



## T5R FAMILY

### 10/100/1000M RUGGEDIZED ETHERNET SWITCH

The T5R family is a 10/100/100 Mbps ruggedized Ethernet switches that provide high performance in a super-compact enclosure. Designed for military and harsh environments, these hardened and sealed enclosure comply with mechanical requirements as specified in MIL-STD-810F.

With auto-sensing 10/100/1000BaseT Fast Ethernet connections, Gigabit copper and fiber uplinks, the T5R is tailor-made for high-density IP services in space-constrained airborne and ground communications environments. The switches can support IP connectivity for radar systems, signals intelligence, UAV data lines, and mobile communications.

T5R can be field upgraded from L2 to L3 without incurring down-time.

#### AccessEthernet™

Advanced Layer 2 Networking using Telco Systems' AccessEthernet™ allows total flexibility in deployment, provisioning, and delivery of Ethernet services. Physical and virtual networking capabilities provide automated address management and discovery, bandwidth profiles, advanced traffic classes, and complete control over how subscriber traffic is transported across a service provider's network.

#### High Availability Rings

Network ring architectures offer greater efficiency, costs savings, and flexibility, allowing multiple services to be consolidated, transported, and drop/inserted as needed. The inherent redundancy, resiliency and re-routing capabilities of ring technology result in increased reliability and high network availability.

The T5R ruggedized switches offer a unique Ethernet Fast Ring technology with recovery time, for link or switch failure, of less than 50ms (verified in rings comprised of up to 14 switches). T5R's software implementation is fully standards-based and is fully interoperable with other standards-based products deployed in the same ring.

#### State-of-the-industry Management

The T5R ruggedized switches utilize the Telco Systems® BiNOST™ field proven, carrier grade operating system. BiNOS features a robust and advanced Layer 2 – 4 software platform geared toward satisfying the most stringent requirements for operations, administration, and management.

These switches are fully manageable via SNMP, CLI, or the web with either In-band (IB) or Out-of-Band (OOB) management tools. The CLI complies with the de facto industry standard and enables administration via a user friendly interface.



### PRODUCT HIGHLIGHTS

- MIL-STD-810F Compliant
- Wire speed, non-blocking Layer 2 switching
- Extensive set of routing capabilities: static routing, RIP, OSPF, IS-IS, VRRP
- TLS for E-2-E tunneling
- Jumbo frames support
- Sub 50ms switch-over time in Ethernet rings
- Link Aggregation (802.3ad & LACP) broadens the bandwidth between switches, adding robustness and redundancy
- 1+1 link redundancy
- Redundant power option
- Extensive QoS support includes traffic classification, rate-limiting, queuing, shaping and congestion avoidance
- Comprehensive set of security features for authentication, connectivity and access control
- Professional management tools provides a vast variety of management methods
- Low power consumption
- Supports singlemode, multimode, single-strand bi-directional, and CWDM SFP optics
- MEF and IEEE standards compliance
- Field upgradeable from L2 switching to L3 routing

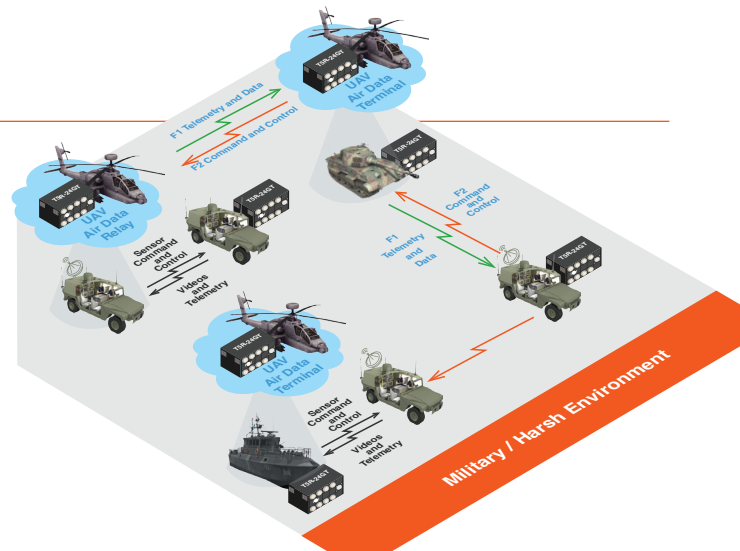
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## 10/100/1000M RUGGEDIZED ETHERNET SWITCH

### PRODUCT SPECIFICATIONS

<b>Hardware Characteristics</b>	<b>T5C-24GT</b> 18 x 10/100/1000BaseT ports 4 x 1000BaseSX/LX uplink port ,SFP copper compatible 1.4" H x 10" W x 14.25" L, optional 3 switches stacking Weight 2.5 kg Power 20 - 30 VDC MIL-STD-704E, optional dual feed
	<b>T5C-24T</b> 22 x 10/100/BaseT ports 2 x 10/100/1000BaseT ports 2 x 1000BaseSX uplink port, SFP cooper compatible 1.4" H x 10" W x 14.25" L, optional 3 switches stacking Weight 2.5 kg. Power 20 - 30 VDC MIL-STD-704E, optional dual feed

<b>Environment</b>	Operating: -40°C to 55°C (optional for +70°C) Altitude: from SL to 45,000 ft operation & non-operation Humidity: operating/storage 95% at 35°C Vibration: MIL-810/810F Shock: MIL-810/810F
<b>Resiliency</b>	xSTP, resilient link, LAG (includes static/IEEE 802.3ad LACP)
<b>Quality of Service</b>	Per port rate limiting and shaping, SP, WRR and hybrid frames scheduling, CoS marking and mapping
<b>Multicast Management</b>	IGMP snooping v1/v2 Multicast VLAN registration (MVR)
<b>Testing &amp; Monitoring</b>	ITU-T Y.1731 SM*
<b>Routing</b>	Static routing, RIP, DHCP server, IRDP, traffic shaping, VRRP, OSPF, PIM-DM/SM (hardware dependent) additional
<b>Management</b>	Console, Telnet, SSHv2, Radius, TACACS+, SNMP v1/2/3, xFTP, NTP, DNS resolver, DHCP client
<b>Security</b>	RADIUS, SSHv2, SNMPv3, port security



### KEY APPLICATIONS

- ▣ Airborne communications
- ▣ Radar Systems
- ▣ Signals Intelligence (SIGINT)
- ▣ Embedded Diagnostics and Testing
- ▣ Telecommunications and Enterprise
- ▣ Unmanned Aerial Vehicle (UAV) Data Links
- ▣ Marine, railroad, and other transportation automation
- ▣ Hostile military environments

### ORDERING INFORMATION

Part Number	Description
<b>T5R-24T-RUG-Opt[x]</b>	22 ports 10/100BaseTX Compact L2, L3 & L4 routing switch with 2 10/100/1000BaseT uplinks, Optional additional 2 unpopulated 1000BaseX miniGBIC (SFP) modules. BiNOS-STD SW enabled. Upgradeable to BiNOS-ML and BiNOS-ML-Adv. Licensing*. DC single-feed power supply. NEBS certified, Telecom-grade switch.
<b>T5R-24GT-RUG-Opt[x]</b>	18 fixed Gigabit Ethernet 10/100/1000BaseT ports and 4 unpopulated 1000BaseX miniGBIC (SFP) Dual PHY ports. BiNOS-STD SW enabled. Upgradeable to BiNOS-ML and BiNOS-ML-Adv. Licensing. DC single-feed power supply. NEBS certified, Telecom-grade switch.
Option 1	Extended Temp. (-40° C- +55° C)
Option 2	RS422 connector instead of RS232
Option 3	Additional 2 Fiber Optics Ports
<b>T5R-24GT-RUG-NGC</b>	Dual feed, 4 x Cooper SFPs (-40 -70° C) BiNOS-ML/BiNOS-ML-ADV
<b>Software Options</b>	
<b>BiNOS-STD</b>	Access Control List (ACL), Rate Limit, VLANs, STP, RSTP, MSTP, 802.1p, TLS, DiffServ, Security, 802.1x, Link Aggregation, Resilient Link (additional features may appear in future software versions)
<b>BiNOS-ML soft</b>	BiNOS-STD + Static Routing, RIP, DHCP Server, IRDP, Traffic Shaping, VRRP (additional features may appear in future software versions) - these features can be ordered already loaded on the switch or as a certificate that can be used to enable the software in the field. Please specify which option is required with your order
<b>BiNOS-ML-adv soft</b>	BiNOS-ML+ OSPF, BGP (HW dependant), PIM-DM/SM (HW dependent) Additional features may appear in future software versions) - these features can be ordered already loaded on the switch or as a certificate that can be used to enable the software in the field. Please specify which option is required with your order
<b>BiNOS-UPG-KIT</b>	Upgrade kit from BiNOS-STD or BiNOS-ML to BiNOS-ML-Adv.



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