



Outstanding Network Solution for Hardened Environment  
Select your new network engine!

As a leading provider of network equipment for Industrial Communication, Benchu group understands the importance of providing stability and safety that can adapt to your business' needs, whether in the Safe City, Traffic, Mining, industrial automatic, Power or energy.

The IES7521-48GE4TF-AC meet EMC industrial level 4 requirements. The product supports wide power input voltage range of 100-260V AC redundant power with reverse polarity protection and wide operating temperature range of -30 to the +75°C.

The switches can be easily installed on a 19in rack as well as in distribution boxes. Each product has passed a 100% burn-in test to ensure its quality high-reliability transmission. supports SSHv2, TLS and SSL protocols to provide strong protection against advanced threats. It includes a range of cybersecurity features such as DHCP Snooping, IP Source Guard, ARP Inspection Protection, 802.1x port-based and MAC-based network access control, RADIUS and TACACS+ user accounts management, SNMPv3 authentication, and so on to complement it as an all-security solution.

Support 4 Ports 1G/2.5G/10G SFP+ Uplink, provides greater bandwidth and powerful processing capacity. It offers a maximum 40Gbps uplink bandwidth through the Four 10Gbps SFP+ ports. In addition, the administrator can flexibly choose the suitable (1.25G/2.5G/10G) SFP/SFP+ transceiver according to the transmission distance or the transmission speed required to extend the network efficiently.

## Highlights

Benchu group IES7521-48GE4TF-AC L3 Industrial Managed Switch, featuring 48-10/100/1000BASE-T ports with 4-1G/2.5G/10GBASE-X fiber ports uplink, with rugged metal case, can be installed in any difficult environment. It provides user-friendly yet advanced IPv6/IPv4 management interfaces, abundant L2/L4 switching functions, Layer 3 OSPFv2 dynamic routing capability, and advanced ITU-G.8032 ERPS Ring technology to improve the rapid self-recovery capability .It is able to operate reliably, stably and quietly in the temperature range from -30 to 75 degrees C.



#### Key features include:

- Layer 3 static routing (IPv4 and IPv6) for interVLAN local routing
- Layer 3 routing, RIP v1/V2, OSPF V1/V2, VRRP
- L2/L3/L4 access control lists (ACLs) for granular network access control including 802.1x port authentication
- Advanced QoS (Quality of Service) for traffic prioritization including port-based, 802.1p and L2/L3/L4 DSCP-based
- STP, RSTP, MSTP, and ERPS ring network protocols are designed for building high reliability and maintaining network stability.
- IGMP Snooping and Querier for multicast optimization
- Dynamic ARP for increased security targeting a class of Man in the Middle attack
- Rate limiting and priority queuing for better bandwidth allocation
- Port mirroring for network monitoring
- Energy Efficient Ethernet (IEEE 802.3az) for maximum power savings
- SNMP v1, v2c, V3 and RMON remote monitoring

#### Build a future-proof network with BENCHU:

- Solid performance with non-blocking architecture, 16K MAC addresses, 100 shared (ingress) ACLs and 512 Multicast groups
- Comprehensive IPv6 supporting management, QoS, ACL and routing, ensuring investment protection and a smooth migration to IPv6-based network
- 4 Dedicated SFP+s, not only providing fiber uplinks, but also uplink redundancy and failover, improving reliability and availability for the network

#### Redundant Ring, Fast Recovery for Critical Network Applications

- The IES7521-48GE4TF-AC supports redundant ring technology and features strong, rapid self-recovery capability to prevent interruptions and external intrusions. It incorporates advanced ITU-T G.8032 ERPS (Ethernet Ring Protection Switching) technology, Spanning Tree Protocol (802.1s MSTP), and redundant power input system into customer's industrial automation network to enhance system reliability and uptime in harsh factory environments. In a certain simple Ring network, the recovery time of data link can be as fast as 50ms.

#### BENCHU Quality and Reliability

- Low power consumption, fanless, high-strength metal casing.
- Contact Discharge 8KV DC; Air Discharge 15KV DC
- -30 to 75 degrees operating temperature
- Industrial design with dual power input
- Rack mounting installation
- CE, FCC, RoHS, CB.
- The user-friendly panel can show the device status through the LED indicator of PWR, Link.

#### Easy operation and maintenance management

- Web management, CLI command line (Console, Telnet), SNMP (V1/V2).
- HTTPS, and SSHV1/V2.
- RMON, system log, LLDP, and port traffic statistics.
- CPU monitoring, memory monitoring, Ping test, and cable diagnose.



## Hardware at a Glance

FRONT				REAR	SIDE
Model Name	Form-Factor	10/100/1000Base-T RJ45 ports	1G/2.5G/10GBASE-X Fiber SFP+ Ports	Power Supply	Fans
IES7521-48GE4TF-AC	Rack Mounting	48	4	Dual power input AC 100~260V	fanless

## Software at a Glance

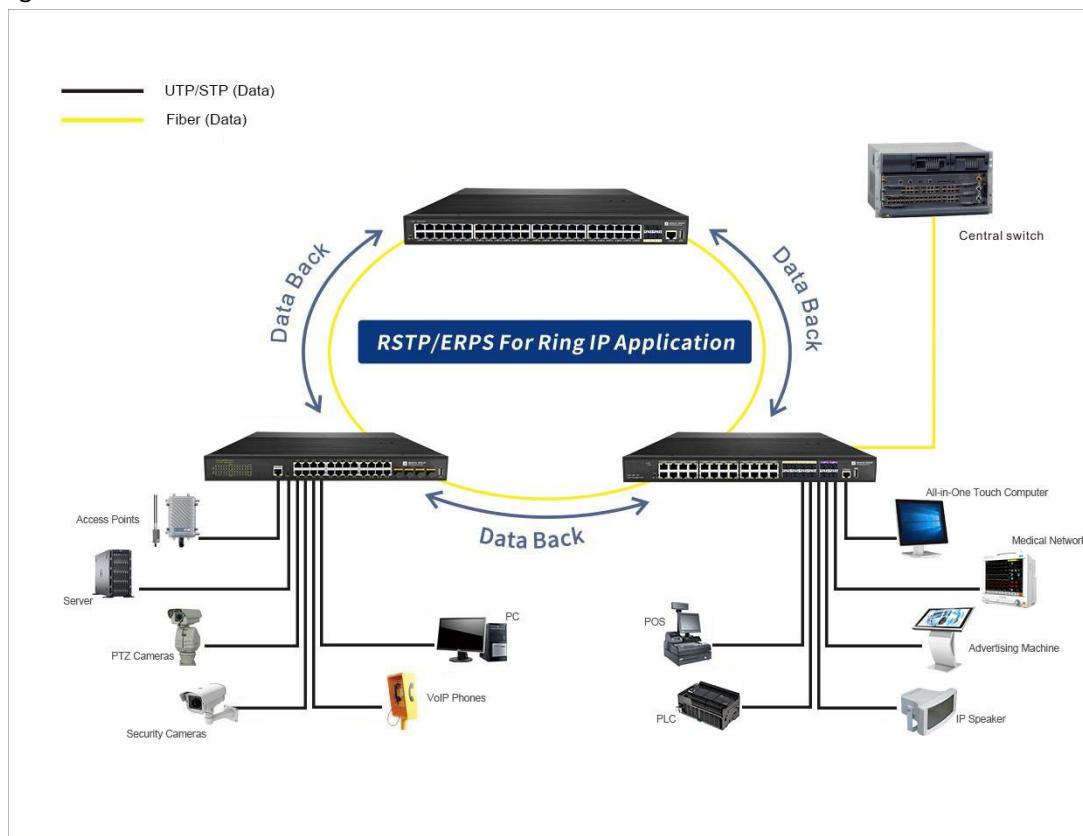
LAYER 2+ / LAYER 3 LITE FEATURES							
Management	IPv4/IPv6 ACL and QoS	IPv4/IPv6 Multicast Filtering	G.8032 ERPS STP/RSTP/MSTP	IEEE (802.3az) Energy Efficient Ethernet	VLANs	Convergence	IPv4 & IPv6 Static Routing RIP/OSPF/VRRP
Web Browser-based GUI(HTTP/HTTPS), PC-Based Smart Control Center Utility (SCC) , RMON, SNMP	L2, L3, L4, ingress	IGMP and MLD Snooping	Yes	Yes	Static Dynamic, Voice, MAC, Protocol-based	LLDP-MED, RADIUS, 802.1X	Yes

## Performance at a Glance

Model Name	Packet buffer	CPU	ACLs	MAC Address Table ARP Table VLANs	Fabric	Latency (Max Connection Speed)	Static Routes (IPv4&IPv6)	Multicast IGMP Group
IES7521-48GE4TF-AC	16MB	Realtek	100 shared	16K MAC 512 ARP 4K VLANs QinQ	256Gbps 132Mpps line-rate	1G Copper: <3.35μs 10G Fiber: <2.5μs	IPv4: 100 IPv6: 100	512

## Target Application

### Network Convergence

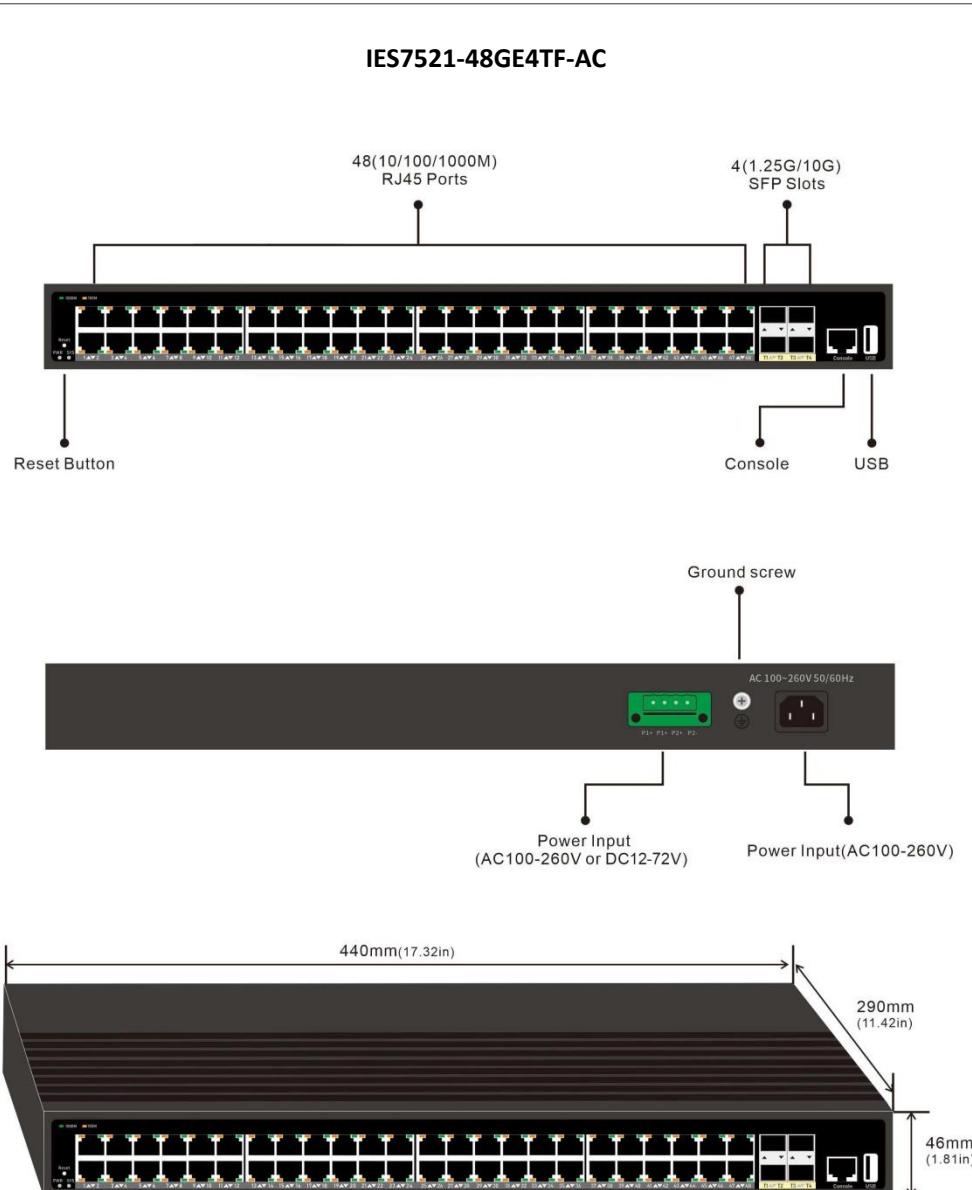


Across industries such as Industrial Parks, Power, Utilities, and Energy, there is a notable surge in the adoption of IoT devices like VoIP phones, IP security cameras, video-over-IP endpoints, proximity sensors, LED lighting, and secure access door locks. The increasing density of these devices necessitates robust and stable industrial network switches to ensure consistent network performance. In environments where devices are deployed in close proximity, maintaining seamless connectivity becomes crucial to avoid network interruptions. Moreover, outdoor and harsh environments demand industrial-grade network switches with exceptional durability and adaptability to withstand extreme conditions. These switches are designed to deliver reliable performance, ensuring uninterrupted operation in challenging scenarios such as temperature fluctuations, exposure to dust, and moisture. With the growing complexity of industrial networks, choosing high-quality industrial-grade switches has become essential to support the expanding IoT ecosystem and meet the demands of modern industry applications.

The new 52-port managed industrial switch support dense deployments of these modern high-stability IoT devices. They offer powerful Layer 2 features for IPv4 and IPv6 with enhanced performance and a focus on usability within Industrial environments:

- Provide 48-10/100/1000M gigabit ethernet ports
- 4 dedicated 1G/2.5G/10G SFP+ fiber ports for aggregation to the network core
- Layer 3 static routing (IPv4 and IPv6) for interVLAN local routing
- Layer 3 RIPv1、v2, OSPFv1、v2, VRRP for multiple routing
- IGMP Snooping, IGMP Querier and IGMP Fast Leave for multicast optimization
- ERPS(G.8032) STP/FSTP/MSTP for Ring network and Link protection
- Include VLANs, ACLs, DiffServ, LACP, MVR and DHCP
- Easy-to-use Web browser-based management GUI — No need for an IT expert
- Excellent features such as fast response, resisting vibration, enduring dust, adapting for the hard environment, etc.

## Structure Diagrams





<b>Technical Specifications</b>		<b>IES7521-48GE4TF-AC</b>
10M/100M/1G RJ-45 copper ports		48
1G/2.5G/10G SFP+ (fiber) ports		4
Console Port (For config )		Yes
USB port (for config file upload/backup & firm-ware updates)		Yes
<b>Performance Specification</b>		
CPU		Realtek
Packet buffer memory (Dynamically shared across only used ports)		16 MB
Forwarding modes		Store-and-forward
Bandwidth		256 Gbps
Priority queues		8
MAC address database size (48-bit MAC ad-dresses)		16K
Multicast groups		512
Number of IPv4 static routes		100
Number of IPv6 static routes		100
Number of VLANs		4094
Number of VLANs(Open QinQ)		16,760,836(4094*4094)
Number of ARP cache entries		512 ARP
Number of DHCP snooping bindings		512
Access Control Lists (ACLs)		100 shared for MAC, IP and IPv6 ACLs (ingress)
Packet forwarding rate (64 byte packet size) (Mpps)		132Mpps
Jumbo frame support (bytes)		Up to 12K packet size
Mean Time Between Failures (MTBF) @ 25°C		172,263 hours
100M Copper Latency (64-byte; 1518-byte; 9216-byte frames)		8.314μs; 8.352μs; 8.451μs
1G Copper Latency (64-byte; 1518-byte; 9216-byte frames)		3.514μs; 3.545μs; 3.628μs
1G Fiber Latency (64-byte; 1518-byte; 9216-byte frames)		2.980μs; 3.101μs; 3.179μs
10G Fiber Latency (64-byte; 1518-byte; 9216-byte frames)		2.330μs; 2.561μs; 2.7129μs



<b>L2 Services - VLANs</b>		<b>IES7521-48GE4TF-AC</b>
IEEE 802.1Q VLAN tagging		Yes
QinQ VLAN tagging		Yes
IP-based VLANs		Yes
MAC-based VLANs		Yes
Protocol-based VLAN		Yes
Voice VLAN		Yes
VLAN mapping		Yes
<b>L2 Services - Availability</b>		
Broadcast, multicast, unknown unicast storm control		Yes
IEEE 802.3ad - LAGs (LACP)		Yes
IEEE 802.3x (full duplex and flow control)		Yes
IEEE 802.1D Spanning Tree Protocol		Yes
IEEE 802.1w Rapid Spanning Tree Protocol		Yes
IEEE 802.1s Multiple Spanning Tree Protocol		Yes
ITU-TG.8032 ERPS		Yes, Recovery time < 50ms
<b>L2 Services - Multicast Filtering</b>		
IGMP snooping (v1, v2 and v3)		Yes
MLD snooping support (v1 and v2)		Yes
IGMP snooping querier (v2)		Yes
MLD snooping querier (v1)		Yes
Multicast VLAN Registration (MVR)		Yes
<b>L3 Services - DHCP</b>		
DHCP client		Yes
DHCP snooping		Yes
DHCP Server		Yes
<b>L3 Services - Routing</b>		
IPv4 static routing		Yes
IPv6 static routing		Yes
VLAN routing		Yes
RIP V1/V2		Yes
OSPF V2		Yes
Number of IP VLAN interfaces(routed VLANs)		48
Policy routing		Yes
VRRP		Yes



Datasheet | **IES7521-48GE4TF-AC**  
Gigabit Managed Industrial Switch with 10G SFP+ Uplink

<b>Link Aggregation</b>		<b>IES7521-48GE4TF-AC</b>
IEEE 802.3ad - LAGs (LACP)		Yes
Manual LAG		Yes
# of LAGs / # of members in each LAG	8 LAGs with max 8 members in each LAG	
<b>Network Monitoring and Discovery Services</b>		
802.1ab LLDP	Yes	
SNMP	v1, v2c, v3	
RMON group 1,2,3,9	Yes	
<b>Network Security</b>		
IEEE 802.1x	Yes	
RADIUS accounting	Yes	
Access Control Lists (ACLs)	Yes	
IP-based ACLs (IPv4 and IPv6)	L2 / L3 / L4	
MAC-based ACLs	Yes	
TCP/UDP-based ACLs	Yes	
Control MAC # static entries	48	
Port-based security by locked MAC addresses	Yes	
Dynamic ARP inspection	Yes	
Broadcast, unicast, multicast DoS protection	Yes	
DoS attacks prevention	Yes	
Network storm protection, DoS	Yes	
Broadcast, unicast, multicast DoS protection	Yes	
DoS attacks prevention	Yes	
<b>Quality of Service (QoS)</b>		
Port-based rate limiting	Yes ingress and egress	
Port-based QoS	Yes	
Support for IPv6 fields	Yes	
DiffServ QoS	Yes ingress	
IEEE 802.1p COS	Yes	
Destination MAC and IP	Yes	
IPv4 and v6 DSCP	Yes	
TCP/UDP-based	Yes	
Weighted Round Robin (WRR)	Yes	
Strict priority queue technology	Yes	



<b>IEEE Network Protocols</b>		<b>IES7521-48GE4TF-AC</b>
• IEEE 802.3 Ethernet	• IEEE 802.3x Full-Duplex Flow Control	
<b>Management, Monitoring &amp; Troubleshooting</b>		
• IEEE 802.3u 100BASE-T	• IEEE 802.1Q VLAN Tagging	Yes
• IEEE 802.3ab 1000BASE-T	• IEEE 802.1AB LLDP with ANSI/TIA-1057 (LLDP-MED)	
• IEEE 802.3z 1000BASE-SX/LX	• IEEE 802.1p Class of Service	
• IEEE 802.3bz 2.5G BASE-X	• IEEE 802.1D Spanning Tree (STP)	
• IEEE 802.3ae 10G BASE-X	• IEEE 802.1s Multiple Spanning Tree (MSTP)	
• IEEE 802.3az Energy Efficient Ethernet (EEE)	• IEEE 802.1w Rapid Spanning Tree (RSTP)	
• IEEE 802.3ad Trunking (LACP)	• IEEE 802.1x RADIUS Network Access Control	
• IPv6 management	Yes	
Admin access control via RADIUS and TACACS+	Yes	
SNMP v1/v2c/v3	Yes	
RMON group 1,2,3,9	Yes	
Port mirroring	Yes ingress and egress	
Many-to-one port mirroring	Yes	
Cable test utility	Yes	
TLS/HTTPS Web-based access (version)	Yes (v1.2)	
File transfers (uploads, downloads)	TFTP / HTTP	
HTTP upload/download (firmware)	Yes	
Syslog (RFC 3164)	Yes	
USB port for firmware and config upload/download	Yes	
LEDs	Yes	
Per port	Speed, Link, Activity	
Per device	Power, system	
<b>Physical Specifications</b>		
Dimensions	440 x 290 x 48 mm (17.32 x 11.42 x 1.89 in)	
Weight	4.8 kg (10.58 lb)	
Power Requirements	AC100~260V 50/60Hz (Dual power input)	
Max power (worst case, all ports used, line-rate traffic) (Watts)	24W	
Idle power consumption (all ports link-down standby) (Watts)	18W	
Fan	Fanless	



Environmental Specifications		IES7521-48GE4TF-AC
<b>Operating</b>		
Operating Temperature		-30° to 75°C (-22° to 167°F)
Humidity		95% maximum relative humidity (RH), non-condensing
Altitude		10,000 ft (3,000 m) maximum
<b>Storage</b>		
Storage Temperature		-40° to 85°C (-40° to 185°F)
Humidity (relative)		95% maximum relative humidity, non-condensing
Altitude		10,000 ft (3,000 m) maximum
<b>Executive Standard &amp; Protection</b>		
<b>Lightning Protection</b>		
IEC61000-4-3 (RS)		10V/m (80~1000MHz)
FCC Part 15/CISPR22 (EN55022)		Class B
IEC61000-6-2		Common Industrial Standard
IEC61000-4-9 (Pulsed magnet field)		1000A/m
IEC61000-4-10 (Damped oscillation)		30A/m, 1MHz
IEC61000-4-12/18 (Shockwave)		CM 2.5kV, DM 1kV
IEC61000-4-4(EFT)		Power cable:±4kV, Data cable: ±2kV
IEC61000-4-16(Common-mode transmission)		30V, 300V, 1s
IEC61000-4-2 (ESD)		±8kV contact discharge, ±15kV air discharge
IEC61000-4-6 (Radio frequency transmission)		10V(150kHz~80MHz)
IEC61000-4-8 (Power frequency magnetic field)		100A/m, 1000A/m, 1s-3s
IEC61000-4-5 (Surge): Power cable		CM±4kV/ DM±2kV, Data cable: ±4kV
<b>Mechanical Properties</b>		
IEC60068-2-6		Anti Vibration
IEC60068-2-32		Free Fall
IEC60068-2-27		Anti Shock



### Electromagnetic Emissions and Immunity

Certifications	CE mark, commercial FCC Part 15 Class A, VCCI Class A Class A EN 55022 (CISPR 22) Class A Class A C-Tick EN 55024 CCC 47 CFR FCC Part 15, SubpartB, Class A ICES-003: 2016 Issue 6, Class A ANSI C63.4:2014 IEC 60950-1:2005 (ed.2)+A1:2009+A2:2013 AN/NZS CISPR 22:2009+A1:2010 CLASS A
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### Safety

Certifications	CB mark, commercial CSA certified (CSA 22.2 #950) EN 60950-1: 2006 + A11:2009 + A1:2010 + A12:2011 + A2:2013 IEC 60950-1:2005 (ed.2)+A1:2009+A2:2013 AN/NZS 60950.1:2015 CCC (China Compulsory Certificate)
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### Warranty and Support

Hardware Limited Warranty	Limited Lifetime*
Technical Support via Phone and Email*	Limited Lifetime*
Limited Lifetime* 24x7 Online Chat Technical Support	Limited Lifetime*

### Package Contents

All models	Smart Industrial Switch AC Power cord with C13 connector (localized to region of sale) Brackets and screws for rack mounting Rubber protection caps, which are already installed in the SFP sockets User's manual
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**IES7521-48GE4TF-AC**

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