

Product Highlight

Key Benefits

- Reduces cost and complexity of amplifier deployment, especially in harsh environments
- Eliminates or reduces cooling requirements in remote location
- Reduces complexity with integrated filtering and termination and two optional OSC channels for either Xenya or third parties
- Minimizes footprint by up to 85% compared to conventional solutions
- Exceeds standards for conduction of emissions immunity; ideal for deployment in electrical utility substations or other industrial networks

Key Features

- o 20 dBm output power
- Full C-band 88 channels at 50 GHz capacity
- Fully configurable constant gain of 20 to 29 dB across all channels
- Tilt control for extended amplifier cascades
- Operating temperature up to 65°C
- Automatically accommodates span loss for temperature dependent loss

Applications

Router-to-router interconnect; long-distance amplification; multi-vendor networks; utility substation deployments

Compliance

Telcordia NEBS Level 3; FDA Class IM laser device; FCC Class A device; UL 60950-1 First Edition; CAN/CSA C22.2 No. 60950 01; CE; RoHS (Exemptions 7b, 8a); IEC 61850-3 Section 5.7 and IEEE 1613 Section 7 and 8 (EMI Immunity)

XENYA Intelligent Line Amplifiers XILAs

with OSC

XILAN and XILAD

Xenya ILAs are rugged, compact I- and 2-rack unit (RU) optical amplification nodes that reduce the complexity of optical amplifier deployment, management, and operation, especially in harsh environments. Deployable as a pre-amp, post-amp, or in-line, the Xenya ILA is self-optimizing, auto-adjusting, and easy to use.

Extended Temperature Operation

Supporting extended operating temperature up to 65°C, the Xenya 2RU ILA supports outside plant deployment, and can dramatically reduce operating cost by eliminating or reducing cooling requirements.

Compact Configuration, Low Maintenance

These Xenya east/west bidirectional ILAs are compact, space-saving, front-access units. Requiring only 1- or 2-RU of rack space for bidirectional amplification, Xenya ILAs can reduce space requirements up to 90 percent compared to similar solutions. Also, front access may allow for lowering costs in physical plants by reducing the number of costly equipment racks.

The hardened design of the 2-RU ILA eliminates the need for an air filter, further reducing operating costs related to basic maintenance, even in areas of poor air quality.

Easy, Flexible OSC

The optical supervisory channel (OSC) of the Xenya ILA reduces management complexity. Both OSC channels are data agnostic, support data rates up to 155 Mbps, and do not consume traffic wavelengths.

Built-in Xenya and third-party OSC channels allow for easy in-line amplification and terminal equipment management without imposing overlay network penalties.

XENYA d.o.o Celovška cesta 172 1000 Ljubljana, SI +386 1 5140610 www.xenya.si



Applications for Xenya ILAs

DCM

Amplifier

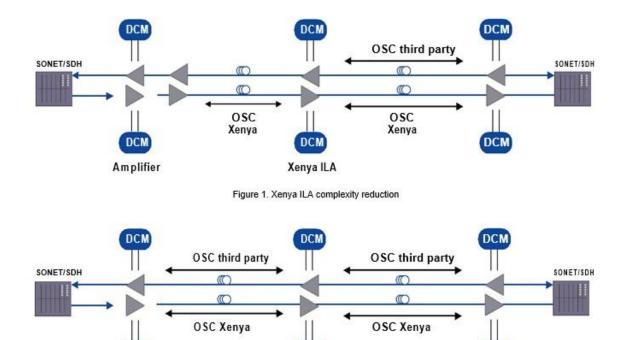


Figure 2. Xenya ILA OSC and interop deployment

DCM

DCM

Xenya ILA

Specifications

Operating ware Image 1584 nm 1584 nm Module temperature range XILAN -5 65 Optical damage threshold? 23 dBm Input power range -30 dBm 7 dBm Maximum output power 20 dBm Maximum output power 20 dBm Maximum per-channel power at stage 1 output -2 dBm Flat gain range (trit control available) ³ 13 dB 26 dB Extended gain range (no tilt control, some till) ³ 26 dB 12 dB Gain aration at 0 dB tilt 12 dB Gain variation at -3 dB Tilt 20 dB Provisional tiltrange in flat gain range ⁶ 20 dB Steady-state gain stability ⁶ -0.25 dB 0.55 dB Polarization-dependent gain 0.55 dB Polarization-tependent gain 0.55 dB Polarizat	EDFA Performance		Minimum	Typical	Maximum	
Module temperature rangeXILAN-555Optical damage threshold223 dBmInput power range-30 dBm7 dBmMaximum output power20 dBmInput LOS threshold (minimum input signal power)-32 dBmMaximum per-channel power at stage 1 output2 dBmMaximum per-channel power at stage 1 output26 dBRetain range (tilt control available)313 dB26 dBExtended gain range (no tilt Gain variation at 0 dB tilt-05 dB0.5 dBGain Variation at -3 dB Tilt12 dBProvisional tilt range in flat gain range50.5 dBSteady-state gain stability6-025 dB0.25 dBPolarization-dependent gain range520 dBmReturn loss740 dB20 dBmReturn loss740 dB20 dBmReturn loss7XILAN1.75 x 11 x 17.2 inchesMonitor tap ratio ratio-21.5 dBMarkitation ratioReturn loss7No filter requiredMonitor tap ratio ratio-21.5 dBNo filter requiredNo filter requiredMonitor tap ratio ratio-21.5 dBTransient setting tingNo filte	-		1528.4 nm	_	1564.3 nm	
range NLL 0 0 00 Optical damage threshold ² 23 dBm Input power range -30 dBm Maximum output power 20 dBm Input LOS threshold (minimum input signal power) -32 dBm Maximum per-channel power at stage 1 output -2 dBm Flat gain range (tilt control available) ³ 13 dB 26 dB Extended gain range (tilt control available) ³ 13 dB 20 dBm Gain variation at 0 dB tilt 0.5 dB 0.5 dB Gain variation at 0 dB tilt 12 dB Gain variation at - 3 dB Tilt 0.5 dB 0.5 dB Provisional tilt- range ⁶ 0.5 dB 0.5 dB Steady-state gain stability ⁶ -0.25 dB 0.5 dB Polarization-dependent gain range ⁶ Steady-state gain stability ⁶			-5	_	55	
Input power range -30 dBm	•	XILAD	-5	_	65	
Instruction Production Produ	Optical damag	je threshold ²	23 dBm	—	—	
Input LOS threshold (minimum input signal power)-32 dBmMaximum per-channel power at stage 1 output2 dBmFlat gain range (tilt control available)313 dB26 dBExtended gain range (no tilt control, some tilt)326 dB29 dBGain accuracy4Full channel load-0.5 dB0.5 dBGain variation at 0 dB tilt1.2 dB1.2 dBProvisional tilt range in flat gain range50.7 dBSteady-state gain stability6-0.25 dB0.25 dBPolarization-dependent gain range50.5 dBPolarization-dependent gain range50.5 dBPolarization-dependent gain range50.5 dBPolarization-dependent gain range520 dBmReturn loss740 dB20 dBmReturn loss7XILAN1.75 x 11 x 17.2 inchesManiter ty Time81.85 dBTransent settling time81.85 dBAir Filter temperatureXILANShort term: -5 to 55°C; long term: -5 to 65°CAmbient temperatureXILANShort term: -5 to 65°CAlarms and SineLC/UPC SMFAlarms and SineLC/UPC SMFAlarms and SineSta sense inputsCraftSta minABSta sense inputs <td>Input power ra</td> <td>inge</td> <td>-30 dBm</td> <td>_</td> <td>7 dBm</td>	Input power ra	inge	-30 dBm	_	7 dBm	
$\begin{array}{c c c c } \mbox{input signal power} &$	Maximum out	putpower	20 dBm	_	—	
stage 1 outputIs define the stage 1 outputIs define the stage 1 outputIs define the stage 1 outputFlat gain range (tilt control available)313 dB26 dBExtended gain range (no tilt control, some tilt)326 dB29 dBGain accuracy4Full channel load-0.5 dB0.5 dBaccuracy4Gain variation at 0 dB tilt1.2 dBGain Variation at -3 dB Tilt2.0 dBProvisional tilt range in flat gain range50.25 dBSteady-state gain stability6-0.25 dB0.25 dBPolarization-dependent gain0.55 dBPolarization mode dispersion<0.1 ps	•		−32 dBm	—	_	
$\begin{array}{ c $			—	—	−2 dBm	
$ \begin{array}{ c c c } \mbox{control, some till}^3 & I & I & I & I & I \\ \hline Gain & Full channel load & -0.5 dB & & 0.5 dB \\ \hline Gain variation & & & 1.2 dB \\ \hline a t 0 dB tilt & I & I & I \\ \hline Gain Variation & & & 2.0 dB \\ \hline a t -3 dB Tilt & I & I & I \\ \hline Gain Variation & & & 0.55 dB \\ \hline Provisional tilt range in flat gain & -3 dB & & 0.25 dB \\ \hline Provisional tilt range in flat gain & -3 dB & & 0.25 dB \\ \hline Polarization -dependent gain & & & 0.55 dB \\ \hline Polarization -dependent gain & & -0 & 0.55 dB \\ \hline Polarization -dependent gain & & -20 dBm \\ \hline Polarization -dependent gain & & -20 dBm \\ \hline Return loss^7 & 40 dB & & -20 dBm \\ \hline Return loss^7 & 40 dB & & -20 dBm \\ \hline Return loss^7 & 40 dB & & -18.5 dB \\ \hline Transient settling time^8 & & & 18.5 dB \\ \hline Transient settling time^8 & & & 18.5 dB \\ \hline Transient settling time & -21.5 dB & & -18.5 dB \\ \hline Transient settling time & -21.5 dB & & -18.5 dB \\ \hline Transient settling time & -21.5 dB & & -18.5 dB \\ \hline Transient settling time & -21.5 dB & & -18.5 dB \\ \hline Transient settling time & -21.5 dB & & -18.5 dB \\ \hline Transient settling time & -21.5 dB & & -18.5 dB \\ \hline Transient settling time & -21.5 dB & & -18.5 dB \\ \hline Transient settling time & -21.5 dB & & -18.5 dB \\ \hline Transient settling time & -21.5 dB & & -18.5 dB \\ \hline Transient settling time & -21.5 dB & & -18.5 dB \\ \hline Transient settling time & -21.5 dB & & -18.5 dB \\ \hline Transient settling time & -21.5 dB & & -18.5 dB \\ \hline Transient settling time & -21.5 dB & & -18.5 dB \\ \hline Transient settling time & -21.5 dB & & -20 dBm \\ \hline Transient settling time & -21.5 dB & & -20 dBm \\ \hline Transient settling time & -21.5 dB & & -18.5 dB \\ \hline Transient settling time & -21.5 dB & & -18.5 dB \\ \hline Transient & -21.5 dB & & -18.5 dB \\ \hline Transient & -21.5 dB & & -18.5 dB \\ \hline Transient & -21.5 dB & & -18.5 dB \\ \hline Transient & -21.5 dB & & -18.5 dB \\ \hline Transient & -21.5 dB & & -18.5 dB \\ \hline Transient & -21.5 dB & & -18.5 dB \\ \hline Transient & & $			13 dB	—	26 dB	
accuracy4 at 0 dB tiltGain variation at 0 dB tilt1.2 dBGain Variation at -3 dB Tilt2.0 dBProvisional tilt range in flat gain range53 dB0.7 dBSteady-state gain stability6-0.25 dB0.25 dBPolarization-dered polarization mode dispersion0.55 dBPolarization mode dispersion0.1 ps0.5 psBackward ASE at input20 dBmReturn loss740 dB20 dBmReturn loss740 dB18.5 dBTransient settling time81 msPhysicalSta 11 x 17.2 inches1 msSize (H x W x D)XILAN1.75 x 11 x 17.2 inchesAir Filter temperature ratingXILANShort term: -5 to 55°C; long term: -5 to 40°CAmbient temperature ratingXILANShort term: -5 to 65°CInterfacesUC/UPC SMFOpticalLC/UPC SMFAlarms and Sense15-pin micro DSub connector · Three dry alarm inputs (Critical, Major, Minor)CraftSB mini AB			26 dB	—	29 dB	
$\begin{tabular}{ c c c c } \hline A & A & A & A & A & A & A & A & A & A$		Full channel load	-0.5 dB	—	0.5 dB	
at -3 dB Tilt-3 dB-Provisional tilt range in flat gain range5-3 dB-0.7 dBSteady-state gain stability6-0.25 dB-0.25 dBPolarization-dependent gain0.55 dBPolarization mode dispersion-<0.1 ps			—	—	1.2 dB	
range5ImageImageSteady-state gain stability6 $-0.25 dB$ $$ $0.25 dB$ Polarization-dependent gain $ -0.25 dB$ $-$ Polarization mode dispersion $$ $<0.1 ps$ $0.5 ps$ Backward ASE at input $$ $-20 dBm$ Return loss740 dB $$ $-20 dBm$ Return loss740 dB $$ $-18.5 dB$ Transient settling time8 $$ $-18.5 dB$ Transient settling time8 $$ $-18.5 dB$ Transient settling time8 $$ $-18.5 dB$ Size (H x W x D)XILAN $1.75 x 11 x 17.2$ inchesXILAD $3.5 x 11 x 17.2$ inchesAir Filter temperature ratingXILANReplaceable filter on fan moduleXILADNo filter requiredAmbient ratingXILANShort term: $-5 to 55^{\circ}C$; long term: $-5 to 65^{\circ}C$ InterfacesOpticalLC/UPC SMFAlarms and Sense 15 -pin micro DSub connector \cdot Three dry alarm inputs (Critical, Major, Minor) \cdot Six sense inputsCraftSB mini AB			—	—	2.0 dB	
Polarization-dependent gain0.55 dBPolarization mode dispersion<0.1 ps			−3 dB	_	0.7 dB	
Polarization mode dispersion< 0.1 ps0.5 psBackward ASE at input20 dBmReturn loss740 dBMonitor tap ratio-21.5 dB18.5 dBTransient settling time818.5 dBPhysicalSize (H x W x D)XILAN1.75 x 11 x 17.2 inchesXILAD3.5 x 11 x 17.2 inchesAir FilterXILANReplaceable filter on fan moduleXILADNo filter requiredAmbient temperature ratingXILANShort term: -5 to 55°C; long term: -5 to 65°CInterfacesOpticalLC/UPC SMFAlarms and SenseLC/UPC SMFAlarms and Sense15-pin micro DSub connector · Three dry alarm inputs (Critical, Major, Minor) · Six sense inputsCraftSB mini AB	Steady-state gain stability ⁶		-0.25 dB	—	0.25 dB	
Backward ASE at input 20 dBm Return loss ⁷ 40 dB Monitor tap ratio -21.5 dB -18.5 dB Transient settling time ⁸ -18.5 dB Physical 1 ms Size (H x W x D) XILAN 1.75 x 11 x 17.2 inches Air Filter XILAN Replaceable filter on fan module Air Filter XILAN Replaceable filter on fan module Ambient XILAN Short term: -5 to 55°C; Iong term: -5 to 40°C rating XILAD Long term: -5 to 65°C Interfaces 15-pin micro DSub connector - Optical LC/UPC SMF Alarms and Sense 15-pin micro DSub connector - · Three dry alarm inputs (Critical, Major, Minor) - Six sense inputs Craft SB mini AB	Polarization-dependent gain		—	—	0.55 dB	
Return loss ⁷ 40 dB Monitor tap ratio -21.5 dB -18.5 dB Transient settling time ⁸ - 1 ms Physical 1 ms Size XILAN 1.75 x 11 x 17.2 inches - (H x W x D) XILAD 3.5 x 11 x 17.2 inches - Air Filter XILAD Replaceable filter on fan module - Air Filter XILAN Replaceable filter on fan module - Ambient XILAN Short term: -5 to 55°C; - Iong term: -5 to 40°C - - - Ambient XILAD Long term: -5 to 65°C - Interfaces - - - - Optical LC/UPC SMF - - - Alarms and Sense 15-pin micro DSub connector - - - - · Three dry alarm inputs (Critical, Major, Minor) - Six sense inputs -	Polarization mode dispersion		—	< 0.1 ps	0.5 ps	
Monitor tap ratio -21.5 dB -18.5 dB Transient settling time® 1 ms Physical 1 ms Size XILAN 1.75 x11 x 17.2 inches (H x W x D) XILAD 3.5 x 11 x 17.2 inches Air Filter XILAN Replaceable filter on fan module Air Filter XILAN Replaceable filter on fan module Ambient XILAN Short term: -5 to 55°C; rating XILAD Long term: -5 to 65°C Interfaces 15-pin micro DSub connector Optical LC/UPC SMF Alarms and Sense 15-pin micro DSub connector - - · Three dry alarm inputs (Critical, Major, Minor) - Six sense inputs - Craft SB mini AB SB mini AB	Backward ASE at input		_	_	-20 dBm	
Transient settling time ⁸ — — 1 ms Physical Size (H x W x D) XILAN 1.75 x 11 x 17.2 inches XILAD Air Filter XILAN Replaceable filter on fan module XILAD Air Filter XILAN Replaceable filter on fan module XILAD Ambient temperature rating XILAN Short term: -5 to 55°C; long term: -5 to 65°C Yet to 40°C Interfaces XILAD Long term: -5 to 65°C Yet to 40°C Optical LC/UPC SMF XILAR Alarms and Sense 15-pin micro DSub connector • Three dry alarm inputs (Critical, Major, Minor) • Six sense inputs Six sense inputs Craft SB mini AB SB mini AB Yet to 40°C	Return loss ⁷		40 dB	_	—	
Physical Size (H x W x D) XILAN 1.75 x 11 x 17.2 inches Air Filter XILAN Replaceable filter on fan module Air Filter XILAN Replaceable filter on fan module Ambient XILAN No filter required Ambient XILAN Short term: -5 to 55°C; long term: -5 to 65°C Interfaces VILAD Long term: -5 to 65°C Optical LC/UPC SMF Alarms and Sense 15-pin micro DSub connector • Three dry alarm inputs (Critical, Major, Minor) • Six sense inputs Craft SB mini AB	Monitor tap ratio		−21.5 dB	_	-18.5 dB	
Size (H xW x D) XILAN 1.75 x 11 x 17.2 inches Air Filter XILAD 3.5 x 11 x 17.2 inches Air Filter XILAN Replaceable filter on fan module XILAD No filter required Ambient temperature rating XILAN Short term: -5 to 55°C; long term: -5 to 40°C Interfaces VILAD Long term: -5 to 65°C Optical LC/UPC SMF Alarms and Sense 15-pin micro DSub connector • Three dry alarm inputs (Critical, Major, Minor) • Six sense inputs Craft SB mini AB	Transient settling time ⁸		_	_	1 ms	
(H x W x D) XILAD 3.5 x 11 x 17.2 inches Air Filter XILAN Replaceable filter on fan module XILAD No filter required Ambient XILAN Short term: -5 to 55°C; long term: -5 to 40°C xILAD Long term: -5 to 65°C Interfaces Optical LC/UPC SMF Alarms and Sense 15-pin micro DSub connector • Three dry alarm inputs (Critical, Major, Minor) • Six sense inputs Craft SB mini AB	Physical					
Air Filter XILAN Replaceable filter on fan module Ambient XILAN No filter required Ambient XILAN Short term: -5 to 55°C; long term: -5 to 40°C rating XILAD Long term: -5 to 65°C Interfaces Optical LC/UPC SMF Alarms and Sense 15-pin micro DSub connector • Three dry alarm inputs (Critical, Major, Minor) • Six sense inputs Craft SB mini AB		XILAN	1.75 x 11 x 17.2 inches			
XILAD No filter required Ambient temperature rating XILAN Short term: -5 to 55°C; long term: -5 to 40°C XILAD Long term: -5 to 65°C Interfaces Optical LC/UPC SMF Alarms and Sense 15-pin micro DSub connector • Three dry alarm inputs (Critical, Major, Minor) • Six sense inputs Craft SB mini AB	(H x W x D)	XILAD	3.5 x 11 x 17.2 inches			
Ambient temperature rating XILAN Short term: -5 to 55°C; long term: -5 to 40°C Interfaces Long term: -5 to 65°C Optical LC/UPC SMF Alarms and Sense 15-pin micro DSub connector • Three dry alarm inputs (Critical, Major, Minor) • Six sense inputs Craft SB mini AB	Air Filter	XILAN	Replaceable filter on fan module			
temperature rating long term: -5 to 40°C XILAD Long term: -5 to 65°C Interfaces LC/UPC SMF Alarms and Sense 15-pin micro DSub connector • Three dry alarm inputs (Critical, Major, Minor) • Six sense inputs Craft SB mini AB		XILAD	No filter required			
Interfaces LC/UPC SMF Alarms and Sense 15-pin micro DSub connector • Three dry alarm inputs (Critical, Major, Minor) • Six sense inputs Craft SB mini AB	temperature	XILAN				
Optical LC/UPC SMF Alarms and Sense 15-pin micro DSub connector • Three dry alarm inputs (Critical, Major, Minor) • Six sense inputs Craft SB mini AB	rating	XILAD	Long term: -5 to 65°C			
Alarms and Sense 15-pin micro DSub connector • Three dry alarm inputs (Critical, Major, Minor) • Six sense inputs Craft SB mini AB	Interfaces		L			
Three dry alarm inputs (Critical, Major, Minor) Six sense inputs Craft SB mini AB	Optical		LC/UPC SMF			
	Alarms and Sense		 Three dry alarm inputs (Critical, Major, Minor) Six sense inputs 			
Ethernet Three 10/100 BaseT	Craft		SB mini AB			
	Ethernet		Three 10/100 BaseT			

Electrical					
	vlaa	Redundant -48 VDC (nominal)			
Input power supply Input operating voltage		-40 to -57.5 VDC			
Fusing		Two GMT indicating			
Grounding		Redundant –48 V returns via connector, isolated from one another as well as from frame ground			
Power	XILAN	80W worst case; 70W at room temperature			
consumption	XILAD	95 W worst ca	se; 80 W at roon	n temperature	
Bulkhead adapter		Replaceable GMT indicating fuses in proximity to the power connections			
Noise Performance				Maximum	
Noise figure, beginning of life (BoL)					
$P_{in} = -6 dBm, G = 26 dB (P_{out} = 20 dBm)$				6.5 dB	
$P_{in} = 0 \text{ dBm}, G = 20 \text{ dB} (P_{out} = 0 \text{ dBm})$			9.2 dB		
$P_{in} = 7 dBm, G = 13 dB (P_{out} = 20 dBm)$				16.5 dB	
$P_{in} = -26 \text{ dBm}, G = 26 \text{ dB} (P_{out} = 0 \text{ dBm})$				7 dB	
$P_{in} = -20 \text{ dBm}, G = 20 \text{ dB} (P_{out} = 0 \text{ dBm})$				9.5 dB	
$P_{in} = -13 \text{ dBm}, G = 13 \text{ dB} (P_{out} = 0 \text{ dBm})$			15.3 dB		
$P_{in} = -30 \text{ dBm},$	$G = 26 \text{ dB} (P_{out} = -4 \text{ d})$	IBm)		7.0 dB	
$P_{in} = -24 \text{ dBm},$	$G = 20 \text{ dB} (P_{out} = -4 \text{ d})$	iBm)		9.5 dB	
P _{in} –17 dBm, G	$= 13 \text{ dB} (P_{\text{out}} = -4 \text{ dB})$			15.3 dB	
$P_{in} - 9 dBm, G =$	$= 29 \text{dB} (\text{P}_{\text{out}} = 20 \text{dBm})$)		6.5 dB	
P _{in} –13 dBm, G	$= 33 dB (P_{out} = 20 dBr$	n)		6.5 dB	
P _{in} –30 dBm, G	$= 33 \text{ dB} (P_{out} = +3 \text{ dB})$			6.7 dB	
P _{in} –30 dBm, G	$= 29 \text{dBm} (\text{P}_{\text{out}} = -1 \text{c})$	lBm)		6.7 dB	
Noise figure, end of life (EoL)					
Maximum degradation at EoL		-		0.3 dB	
OSC Performance		Minimum	Typical	Maximum	
OSC wavelength	Low-Band OSC	1500 nm	1510 nm	1520 nm	
	High-Band OSC	1570 nm	1610 nm	1630 nm	
OSC drop loss with respect to line in		—	—	2.2 dB	
OSC add loss with respect to line out		—	—	1.6 dB	

 All specifications are guaranteed over the lifetime, temperature, wavelength range, and operating voltages unless otherwise specified.

2. All optical ports.

3. User configurable with resolution of 0.1 dB.

4. 13 – 26 dB gain.

5. Full-range only available [13, 26] dB gain range.

6. Over 1 ms, 2 μs sampling rate with 64 times averaging.

7. Input or output port.

8. Gain \geq 17 dB with 16.4 dB change, maximum gain excursion of 1 dB.

Ordering Information

For more information on this or other products and their availability, please contact your local Xenya account manager or Xenya directly at +386 | 5|40610 or via e-mail at info@xenya.si.

Product Code	Description	
XILAN	Compact in-line amplifier with OSC, I RU, standard temperature	
XILAD	Compact in-line amplifier with OSC, 2 RU, extended temperature	

E-mail: info@xenya.si

Web: <u>www.xenya.si</u>