



Norsat
International Inc.

Intelligent Satellite Solutions



Norsat SigmaLink™

The new Norsat SigmaLink™ is the latest in a series of transportable satellite terminals. The SigmaLink™ is ideally suited to provide broadband connectivity for base camps or other prolonged missions where assignments are temporary but deployment is protracted. With simple setup and alignment procedures, personnel with minimal training can have the Norsat SigmaLink™ up and transmitting in under 15 minutes.



Flexible. Intelligent. Rugged.

The Norsat SigmaLink™ was designed from the ground up to deliver broadband data connectivity in a transportable, rugged and easy-to-use package. The terminal can be easily configured to meet varying needs; it includes a 1.8m or 2.4m antenna; interchangeable Ku/X/C band capability; various power amplifiers options; positioner; controller; pointing tools; and different system configurations (pointing box and/or baseband configuration). Norsat is also the first in the industry to incorporate an easy-to-use graphical interface for antenna alignment, satellite acquisition and peaking, transmitter control, and access to the built-in spectrum analyzer, beacon detector, and DVB receiver.

The Norsat Advantage

Only the Norsat SigmaLink™ provides a quick assembly platform that can be set up in less than 15 minutes without tools. It comes complete with pointing tools (compass, inclinometer, and GPS) to aid in satellite alignment. The sophisticated LinkControl™ software together with an easy-to-use pointing box, or Satellite Acquisition Assistant (SAA), makes alignment and acquisition easy for even novice operators. To further simplify operation in the field, a full range of settings can be pre-configured in user selectable profiles before the Norsat SigmaLink™ is sent out on assignment.

Flexible

- Ku/X/C band capable
- 1.8m or 2.4m antenna for greater throughput
- Available with pointing box (SAA) and/or baseband configuration
- Configurable to operate on any commercial satellite at any time

Intelligent

- Quick and simple assembly
- Assisted-acquire via easy-to-use SAA
- Intuitive graphical software interface
- Built-in spectrum analyzer, beacon detector, DVB receiver
- Software control of transmitter

Rugged

- Packaged in ruggedized industrial cases
- Built tough and weatherized for harsh environments
- Shock protected assemblies
- Compliant with military environmental standards

1.8M SigmaLink™ Baseband Variant

System	C-Band		X-Band		Ku-Band	
	Rx	Tx	Rx	Tx	Rx	Tx
EIRP	N/A	53.3 dBW	N/A	55.2 dBW	N/A	58.3 dBW
G/T	15.3 dB/K	N/A	19.6 dB/K	N/A	23.7 dB/K	N/A

Antenna						
Frequency	3.4 - 4.2 GHz	5.85 - 6.425 GHz	7.25 - 7.75 GHz	7.9 - 8.4 GHz	10.95 - 12.75 GHz	13.75 - 14.5 GHz
Midband Gain	35.4 dBi	39.3 dBi	41 dBi	41.7 dBi	45.1 dBi	46.8 dBi
X-pol	30 dB on axis, 23 dB within 1 dB contour	30 dB on axis, 23 dB within 1 dB contour	N/A	N/A	35dB on axis, 23 dB within 1db contour	35dB on axis, 23 dB within 1db contour
Axial Ratio	N/A	N/A	1.5 dB	1.5 dB	N/A	N/A
Sidelobe	Meets ITU 580 outside main lobe		Meets DSCS		Meets ITU 580	
Isolation						
Tx - Rx	-60 dB	N/A	-110 dB	N/A	-85 dB	N/A
Rx - Tx	N/A	-50 dB	N/A	-110 dB	N/A	-30 dB
Reflector Size	1.8m, 4 piece segmented reflector, offset feed		1.8m, 4 piece segmented reflector, offset feed		1.8m, 4 piece segmented reflector, offset feed	
Antenna Travel						
Az	+/- 35 degrees fine adjust		+/- 35 degrees fine adjust		+/- 35 degrees fine adjust	
EI	0 - 90 degrees		0 - 90 degrees		0 - 90 degrees	
Pol	+/- 90 degrees		+/- 90 degrees		+/- 90 degrees	
Feed	2-port linear		2-port circular		2-port linear	

Transmit

	C-Band	X-Band	Ku-Band
Output Frequency	5.85 - 6.425 GHz	7.9 - 8.4 GHz	13.75 - 14.5 GHz
Reference	10 MHz	10 MHz	10 MHz
Reference Level	0 +/- 5 dBm	0 +/- 5 dBm	0 +/- 5 dBm
Output Power @ P1dB	40 W	35 W	25 W
Gain (typical)	50 dB	50 dB	50 dB
Spectral Regrowth	-26 dBc @ 44.7 dBm	-26 dBc @ 45.5 dBm	-26 dBc @ 44 dBm

Receive

LNB NF	0.5	0.8	0.8
Reference	10 MHz	10 MHz	10 MHz
Reference Level	-5 +/- 5 dBm	+2 +/- 5 dBm	+2 +/- 5 dBm
Phase Noise	-73 dBc/Hz at 1 kHz -83 dBc/Hz at 10 kHz -93 dBc/Hz at 100 kHz	-75 dBc/Hz at 1 kHz -85 dBc/Hz at 10 kHz -95 dBc/Hz at 100 kHz	-65 dBc/Hz at 1 kHz -75 dBc/Hz at 10 kHz -85 dBc/Hz at 100 kHz
Input VSWR	2.2 : 1	2.0 : 1	2.2 : 1
Output VSWR	2.2 : 1	1.5 : 1	2.2 : 1
Conversion Gain Typical	65 dBm	55 dBm	65 dBm
Output P1 dB	9 dBm	5 dBm	7 dBm
Power Req	15 - 24 V on IF cable	15 - 24 V on IF cable	15 - 24 V on IF cable
Current Drain	550 mA	300 mA	200 mA

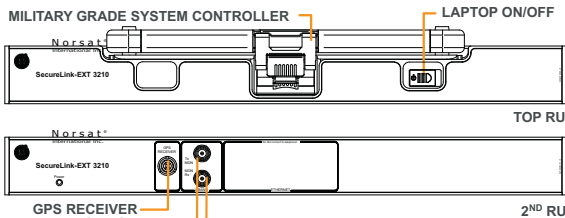
Shock Protected Baseband

- Top Rack Unit: System Controller, Power Supply
- Middle Rack Unit: Pointing Tools (Spectrum Analyzer, DVB Receiver) SSPA Control and Management Ethernet Switch
- Bottom Rack Unit: Modem (user supplied)

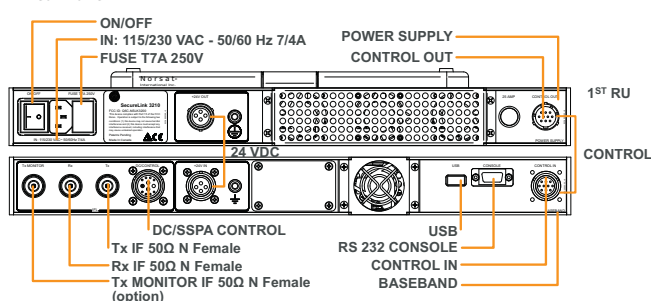


3 RU Custom Case

Front Panel



Rear Panel



Built-in Military Grade System Controller

Operating System	Microsoft(R) XP Tablet Edition		
Screen	264mm Touchscreen XGA LCD, TFT sunlight readable		
Keyboard	87 Key Compact, Sealed		
CPU	Intel® Core TM Duo Processor L2400 (1.06 GHz) Low power, shock mounted, fully sealed		
Physical	Ruggedized MIL-Spec Laptop 1RU 254mm deep rack enclosure 482 x 44 x 254mm (WxHxD)		
MIL-STD 810F	514.5	I	(vibration)
	516.5	IV	(freefall)
	501.4	I & II	(stabilized temp.)
	503.4	I	(sudden changes)
	506.4	III	(falling or sprayed liquids)

Indoor Power Supply

Prime Power	115 / 230 VAC
	50 / 60 Hz
Output Voltage	24 V DC
Consumption	< 500 VAAC

Interfacility Link Cable

Length	10m (Standard) 30m (Optional) longer lengths available on request
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Environmental

Operating Temp	-30 to +50 °C (Antenna/RF) 0 to +50 °C (Indoor Equipment)
Rainfall	50mm/h Operational 100mm/h Survival
Wind Speed	72km/h Operational 108km/h Survival
Humidity	100% condensing (Antenna / RF) 5 - 95% non-condensing (Indoor Equipment)



1.8M SigmaLink™ SAA Variant

System	C-Band		X-Band		Ku-Band	
	Rx	Tx	Rx	Tx	Rx	Tx
EIRP	N/A	53.3 dBW	N/A	55.2 dBW	N/A	58.3 dBW
G/T	15.3 dB/K	N/A	19.6 dB/K	N/A	23.7 dB/K	N/A
Antenna						
Frequency	3.4 - 4.2 GHz	5.85 - 6.425 GHz	7.25 - 7.75 GHz	7.9 - 8.4 GHz	10.95 - 12.75 GHz	13.75 - 14.5 GHz
Midband Gain	35.4 dBi	39.3 dBi	41 dBi	41.7 dBi	45.1 dBi	46.3 dBi
X-pol	30 dB on axis, 23 dB within 1 dB contour	30 dB on axis, 23 dB within 1 dB contour	N/A	N/A	35dB on axis, 23 dB within 1db contour	35dB on axis, 23 dB within 1db contour
Axial Ratio	N/A	N/A	1.5 dB	1.5 dB	N/A	N/A
Sidelobe	Meets ITU 580 outside main lobe		Meets DSCS		Meets ITU 580	
Isolation						
Tx - Rx	-60 dB	N/A	-110 dB	N/A	-85 dB	N/A
Rx - Tx	N/A	-50 dB	N/A	-110 dB	N/A	-30 dB
Reflector Size	1.8m, 4 piece segmented reflector, offset feed		1.8m, 4 piece segmented reflector, offset feed		1.8m, 4 piece segmented reflector, offset feed	
Antenna Travel						
Az	+/- 35 degrees fine adjust		+/- 35 degrees fine adjust		+/- 35 degrees fine adjust	
El	0 - 90 degrees		0 - 90 degrees		0 - 90 degrees	
Pol	+/- 90 degrees		+/- 90 degrees		+/- 90 degrees	
Feed	2-port linear		2-port circular		2-port linear	

Transmit

	C-Band	X-Band	Ku-Band
Output Frequency	5.85 - 6.425 GHz	7.9 - 8.4 GHz	13.75 - 14.5 GHz
Reference	10 MHz	10 MHz	10 MHz
Reference Level	0 +/- 5 dBm	0 +/- 5 dBm	0 +/- 5 dBm
Output Power @ P1dB	40 W	35 W	25 W
Gain (typical)	50 dB	65 dB	65 dB
Spectral Regrowth	-26 dBc @ 46 dBm	-26 dBc @ 45.5 dBm	-26 dBc @ 44 dBm

Interfacility Link Cable

Length	10m (Standard) 30m (Optional) longer lengths available on request
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Environmental

Operating Temp	-30 to +50 °C (Antenna/RF) 0 to +50 °C (Indoor Equipment)
Rainfall	50mm/h Operational 100mm/h Survival
Wind Speed	72km/h Operational 108km/h Survival
Humidity	100% condensing (Antenna RF) 5 - 95% non-condensing (Indoor Equipment)

Receive

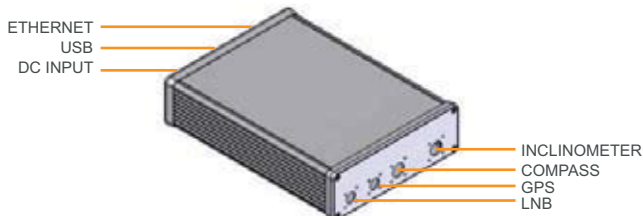
	C-Band	X-Band	Ku-Band
LNB NF	0.5	0.8	0.8
Reference	10 MHz	10 MHz	10 MHz
Reference Level	+2 +/- 5 dBm	+2 +/- 5 dBm	+2 +/- 5 dBm
	-73 dBc/Hz at 1 kHz	-75 dBc/Hz at 1 kHz	-73 dBc/Hz at 1 kHz
	-83 dBc/Hz at 10 kHz	-85 dBc/Hz at 10 kHz	-85 dBc/Hz at 10 kHz
	-93 dBc/Hz at 100 kHz	-95 dBc/Hz at 100 kHz	-95 dBc/Hz at 100 kHz
Phase Noise	100 kHz	100 kHz	100 kHz
Input VSWR	2.2 : 1	2.0 : 1	2.2 : 1
Output VSWR	2.2 : 1	1.5 : 1	2.2 : 1
Conversion Gain Typical	65 dBm	55 dBm	65 dBm
Output P1 dB	9 dBm	5 dBm	7 dBm
Power Req	15 - 24 V on IF cable	15 - 24 V on IF cable	15 - 24 V on IF cable
Current Drain	550 mA	300 mA	200 mA

Built-in Military Grade System Controller

modem	user supplied
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Satellite Acquisition Assistant

Includes Inclinometer, Compass, GPS, SA / RSSI, DVB Receiver, Interface with laptop



Outdoor Power Supply

Prime Power	115 / 230 VAC
	50 / 60 Hz
Output Voltage	24 V DC
Consumption	< 500 VA AC



2.4M SigmaLink™ Baseband Variant

System	C-Band		X-Band		Ku-Band	
	Rx	Tx	Rx	Tx	Rx	Tx
EIRP	N/A	56.6 dBW	N/A	58.7 dBW	N/A	61.6 dBW
G/T	18.5 dB/K	N/A	23.5 dB/K	N/A	27.2 dB/K	N/A

Antenna						
Frequency	3.625 - 4.2 GHz	5.85 - 6.425 GHz	7.25 - 7.75 GHz	7.9 - 8.4 GHz	10.95 - 12.75 GHz	13.75 - 14.5 GHz
Midband Gain	38.0 dBi	42.2 dBi	43.7 dBi	44.3 dBi	47.6 dBi	49.2 dBi
	N/A	N/A	N/A	N/A	-30 dB on axis	-30 dB on axis
Axial Ratio	3.0	2.3	1.5 dB	1.5 dB	N/A	N/A
Sidelobe	ITU 580 / IESS 207			Meets DSCS		Meets IESS 208
Isolation						
Tx - Rx	-60 dB	0 dBm input	-110 dB	0 dBm input	-110 dB	0 dBm input
Rx - Tx	0 dBm input	-60 dB	0 dBm input	-110 dB	0 dBm input	-35 dB
Reflector Size	2.4m, 4 piece segmented reflector, offset feed		2.4m, 4 piece segmented reflector, offset feed		2.4m, 4 piece segmented reflector, offset feed	
Antenna Travel						
Az	± 35° fine adjust (360° coarse)		± 35° fine adjust (360° coarse)		± 35° fine adjust (360° coarse)	
El	5 - 90°		5 - 90°		5 - 90°	
Pol	± 90°		± 90°		± 90°	
Feed	2-port circular		2-port circular		2-port linear	

Transmit			
	C-Band	X-Band	Ku-Band
Output Frequency	5.85 - 6.425 GHz	7.9 - 8.4 GHz	13.75 - 14.5 GHz
Reference	10 MHz	10 MHz	10 MHz
Reference Level	0 +/- 5 dBm	0 +/- 5 dBm	0 +/- 5 dBm
Output Power @ P1dB	40 W	40 W	25 W
Gain (typical)	70 dB	70 dB	70 dB
Spectral Regrowth	-26 dBc @ P1dB	-26 dBc @ P1dB	-26 dBc @ P1dB

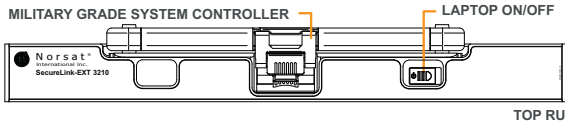
Receive			
LNB NF	0.5	0.8	0.8
Reference	10 MHz	10 MHz	10 MHz
Reference Level	-5 +/- 5 dBm	+2 +/- 5 dBm	+2 +/- 5 dBm
Phase Noise	-73 dBc/Hz at 1 kHz	-75 dBc/Hz at 1 kHz	-65 dBc/Hz at 1 kHz
	-83 dBc/Hz at 10 kHz	-85 dBc/Hz at 10 kHz	-75 dBc/Hz at 10 kHz
	-93 dBc/Hz at 100 kHz	-95 dBc/Hz at 100 kHz	-85 dBc/Hz at 100 kHz
Input VSWR	1.5 : 1	1.3 : 1	1.3 : 1
Output VSWR	1.3 : 1	1.3 : 1	1.3 : 1
Conversion Gain Typical	65 dBm	55 dBm	65 dBm
Output P1 dB	9 dBm	5 dBm	7 dBm
Power Req	15 - 24 V on IF cable	15 - 24 V on IF cable	15 - 24 V on IF cable
Current Drain	550 mA	300 mA	200 mA

Shock Protected Baseband

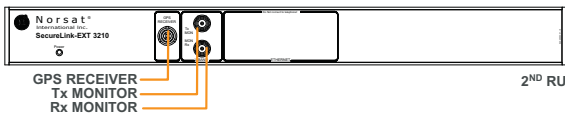
- Top Rack Unit: System Controller, Power Supply
- Middle Rack Unit: Pointing Tools (Spectrum Analyzer, DVB Receiver) SSPA Control and Management Ethernet Switch
- Bottom Rack Unit: Modem (user supplied)



Front Panel

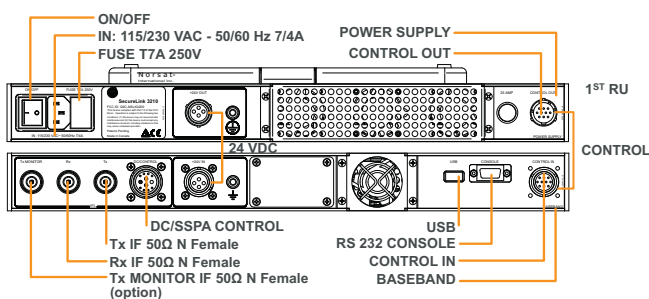


TOP RU



2ND RU

Rear Panel



1ST RU
CONTROL

Built-in Military Grade System Controller

Operating System	Microsoft(R) XP Tablet Edition
Screen	264mm Touchscreen XGA LCD, TFT sunlight readable
Keyboard	87 Key Compact, Sealed
CPU	Intel® CoreTM Duo Processor L2400 (1.06 GHz) Low power, shock mounted, fully sealed
Physical	Ruggedized MIL-Spec Laptop 1RU 254mm deep rack enclosure 482 x 44 x 254mm (WxHxD)
MIL-STD 810F	514.5 I (vibration) 516.5 IV (freefall) 501.4 I & II (stabilized temp.) 503.4 I (sudden changes) 506.4 III (falling or sprayed liquids)

Indoor Power Supply

Prime Power	115 / 230 VAC 50 / 60 Hz
Output Voltage	24 V DC
Consumption	< 500 VA AC

Interfacility Link Cable

Length	10m (Standard) 30m (Optional) longer lengths available on request
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Environmental

Operating Temp	-40 to +60°C Operational (ODU) -50 to +70°C Survival (ODU) 0 - 50°C (IDU)
Rainfall	50.8mm/h Operational 101.6mm/h Survival
Wind Speed	Up to 45 km/h Operational (no ballast or anchors) 30 Gusting to 45 km/h Operational (ballast or anchors) 96km/h Survival
Humidity	0 - 100% condensing (Antenna / RF) 5 - 95% non-condensing (Indoor Equipment)



2.4M SigmaLink™ SAA Variant

System	C-Band		X-Band		Ku-Band	
	Rx	Tx	Rx	Tx	Rx	Tx
EIRP	N/A	56.6 dBW	N/A	58.7 dBW	N/A	61.6 dBW
G/T	18.5 dB/K	N/A	23.5 dB/K	N/A	27.2 dB/K	N/A

Antenna						
Frequency	3.625 - 4.2 GHz	5.85 - 6.425 GHz	7.25 - 7.75 GHz	7.9 - 8.4 GHz	10.95 - 12.75 GHz	13.75 - 14.5 GHz
Midband Gain	38.0 dBi	42.2 dBi	43.7 dBi	44.3 dBi	47.6 dBi	49.2 dBi
	N/A	N/A	N/A	N/A	-30 dB on axis	-30 dB on axis
Axial Ratio	3.0	2.3	1.5 dB	1.5 dB	N/A	N/A
Sidelobe	ITU 580 / IESS 207		Meets DSCS		Meets IESS 208	
Isolation						
Tx - Rx	-60 dB	0 dBm input	-110 dB	0 dBm input	-110 dB	0 dBm input
Rx - Tx	0 dBm input	-60 dB	0 dBm input	-110 dB	0 dBm input	-35 dB
Reflector Size	2.4m, 4 piece segmented reflector, offset feed		2.4m, 4 piece segmented reflector, offset feed		2.4m, 4 piece segmented reflector, offset feed	
Antenna Travel						
Az	± 35° fine adjust (360° coarse)		± 35° fine adjust (360° coarse)		± 35° fine adjust (360° coarse)	
EI	5 - 90°		5 - 90°		5 - 90°	
Pol	± 90°		± 90°		± 90°	
Feed	2-port circular		2-port circular		2-port linear	

Transmit

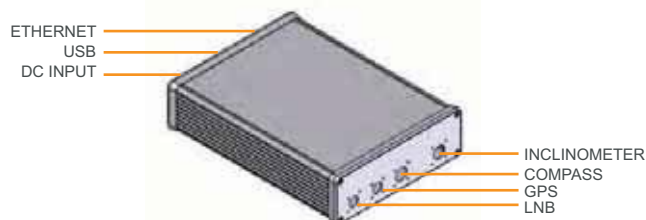
	C-Band	X-Band	Ku-Band
Output Frequency	5.85 - 6.425 GHz	7.9 - 8.4 GHz	13.75 - 14.5 GHz
Reference	10 MHz	10 MHz	10 MHz
Reference Level	0 +/- 5 dBm	0 +/- 5 dBm	0 +/- 5 dBm
Output Power @ P1dB	40 W	40 W	25 W
Gain (typical)	70 dB	70 dB	70 dB
Spectral Regrowth	-26 dBc @ P1dB	-26 dBc @ P1dB	-26 dBc @ P1dB

Receive

	C-Band	X-Band	Ku-Band
LNB NF	0.5	0.8	0.8
Reference	10 MHz	10 MHz	10 MHz
Reference Level	+2 +/- 5 dBm	+2 +/- 5 dBm	+2 +/- 5 dBm
	-73 dBc/Hz at 1 kHz	-75 dBc/Hz at 1 kHz	-73 dBc/Hz at 1 kHz
	-83 dBc/Hz at 10 kHz	-85 dBc/Hz at 10 kHz	-85 dBc/Hz at 10 kHz
	-93 dBc/Hz at 100 kHz	-95 dBc/Hz at 100 kHz	-95 dBc/Hz at 100 kHz
Phase Noise	100 kHz	100 kHz	100 kHz
Input VSWR	1.5 : 1	1.3 : 1	1.5 : 1
Output VSWR	1.3 : 1	1.3 : 1	1.3 : 1
Conversion Gain Typical	65 dBm	65 dBm	65 dBm
Output P1 dB	9 dBm	5 dBm	7 dBm
Power Req	15 - 24 V on IF cable	15 - 24 V on IF cable	15 - 24 V on IF cable
Current Drain	550 mA	300 mA	200 mA

Satellite Acquisition Assistant

Includes Inclinometer, Compass, GPS, SA / RSSI, DVB Receiver, Interface with laptop



Outdoor Power Supply

Prime Power	115 / 230 VAC
	50 / 60 Hz
Output Voltage	24 V DC
Consumption	< 500 VA AC



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Interfacility Link Cable

Length	10m (Standard) 30m (Optional) longer lengths available on request
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Environmental

Operating Temp	-40 to +60°C Operational (ODU) -50 to +70°C Survival (ODU) 0 - 50°C (IDU)
Rainfall	50.8mm/h Operational 101.6mm/h Survival
Wind Speed	Up to 45 km/h Operational (no ballast or anchors) 30 Gusting to 45 km/h Operational (ballast or anchors) 96km/h Survival
Humidity	0 - 100% condensing (Antenna / RF) 5 - 95% non-condensing (Indoor Equipment)

