AV-over-IP product matrix

visual engineering LIGHTWARE

NETGEAR

1 gigabit VINX			
Lightware VINX partnumber	**Network interface**	**Works with NETGEAR models**	**PoE**
VINX-210AP-HDMI-ENC	RJ45 1 gbit coopper, SFP 1 gbit fiber	All M4250, M4300 GSM43xxx 1gb models	Yes
VINX-120-HDMI-ENC	RJ45 1 gbit coopper	All M4250 PoE+ models, M4300 copper and PoE mo	No
VINX-120AP-HDMI-ENC-DNT	RJ45 1 gbit coopper, SFP 1 gbit fiber	All M4250, M4300 GSM43xxx 1gb models	Yes
VINX-110AP-HDMI-DEC	RJ45 1 gbit coopper, SFP 1 gbit fiber	All M4250, M4300 GSM43xxx 1gb models	Yes
VINX-120AP-HDMI-ENC	RJ45 1 gbit coopper, SFP 1 gbit fiber	All M4250, M4300 GSM43xxx 1gb models	Yes
VINX-110-HDMI-DEC	RJ45 1 gbit coopper	All M4250 PoE+ models, M4300 copper and PoE mo	No

General VINX network design advice	Small	Medium	Large
NUMBER OF ENCODERS/DECODERS	Up to 4 encoders and 4 decoders; one sw	Up to 18 VINX encoders and decoders, would need to spread over 2 to 5 switches	More than 18 combined VINX encoders/decoders, up to 60 x 60 = 120 devices. We advise with 30-40 devices to manage the bandwidth better by spreading over multiple switches with each 2 x10gb SFP+ interconnect.
NETGEAR M4250 Switch recommendat	GSM4212xxx, GSM4230xxx. GS4248xxx	GSM4212PX, GSM4212UX, GSM4230PX , GSM4248PX or GSM4248UX	Nax 18 devices per M4250 :"X" switchmodels , with 2 x SFP+m uplink to guarantee 20gbit non blocking bandwidth switch interconnect
			Up to 60 encoders and 60 decoders; this is 120 ports; connections needs to be evenly spread over 3 x GSM4248PX, with XSM4216XF as top aggregation switch

10/20 gigabit UBEX			
Lightware UBEX partnumber	**Network interface**	**Optical Connector(s)**	**Ethernet Port for Control**
UBEX-MMU-X200	RJ45 gigabit copper. The MMU device also has an SFP 1G port parallel to the RJ45, so the UBEX network can be connected either way. Typically optical transceiver is used.	-	
UBEX-Pro20-HDMI-R100 2xMM-2xDUO	2x 10G SFP+ multimode	2x Neutrik OpticalCON DUO	1x Neutrik EtherCON
UBEX-Pro20-HDMI-R100 2xMM-QUAD	2x 10G SFP+ multimode	1x Neutrik OpticalCON QUAD	2x Neutrik EtherCON
UBEX-Pro20-HDMI-R100 2xSM-2xDUO	2x 10G SFP+ singlemode	2x Neutrik OpticalCON DUO	1x Neutrik EtherCON
UBEX-Pro20-HDMI-R100 2xSM-QUAD	2x 10G SFP+ singlemode	1x Neutrik OpticalCON QUAD	2x Neutrik EtherCON
UBEX-Pro20-HDMI-R100 2xSM-BiDi-DU	2x 10G BiDi SFP+ singlemode	1x Neutrik OpticalCON DUO	2x Neutrik EtherCON

Only the R types are listed. There are also the standard F (non-rental type) F100/F110/F120 types. They either come with empty SFP+ ports, but have types outfitted with two multimode or singlemode 10G transceivers as well.

UBEX Works with <u>one or two ports</u> 10gig SFP+ per decoder/encoder on NETGEAR M4300 and M4500 switch models

M4300-8X8F
M4300-12X12F
M4300-24XF
M4300-24X24F
Model: M4300-24X24F
M4300-48XF
M4300-96X with APM408F portcards and optional APM402XL for 40G uplinks
M4500-48XF8C
M4500-48XF8C
M4500-32C

General UBEX network design advice	IMPORTANT: Are you using up to 10gig or up to 20gig streams?	
Calculate minimum uplink bandwidth avaialble for non-blocking operation as follows; (Number of physical encoder ports + Number of physical decoder ports) x 10gb; plus one extra gigabit port for the MMU, with an intermediate switch or mediaconverters.		
One UBEX TX device can deliver ~19.8Gbps of video signals in one direction, sending 2 streams in parallel. In this case the TX device's LAG 2x10G ports' ingress is ~19.8Gbps, the egress in rather small (kbps range), mostly control messages and LACP. *We also have Transceiver mode, where the same endpoint device can send and receive one video signal in parallel, so we can have more than 10G traffic going both ways on the 2x10G SFP+ ports simultaneously.*		

Example deployments	Small	Medium	Large
	1-48 encoders and 1-48 decoders; one or two switch requirement	12-100 encoders and 12-100 decoders	>100 encoders & >100 decoders
NETGEAR M4300 Switch recommendat	*Any M4300 model as listed above, with total portcount equal to total numbers of encoder/decoder 10 gig ports used, plus one extra for MMU.*	*1 or 2 M4300-96X with APM408F portcards and optional APM402XL for 40G uplinks, with total portcount equal to total numbers of encoder/decoder 10 gig ports used, plus one extra for MMU.*	*M4300-96X with APM408F portcards and optional APM402XL for 40G uplinks, with total portcount equal to total numbers of encoder/decoder 10 gig ports used, plus one extra for MMU.*
NETGEAR M4500 Switch recommendat	none	M4500-48XF8C core	M4500-32C core

Pllease note	*If we have a system with up to 48 TX and 48 RX devices. those together would (in maximum usage) need 192x 10G SFP+ ports if each transmitting device sends ~ 20G traffic (2 video streams from 2 HDMI inputs) one way.*
Pllease note	*The M4300-48XF can only connect 24 endpoint devices (let's say 12 TX and 12 RX devices) when used with encoders/decoders on 20G. The MMU goes to the extra RJ-45 port, so no loss of SFP+ LAGs because of the MMU 1G connection.*
Pllease note	Please contact proavdesign@netgear.com to verify your design
Pllease note	https://kb.netgear.com/000062312/What-modules-and-cables-are-compatible-with-the-M4250

Pllease note	https://www.downloads.netgear.com/files/GDC/datasheet/en/M4300.pdf?cid=wmt_netgear_organic

NETGEAR Optics Cables Ordering SKU	Lightware and NETGEAR strongly recommend only using these DAC cables and transceivers
AGM731F	NETGEAR 1000BASE-SX SFP LC Transceiver (multimode, 1000m OM4, 550m OM3 50/125µm, 275m OM2/OM1 62.5/125µm)
AGM732F	NETGEAR 1000BASE-LX SFP LC Transceiver (single mode, 10km 9/125µm)
AGM734-10000S	NETGEAR 1000BASE-T SFP RJ45 Transceiver
AXC761-10000S	NETGEAR 10G Direct Attach SFP+ to SFP+ 1 Meter Passive DAC Cable
AXC763-10000S	NETGEAR 10G Direct Attach SFP+ to SFP+ 3 Meter Passive DAC Cable
AXC765-10000S	NETGEAR 10G Direct Attach SFP+ to SFP+ 5 Meter Active DAC Cable
AXC767-10000S	NETGEAR 10G Direct Attach SFP+ to SFP+ 7 Meter Active DAC Cable
AXC7610-10000S	NETGEAR 10G Direct Attach SFP+ to SFP+ 10 Meter Active DAC Cable
AXC7615-10000S	NETGEAR 10G Direct Attach SFP+ to SFP+ 15 Meter Active Optical DAC Cable
AXC7620-10000S	NETGEAR 10G Direct Attach SFP+ to SFP+ 20 Meter Active Optical DAC Cable
AXM761-10000S	NETGEAR 10GBASE-SR SFP+ LC Transceiver (multimode, 550m OM4, 300m OM3 50/125µm, 33m OM2/OM1 62.5/125µm)
AXM761P10-10000S	Pack of 10 NETGEAR 10GBASE-SR SFP+ LC Transceiver (multimode, 550m OM4, 300m OM3 50/125µm, 33m OM2/OM1 62.5/125µm)
AXM762-10000S	NETGEAR 10GBASE-LR SFP+ LC Transceiver (single mode, 10km 9/125µm)
AXM762P10-10000S	Pack of 10 NETGEAR 10GBASE-LR SFP+ LC Transceiver (single mode, 10km 9/125µm)
AXM763-10000S	NETGEAR 10GBASE-LRM SFP+ LC Transceiver (multimode, 260m OM4/OM3 50/125µm, 220m OM2 50/125µm and OM1 62.5/125µm)
AXM764-10000S	NETGEAR 10GBASE-LR LITE SFP+ LC Transceiver (single mode, 2km 9/125µm)
AXM765-10000S	NETGEAR 10GBASE-T SFP+ RJ45 Transceiver (30m)
AXLC761-10000S	NETGEAR 40G Direct Attach QSFP+ to QSFP+ 1 Meter Passive DAC Cable
AXLC763-10000S	NETGEAR 40G Direct Attach QSFP+ to QSFP+ 3 Meter Passive DAC Cable
AXLM761-10000S	NETGEAR 40GBASE-MR4 Duplex LC (one duplex MMF link) 150m QSFP+ Transceiver
AXLM762-10000S	NETGEAR 40GBASE-LR4 Duplex LC (one duplex SMF link) 10km QSFP+ Transceiver
ACC761-10000S	NETGEAR 100G Direct Attach QSFP28 to QSFP28 1 Meter Passive DAC Cable
ACC763-10000S	NETGEAR 100G Direct Attach QSFP28 to QSFP28 3 Meter Passive DAC Cable
ACM761-10000S	NETGEAR 100GBASE-SR4 MMF 100m MTP/MPO (4 duplex MMF links) 100m QSFP28 Transceiver
ACM762-10000S	NETGEAR 100GBASE-LR4 LC SMF (one duplex SMF link) 10km QSFP28 Transceiver