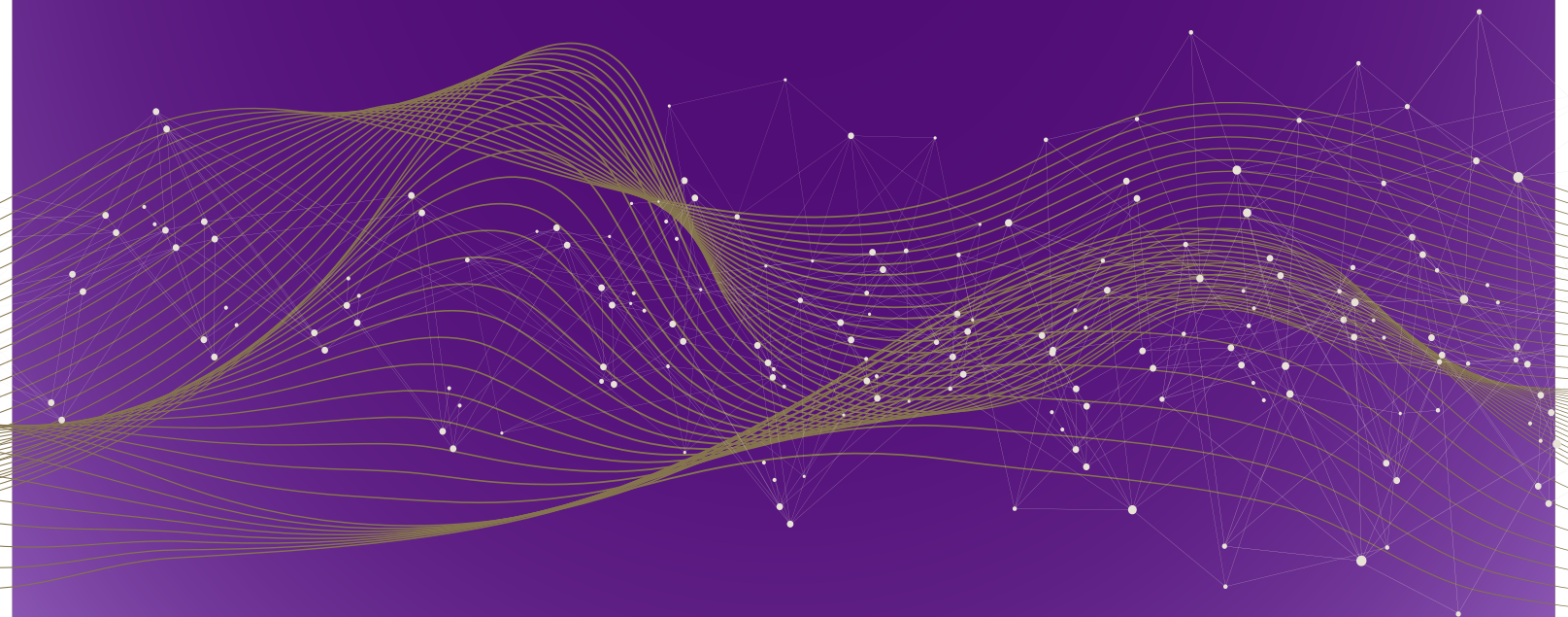


Fueling Growth

with

Seamless Connectivity



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01

Introduction

In today's digital age, having access to reliable and high-speed internet connectivity has transitioned from being a luxury to an absolute necessity, impacting individuals, businesses, and entire communities alike. Yet, the digital divide remains a significant challenge, leaving millions of households worldwide without affordable access to high-speed broadband options.

With the projected 21.3% growth in the number of global internet users between 2022 to 2028, it is evident that establishing a reliable and fast internet connection is not merely a desire but a requirement for a connected life in the digital age.

HFCL acknowledges the pressing need for innovative solutions to bridge this gap and is proud to present its highly efficient software-driven cloud networking solutions, leveraging cutting-edge hardware platforms. These solutions are tailored for small to medium-sized deployments and are scalable to meet the demands of the highest density environments.

As of January 2023,
there are 5.16 billion
internet users spending
an average of 6H and
37M online daily.

In today's world, it's common to see individuals carrying one or more Wi-Fi-enabled devices with them wherever they go. The demand for Wi-Fi delivery products has become essential, facilitating constant connectivity for everyone. In this era of smart products and services where time holds more value than money, IoT connectivity solutions, with their advanced Wi-Fi technology products and solutions, are poised to usher in a transformative shift, redefining the way we connect.

OUR
NETWORK
REACHES | **ANYWHERE
EVERYWHERE**

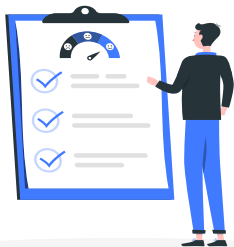
04

io Values

1

io represents an unwavering dedication to delivering excellent Wi-Fi connectivity experiences through the embrace of cutting-edge technology and innovation.

Promised Delivery



2

io stands for its commitment to nurturing business relationships through a display of service excellence. Our brand's service motto, "Leave no stone unturned," serves as the cornerstone of delivering customer delight.

Customer-First Mindset



3

io is not a mere belief; it's a concrete dedication to providing intricate yet easily adaptable Wi-Fi networks, driven by our scalable, high-speed, and dependable products, ensuring flawless wireless connectivity.

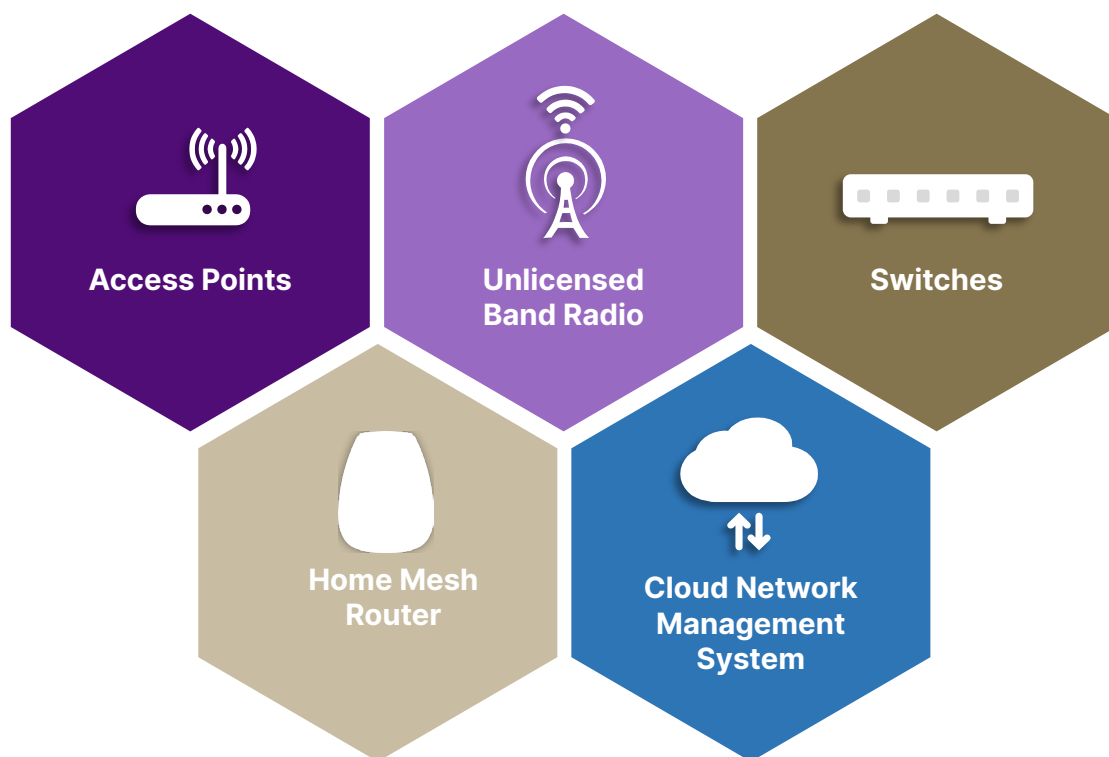
Next Level
Networking
Experience



05

Product Overview

io offers a comprehensive range of product & solutions



A

Access Points

io carrier-grade Access Points (APs) are uniquely designed for high-performance, next-generation networks, providing high capacity for mission-critical and data-intensive applications.

Key Features:

- The Access Points support MU-MIMO, thus providing simultaneous data transmission to multiple devices, maximizing data throughput, and improving network efficiency
- io Access Points provide advanced location and indoor way finding and proximity-based push notification capabilities, enabling businesses to leverage mobility context to develop applications that deliver enhanced user experience and increased value
- All io Access Points are easily configurable and manageable on massively scalable cloud-based management platform iCon cNMS, or it can be operated standalone, using an appliance-based controller and EMS
- The access points offer a peak data rate of up to 11 Gbps, support 1536 simultaneous clients, and support up to 4096 QAM.



World's First Open-Source Wi-Fi 7 Access Point

Indoor | Outdoor Access Points (Coming soon)

4X4:4 Coordinated
MU-MIMO
TB DC Operation in
2.4, 5 & 6 GHz bands

Multilink Operation,
Preamble Puncturing
and Multi-Resource
Unit

Supports IEEE 802.11
a/b/g/n/ac/ax
Wave2/ax/be
standards

EasyMesh, Passpoint
3.0 & WFA certified
Hostpot 2.0.

Outdoor Access Points



(ion12x, ion12xe, ion8x, ion8xe)

Indoor Access Points



(ion12xi, ion8xi)

Tri radio Access Point (ion12xi, ion12x, ion12xe)

- Tri radio concurrent operation with access to one 2.4 and two 5 GHz radios
- ~ 11 Gbps Peak Data Rate
- Support 1536 simultaneous clients, 48 SSIDs
- Up to 4096 QAM
- Option for high gain Omnidirectional Antenna/ External Antenna optimized for maximum coverage & range
- Rugged design with IP67 rated enclosure (outdoor version), UL2043 Plenum certified (indoor version)
- Configurable in standalone mode or via cloud controller

Dual radio Access Point (ion8xi, ion8x, ion8xe)

- Dual radio concurrent operation with access to one 2.4 and one 5 GHz radios
- ~ 6 Gbps Peak Data Rate
- Support 1024 simultaneous clients, 32 SSIDs
- Up to 1024 QAM
- Option for high gain Omnidirectional Antenna/ External Antenna optimized for maximum coverage & range
- Rugged design with IP67 rated enclosure (outdoor version), UL2043 Plenum certified (indoor version)
- Configurable in standalone mode or via cloud controller

Wi-Fi 6

Indoor | Outdoor Access Points

Dual band concurrent operation in 2.4 and 5 GHz bands

4X4:4 MU-MIMO Products, automatic band steering

Supports IEEE 802.11 a/b/g/n/ac/ax Wave2/ax standards

WPA3 Security, WFA certified for Hotspot 2.0 and EasyMesh



Coming soon

Indoor Access Point (ion8xi)

- 4X4:4 MU-MIMO
- 1024 simultaneous clients, 32 SSIDs
- Peak Data Rate: ~6 Gbps
- TX Power ~ 29 dBm
- 5dBi integrated omnidirectional antennas.
- DB DC Operation in 2.4 and 5 GHz bands



Coming soon

Outdoor Access Point (ion8x/ion8xe)

- 4X4:4 MU-MIMO
- 1024 simultaneous clients, 32 SSIDs
- Peak Data Rate: ~6 Gbps
- 8dBi integrated omnidirectional antennas/option for external antenna
- TX Power ~ 29 dBm
- DB DC Operation in 2.4 and 5 GHz bands
- Rugged design with IP67 rated enclosure



Indoor Access Point (ion12xi_h)

- 1024 Simultaneous Clients; 32 SSIDs
- 4X4:4 and 8x8:8 MU-MIMO configuration
- 28 dBm Tx Power
- Peak Data Rate: ~6 Gbps
- 6 dBi Integrated Omni antennas
- DB DC Operation in 2.4 and 5 GHz bands
- Advanced Parental Control



Wall Plate Access Point (ion4xi_WP)

- TIP OpenWiFi compliant
- 256 Simultaneous Clients; 16 SSIDs
- 2X2:2 MU-MIMO
- 23 dBm Tx Power
- 1.8 Gbps Peak Data Rate
- 4 dBi Integrated Omni antennas

Wi-Fi 6

Indoor | Outdoor Access Points

Dual band concurrent operation in 2.4 and 5 GHz bands

2X2:2 MU-MIMO Products, automatic band steering

Supports IEEE 802.11 a/b/g/n/ac/ax Wave2/ax standards

WPA3 Security, WFA certified for Hotspot 2.0 and EasyMesh



Indoor Access Point (ion4xi_w)

- TIP OpenWiFi compliant
- 256 Simultaneous Clients; 16 SSIDs
- 2X2:2 MU-MIMO
- 25 dBm Tx Power
- 3 Gbps Peak Data Rate
- 5 dBi Integrated Omni antennas
- EasyMesh and Passpoint 3.0



Outdoor Access Point (ion4x_w)

- TIP OpenWiFi compliant
- 256 Simultaneous Clients; 16 SSIDs
- 2X2:2 MU-MIMO
- 25 dBm Tx Power
- 3 Gbps Peak Data Rate
- 9 dBi Integrated Omni antennas
- EasyMesh and Passpoint 3.0
- Rugged design with IP67 rated enclosure



Indoor Access Point (ion4xi)

- 1024 Simultaneous Clients; 32 SSIDs
- 2X2:2 MU-MIMO
- 27 dBm Tx Power
- 1.8 Gbps Peak Data Rate
- 4 dBi Integrated Omni antennas
- DB DC Operation in 2.4 and 5 GHz bands



Outdoor Access Point (ion4x/ion4xe)

- 1024 Simultaneous Clients; 32 SSIDs
- 2X2:2 MU-MIMO
- 27 dBm Tx Power
- 1.8 Gbps Peak Data Rate
- Integrated and External antenna options
- Rugged IP67 Enclosure

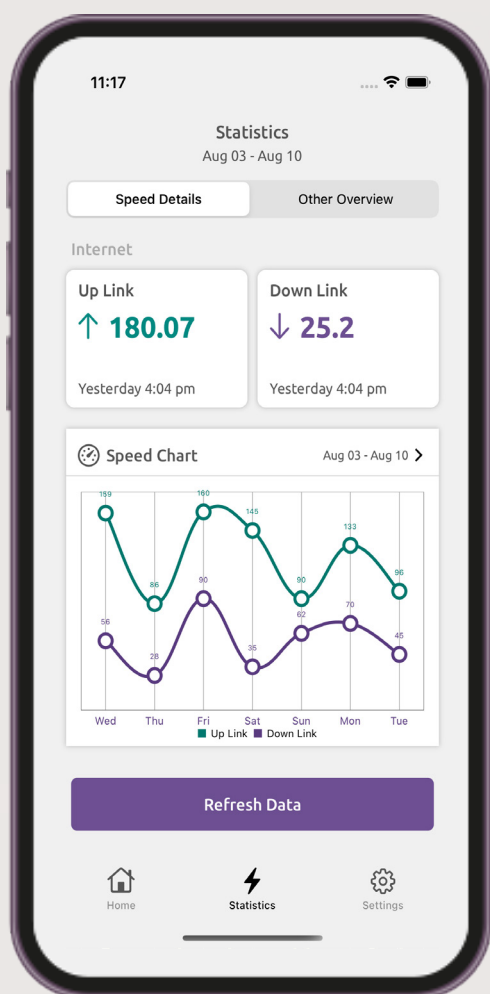
io Weave

Home Mesh Router

io Weave (ion4xi_HMR)

Create your EasyMesh

- Scalable & flexible network that matches your needs
- Mix & match any EasyMesh certified Access Point / Router to create your own home network
- Dual band concurrent operation in 2.4 and 5 GHz bands
- Concurrent data rate up to 3 Gbps
- Supports 256 concurrent users per router



io Weave Mobile App

No Wi-Fi Dead Zones

- Blanket coverage across entire house with high speed Wi-Fi
- Seamless roaming across floors and rooms without any coverage breaks

Secure Home

- Choose what, when and how you want your children to consume content via parental control
- Secure your network by creating a separate network for your guests
- Stay protected with the latest WPA3 security
- Control which devices has access to the internet
- Monitor your network remotely

Network Management

- Plug and play with ease
- Manage your network with our mobile App
- Central control with our cloud management solution, an ideal solution for ISPs and TSPs offering managed home Wi-Fi services

B

Unlicensed Band Radio

P2P | P2MP

io UBR

- io UBR is a feature-rich, affordable Unlicensed Band Radio with 2X2 MIMO support. It provides a throughput of up to 2000 Mbps on the 5 GHz RF band
- Our P2P & P2MP solution is optimally designed to support medium to high capacity enterprise applications in the unlicensed 5 GHz spectrum for short to long range links
- Max Transmit Power 30 dBm for 5 GHz (will depend on country-specific guidelines)
- Its high precision integrated GPS sync technology allows reuse of the same channel at collocated sites, thereby delivering maximum capacity in minimum spectrum

IP67

io UBRs are able to withstand extreme weather elements and harsh environmental conditions without compromising on performance. They are IP67 certified to protect against water and contaminants, ingress

External Antenna

Extend coverage with our wide range of external antennas to cover distant areas without deploying more UBRs

Ease of Installation

UBRs can be mounted on walls & poles. Freedom of movement of the antennas during installation in both horizontal and vertical axis for quick and easy alignment



UBR with External Antenna option



UBR with Dish Antenna



BTS UBR with Sector Antenna



CPE UBR with Dish Antenna

	Throughput	External Antenna	Dish Antenna	Sector Antenna
V. High Capacity*	2000 Mbps	ion4xmle	ion4xmIn	ion4xmIn_BTS
High Capacity	1000 Mbps	ion4xle	ion4xIn	
Medium Capacity	700 Mbps	ion4le	ion4In	ion4In_BTS
Low Capacity	300 Mbps	ion4le_CPE	ion4In_CPE	

*coming soon

2 Gbps Next-Gen Fixed Wireless Access (ngFWA)*



Integrated Dish Antenna (ion4xmln)
25/27 dBi Antenna Variants



External Antenna (ion4xmle)
for >27 dBi Antenna Gain

- 4.9 GHz to 6.4 GHz 2 Gbps Single Radio P2P UBR
- ~2Gbps aggregate UL/DL throughput
- 2×2 MIMO; 1024 QAM, High Capacity TDMA
- Redundant Link Switching supports 1+1 & 2+0 deployments with very less switching time
- High precision integrated GPS sync technology allows reuse of the same channel at collocated sites
- Dying Gasp provides valuable real-time information about the status of a device, aiding in troubleshooting and maintenance
- Designed to withstand and support wind load of up to 180 kmph and perform in extreme weather conditions and extreme temperature (-40° to 55° C)
- Ruggedized PoE to support 6KV surge on telecom and power ports

*Coming soon

- 4.9 GHz to 6.4 GHz 2 Gbps Single Radio P2mP UBR
- ~2Gbps aggregate UL/DL throughput
- Device configurable as Master BTS; Handle up to 20 CPEs
- 2×2 MIMO; 1024 QAM, High Capacity TDMA
- Redundant Link Switching supports 1+1 & 2+0 deployments with very less switching time
- High precision integrated GPS sync technology allows reuse of the same channel at collocated sites
- Dying Gasp provides valuable real-time information about the status of a device, aiding in troubleshooting and maintenance
- Designed to withstand and support wind load of up to 180 kmph and perform in extreme weather conditions and extreme temperature (-40° to 55° C)
- Ruggedized PoE to support 6KV surge on telecom and power ports



Integrated Sector Antenna
(ion4xmln_BTS)
17/19 dBi Antenna Variants

*Coming soon

1 Gbps Unlicensed Band Radio (UBR)



Integrated Dish Antenna (ion4xIn)
23/25/27 dBi Antenna Variants



External Antenna (ion4xle)
(for >27 dBi Antenna Gain)

- P2P UBR with ~1Gbps aggregate UL/DL throughput
- 2x2 MIMO; 1024 QAM, High Capacity TDMA
- Redundant Link Switching supports 1+1 & 2+0 deployments with very less switching time
- IPv4 and IPv6 network protocol support
- High precision integrated GPS sync technology allows reuse of the same channel at collocated sites
- Dying Gasp provides valuable real-time information about the status of a device, aiding in troubleshooting and maintenance
- IP 67 rated Hardware that is designed to withstand and support wind load of up to 180 kmph and perform in extreme temperatures (-40° to 55° C)
- Ruggedized PoE to support 6KV surge on telecom and power ports

700 Mbps Unlicensed Band Radio (UBR)

- P2P UBR with ~700 Mbps aggregate UL/DL throughput
- 2x2 MIMO; 256 QAM
- High Capacity TDMA
- IPv4 and IPv6 network protocol support
- Flexibility for 1+0, 2+0 and 1+1 deployment
- IP67 Rated enclosure



Integrated Dish Antenna (ion4In)
23/25/27 dBi Antenna Variants



External Antenna (ion4le)
(for >27 dBi Antenna Gain)

700 Mbps Unlicensed Band Radio (UBR)



Integrated Sector Antenna (ion4In_BTS)
17/19 dBi Antenna Variants

- P2mP UBR with ~700 Mbps aggregate UL/DL throughput
- 2×2 MIMO; 256 QAM
- Device configurable as Master BTS; Handle up to 16 CPEs
- High Capacity TDMA
- IPv4 and IPv6 network protocol support
- Flexibility for 1+0, 2+0 and 1+1 deployment
- IP67 Rated enclosure
- Remote Management

300 Mbps Unlicensed Band Radio (UBR)



Integrated Sector Antenna (ion4In_CPE)
23/25 dBi Antenna Variants

- P2mP UBR with ~300 Mbps aggregate UL/DL throughput
- 2×2 MIMO; 256 QAM
- High Capacity TDMA
- Device configurable at Slave end
- IPv4 and IPv6 network protocol support
- Flexibility for 1+0, 2+0 and 1+1 deployment
- IP67 Rated enclosure
- Remote Management

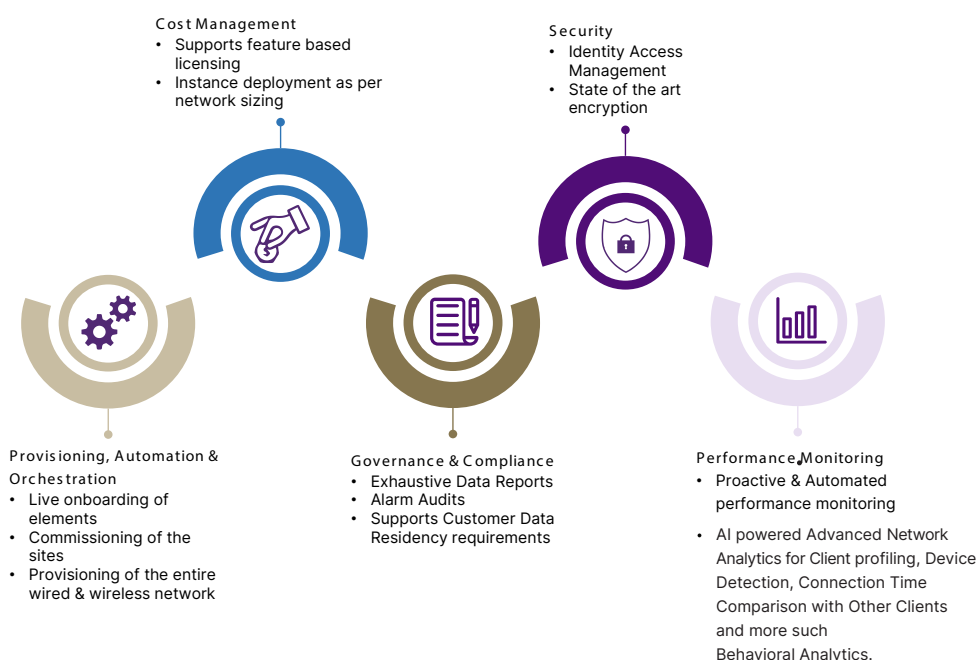
C

Unify cNMS and Unify cNMS Lite Single Window View of Your Entire Network

io Unified Cloud Network Management System combines the functionality of Wireless LAN Controller and Element Management System provides a single window view of all network management & configuration needs. cNMS enables plug-and-play deployments and offers massive scalability with practically no limit on the number of Access Points, *Unlicensed Band Radios and clients supported. Its VM based modular architecture makes it suitable for any cloud deployment, be it existing cloud infrastructure or a hybrid cloud mode.

The Lite version of the Unify cNMS is appropriate for small scale deployments that require support for up to 1000 network elements. The Unify cNMS Lite can be seamlessly configured on a laptop/ desktop/ Virtual Machine having basic system configurations.

Key Features



Why Unify cNMS

Enterprises, big or small, have few big asks when evaluating network architecture alternatives such as:



D

Switches

Industrial Access Switch

8-PORT Industrial L2

HSP-IO-8GE2S-I2PDH

HFCL 8-Port PoE+ L2 Managed Industrial Switch with 2×1G SFP and 2×1G RJ45 Uplinks and Dual DC Power Supplies



Overview

- Fully L2 Managed Switch
- All Gigabit Ethernet Ports in a fixed 1U configuration
- 8 1G PoE+ capable access ports
- 4 1G Uplink Ports that allow termination of both fiber and copper simultaneously
- Dual Redundant Power supply for high availability
- Rugged Design with DIN rail mount for outdoor installation
- Up to 24 Gbps Switching capacity and up to 12 Gbps of Full-Duplex Throughput
- PoE Variants Suitable in an enterprise/telco environment to connect end PoE clients like Wi-Fi AP, CCTV, P2P, P2MP, IoT, etc

Commercial Access Switch

8-PORT L2

HSP-IO-8GE2S-C2A

HFCL 8-Port Non-PoE L2 Managed Switch with 2×1G SFP and 2×1G RJ45 Uplinks and Single AC Power Supplies



Overview

- Fully Managed L2 Switch
- All Gigabit Ethernet Ports in a fixed 1U configuration
- Eight 1G Access ports with PoE and Non-PoE Options
- Four 1G Uplink Ports that allow termination of both fiber and copper simultaneously
- Multiple Power Supply options (Single, Redundant, Universal (AC+DC)) to choose from
- Up to 24 Gbps Switching capacity and up to 12 Gbps of Full-Duplex Throughput
- PoE Variants Suitable in an enterprise/telco environment to connect end PoE clients like Wi-Fi AP, CCTV, P2P, P2MP, IoT, etc.
- Non-PoE Variants Suitable to connect Small Cells / BTS, P2P/P2MP, etc. in telco environment and Desktops/ Servers, IP-Phone, etc. in an Enterprise environment

Commercial Access Switch

HSP 8-Port L2 Managed Switch Variants

Model: HSP-IO-8GE2S-C2PA

HSP 8-Port PoE+ L2 Managed Switch with 2×1G SFP and 2×1G RJ45 Uplinks and Single AC Power Supply

Model: HSP-IO-8GE2S-C2PD

HSP 8-Port PoE+ L2 Managed Switch with 2×1G SFP and 2×1G RJ45 Uplinks and Single DC Power Supply

Model: HSP-IO-8GE2S-C2A

HSP 8-Port Non-PoE L2 Managed Switch with 2×1G SFP and 2×1G RJ45 Uplinks and Single AC Power Supply

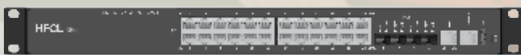
Model: HSP-IO-8GE2S-C2D

HSP 8-Port Non-PoE L2 Managed Switch with 2×1G SFP and 2×1G RJ45 Uplinks and Single DC Power Supply

24-PORT

HSP-IO-24GE4XS-C2AH

HFCL 24-Port Non-PoE L2 Managed Switch with SFP Uplinks and Dual AC Power Supplies



Overview

- Fully Managed L2 Switch
- All Gigabit Ethernet Ports in a fixed 1U configuration
- 24 1G Access ports with PoE and Non-PoE Options
- Multiple Power Supply options (Single, Redundant) to choose from
- PoE Variants Suitable in an enterprise/telco environment to connect end PoE clients like Wi-Fi AP, CCTV, P2P, P2MP, IoT, etc.
- Non-PoE Variants Suitable to connect Small Cells / BTS, P2P/P2MP, etc. in telco environment and Desktops/ Servers, IP-Phone, etc. in an Enterprise environment
- L3 Lite Features: Dynamic Routing Protocols - OSPFv2, RIPv1/v2, PBR, ECMP, PIM, Gateway Redundancy Protocol - VRRP
- Routing Entries (IPv4/IPv6): 1K (L3 Variants only)

HSP 24-Port L2 Managed Switch Variants

Model: HSP-IO-24GE4XS-C2A

HSP 24-Port Non-PoE L2 Managed Switch with SFP Uplinks and Single AC Power Supply

Model: HSP-IO-24GE4XS-C2AH

HFCL 24-Port Non-PoE L2 Managed Switch with 4×1/10G SFP+ Uplinks and Dual AC Power Supplies

Model: HSP-IO-24GE4XS-C2PAH

HSP 24-Port PoE+ L2 Managed Switch with SFP Uplinks and Dual AC Power Supplies

Model: HSP-IO-24S4XS-C2AH

HSP 24-Port SFP L2 Managed Switch with 4×10G SFP+ Uplinks and Dual AC Power Supplies

F

Element Management System



io Element Management System (iEon) is a smart, secure, and scalable yet easy-to-use application suite that offers a comprehensive set of network management tools easily accessible from a client workstation with just a web browser. iEon has full FCAPS (Fault, Configuration, Accounting, Performance, and Security) implementation to manage all network elements. It has the flexibility to run on any carrier-grade x86 server and has backup and restore functionality.

07

The Best of HFCL Limited

HFCL is a leading technology company specialising in creating digital networks for telcos, enterprises and governments. Over the years, HFCL has emerged as a trusted partner offering sustainable high tech solutions with a commitment to provide the latest technology products to its customers. Our strong R&D expertise coupled with our global system integration services and decades of experience in fibre optics enable us to deliver innovative digital network solutions required for the most advanced networks.

The Company's in-house R&D Centres located at Gurgaon & Bengaluru along with invested R&D Houses and other R&D collaborators at different locations in India and abroad, innovate a futuristic range of technology products and solutions. HFCL has developed capabilities to provide premium quality Optical Fiber and Optical Fiber Cables, state-of-the-art telecom products including 5G Radio Access Network (RAN) products, 5G Transport Products, WiFi Systems (WiFi 6, WiFi 7), Unlicensed Band Radios, Switches, Routers and Software Defined Radios.

The Company has state-of-the-art Optical Fiber and Optical Fiber Cable manufacturing plants at Hyderabad, Optical Fiber Cable manufacturing plant in Goa and in its subsidiary HTL Limited at Chennai.

We are a partner of choice for our customers across India, Europe, Asia Pacific, Middle East, Africa and USA. Our commitment to quality and environmental sustainability inspires us to innovate solutions for the ever-evolving customer needs.

A hand holding a smartphone, with a cityscape and network lines in the background.

“ Developing an Effective Wired & Wireless Network Connectivity “



IO by HFCL

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