9.4. Optical Master Unit
COBHAM OMU II

COBHAM

Technical specification

RF Parameters	
Opto module	1310 or 1330
Opto splitter (SCC)	+5 ± 2 dBm
Maximum optical input power	+5 dBm
Output power (Tx) max	+7 dBm
Operating temperature	+41 to 113° F (+5 to +45°C)
Automatic fibre optic loss compensation	Yes

Power requirements	
Power requirements	230/115 VAC, 50/60 Hz, 24/-48 VDC
Power consumption	Typical 50 W (fully equipped)

9.5. EMEA Repeater High Selectivity Digital Multi-Band FM Repeater COBHAM D-CSR 2601-24

APPENDIX A. SPECIFICATIONS

Electrical Specifications	
Frequency range	87.5 - 108MHz
Number of Channels	Up to 24
Filter Pass bandwidth	20 MHz, typical
Channel bandwidth	200KHz
Impedance	50 Ω
Noise Figure	4.5dB at maximum gain
DL Output power/carrier	1 carrier @ 26 dBm; 2 carriers @ 23 dBm; 4 carriers @ 19 dBm; 8 carriers @ 17 dBm; 16 carriers @ 15dBm; 24 carriers @ 12dBm;
Maximum DL Output Output power/carrier	2 carriers @ 35dBm; 4 carriers @ 29dBm; 8 carriers @ 23dBm; 16 carriers @ 17dBm; 24 carriers @ 14dBm
Gain	55 – 85 dB, in 1 dB steps
Third Order Intercept	+54 dBm, typical
Spurious Emissions from RF port	< -36dBm ETSI Compliant
Remote control and alarm supervision	Ethernet Optional - via GSM Modem, P-25, PSTN,
Power requirements	+24/-48VDC, 110VAC 60Hz, 230VAC 50Hz
Power consumption	140W, typical

9.6. DATA CENTER
HPE EDGELINE EL1000 CONVERGED EDGE SYSTEM

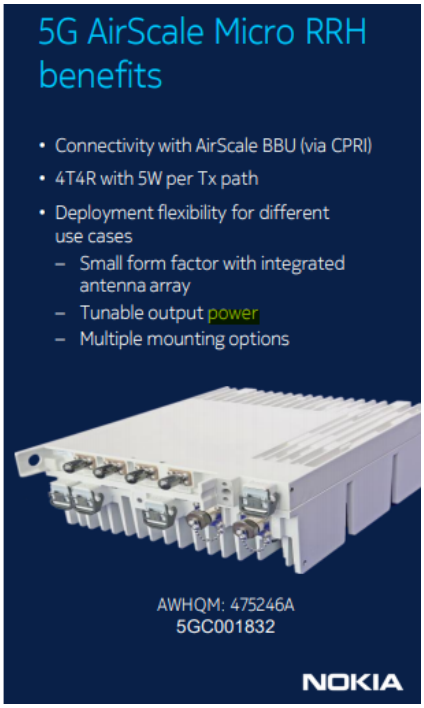
Technical specifications	HPE Edgeline EL1000 Converged Edge System
High-density compute nodes	One HPE ProLiant Server Cartridge Either a HPE ProLiant m510 (Intel® Xeon® D – 8 or 16 cores each) -or- a HPE ProLiant m710x (Intel® Xeon® E3 - 4 core with workstation-class GPU) compute node
Built-in I/O	Two 1 Gb (RJ45) Ethernet ports Four USB 3.0 ports HPE iLO4 enterprise-class management processor with a dedicated RJ45 network port
Storage	Two 2.5" Small Form Factor (SFF) Hot-Plug disk bays. Choose SATA drives for up to 4 TB total capacity Three to five Solid State Drive (SSD) slots on each compute node. Choose from cost effective SATA SSDs or high performance NVMe SSDs, for up to 4TB total capacity External storage via PCIe add-in I/O cards (e.g. FC SAN) iSCSI with RDMA over Ethernet (RoCE) capability (when supported by compute node for data volume only, not boot)
Mechanical and power	Chassis Dimensions: 88mm (3.46") tall, 352mm (13.86") wide, 233mm (9.17") deep Weight: Approximately 7.5 KG (16.5 lbs) Standard Rack, ETSI Rack or Wall-mount Typical: 100-150W, Maximum: 225W AC supply: 95-265 VAC input, 500 Watts DC supply: -48 VDC input, 800 Watts

9.7. 5G Airscale Micro RRH

Nokia AWHQM AWHQM: 475246A 5GC001832

AWHQM AirScale Micro RRH 4T4R n77

Specification	Details
5G Band/Frequency	N77 3800-4100
RF Output Power	Up to 5W per Tx path (4 Tx paths)
RF Bandwidth	OBW: 100MHz; IBW: 200MHz
Carrier Bandwidth	NR:20, 40, 50,60, 80, 100MHz *
Modulation	256QAM (DL), 64QAM (UL)
Physical Size[1]	Dimensions: 245(w) x 295(h) x 110(d) mm Volume: ~8L, Weight: ~11kg (w/o antenna) AC/DC Module: 25 (w) x 295 (h) x 105(d) mm; Volume: 1L, Weight: 1.5kg
Synchronization	via CPRI interface
Fronthaul Port	Three SFP+ Ports (3x 9.8Gbps)
EAC	One EAC port supporting two external alarms
AISG	One AISG connector. Voltage: 24V. Max power: 30W
Antenna	Configuration: 4 Tx/4 Rx (with Nex10 connectors) Type: Directional panel w/o beamforming (AAHN under development) Nominal Gain: ~10dBi
Input Power	76 to 288 VAC or -40.5 to -57 VDC
Power Consumption	Max: 285W. Typical: 250W
Reference sensitivity power level	-95.6[dBm]
Regulatory	TELEC - Japan



9.8. ASIK AirScale Common unit

Nokia ASIK 474021A

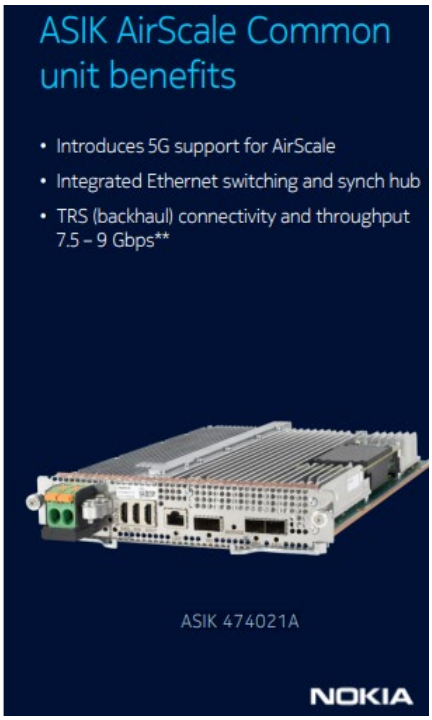
ASIK AirScale Common

Technical data

Specification*	Details
RAT standards	5G NR
Capacity unit support	ABIL
Subrack compatibility	AMIA, AMOB, AMOD
Number of supported capacity units	Up to 3 ABIx units above ASIK
Max throughput (DL+UL)	7.5 – 9 Gbps**
Hold-over time	24h +/- 3 µs
Backhaul/Transport (EIF) interfaces	2x SFP28 (1/10/25GE)
System Extension (SEI) interfaces	1x QSFP+ (4x 10GE)
Synchronization (SIN, SOUT) interfaces	2x HDMI. GNSS sync, GSM frame clock/number, ITU G.703 2.048 MHz or 10Mhz, power feed & control to GNSS
External Alarm Control (EAC) interface	1x HDMI. 12 alarms or 6-alarms + max. 6-controls incl. control bus to FSEB for 24-alarms or FSEE for up to 48 -alarms
Local Management Port (LMP) interface	RJ45 1 GE
Dimensions (H x W x D)	48 x 219 x 377 mm
Weight	3.2 Kg
Supply voltage / Connector type	DC-48V / -36V to -60V / 2 pole clamp
Power consumption	Typical 90W [at 25°C according ETSI ES202 706] Max 180W [all ports loaded, SFP's and cables connected]
Operational temperature range	-5°C to +55°C Front-to-Back airflow
Environmental protection	IP20, ETSI EN 300 019-1-3, class 3.1E

* HW specifications; capacity, performance and features subject to SW roadmap, configurations & traffic model and use case

** Dependent on traffic model and TRS interface configuration; single interface values with max 80% unidirectional utilization used as dimensioning guideline for terminated traffic (values w. two interfaces may be higher)



9.9. AMIA AirScale Subrack

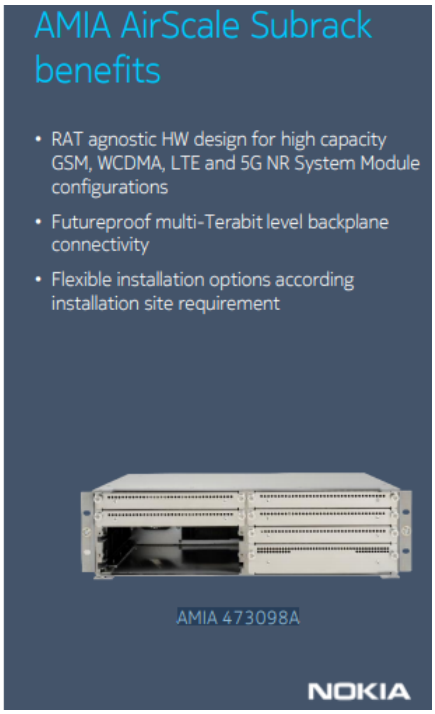
Nokia AMIA 473098A

AMIA AirScale Subrack

Technical data

Specification*	Details
Common unit support	Max 2 pcs, slots C1 and C2
Capacity unit support	Max 6 pcs, slots B1 to B6
Installation options	19 inch standard rack mounting with support shelf/tray. Flexi mounting plinth and stacking compatibility
Air-flow direction	Default: Front-to-Back, can be changed to Back-to-Front
Operation with a single Common	Yes, diagonal connectivity supported
Resiliency and redundancy	Common unit redundancy for clock & power & TRS supported
Subrack partitioning	Removable DC-bridge for separate halves at backplane
Dimensions (H x W x D)	3U size Subrack, 129 mm x 447 mm x 400 mm
Installation depth requirement	400mm from 19" fixing point + 40mm clearance at rear
Weight	5.1 kg without blinds
Power consumption	Typical 5W to 20W, max 40W (fans at full speed)
Operation voltage	-48VDC nominal, extended range -36VDC to -60VDC
Operational temperature range	-5°C up to +60°C
Environmental protection	IP20, ETSI EN 300 019-1-3, class 3.1E

HW specifications; capacity, performance and features subject to SW roadmap, configurations & traffic model and use case



10. COMMUNICATIONS SYSTEMS, INCLUDING EMERGENCY AND MAINTENANCE TELEPHONES

12.1 RADIO REBROADCASTING

COBHAM / IBIKI

- **Main Products**

RF Products, microwave

- **Manufacturer's Warranty**

Standard warranty is 12 months.

We are able to offer an extended warranty of 60 months.

- **Manufacturers assessment of asset design life**

The products have a design life of 15 years

when operated in accordance with regular maintenance carried out in accordance with the procedures detailed in the maintenance manuals.

- **Extended Life Cycle and Refurbishment**

It will be possible to extent your product life cycle to 26 years?

Yes, depends on the conditions of use

and refurbishment to 13 years ? Yes

12.1.1 FM Modulator Shelf

FM Modulator Shelf 20-003617 Specification

Parameter	Specification
Analogue Input	
Number of Inputs	2
Input impedance	600 Ohms
Nominal input level	-12 to +12dBu
Max input level	+24dBu
Connectors	XLR floating, EMI suppressed
RF Output	
Number of Outputs	4
Output level	+10dBm nominal
Connectors	N type female
Power	85-265 VAC 50-60Hz
Size	44mm x 482mm x 200mm
Weight	1.6 Kg

12.1.2 Optical Master Unit
COBHAM OMU II

Power requirements	
Power requirements	230/115 VAC, 50/60 Hz, 24/-48 VDC
Power consumption	Typical 50 W (fully equipped)

5 Maintenance

5.1 General

The system normally operates without any operator intervention or maintenance.

Should the system malfunction, the condition of the antenna systems as well as the continuity of the cabling should be checked before replacing any of the OMU units.

In the unlikely event of a unit failure, the field replaceable components (antenna unit, cables, etc.) should be checked and replaced if faulty and the system restored.

A failed unit can be removed and replaced with a spare while the rest of the system (other OMUs) is still in operation.

Caution

Un-terminated optical receptacles may emit laser radiation. Do not stare into beam or view with optical instruments.

Note! The power supply of the failed OMU should be isolated from AC mains and DC power before any module is replaced.

5.2 Preventive Maintenance

The OMU does not require any preventative maintenance apart from changing the battery every three years.

Caution

Risk of explosion if battery is replaced by an incorrect type.

Dispose of used batteries according to local laws and instructions.

12.2 COMMUNICATION SWITCHES

Specifications

Model Name	IGS-12040MT	
Hardware Specifications		
Copper Ports	8 10/100/1000BASE-T RJ45 Auto-MDI/MDI-X ports	
SFP Slots	4 1000BASE-SX/LX/BX SFP interfaces (Port-9 to Port-12) Compatible with 100BASE-FX SFP	
Console	1 x RJ45 serial port (115200, 8, N, 1)	
Switch Architecture	Store-and-Forward	
Switch Fabric	24Gbps / non-blocking	
Throughput (packet per second)	17.85Mpps@64Bytes	
Address Table	8K entries, automatic source address learning and ageing	
Shared Data Buffer	4Mbits	
Flow Control	IEEE 802.3x pause frame for full duplex Back pressure for half duplex	
Jumbo Frame	9Kbytes	
SDRAM	512Mbytes	
Flash Memory	64Mbytes	
Reset Button	< 5 sec: System reboot > 5 sec: Factory Default	
Connector	Removable 6-pin terminal block for power input Pin 1/2 for Power 1; Pin 3/4 for fault alarm; Pin 5/6 for Power 2 Removable 6-pin terminal block for DI/DO interface Pin 1/2 for DI 0 & DI 1; Pin 3/4 for DO 0 & DO 1; Pin 5/6 for GND	
Alarm	One relay output for power failure. Alarm Relay current carry ability: 1A @ 24V AC	
Digital Input(DI)	2 Digital Input (DI): Level 0: -24V~2.1V (±0.1V) Level 1: 2.1V~24V (±0.1V) Input Load to 24V DC, 10mA max.	
Digital Output (DO)	2 digital output: Open collector to 24VDC, 100mA	
Enclosure	IP30 aluminum case	
Installation	DIN- rail kit and wall-mount kit	
Dimensions (W x D x H)	76 x 107 x 152 mm	
Weight	1,010g	
Power Requirements	DC 12V to 72V AC 24V	
Power Consumption	6.5 watts / 22.18BTU (System on) 12 watts / 40.95BTU (Full loading)	
ESD Protection	6KV DC	
LED Indicator	System: Power 1 (Green) Power 2 (Green) Fault Alarm (Green) Ring (Green) R.O. (Green)	Per 10/100/1000T RJ45 Port: 1000 LNK/ACT (Green) 10/100 LNK/ACT (Orange) Per SFP Interface: 1000 LNK/ACT (Green) 100 LNK/ACT (Orange)
Layer 2 Management Functions		
Port Configuration	Port disable/enable Auto-negotiation 10/100/1000Mbps full and half duplex mode selection Flow Control disable / enable Power saving mode control	
Port Status	Display each port's speed duplex mode, link status, fFlow control status, a. Auto negotiation status and, trunk status.	
Port Mirroring	TX/RX/Both Many to 1 monitor	
VLAN	802.1Q tag-based VLAN, up to 255 VLAN groups Q-in-Q tunneling Private VLAN Edge (PVE) MAC-based VLAN Protocol-based VLAN Voice VLAN MVR (Multicast VLAN Registration) Up to 255 VLAN groups, out of 4095 VLAN IDs	
Link Aggregation	IEEE 802.3ad LACP / Static Trunk Support 6 groups of 8-port trunk support	

Spanning Tree Protocol	IEEE 802.1D Spanning Tree Protocol IEEE 802.1w Rapid Spanning Tree Protocol IEEE 802.1s Multiple Spanning Tree Protocol
IGMP Snooping	IPv4 IGMP (v1/v2/v3) Snooping IPv4 IGMP Querier mode support Up to 255 multicast Groups
MLD Snooping	IPv6 MLD (v1/v2) Snooping IPv6 MLD Querier mode support Up to 255 multicast Groups
Access Control List	IP-based ACL/MAC-based ACL ACL based on: - MAC Address - IP Address - Ethertype - Protocol Type - VLAN ID - DSCP - 802.1p Priority Up to 256 entries
Bandwidth Control	Per port bandwidth control Ingress: 500 Mbps ~1000Mbps Egress: 500 Mbps ~1000Mbps
QoS	Traffic classification based, strict priority and WRR 8-level priority for switching - Port Number - 802.1p priority - 802.1Q VLAN tag - DSCP/TOS field in IP Packet
Synchronization	IEEE 1588v2 PTP(Precision Time Protocol) - Peer-to-peer transparent clock - End-to-end transparent clock
Layer 2 Management Functions	
IP Interfaces	Max. 8 VLAN interfaces
Routing Table	Max. 32 routing entries
Routing Protocols	IPv4 software static routing IPv6 software static routing
Switch Management	
Basic Management Interfaces	Console; Telnet; Web browser; SNMP v1, v2c
Secure Management Interfaces	SSHv2, TLS v1.2, SSL, SNMPv3
System Management	Firmware upgrade by HTTP protocol through Ethernet network Configuration upload/download through HTTP Remote Syslog System log LLDP protocol NTP PLANET Smart Discovery Utility
SNMP MIBs	RFC-1213 MIB-II IF-MIB RFC 1493 Bridge MIB RFC 1643 Ethernet MIB RFC 2863 Interface MIB RFC 2665 Ether-Like MIB RFC 2819 RMON MIB (Group 1, 2, 3 and 9) RFC 2737 Entity MIB RFC 2618 RADIUS Client MIB RFC 2933 IGMP-STD-MIB RFC 3411 SNMP-Frameworks-MIB IEEE 802.1X PAE LLDP MAU-MIB
Standards Conformance	
Regulatoryion Compliance	FCC Part 15 Class A, CE

Stability Testing	IEC 60068-2-32 (free fall) IEC 60068-2-27 (shock) IEC 60068-2-6 (vibration)	
Standards Compliance	IEEE 802.3 10BASE-T IEEE 802.3u 100BASE-TX/100BASE-FX IEEE 802.3z Gigabit SX/LX IEEE 802.3ab Gigabit 1000T IEEE 802.3x flow control and back pressure IEEE 802.3ad port trunk with LACP IEEE 802.1D Spanning Tree Protocol IEEE 802.1w Rapid Spanning Tree Protocol IEEE 802.1s Multiple Spanning Tree Protocol IEEE 802.1p Class of Service IEEE 802.1Q VLAN tagging IEEE 802.1ad Q-in-Q VLAN stacking IEEE 802.1X Port Authentication Network Control IEEE 802.1ab LLDP IEEE 802.3ah OAM	IEEE 802.1ag Connectivity Fault Management(CFM) IEEE 1588 PTPv2 RFC 768 UDP RFC 793 TFTP RFC 791 IP RFC 792 ICMP RFC 2068 HTTP RFC 1112 IGMP v1 RFC 2236 IGMP v2 RFC 3376 IGMP version 3 RFC 2710 MLD version 1 FRC 3810 MLD version 2 ITU-T G.8032 ERPS Ring ITU-T Y.1731 Performance Monitoring
Environment		
Operating	Temperature: -40 ~ 75 degrees C Relative Humidity: 5 ~ 95% (non-condensing)	
Storage	Temperature: -40 ~ 85 degrees C Relative Humidity: 5 ~ 95% (non-condensing)	

PLANET Technology Corporation
Calculate MTBF

Model :	IGS-12040MT	Failure Rate :	4.2875
Date :	2015/4/2	MTBF(hours)	233236.152
Calculate MTBF Under :	MIL-HDBK-217F @ 25 degree C		

PLANET Technology Corporation
Calculate MTBF

Model :	MFB-T series(-40~75 degrees C) MGB-T series(-40~75 degrees C) MTB-T series(-40~75 degrees C)
Date :	2018/3/15
Calculate MTBF Under :	Telcordia GR-468-CORE

Operating Temperature (Unit: Degree C)	MTBF (Hours)
85	81976
80	103487
75	158628
70	193487
65	225391
60	272795
55	317465
50	386746
45	476198
40	589314
35	669687
30	773469
25	855628
20	1169643
15	1437246
10	1982369
5	2564645
0	3452461
-10	6882861
-20	13606511
-30	28609414
-40	65217274

11. POWER & COMMUNICATIONS CABLING

Not applicable.

12. CCTV & PA SYSTEMS

12.1. CCTV
BOSCH

Dome Cameras AUTODOME IP STARLIGHT 7000 HD

Dome Cameras AUTODOME IP 5000i IR

Fixed Cameras DINION IP STARLIGHT 7000 HD

NVR Video Recorder DIVAR 7000 2U

- **Manufacturer's Warranty**

Standard warranty is 24 months.

- **Manufacturers assessment of asset design life**

The products have a design life of 15 years,

when operated in accordance with regular maintenance carried out in accordance with the procedures detailed in the maintenance manuals.

Notice
Conformity to EN 50130-4
One of the following power supply units is required to conform to the EN 50130-4 standard: VG4-A-PSU0, VG4-A-PSU1, VG4-A-PSU2, VG4-A-PA0, VG4-A-PA1, or VG4-A-PA2.

Region	Certification	
Europe	CE	Declaration of Conformity (DoC) - AUTODOME 7000
USA	UL	AUTODOME 7000

Technical specifications

AUTODOME IP starlight 7000 HD camera

Imager	1/2.8-type Exmor R CMOS sensor
Effective Picture Elements (Pixels)	1945 x 1097 (2.13 MP)
Lens	30x Zoom 4.3 mm to 129 mm F1.6 to F4.7
Field of View (FOV)	2.3° to 63.7°
Focus	Automatic with manual override
Iris	Automatic with manual override
Digital Zoom	12x

Video performance - Sensitivity	
(3100K, reflectivity 89%, 1/30, F1.6, 30 IRE)	
Color	0.0077 lx
Mono	0.0008 lx

Additional Camera Settings

Gain control	AGC, Fixed
Aperture Correction	Horizontal and vertical
Electronic Shutter Speed (AES)	1/1 sec to 1/10000 sec (22 steps)
Signal-to-Noise Ratio (SNR)	>55 dB
Backlight compensation (BLC)	On, Off
White balance	2000 K to 10,000 K ATW, AWB Hold, Extended ATW, Manual, Sodium Lamp Auto, Sodium Lamp
Day/Night	Monochrome, Color, Auto
Intelligent defog	Improves visibility when viewing foggy or other low-contrast scenes.

Dynamic range	
High Dynamic Range (HDR) Mode	120 dB WDR

Mechanical

	In-Ceiling	Pendant
Pan Range	360° cont.	360° cont.
Tilt Angle	1° above horizon	18° above horizon
Pre-position Speed	Pan: 400°/s Tilt: 300°/s	Pan: 400°/s Tilt: 300°/s
Pan/Tilt Modes		
• Turbo Mode (Manual Control)	Pan: 0.1°/s – 400°/s Tilt: 0.1°/s – 300°/s	
• Normal Mode	0.1°/s-120°/s	0.1°/s-120°/s
Preset Accuracy	± 0.1° typ.	± 0.1° typ.

Electrical

	In-Ceiling	Pendant
Input Voltage	21-30 VAC, 50/60 Hz; (class II) High PoE (with Bosch Midspan (NPD-6001A); required to power the heater) PoE+ (IEEE 802.3at, class 4 standard) (when used indoors, not powering the heater)	
Power Consumption, typical	24 W / 44 VA	60 W / 69 VA (heaters on) or 24 W / 44 VA (heaters off / without heater connected in power supply box for indoor applications)

Surge Suppression

Protection on Alarm Inputs	Peak current 17 A, peak power 300 W (8/20 µs)
Protection on Alarm Outputs	Peak current 2 A, peak power 300 W (8/20 µs)
Protection on Relay Output	Peak current 7.3 A, peak power 600 W (10/1000 µs)
Protection on Power Input (Dome)	Peak current 7.3 A, peak power 600 W (10/1000 µs)
Protection on Power Output (Arm Power Supply)	Peak current 21.4 A, peak power 1500 W (10/1000 µs)
10/100 Ethernet Data Lines	Peak current 14 A, peak power 200 W (8/20 µs)

Video content analysis	
Analysis type	Essential Video Analytics
Configurations	Silent VCA / Profile 1 - 16
Alarm rules (combinable)	Any object Object in field Crossing line Entering field Leaving field Loitering Following route Idle object Removed object Counter Occupancy Crowd detection Condition change Similarity search Tampering
Object filters	Duration Size Aspect ratio v/h Speed Direction Color Object classes (Upright persons, Bikes, Cars, Trucks)
Calibration	Automatic self-calibrating when height is set

Mechanical	
Pan/Tilt Modes	Normal: 0.1°/s - 120°/s Turbo: Pan: 0.1°/s - 240°/s; Tilt: 0.1°/s - 120°/s
Preset Speed	Pan: 240°/s Tilt: 160°/s
Pan Range	360° continuous
Tilt Angle	-90° to 3° (Auto-flip 186°)
Pre-position Accuracy	± 0.1° typ.
Pre-positions	256
Tours	Two (2) types of tours: • Recorded tours: two (2), maximum total duration 15 minutes (depending on the amount of commands sent during recording) • Pre-position tour: one (1), consisting of up to 256 scenes consecutively, and one (1), customized up to 64 scenes

Electrical	
Input voltage	24 VAC and PoE+
Power consumption	20 W (IR off) / 25 W (IR on)

Network	
Video compression	H.265 H.264 M-JPEG
Streaming	Four (4) streams: Two (2) configurable streams in H.264 or H.265 One (1) I-frame-only stream based on first stream One (1) M-JPEG Stream
Maximum frame rate	60fps at all resolutions
IP delay (typical)	60 fps: 200 ms

Resolution (H x V)	
1080p Full HD (16:9)	1920 x 1080
720p HD (16:9)	1280 x 720
1.3MP (5:4)	1280 x 1024 cropped
D1 4:3 (cropped) (4:3)	704 x 576
640x480 (4:3)	640x480 cropped
432p SD	768 x 432
288p SD	512 x 288

Bitrate: The average typical optimized bitrate in kbits/second for various frame rates is shown in the following table:

Video compression	H.265	
IPS	1080p	720p
60	1649	1249
30	1413	1096
15	1157	902

Standards	Type
ONVIF conformance	EN 50132-5-2:2011/AC:2012 EN 62676-2-3:2014
Image quality	UL 2802

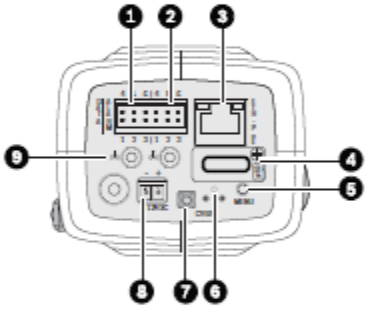
* Chapters 7 and 8 (mains voltage supply requirement) are not applicable to the camera. However, if the system in which this camera is used needs to comply with this standard, then any power supplies used must comply with this standard.

Marks	CE, cULus, WEEE, RCM, EAC and China RoHS

Region	Regulatory compliance/quality marks
Europe	CE
USA	UL ST-VS 2016-E-045

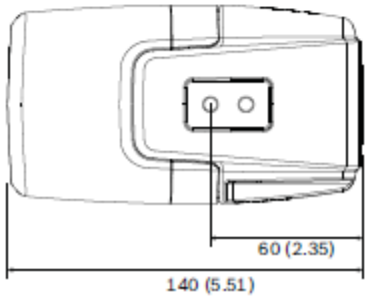
Installation/configuration notes

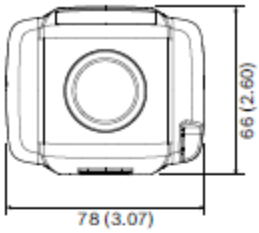
Controls



1	Data (RS485/422/232)	6	Reset button
2	Alarm In, alarm out	7	Video out (SMB connector)
3	10/100 Base-T Fast Ethernet	8	Power supply input
4	MicroSD card slot	9	Audio In / Audio out
5	Menu button		

Dimensions





mm (in)

Technical specifications

Power (12 VDC/PoE version)	
Input voltage	Power-over-Ethernet (48 VDC nominal) and/or +12 VDC ±10% (auxiliary)
PoE IEEE standard	802.3af (802.3at Type 1) Power level: Class 3
Power Consumption	7.2 W max.
Current draw (PoE)	200 mA max.
Current draw (12 VDC)	600 mA max.
Power (24 VAC/PoE version)	
Input voltage	Power-over-Ethernet (48 VDC nominal) and/or 24 VAC ±10%/ +12 VDC ±10% (auxiliary)
PoE IEEE standard	802.3af (802.3at Type 1) Power level: Class 3
Power Consumption	7.2 W max.
Current draw (PoE)	200 mA max.
Current draw (24 VAC)	500 mA max.
Current draw (12 VDC)	600 mA max.
Sensor (1080p version)	
Sensor type	1/2.8-inch CMOS
Effective pixels	1920 (H) x 1080 (V); 2MP (approx.)
Sensor (720p version)	
Sensor type	1/2.8-inch CMOS
Effective pixels	1280 (H) x 720 (V)

Storage	
Storage type	8 Trays: 3.5-inch SATA
Hard Drives installed	DIP-7082-8HD: 16 TB, 2 TB SATA/300 7.200 RPM 3.5" DIP-7083-8HD: 24 TB, 3 TB SATA/300 7.200 RPM 3.5"
SAS RAID card	2108 based SAS/SATA RAID card – 8 internal ports/low profile-PCI-E
Graphics card	AMD FirePro V3900 1 GB, low profile
Sound card	Creative Sound Blaster PCI sound card
OS drive	Intel SSD 320 OVR, 80 GB (MLC)
DVD writer	Internal

Accessories	
Keyboard	EN-US (QWERTY)
Mouse	standard

System status
DIVAR IP 3000/7000 family comes fully loaded and fully functional with Microsoft Operating System and Bosch application pre-installed: Windows Storage Server 2008 R2, 64-bit; Bosch Video Management System; Bosch Video Recording Manager including Video Streaming Gateway; Dynamic Transcoding.

Technical specifications

Electrical	
AC input rating	100 to 240 V / 9 to 4 A / 50 to 60 Hz

Electrical 120 VAC input	
Actual output wattage from power supply	256.44 W
Efficiency of power supply	88%
Power consumption (w/o hard drives)	291.41 W
Power consumption (fully populated)	378 W approx
Total BTU/h	994.59
Power factor	.95
System AC input VA requirement	306.75 VA

Electrical 240 VAC input	
Actual output wattage from power supply	256.44 W
Efficiency of power supply	90%

Electrical 240 VAC input	
Power consumption (w/o hard drives)	284.94 W
Power consumption (fully populated)	373 W approx
Total BTU/h	972.49
Power factor	.92
System AC input VA requirement	309.71 VA

Mechanical	
Form factor	2HU rack mount
Power supply	740 W Platinum Level Redundant
USB ports	4 USB 2.0
Network	Dual Intel 82574L Gigabit LAN
Dimensions (H x W x D)	89 x 437 x 648 mm (3.5 x 17.2 x 25.5 in)
Weight	23.6 kg (52 lb)

Environmental	
Operating temperature	+10 °C to +35 °C (+50 °F to +95 °F)
Non-operating temperature	-40 °C to +70 °C (-40 °F to +158 °F)
Operating relative humidity	8 to 90% (non-condensing)
Non-operating relative humidity	5 to 95% (non-condensing)

Additional information
Video clips for guided setup and configuration are available on the Security Systems Video Portal.
http://video.boschsecurity.us/category/digital-recording/26

Ordering information

DIVAR IP 7000 2U, 8 x 2 TB HDD
All-in-one recording, viewing and management solution for network surveillance systems of up to 128 channels, 8 x 2 TB storage capacity
Order number **DIP-7082-8HD**

DIVAR IP 7000 2U, 8 x 3 TB HDD
All-in-one recording, viewing and management solution for network surveillance systems of up to 128 channels, 8 x 3 TB storage capacity
Order number **DIP-7083-8HD**

12.2. PA SYSTEM

12.2.1. CLASS D DIGITAL POWER UNITS

OPTIMUS DA-500D2/ DA-500D4

	DA-500D2	DA-500D4
Rated Power Output	2 x 500 W	4 x 500 W
Speaker Outputs	100 V	100 V
Input	775 mV / 0 dB 10 kΩ	775 mV / 0 dB 10 kΩ
Frequency Response	80 ~ 16,000 Hz (± 1.5 dB)	80 ~ 16,000 Hz (± 1,5 dB)
S/N Ratio	> 85 dB	> 85 dB
THD	< 1 %	< 1 %
Cooling	Two internal fans 50 / 70 ºC Thermostat	Two internal fans 50 / 70 ºC Thermostat
Indicators	POWER, PROT, CLIP, SIGNAL & STBY	POWER, PROT, CLIP, SIGNAL & STBY
Protection	AC fuse, short-circuit, peak and high temp	AC fuse, short-circuit, peak and high temp
Power Supply	115 / 230 V CA, 50 ~ 60 Hz 24 V CC (21.6 ~ 26.5 V)	115 / 230 V CA, 50 ~ 60 Hz 24 V CC (21.6 ~ 26.5 V)
Consumption	1150 W	2260 W
Weight	8.05 kg	10 kg
Dimensions	484 x 444,5 x 88 mm (2u rack mount)	484 x 444,5 x 88 mm (2u rack mount)

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12.2.2. AUDIO SWITCHING MATRIX

OPTIMUS COMPACT-E

AUDIO SWITCHING MATRIX

COMPACT

Audio matrix with IP connection and monitoring functions, for complete management of Public Address and Voice Alarm systems. Main component from COMPACT SYSTEM control system.

Power supply	24 V DC (duplicate)
Consumption	730 mA
Audio inputs	2 (-60 dB / -20 dB / 0 dB) + frontal USB
Contacts	16 inputs and 4 outputs
Capacity	8 cards
Audio channels	16
Communication system	IP Layer 3 & Layer 2 Network
Network connections	ETH A / ETH B (redundant system)
Built-in FAS interface	3 in / 3 out
Outputs	Fail relay (NO/NC)
Finishing	Iron black painted RAL9005
Weight	9 kg
Dimensions (mm)	482.6 (Width) x 133 (Height) x 280 (Depth)
Rack units	3

Compact SYSTEM

- System consisting of one MAIN unit and up to ten SECONDARY units
- Four IP audio channels, for local microphone, global microphone and prerecorded messages
- Three built-in analogue audio inputs (one frontal USB)
- Monitoring of loudspeakers zones and power amplifiers.
- Input for eight microphones with zones control connected in BUS
- Emergency contact inputs & outputs, message activation, zones control...
- Card slots to extend the system with the necessary audio outputs

OPTIMUS IF-702ETH

CONTROL SYSTEMS

IP INTERFACE & AUDIO MATRIX

Compact SYSTEM

IF-702ETH 2 output

Interface and audio matrix to connect amplifiers at any point in the network. As part of the COMPACT system, it receives digital audio via IP connection (4 simultaneous channels), whether for music or announcements.

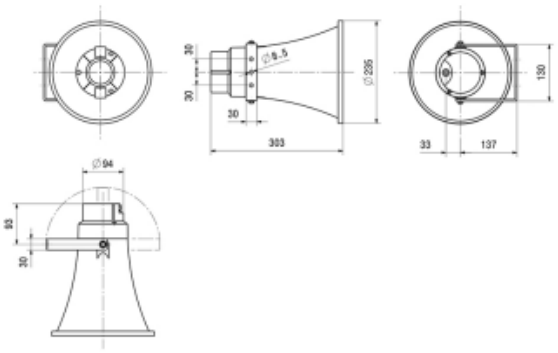
It has two audio outputs with DSP and supervision, configurable input and output contacts, front USB input for music, 16 GB SD card to store audio messages, communication bus to connect desks or noise sensors, reception of VoIP calls from standard SIP phones ...

Power supply	100 – 240 V AC | 24 V DC | 1.1 A
Communication	2 x Ethernet (redundant) CAN Bus
VoIP	SIP Protocol
Contacts	3 x inputs, configurable NA/NC & supervisables 3 x outputs, configurable NA/NC. FAIL relay
USB input	front (WAV, MP3 & OGG files)
Audio output	2 x +4 dBm balanced, 600 ohm, connector RJ45 frequency response: 100 – 18,000 Hz SNR > 60 dB volume, bass & treble control via software
Prerecorded messages	SD card, 16 GB
Finish	Black metal RAL 9005
Dimensions (mm)	482,6 x 44 x 430 (1 u rack height)
Weight	5.6 kg

12.2.3. Loud speaker

OPTIMUS AC-930EN

Rated Power (RMS)	30 W
Power Taps 100 V	30 W, 20 W, 10 W & 5 W
Impedance	333 Ω, 500 Ω, 1k Ω, 2k Ω & 20 Ω
Sensitivity	97.9 dB SPL at 1 W / 1 m IEC268-5
Sound Pressure	112.7 dB SPL at 30 W / 1 m IEC268-5
Sensitivity EN54-24	85.9 dB SPL at 1 W / 4 m
Freq. Response	250 ~ 15,000 Hz
Dispersion 1kHz / 4kHz	103º / 32º (-6 dB)
Operating temperature	-20ºC ~ +90ºC
Protection range	IP66
Dimension (mm)	Ø 235 x 303 (length)
Weight	2.17 kg
Finish	ABS, colour light gray (RAL7035)
Mounting	U type stainless steel mounting bracket
Power selection	Rotary switch
Standard	EN54. In compliance with BS-5839, part 8.



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12.2.4. Microphone desk

OPTIMUS DC-700ETH

Inputs	ETH A / ETH B (redundant system)
Communication system	IP Layer 3 & Layer 2 Network
Power supply	24 V CC (duplicate)
Consumption	500 mA
Weight	3,5 kg
Finish	Bayblend Plastic RAL7021
Microphone	
Capsule	Dynamic type
Polar diagram	Unidirectional
Frequency response	150 Hz ~ 8 KHz
Sensitivity	-76 dB ± 3 dB (0 dB =1 V/µbar, 10 kHz)
Input impedance	500 Ohm ± 30 % (1 kHz)
Finish	Aluminium

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(+34) 972 203 300

OPTIMUS
SOUND & COMMUNICATION

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13. INCIDENT DETECTION & MANAGEMENT SYSTEMS

Company name: FLIR

- **Main Products**
  Video Automatic Incident Detector TRAFIBOT HD

- **Manufacturer's Warranty**
  Standard warranty is **12** months.

  We are able to offer an extended warranty of **60** months.

- **Manufacturers assessment of asset design life**
  The products have a design life of 15 years,

  when operated in accordance with regular maintenance carried out in accordance with the procedures detailed in the maintenance manuals.

- **Extended Life Cycle and Refurbishment**
  It will be possible to extent your product life cycle to 26 years? **No**

  and refurbishment to 13 years ? **Yes**

14.1 AID BOX CAMERA
FLIR TRAFIBOT HD

FLIR

AID BOX CAMERA WITH INTEGRATED VIDEO ANALYTICS

TrafiBot HD

SPECIFICATIONS

System Overview	
Video Input	1/2.8" CMOS
Encoding Format	H.264, MJPEG
Max Resolution	Full HD (1920 × 1080) @ 30 fps
Multi-Streaming	Dual streaming: H.264 (HP-MP) or MJPEG
Max Streams	Unicast and/or multicast, max 20
Audio	1 full duplex stereo Optional: 24 bit audio transmission
Power Supply, Outputs, and Communications	
Power	7 W
Standalone Form	12 V DC or 24 V AC or 802.3af PoE
LAN Connector Type	10/100 Mbps RJ45 or SFP for fibre or IP over coax (ECO)
Digital Inputs	2
Digital Outputs	2
Data	RS232 or RS422/485
PTZ Control	Yes
Communication Standards	ONVIF profile S, NTCIP, SNMP

16 OVERHEIGHT VEHICLE DETECTION SYSTEMS

15.1 OVERHEIGHT DETECTOR ICK HISIC450

- **Manufacturer's Warranty**
  Standard warranty is **12** months.

  We are able to offer an extended warranty of **60** months.

- **Manufacturers assessment of asset design life**
  The products have a design life of 15 years, when operated in accordance with regular maintenance carried out in accordance with the procedures detailed in the maintenance manuals.

- **Extended Life Cycle and Refurbishment**
  It will be possible to extent your product life cycle to 26 years? **No**

  and refurbishment to 13 years ? **Yes**

Technichal Data	HISIC450		
Versions	**HISIC450-R250**	**HISIC450-P250**	**HISIC450-N250**
Measuring components	Overheight detection		
Measuring path	Typically: • Enclosed areas: 300 meters • Outdoors: max. 100 meters		
Ambient conditions			
Ambient temperature	–25 ... +55 ° C		
Approvals			
Protection class	IP 67		
Electrical safety	EC		
Inputs, outputs, interfaces			
Digital output	Relais, 1 x U; Max.: 120 W/750	PNP Max.: 200 mA Short-circuit proof	NPN Max.: 200 mA short-circuit proof
Device data			
Sender	LED, infrarot, pulsed		
Light spot	1.5 m at 100 m distance		
Width of receiver optics B	35 mm		
Max. Signal sequence	10/s	1000/s	
Response time t_R	≤ 10 ms	≤ 500 µs	
Min. diameter of recognised objects [1] (D_{min})	$D_{min} = B + t_R * v$ v = travelling speed of vehicle		
Supply voltage	UC 24 V .... 240 V +10 % / –25 %	DC 10 V ... 60 V Limit values, ripple max. 5 Vss; Connections reverse-poled protected	
Current/power consumption	6 VA	Max. 500 mA	
General Information			
System components	2 x Sender 2 x Receiver 4 x Weather protection 4 x Ball joint brackets		
Mounting	Direct mounting in front of bridges and tunnels		

[1] This value is valid under ideal conditions for objects, that cover the light beam completely and without reflection

Official Lifetime Statement for

HISIC450 overheight detection

The devices of the product family HISIC450 were designed and manufactured according to the high quality standards and regulations applied at SICK AG. Details about these standards can be seen in the quality manual. SICK AG is certified according to DIN EN ISO9001 and EN ISO 14001.

Design Life-Time:

10…15 years

MTBF from repair statistics:

48 years

Reute, March 2020

SICK AG
Productmanager Traffic Sensors

i.A. Christian Kuhn

Maintenance work

- ► Clean the screens of the transmitter and the receiver when soiled.
- ► Check the screw connections once a year.

The device variants HISIC450-P and -N additionally have a test input and a soiling output:

- The transmitter can be switched off via the test input to check the function.
- The soiling output signals when the light reception is no longer optimal.

In device variant HISIC450-R, the relay can be set to pick up or drop out for test purposes with the delay mode adjusting screw.

17. TRAFFIC MONITORING AND MANAGEMENT SYSTEMS

17.1. VIDEO WALL

17.1.1. Networked Single Display video wall controller
BARCO TransForm NSD-211

PRODUCT SPECIFICATIONS	TRANSFORM NSD-211
Processor	Intel(R) Core(TM) i7 Quad core 3.2GHz (max Turbo frequency 4.0GHz) processor
Memory	16 GB RAM
Hard disk	256 GB Solid-State Disk SSD
Operating system	Windows 10 64-bit IoT Enterprise
Software	Any CMS deployment, CMS Basic is advised for standalone use
Network	2x 1Gb/s LAN
Graphics card	4-channel professional high-performance NVIDIA Quadro-series graphic card
Output	Up to 4 4K-UHD displays Up to 16 HD displays with Barco loop-through displays
Streaming video standards	H.264, MPEG-2/4, MxPEG, MJPEG, V2D, H.263, VNC, Pro-Server ▪ For all supported codecs see our continuously extended supported encoders reference list ▪ For supported number of sources see VCORE Check tool
Form factor	3U ½ 19" Rackmount housing
Dimensions	133mm x 220mm x 300mm | 5.24" x 8.66" x 11.81"
Weight	6.3 kg (8.1 kg incl. packaging)
Power supply	100-240V, 6-3A, 50/60Hz
Power consumption	Typ. 110W | max. 135W

Last updated: 26 Nov 2019

Technical specifications are subject to change without prior notice. Please check www.barco.com for the latest information.

www.barco.com

ENABLING BRIGHT OUTCOMES

BARCO

17.1.2. Networked Display Node
BARCO TransForm NDN-215 Pro

PRODUCT SPECIFICATIONS	TRANSFORM NDN-215 PRO
Memory	8 GB
Disk drive	128 GB Solid-State Disk SSD
Network	2x 1Gb/s LAN
Graphics card	Professional high-performance NVIDIA Quadro-series graphic card
Processor	Intel(R) Core(TM) i7 Quad core 4GHz processor
Output	4x Display Port 1.2 (supporting up to 4x 4K-UHD) 4x DVI-SL via included adapters (supporting up to 4x HD)
Input	H.264, MPEG-2/4, V2D, H.263, VNC, Pro-Server (see supported codec list)
Form factor	3U ½ 19" Rackmount housing
Dimensions	133mm x 220mm x 300mm | 5.24in x 8.66in x 11.81in
Power supply	100-240V, 5-3A, 50/60Hz
Power consumption	Typ. 124W | max. 270W

17.1.3. Enterprise media server

BARCO EMS-110

Power consumption	Typ. 83W | max. 109 W
Inrush current limiting	174A @230V / 72.5A @115V
Heat dissipation	283 BTU/h
Temperature range	0° -40°C | 32° -104°F
Humidity	Max 80% (non-condensing)
MTBF	47,500 h
Noise Level	Max. 32dbA (measured at 1m/32.8ft distance at 22°/72°F)
Regulation Compliance	CE, CB, UL, RCM, BIS, CU-EAC, CCC, KC, FCC Class A, CCC
Model	P110
Form factor	60 x 190 x 190 mm | 2.36 x 7.48 x 7.48 in Packed: 230 x 260 x 308 mm | 9.06 x 10.24 x 12.13 in
Weight	2.2 kg (4.5 kg packed)
Package content	1x EMS-110 Server 1x Power Supply 1x Mounting bracket set 1x Vertical stand 1x Region specific mains cable (option)
Article number	R9811011F EMS-110 Media Server (EU Power Cable) R9811011B EMS-110 Media Server (US Power Cable) R9811011G EMS-110 Media Server (UK Power Cable) R9811011I EMS-110 Media Server (CN Power Cable) R9811011X EMS-110 Media Server (C13C14 Power Cable) R9811011 EMS-110 Media Server (No Power Cable included)
Mounting	R9811098 P110 VESA Mount (for 1x OPS-110 + 1x PSU) R9811099 P110 Rack Mount (for 2x OPS-110 + 2x PSU)

17.1.4. Compact 4K single channel H.264 & V2D Encoder

Barco NGS-D320 FLEXNGS-D320 FLEX

PRODUCT SPECIFICATIONS	NGS-D320 FLEX
Number of inputs and outputs	
Audio	1 3.5mm jack stereo line level in & line out 1 3.5mm jack mono mic in & stereo headphones out (combined)
USB	3 Type A connectors, 1 Micro-B connector
Network	RJ45 (1Gb copper)
Video	1 Dual Link DVI & 1 DisplayPort 1.1a & 1 HDMI 1.4 input 1 Dual Link DVI & 1 DisplayPort 1.2 & 1 HDMI 1.4 output Flexible Loop Through Maximum input bandwidth of 330Mhz
Network interfaces	
Ethernet	2x 1GbE full duplex
IP addressing	DHCP, link local, fixed IP
Protocols	Unicast, Multicast (IGMP v3), RTP, RTSP, DNS, NTP
RTSP Sessions	Multicast: maximum 12 simultaneous RTSP session per channel Unicast : maximum 2 simultaneous RTSP session per channel
Discovery	Zeroconf, SAP (RFC 2974)
Management interfaces	
Firmware upgrade	HTTPS Web interface, USB Storage Device
Standalone	HTTPS Web interface
Advanced features	
Image processing	Color space conversion, scaling, frame rate reduction
Automatic downscaling	Y (Adjust to profile)
Remote keyboard and mouse	Supported (Native keymap)
General specifications	
Dimensions	38 mm H x 170 mm W x 170 mm D | 1.5" H x 6.7" W x 6.7" (+/-2mm / 0.1")
Weight	1 ± 0.01 kg (2.20 lbs)
Power	Typical 35W, maximum 48W
Power supply	12VDC, 100-240VAC 60W, external locking power

17.1.5. Compact 4K single channel H.264 Encoder and Decoder

Barco NGS-D320 Lite

PRODUCT SPECIFICATIONS	NGS-D320 LITE
General specifications	
Dimensions	38 mm H x 170 mm W x 170 mm D | 1.5" H x 6.7" W x 6.7" (+/-2mm / 0.1")
Weight	1 ± 0.01 kg (2.20 lbs)
Power	Typical 35W, maximum 48W
Power supply	12VDC, 100-240VAC 60W, external locking power
Operating temperature	0°C to 40°C (32°F to 104°F)
Storage temperature	-20°C to 70°C (-4°F to 158°F)
Sound level	Typical 32dBA at 20°C
Mounting	Optional VESA adapter plate or 1U rack mount for 2 devices

17.1.6. Small form factor thin client for HD displays

BARCO OpSpace OpS-110

PRODUCT SPECIFICATIONS	OPSPACE OPS-110
Platforms	OpS-110
Processor	Intel(R) Core(TM) i7 Quad core CPU 3.4GHz
Memory	8 GB RAM
Hard disk	128 GB SSD
Network	2x 1Gb/s LAN
Graphics card	Intel HD Graphics 630
Outputs	Up to 2x displays HD 1920x1200 @60Hz via DisplayPort (HDMI via included adapters)
Input	IP video sources (H.264), Video2Data (Barco V2D), Virtual Network Computing (VNC), Remote Desktop Protocol (RDP)
Form factor	60 x 190 x 190 mm | 2.36 x 7.48 x 7.48 in Packed: 230 x 260 x 308 mm | 9.06 x 10.24 x 12.13 in
Weight	2.2kg Packed: 4.5kg
Power supply	External PSU 150W / 90 – 264 VAC / 47 – 63 Hz
Power consumption	Typ. 83W | max. 110W

17.1.7. Medium form factor thin client for WUXGA/WQHD/4K displays

BARCO OpSpace OpS-210

PRODUCT SPECIFICATIONS	OPSPACE OPS-210
OS	Linux
Memory	8 GB
Disk drive	128 GB Solid-State Disk SSD
Network	2x 1Gb/s LAN
Graphics card	Professional high-performance NVIDIA Quadro-series graphic card
Processor	Intel(R) Core(TM) i7 Quad core 4GHz processor
Output	Up to 2x displays WUXGA 1920x1200 @60Hz (Display Port 1.2/OPS) Up to 2x displays WQHD 2560x1440 @60Hz (Display Port 1.2/OPS) Up to 1x display UHD 3840x2160 @60Hz (Display Port 1.2/OPS)
Input	IP video sources (H.264), Video2Data (Barco V2D), Virtual Network Computing (VNC), Remote Desktop Protocol (RDP)
Form factor	3U ½ 19" Rackmount housing
Dimensions	133mm x 220mm x 300mm | 5.24in x 8.66in x 11.81in
Power supply	100-240V, 5-3A, 50/60Hz
Power consumption	Typ. 124W | max. 270W

17.1.8. Certified enterprise-class server for networked visualization environment

BARCO Enterprise-class Server R 340-D1

PRODUCT SPECIFICATIONS	ENTERPRISE-CLASS SERVER R 340-D1
General specifications	
CPU	Intel quad-core XEON E2124 3.3 GHz
Memory	16 GB
Hard disk	2 x 480 GB Solid State Drive, Hot-plug RAID-1
Optical drive	DVD ROM, SATA
Network connection	2x1Gb/s LAN
Power supply	2x350W Hot-plug redundant (platinum)
Redundancy	Hot-plug redundant power supply RAID-1 redundant disk drives
Weight	max. 13.6 / 29.98 lbs
Housing	19" rackmount 1U
Dimensions	434 x 42.4 x 596 mm (17.09" x 1.67" x 23.5")

Last updated: 17 Feb 2021

Technical specifications are subject to change without prior notice. Please check www.barco.com for the latest information.

17.1.9. Laser-lit rear-projection video walls for 24/7 control rooms

BARCO RGB Laser ODL-721

PRODUCT SPECIFICATIONS	RGB LASER ODL-721
Resolution	Full HD (1920 x 1080 pixels)
Screen	Under native color gamut

Screen type	WV-FEL	NoGap	CSI	BBP	Light source lifetime (hrs)*
Boost	940 cd/m²	800 cd/m²	650 cd/m²	340 cd/m²	60,000
Normal	730 cd/m²	620 cd/m²	500 cd/m²	260 cd/m²	125,000
Eco	365 cd/m²	310 cd/m²	250 cd/m²	130 cd/m²	125,000
Horizontal half gain viewing angle	38°	36°	36°	45°	-
Vertical half gain viewing angle	21°	33°	34°	45°	-

On-screen contrast	1800:1
Color	Up to 170% REC709 color triangle
Display technology	Rear projection DLP
White point	Customized white points
Brightness uniformity	Typ. >95% ANSI 9 Typ. >90% ANSI 13
Screen gap	Dependant on screen type
Color stability	Sense X automatic calibration
Dimensions	• Diagonal: 70" (Approx.) • Width: 1,550 mm | 61.02" • Height: 872 mm | 34.33" • Depth: 622 mm | 24.49" • Weight: Projection Module: < 63 kg | 139 lbs • Weight: Support frame: < 39 kg | 86 lbs
Light source	RGB lasers illumination (Lasers Class 1 RG2)
Redundancy	Redundant laser banks with redundant power supply drivers, input signal & external power supply
Light source lifetime	> 125,000 hrs in both Normal and Eco mode
Noise Level	Less than 20 dB (measured from 3 meters in front)
Conditions for operation	10°C-40°C | 50°F-104°F Up to 80% humidity (non-condensing)
AC input voltage	100 – 240 VAC, 50-60Hz
Power	120W (eco) 200W (normal)

Last updated: 29 Sep 2020

Technical specifications are subject to change without prior notice. Please check www.barco.com for the latest information.

2. Warranty.*[JNCO]* 2 years by default. We can offer extension up to 5 years for electronics and software, and up to 10 years for LASER rear projection cubes

3. Recommended maintenance intervals *[JNCO]* preventive maintenance 1 visit per year.

4. Life span *[JNCO]*

Laser Cubes ODL-721: lifetime=125.000h for light source.
This can be replaced on site to get another 125.000h

In addition to that, MTBF (in hours) are:

Laser Cubes ODL-721	125.000
CMS server:	200.000
NDN-215:	96.000
NSD-211:	106.100
NGS-D320	48.000
OPS-110	47.478
OPS-210	44.000
EMS-110	47.000

PRODUCT SPECIFICATIONS	RGB LASER ODL-721
Resolution	Full HD (1920 x 1080 pixels)
Screen	Under native color gamut

Screen type	WV-FEL	NoGap	CSI	BBP	Light source lifetime (hrs)*
Boost	940 cd/m²	800 cd/m²	650 cd/m²	340 cd/m²	60,000
Normal	730 cd/m²	620 cd/m²	500 cd/m²	260 cd/m²	125,000
Eco	365 cd/m²	310 cd/m²	250 cd/m²	130 cd/m²	125,000
Horizontal half gain viewing angle	38°	36°	36°	45°	-
Vertical half gain viewing angle	21°	33°	34°	45°	-

On-screen contrast	1800:1
Color	Up to 170% REC709 color triangle
Display technology	Rear projection DLP
White point	Customized white points
Brightness uniformity	Typ. >95% ANSI 9 Typ. >90% ANSI 13
Screen gap	Dependant on screen type
Color stability	Sense X automatic calibration
Dimensions	• Diagonal: 70˝ (Approx.) • Width: 1,550 mm | 61.02˝ • Height: 872 mm | 34.33˝ • Depth: 622 mm | 24.49˝ • Weight: Projection Module: < 63 kg | 139 lbs • Weight: Support frame: < 39 kg | 86 lbs
Light source	RGB lasers illumination (Lasers Class 1 RG2)
Redundancy	Redundant laser banks with redundant power supply drivers, input signal & external power supply
Light source lifetime	> 125,000 hrs in both Normal and Eco mode
Noise Level	Less than 20 dB (measured from 3 meters in front)
Conditions for operation	10°C-40°C | 50°F-104°F Up to 80% humidity (non-condensing)
AC input voltage	100 – 240 VAC, 50-60Hz
Power	120W (eco) 200W (normal)
Heat dissipation	390 BTU/h (eco) 680 BTU/h (typ) 860 BTU/h (max)
Connectivity	2x DP1.2 inputs & 1x output 2x HDMI inputs 2x USB ports (only for power) 2x Ethernet ports
Signal processing	Loop through Cropping, scaling with wall configuration
Direct ethernet access	Built in web server
Graphical user interface	All settings and operational parameters
Integration to third party equipment	WEB service API
Warranty	2 years
Notes	* for ODL Gen2 engine