180˚	±180˚	±200°	±180˚	±200˚	±200˚	±20° Fine, 360° Continuous
Elevation Range	10˚ to 90˚	10˚ to 90˚	0˚ to 90˚	0˚ to 90˚	0˚ to 90˚	0˚ to 90˚	10˚ to 90˚	10˚ to 90˚	5° to 90°Continuous
Polarization Range	-	± 90°	±90˚	±90˚	±90˚	±90˚	±90˚	±90˚	-
Azimuth Speed	0.1˚/s to 3˚/s	0.1˚/s to 3˚/s	0.1˚/s to 3˚/s	-	-	-	0.1˚/s to 6˚/s	0.1˚/s to 6˚/s	-
Elevation Speed	0.1˚/s to 3˚/s	0.1˚/s to 3˚/s	0.1˚/s to 3˚/s	-	-	-	0.1˚/s to 6˚/s	0.1˚/s to 6˚/s	-
Polarization Speed	0.1˚/s to 1˚/s	0.1˚/s to 3˚/s	0.1˚/s to 1˚/s	-	-	-	0.1˚/s to 6˚/s	0.1˚/s to 6˚/s	-
Feed Interface	WR75	WR75	WR75	WR75	WR75	WR75	WR75	WR75	-
Power Supply	AC110-230V 50/60Hz, rated 200W, 550W max.	AC110-230V 50/60Hz, rated 200W, 550W max.	AC110-230V 50/60Hz, rated 400W, 1000W max.	-	-	-	AC110-230V 50/60Hz, rated 200W, 500W max.	AC110-230V 50/60Hz, rated 400W, 1000W max.	-
Number of Cases	2	2	6	1 (Up to 10W BUC)	2	2	N/A	N/A	N/A
Max. Case Weight	≤ 30 Kg	≤ 30 Kg	≤ 50 Kg	≤ 25 Kg	≤ 25Kg	≤ 85 Kg	≤ 85 Kg	≤ 140 Kg	≤40 Kg
ENVIRONMENTAL									
Wind Load - Operational	49 km/h	36 km/h	40 km/h	70 km/h	36 km/h	40 km/h	72 km/h	72 km/h	80 km/h
Wind Load - Survival	100 km/h	61 km/h	65 km/h	100 km/h	65 km/h	65 km/h	90 km/h	90 km/h	201 km/h
Temperature	-40˚C to +60˚C	-30°C to +60°C	-40˚C to +60˚C	-40˚C to +60˚C	-40°C to +60°C	-40˚C to +60˚C	-40˚C to +55˚C	-40˚C to +55˚C	-40˚C to +60˚C
Humidity	0-95%	0-95%	0-95% (20˚)	0-95% (20°C)	0-95% (20°C)	0-95% (20˚)	0-95%	5-95%	0-100% with condensation
Water Ingress	IP 65 (antenna only)	IP 65 (antenna only)	IP 65 (antenna only)	IP 65 (antenna only)	IP 65 (antenna only)	IP 65 (antenna only)	IP 65	IP 65	-

Specifications are subject to change without notice

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FLY AWAY

Norsat WAYFARER™ fly-away antennas are fast deploying, easy-to-use, and compact SATCOM VSATs. They offer excellent rugged and reliable satellite links for remote enterprise, energy, emergency, and media applications.

Features

- Satellite communication at transient locations
- Airline checkable
- Available for Ka-band with 1.2m reflector sizes
- Available for Ku-band with 0.9m, 1.2m & 1.8m reflector sizes
- Easy and intuitive LinkControl™ Interface
- Rugged and lightweight pedestal design
- Durable carbon fiber reflector
- Fast, simple, tool-free deployment with set up in 5 min
- Automatic 3-axis, one-button acquisition (option)
- Ruggedized packing solution
- Wide range of Norsat BUC and LNB configurations
- IP65

FIXED

Norsat's WAYFARER™ fixed antennas deliver adaptable and dependable solutions for SATCOM installations in remote locations. Application include remote broadband, crew welfare, remote mobile communications, mining, oil & gas exploration, field camp offices, construction and remote site offices.

Features

- Available for Ku-band with 1.2m reflector size
- Fast, simple installation
- Manual acquisition for robust, weather-proof durability
- Mast and non-penetrating mount options
- Wide selection of BUC and LNB options

DRIVE AWAY

The WAYFARER™ drive-away antennas are Norsat's solution for reliable and easy-to-deploy mobile communications. The solid, low weight, and low height reflector mount deploys easily for fast and reliable satellite acquisition. Whether mounted on an emergency vehicular command center or a mobile broadcast van – count on Norsat's WAYFARER™ driveaway terminals for drive-away broadband-level communications capability.

Features

- Vehicle-mounted, ready to operate as COTP
- Available for Ku-band with 1.2m & 1.8m reflector sizes
- Easy and intuitive LinkControl™ Interface
- Heavy duty platform and reflector folding design, low profile for transport
- Lightweight and durable carbon fiber reflector
- From "stow-to-go" in under 8 minutes with automatic 3-axis acquisition
- Wide range of Norsat BUC and LNB configurations
- Includes easy-to-use 1RU ACU for easy indoor operation
- IP65 rating

DIFFERENTIATORS

Turnkey Solution

- Integration of all system components
- Broad range of RF selection, packaged as a standard offering
- Customizable at individual component level

LinkControl Software

- Facilitates satellite signal acquisition and monitoring of terminal health

OpenAMIP Support

- Enable carrier to optimize terminal signal at all times

Value

- Ruggedized weather-proof packaging
- Value for performance with competitive pricing
- Customer service - 24/7/365 Global Customer Support

Warranty

- 1 year for Satellite Terminals, 3 years for Standard BUCs and LNBs

NORSAT SUPPORTS THE BROADCAST INDUSTRY WITH ADVANCED FLY-AWAY SATELLITE TERMINALS

Norsat has been a leading provider of satellite communication solutions for a variety of commercial applications. Our high-quality fly-away satellite terminals and SNG equipment have been used by the broadcast industry for decades. Learn how Norsat supported CTV - Canada's largest private broadcaster, with the NewsLink fly-away system, which has been used heavily by the Canadian press pool for remote broadcasting and deployment throughout sandstorms, earthquake aftermaths, arctic conditions and extreme rainfall, while continuing key broadcasts. Norsat's WAYFARER™ Series are the next-generation of rugged, ultra-portable fly-away, drive-away and fixed satellite terminals that are strong enough for military but made for commercial applications. These terminals seamlessly integrate all the tools needed for remote communication with an easy-to-use interface, LinkControl satellite acquisition software and advanced capabilities.

SUMMARY

Norsat has provided high quality Satellite News Gathering Equipment and services to CTV, Canada's largest private broadcaster, since 2006. Prior to working with Norsat, CTV used a combination of Satellite News Trucks and low bandwidth satellite terminals to cover Canada's international and domestic news events, however they lacked a solution that could be easily transported overseas, provide live broadcast capabilities anywhere in the world, and reduce operating expenses.

CTV is Canada's largest private broadcaster, providing an excellent range of news, sports, and entertainment programming. Owned by Bell Media, CTV has been the most-watched television network in Canada for years. CTV broadcasts news from around the world and has a critical need to supply up to date, broadcast quality news to the more than 25 million viewers who watch the network each week.

Problem

Prior to Norsat's involvement, CTV used low bandwidth satellite data terminals to uplink stories produced by their correspondents who were covering Canada's mission in Afghanistan. Submitting a single two to three minute story often took eight or nine hours, and incurred significant satellite airtime charges. The legacy system also did not have the bandwidth required to perform live interviews with acceptable video quality. Due to the ongoing expense and lack of flexibility of this system, CTV searched for a solution that would provide the ability to send live broadcast-quality video, reduce their operating expenses, and remain easy to use, so the network could avoid sending broadcast engineer into crisis situations. The solution had to be transportable, rugged, and reliable enough to operate for several years in the challenging environment of Kandahar. The critical time scales for breaking news coverage also necessitated that the solution be supported by a technical support team who would provide 24x7x365 troubleshooting and assistance to ensure that the broadcast team never missed a story. Additionally, CTV was looking for a rental option to provide supplemental coverage when other systems were unavailable.

Solution

After a consultation with CTV on their needs and applications, Norsat proposed a 1m lightweight carbon fibre 25 Watt NewsLink Satellite News Gathering Flyaway System. Norsat provided operational training for the broadcast team and following training, the system was hand carried to Kandahar, where it was used to cover the Canadian troop deployment to Afghanistan. Over the next five years, the NewsLink fly-away was used heavily by the Canadian press pool for satellite news gathering and broadcast. In the spring of 2011, Norsat remotely upgraded the terminal at CTV's request with an SDI (BNC) digital video input with embedded audio to the MPEG-2 encoder, to enable a full digital path for both audio and video.

Innovative Communication Solutions
case study

NORSAT SUPPORTS THE BROADCAST INDUSTRY WITH ADVANCED FLY-AWAY SATELLITE TERMINALS

Recently, one of CTV's Satellite News Trucks was critically damaged after covering a major news event in British Columbia. As this was their only satellite truck in western Canada, CTV urgently needed a solution that would fill in for the satellite truck while it was being repaired and upgraded. Following this urgent request, Norsat was able to provide another NewsLink portable terminal on short notice to meet their specifications and needs. The system was provided on a flexible rental contract to facilitate rapid deployment and enabled CTV to continue their coverage of breaking news events without significant interruption. The unit remained in use for a further four months while the satellite truck was repaired and during that time it provided news contribution capabilities to all of Western Canada. Norsat continues to provide temporary SNG flyaway rental terminals for CTV and other broadcasters as needed to support short term requirements

Following the completion of Canada's mission in Afghanistan, the original NewsLink flyaway system was shipped back to Norsat's Vancouver facilities where it was refurbished and upgraded to support full HD. The original 25W NewsLink was rebuilt with an 80W SSPA and an MPEG4/DVB-S2 encoder/modulator to enable full High Definition capabilities. The upgraded NewsLink fly-away system was subsequently used to cover a variety of Canadian political news events in HD quality broadcast, including elections in BC and Alberta.

Results

Norsat's NewsLink SNG fly-away terminal provided the rugged, portable, cost effective solution CTV needed. The terminal was easily airline portable, enabling CTV to send it on location to Kandahar, where it was used as a primary news gathering and broadcast link for the Canadian press corps for five full years. The portability of the unit reduced CTV's reliance on Satellite News trucks, reducing the cost associated with broadcasting from remote locations, and providing a return on investment very quickly. The NewsLinkTM flyaway enabled CTV to provide live broadcast quality coverage, and reduced the operating expenses via lowered access fees. The durability and reliability of the terminal was clearly evident as it remained in excellent operational form during deployment in Kandahar, requiring very little maintenance and ensuring high quality news feed for Canadian broadcasters.

The terminal was scalable and easily upgraded as CTV's needs changed. The terminal was adjusted remotely to enable digital audio while on location in Kandahar, and eventually upgraded to enable HD broadcast. Norsat can continue to modify or upgrade the terminal as needed.

Norsat's quick response to CTV's emergency satellite terminal needs enabled the network to continue covering important breaking news across Western Canada. When the network's satellite news truck was damaged in 2010, this was their only available method of broadcast and Norsat's quick provision, setup and service of a rental NewsLink flyaway was essential for Western Canadian news coverage during the truck's repair. The rapid deployment, ease of use and cost effectiveness of this rental led CTV to continue to their use of Norsat's rental service in the following months, and Norsat continues to provide satellite terminal rentals to cover a variety of Canadian events such as festivals and concerts.

The Norsat support team has been available to CTV on a 24x7x365 basis to provide trouble-shooting and operational support, ensuring every broadcast is timely and successful. Additionally, Norsat's thorough training of CTV's broadcast team enables team members to successfully operate and maintain the unit in the field, and removes the need to send broadcast engineers into dangerous situations.

'We have already put this unit through the harshest test of service in Kandahar and if its performance there was any indication we will be on the air from, well anywhere, for years to come.'
- **Dave Alexander, ENG Operations Manager, CTV**

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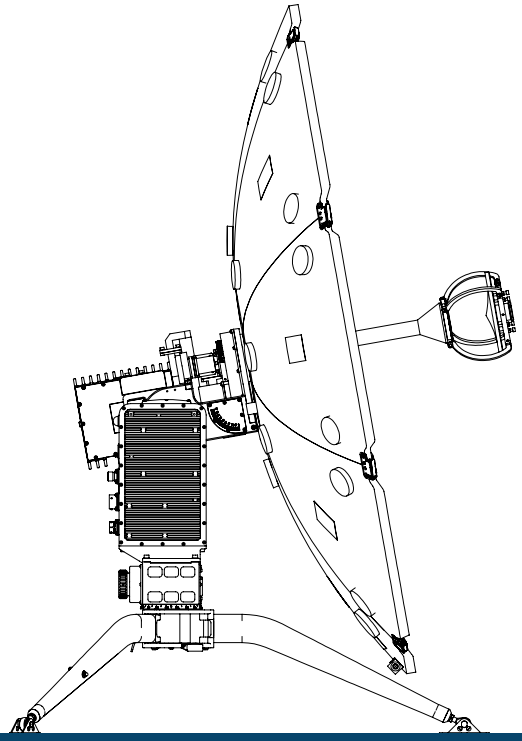

ABOUT NORSAT

Norsat International Inc., founded in 1977, is a leading provider of innovative communication solutions that enable the transmission of data, audio and video for remote and challenging applications. Norsat's products and services include customizable satellite components, portable satellite terminals, maritime solutions and satellite networks. The company's products and services are used extensively by telecommunications services providers, emergency services and homeland security agencies, military organizations, health care providers and Fortune 1000 companies.

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