

# NPT 1022 Family

High Capacity CPE and Access Edge Router



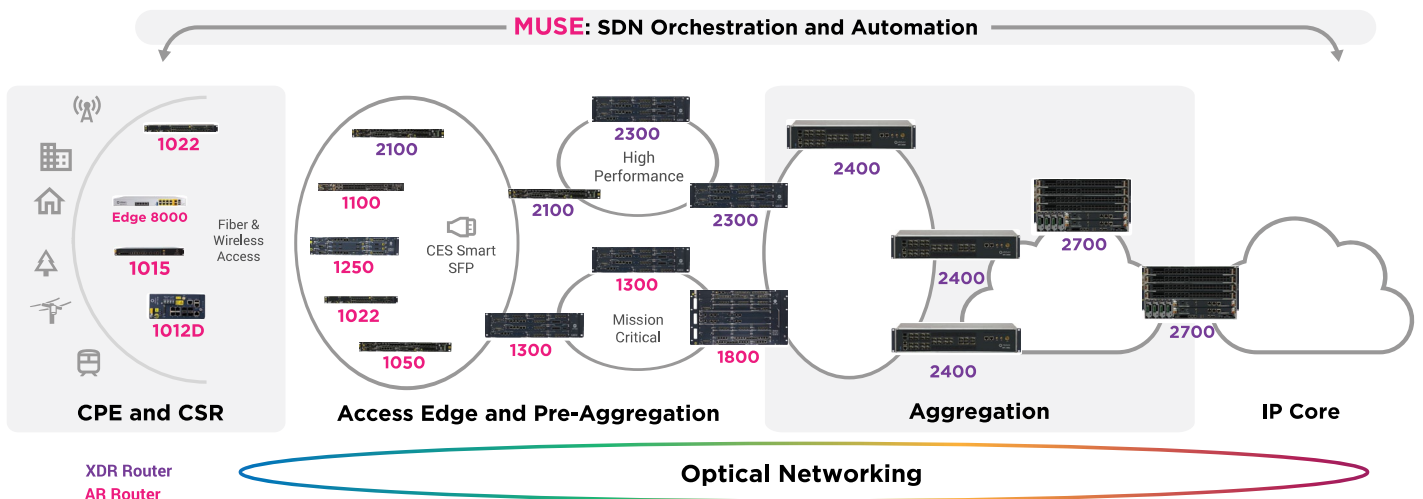
NPT 1022 provides support for multiple access technologies making it ideal for operators wanting highcapacity, compact CPE device or access edge router which provides support for new and legacy services.



NPT 1022 provides 64 Gbps switching capacity and a generous fan-out for 10G/GE interfaces in a 1RU form factor. It provides support for multiple access technologies such as Ethernet, MPLS, PON and legacy TDM(CES), making it the ideal solution for deployment as a multi-access CPE or access edge device. With a full set IP/MPLS and MPLS-TP transport capabilities and OTN mapping, the NPT 1022 can efficiently aggregate and route the services over the network, meeting their service performance needs (SLAs) on a service by service basis.

With such a rich and robust feature-set, NPT 1022 is well suited for a wide variety of applications and networking scenarios, these include:

- TDM migration: supporting voice trunk and legacy service migration with circuit emulation services (CES) mapping a full range of legacy TDM interface speeds onto the packet switched network (PSN)
- Access Edge and CPE for Business services: a full range of Ethernet interfaces and full set of IP protocols ensure services are transported to meet the SLA's on a per service basis
- PON infill: with a 10GSFP+ OLT Optics pluggable module providing XGS-PON/EPON connectivity supporting up to 128 ONUs per OLT
- Converged Multi-access: Supporting 5G, broadband backhaul, business services, PON and TDM migration all from a single converged platform
- The NPT 1022B is an enhancement to the NPT 1022 base model, featuring a built-in GNSS receiver and double the controller memory size
- The NPT 1022H is an enhancement to the NPT 1022 base mode, adding G8275.2 timing



## Key NPT 1022 Family Product Specifications

### Platform

| Description                    | Specification                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                | NPT 1022                                                                                                                                                                                                                                                                                                                                                                                      | NPT 1022B                                                                                                                                                                                                                                                                                                                                                                                 | NPT 1022H                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Chipset</b>                 | • Qumran- UX                                                                                                                                                                                                                                                                                                                                                                                  | • Qumran- UX                                                                                                                                                                                                                                                                                                                                                                              | • Qumran- UX                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>CPU</b>                     | • 8-cores PPC                                                                                                                                                                                                                                                                                                                                                                                 | • 8-cores PPC                                                                                                                                                                                                                                                                                                                                                                             | • 8-cores PPC                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Memory</b>                  | • 4G DDR3                                                                                                                                                                                                                                                                                                                                                                                     | • 8G DRAM                                                                                                                                                                                                                                                                                                                                                                                 | • 4G DDR3 DRAM                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Storage</b>                 | • 8GB                                                                                                                                                                                                                                                                                                                                                                                         | • 32GB eMMC                                                                                                                                                                                                                                                                                                                                                                               | • 8GB eMMC                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Interfaces</b>              | <ul style="list-style-type: none"> <li>• 4 x 10/100/1000 Base-T</li> <li>• 12 x 100/1000 Base-X</li> <li>• 4 x 10/1GE</li> <li>• Max Fan-Out               <ul style="list-style-type: none"> <li>- 30xGE</li> <li>- 6x10GE</li> </ul> </li> </ul>                                                                                                                                            | <ul style="list-style-type: none"> <li>• 4 x 10/100/1000 Base-T</li> <li>• 12 x 100/1000 Base-X</li> <li>• 4 x 10/1GE</li> <li>• Max Fan-Out               <ul style="list-style-type: none"> <li>- 30xGE</li> <li>- 6x10GE</li> </ul> </li> </ul>                                                                                                                                        | <ul style="list-style-type: none"> <li>• 4 x 10/100/1000 Base-T</li> <li>• 12 x 100/1000 Base-X</li> <li>• 4 x 10/1GE</li> <li>• Max Fan-Out               <ul style="list-style-type: none"> <li>- 30xGE</li> <li>- 6x10GE</li> </ul> </li> </ul>                                                                                                                                                         |
| <b>Performance</b>             | • 64Gbps                                                                                                                                                                                                                                                                                                                                                                                      | • 64Gbps                                                                                                                                                                                                                                                                                                                                                                                  | • 64Gbps                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Power Supplies</b>          | • 2 hot swappable with 1+1 redundancy                                                                                                                                                                                                                                                                                                                                                         | • 2 hot swappable with 1+1 redundancy                                                                                                                                                                                                                                                                                                                                                     | • 2 hot swappable with 1+1 redundancy                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Cooling</b>                 | <ul style="list-style-type: none"> <li>• 1 Fan</li> <li>• Airflow – right to left</li> </ul>                                                                                                                                                                                                                                                                                                  | <ul style="list-style-type: none"> <li>• 1 Fan</li> <li>• Airflow – right to left</li> <li>• Integrated Air Filter</li> </ul>                                                                                                                                                                                                                                                             | <ul style="list-style-type: none"> <li>• 1 Fan</li> <li>• Airflow – right to left</li> <li>• Integrated Air Filter</li> </ul>                                                                                                                                                                                                                                                                              |
| <b>Timing</b>                  | <ul style="list-style-type: none"> <li>• SyncE with ESMC</li> <li>• 1588v2</li> <li>• External timing 1PPS and TOD</li> <li>• Internal stratum 3E clock (holdover state)</li> <li>• Primary and secondary sources (supports SSM bits)</li> <li>• ACR, DCR</li> <li>• G.8262.1, G.8275.1</li> <li>• G.8273.2 – class C</li> <li>• Loop timing on SAToP, TDM bits (T3/ T4), and SNTP</li> </ul> | <ul style="list-style-type: none"> <li>• SyncE with ESMC</li> <li>• 1588v2</li> <li>• External timing 1PPS and TOD</li> <li>• Internal stratum 3E clock (holdover state)</li> <li>• Primary and secondary sources (supports SSM bits)</li> <li>• ACR, DCR</li> <li>• G.8262.1, G.8275.1</li> <li>• G.8273.2 – class C</li> <li>• Loop timing on SAToP, GNSS receiver, and SNTP</li> </ul> | <ul style="list-style-type: none"> <li>• SyncE with ESMC</li> <li>• 1588v2</li> <li>• External timing 1PPS and TOD</li> <li>• Internal stratum 3 clock (holdover state)</li> <li>• Primary and secondary sources (supports SSM bits)</li> <li>• ACR, DCR</li> <li>• Loop timing on SAToP, BITS (T3/4) and SNTP</li> <li>• Supported profiles : G.8262.1, G.8275.1, G.8275.2, G.8273.2 - class C</li> </ul> |
| <b>Physical Specifications</b> | <ul style="list-style-type: none"> <li>• 1RU</li> <li>• Dimension: 483 mm (W) x 243 mm (D) x 44mm (H)</li> <li>• Weight: 3.21Kg</li> </ul>                                                                                                                                                                                                                                                    | <ul style="list-style-type: none"> <li>• 1RU</li> <li>• Dimension: 483 mm (W) x 243 mm (D) x 44mm (H)</li> <li>• Weight: 3.21Kg</li> </ul>                                                                                                                                                                                                                                                | <ul style="list-style-type: none"> <li>• 1RU</li> <li>• Dimension: 483 mm (W) x 243 mm (D) x 44mm (H)</li> <li>• Weight: 3.21Kg</li> </ul>                                                                                                                                                                                                                                                                 |

## Environmental

| Description                               | Specification                            |                                          |
|-------------------------------------------|------------------------------------------|------------------------------------------|
|                                           | NPT 1022                                 | NPT 1022 (B, H)                          |
| <b>Operating environment and altitude</b> | • -25°C to +70°C (-13°F to 158°F)        | • -25°C to +65°C                         |
| <b>Operating humidity</b>                 | • 5% to 95%                              | • 5% to 95%                              |
| <b>Altitude</b>                           | • Up to 4000 m                           | • Up to 4000 m                           |
| <b>Acoustics</b>                          | • NEBS GR-63-CORE                        | • NEBS GR-63-CORE                        |
| <b>Power over Ethernet (PoE+)</b>         | • Up to 30W                              | • Up to 30W                              |
| <b>Power input</b>                        | • -40 VDC to -72 VDC, 110 VAC to 230 VAC | • -40 VDC to -72 VDC, 110 VAC to 230 VAC |
| <b>Power dissipation</b>                  | • 50W                                    | • 50W                                    |

## Multi-access Capabilities for NPT 1022 Family

| Description               | Specification                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>L2/L3 VPN Services</b> | <ul style="list-style-type: none"> <li>• L2VPN - MEF 3.0 (IP-MPLS and MPLS-TP)               <ul style="list-style-type: none"> <li>• E-Line</li> <li>• E-LAN</li> <li>• E-Tree</li> <li>• E-Access</li> </ul> </li> <li>• Ethernet Virtual Private Network (EVPN)               <ul style="list-style-type: none"> <li>• Virtual Private Wire Service (EVPN-VPWS, EVPN-ELINE)</li> <li>• Virtual Private LAN Services (EVPN-VPLS, EVPN-ELAN)</li> <li>• Anycast IRB with IPv4 and IPv6 support</li> <li>• Multihoming – Active-Active, Single-Flow-Active, Port-Active</li> <li>• PW Virtual Ethernet Segment</li> </ul> </li> <li>• L3VPN               <ul style="list-style-type: none"> <li>• IPv4 VRF</li> <li>• 6VPE</li> <li>• IRB, PHT</li> </ul> </li> </ul> |
| <b>IP Over DWDM</b>       | <ul style="list-style-type: none"> <li>• Colored C/DWDM</li> <li>• Tunable G.709 FEC/eFEC</li> <li>• Amplifiers</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>TDM Services</b>       | <ul style="list-style-type: none"> <li>• Circuit Emulation Services (CES)               <ul style="list-style-type: none"> <li>• SAToP</li> <li>• CESoPSN</li> <li>• CEP</li> </ul> </li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>TDM Pluggables</b>     | <ul style="list-style-type: none"> <li>• E1/T1</li> <li>• E3/DS3</li> <li>• STM-1/OC-3</li> <li>• STM-4/OC-12</li> <li>• STM-16/OC-48</li> <li>• 1 x STM-16/OC-48 (per smart SFP)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>TDM Interfaces</b>     | <ul style="list-style-type: none"> <li>• Max. Interfaces:               <ul style="list-style-type: none"> <li>• 32 x E1/T1</li> <li>• 4 x STM-1/OC-3</li> <li>• 1 x STM-4/OC-12</li> <li>• 1 x STM-16/OC-48 (per smart SFP)</li> </ul> </li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>PON Pluggables</b>     | <ul style="list-style-type: none"> <li>• Smart SFP 10G XGS-PON - 10G SFP+ OLT optics modules</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

## Software features provided by the Ribbon IP Wave rNOS

| Description                 | Specification                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Layer 2</b>              | <ul style="list-style-type: none"> <li>• Layer 2 forwarding and bridging</li> <li>• Bridge Domains (BD)</li> <li>• Flexible VLAN-Tagging</li> <li>• IEEE 802.1Q VLANs and Q-in-Q</li> <li>• Ethernet Link Aggregation Group (LAG)</li> <li>• Link Aggregation Control Protocol (LACP) 802.3ad</li> <li>• G.8032</li> <li>• Spanning Tree Protocol</li> <li>• Jumbo frames on all ports</li> </ul>                                                                                                                                                                                                                                                                  |
| <b>Layer 3</b>              | <ul style="list-style-type: none"> <li>• IPv4 and IPv6 unicast routing</li> <li>• Layer 3 interfaces: physical interfaces and logical interfaces (Units).</li> <li>• Virtual Routing and Forwarding (VRF)</li> <li>• Open Shortest Path First (OSPFv2, OSPFv3)</li> <li>• Intermediate System to Intermediate System (ISIS)</li> <li>• Multiprotocol Border Gateway Protocol (MP-BGP)</li> <li>• Equal-Cost Multipath (ECMP)</li> <li>• Bidirectional Forwarding Detection (BFD), MH-BFD</li> <li>• Virtual Router Redundancy Protocol (VRRP)</li> <li>• Integrated Routing Bridging (IRB), Anycast IRB</li> <li>• Pseudowire Headend Termination (PHT)</li> </ul> |
| <b>MPLS</b>                 | <ul style="list-style-type: none"> <li>• Label switching (LER, LSR)</li> <li>• Label Distribution Protocol (LDP)</li> <li>• BGP Labeled Unicast (BGP-LU)</li> <li>• MPLS-TP</li> <li>• MPLS Traffic Engineering with RSVP-TE, SR-TE</li> <li>• Point-to-point L2VPN – Static, T-LDP, EVPN-VPWS</li> <li>• Multipoint L2VPN – VPLS, EVPN</li> <li>• EVPN with Anycast IRB</li> <li>• 6VPE</li> <li>• IP Loop-Free Alternate (LFA) Fast Reroute (FRR)</li> <li>• RSVP-TE Fast Reroute (FRR) and Path-Protection</li> </ul>                                                                                                                                           |
| <b>Segment Routing (SR)</b> | <ul style="list-style-type: none"> <li>• SR-MPLS</li> <li>• ISIS, OSPF, BGP extensions to segment routing</li> <li>• TI-LFA</li> <li>• Segment Routing Traffic Engineering (SR-TE, SR Policies) <ul style="list-style-type: none"> <li>• PCE, PCC initiated SR Policies</li> <li>• Path Protection</li> <li>• TI-LFA Local Repair Protection</li> <li>• Anycast SID</li> <li>• Binding SID</li> </ul> </li> <li>• SR, SR-TE OAM</li> <li>• Flexible Algorithm</li> <li>• BGP Color Extended Community</li> </ul>                                                                                                                                                   |

## Software features provided by the Ribbon IP Wave rNOS

| Description                     | Specification                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Multicast</b>                | <ul style="list-style-type: none"> <li>• IPv4 and IPv6 Multicast Routing</li> <li>• PIM-SM, PIM-SSM, PIM-ASM</li> <li>• IGMPv3, MLDv2</li> <li>• MSDP</li> <li>• Anycast RP</li> <li>• BGP IPv4 Multicast</li> </ul>                                                                                                                                                                                                                     |
| <b>Quality of Service (QoS)</b> | <ul style="list-style-type: none"> <li>• Class-based 3-level Hierarchical QoS</li> <li>• Virtual Output Queueing (VOQ)</li> <li>• Policing, Shaping</li> <li>• Multi-level priority queuing</li> <li>• Classification based on L2/L3/L4 fields</li> <li>• Remarking</li> <li>• Weighted Random Early Detection (WRED)</li> <li>• Deep packet buffer</li> </ul>                                                                           |
| <b>OAM</b>                      | <ul style="list-style-type: none"> <li>• Ethernet OAM - IEEE802.3ah, IEEE 802.1ag and ITU-T Y.1731 PM</li> <li>• IP OAM - BFD, Ping, Trace-route, TWAMP</li> <li>• MPLS-TP OAM - G8113.2, RFC5860, BFD</li> <li>• MPLS OAM – Ping/Traceroute MPLS</li> <li>• RFC 2544 Generator, Y.1564</li> <li>• LLDP</li> <li>• DHCP Relay</li> <li>• Streaming Telemetry</li> <li>• sFlow</li> <li>• Link Delay-Measurement</li> </ul>               |
| <b>Security</b>                 | <ul style="list-style-type: none"> <li>• Control-plane and management plane protection</li> <li>• Authentication, Authorization, and Accounting (AAA)</li> <li>• RADIUS</li> <li>• Terminal Access Controller Access-Control System Plus (TACACS+)</li> <li>• Secure Shell (SSH)</li> <li>• Layer 2 and Layer 3 ingress Firewall filters (ACL)</li> <li>• Unicast Reverse Path Forwarding (Unicast RPF)</li> <li>• IEEE802.1x</li> </ul> |
| <b>Manageability</b>            | <ul style="list-style-type: none"> <li>• CLI</li> <li>• LCT</li> <li>• SNMP MIB</li> <li>• NETCONF/gRPC - XML, JSON, GPB</li> <li>• YANG models - OpenConfig, IETF</li> <li>• Muse software suite (SDN orchestration and control)</li> <li>• LightSOFT® NMS</li> <li>• Zero-Touch Provisioning (ZTP)</li> </ul>                                                                                                                          |

## Standards Compliance for NPT 1022 Family

| Description   | Specification                                                                                                                                                                                                 |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Regulatory    | Products should comply with CE markings according to directives 2014/30/EC and 2014/35/EC                                                                                                                     |
| NEBS          | Certified with GR-63, GR-1089 and GR-3160                                                                                                                                                                     |
| Safety        | <ul style="list-style-type: none"> <li>• IEC 62368-1</li> <li>• UL 62368-1</li> <li>• IEC 60825-1 for lasers</li> <li>• IEC 60825-2 for lasers</li> </ul>                                                     |
| EMS Standards | <ul style="list-style-type: none"> <li>• FCC CFR 47 Part 15 Subpart B ANSI C63.4</li> <li>• IEC 61850-3</li> <li>• IEEE 1613</li> <li>• ETSI EN 50121-4</li> <li>• IEC 62236-4</li> <li>• FTZ 1TR9</li> </ul> |
| EMC Immunity  | <ul style="list-style-type: none"> <li>• ETSI EN 300 386</li> <li>• IEC 61000-4 series</li> </ul>                                                                                                             |
| ETSI          | <ul style="list-style-type: none"> <li>• ETSI EN 300 019 - Storage: Class 1.1, Transportation: Class 2.3, In-Use/Operational: Class 3.1</li> <li>• QM 333</li> <li>• ETSI EN 300 753</li> </ul>               |
| RoHS          | <ul style="list-style-type: none"> <li>• Compliance per EU RoHS, RoHS 2 directive 2011/65/EU and amendment 2015/863/EU directives.</li> </ul>                                                                 |

*Specifications subject to change without notice*

**Contact Us**

We are here to help. Contact us about our IP Wave solutions.

### About Ribbon

Ribbon Communications (Nasdaq: RBBN) delivers communications software, IP and optical networking solutions to service providers, enterprises and critical infrastructure sectors globally. We engage deeply with our customers, helping them modernize their networks for improved competitive positioning and business outcomes in today's smart, always-on and data-hungry world. Our innovative, end-to-end solutions portfolio delivers unparalleled scale, performance, and agility, including core to edge software-centric solutions, cloud-native offers, leading-edge security and analytics tools, along with IP and optical networking solutions for 5G. We maintain a keen focus on our commitments to Environmental, Social and Governance (ESG) matters, offering an annual Sustainability Report to our stakeholders. To learn more about Ribbon, please visit [ribbon.com](https://www.ribbon.com).