Chía, 06 de Diciembre de 2024

Señores:
SERVICIO NACIONAL DE APRENDIZAJE -SENA-
REFERENCIA: PROCESO DE MC-CMC-CDA-031-2024
Objeto: Adquisición de elementos para adelantar los procesos formativos dirigidos a los aprendices que hacen del Centro de Desarrollo Agroempresarial.

ESPECIFICACIONES TÉCNICAS DEL OBJETO A CONTRATAR

ITEM	ELEMENTO	UNIDAD DE MEDIDA	CANT
1	UPS trifásica de 30kVA online. Certificación RETIE / CE /UL. Tensión nominal 220/127V, Factor de potencia ≥ 0,99. Incluye: banco de batería interno, transformador de aislamiento interno y tarjeta de comunicación Modbus.	UN	1
2	Gabinete 45RU, DOBLE CUERPO, 210x70x90 Fabricados en lámina de acero láminado en frio CR, Cal-14, 16 y 18 , con terminación pintura electrostática en polvo color negro micro. Caracteristicas:* Techo con perforaciones con tapas y micro uniones para el ingreso de cables e instalación de ventilación forzada si se requiere. * Paneles lateral y posteriores desmontables por medio de tornilleria Bristol.* Puerta frontal curva en malla perforada para ventilación al 85%, apertura a 120°* Cerradura de seguridad tipo maneta abatible con tapa de guarda de (1) punto de 150 mm.* 4 rodachinas giratorias para desplazamiento vacio* 4 parales de montaje ajustables con formato 19" de acuerdo a la Norma EIA/ECA310-E. Identificados con las unidades de rack.* Barraje a tierra de 1/8" x 1/2" con 5 puntos de conexión en la base del chasis del gabinete.* Cable equipotencial aterrizado la puerta frontal.* Kit de tuercas canastillas o enjaulada M6 con tornillo M6X12. Capacidad de carga para racks es de 600 libras. Producto certificado RETIE. Trabajados bajo la norma IP20, IK7, cumpliendo estandares de la EIA/ECA310-E y 400 horas en cámara salina	UN	1
3	Multitoma horizontal 19" 12 salidas regulada.	UN	11
4	Enrutador (Router), 16 núcleos ejecutándose a 2 GHz,16GB de RAM, 13 puertos gigabit ethernet y 4 puertos SFP+	UN	1

5	switch: • Enlace ascendente ultrarrápido de 10G: 4 ranuras SFP + de 10 Gbps que permiten una conectividad de gran ancho de banda y una capacidad de conmutación sin bloqueo. • Presupuesto PoE de 384 W : 24 puertos PoE + compatibles con 802.3at / af con un PoE total de 384 W * .• Integrado SDN : aprovisionamiento sin intervención (ZTP) ** , administración centralizada en la nube y monitorización inteligente.• Gestión centralizada : acceso a la nube para una máxima comodidad • Enrutamiento estático : ayuda a enrutar el tráfico interno para un uso más eficiente de los recursos de la red.• Estrategias de seguridad sólidas : enlace de puerto IP-MAC, ACL, seguridad de puerto, defensa DoS, control de tormentas, indagación DHCP, 802.1X, autenticación Radius y más.• Optimice las aplicaciones de voz y video : QoS L2 / L3 / L4 e IGMP snooping.• Gestión independiente : Web, CLI (puerto de consola, Telnet, SSH), SNMP, RMON e imagen dual ofrecen potentes capacidades de gestión	UN	3
6	"Wi-Fi rápido de doble banda: 450 Mbps simultáneos en 2.4 GHz ∆ y 867 Mbps en 5 GHz totalizan velocidades de Wi-Fi de 1317 Mbps. † Integrado en Omada SDN: Zero-Touch Provisioning (ZTP), Administración centralizada de la nube y Monitorización inteligente. Gestión centralizada: acceso a la nube y aplicación Omada para una mayor comodidad y fácil gestión. Roaming sin interrupciones: incluso las transmisiones de video y las llamadas de voz no se ven afectadas a medida que los usuarios se mueven entre ubicaciones.§ Soporte PoE: admite tanto el estándar 802.3af / at como el PoE pasivo (adaptador PoE incluido) ∆ para instalaciones flexibles. Red segura para invitados: junto con múltiples opciones de autenticación (SMS / Facebook Wi-Fi / Vale, etc.) y abundantes tecnologías de seguridad inalámbrica. Tecnología inalámbrica avanzada: optimice el rendimiento de la red con las tecnologías MU-MIMO, Band Steering, Airtime Fairness y Beamforming. ∆"	UN	9

7	Probador de Cableado: Compatible con cable CAT5e, CAT6 y CAT6A (blindado y no blindado) y cables coaxiales Medición de distancia en pies (ft) o metros. Se pueden generar tonos de rastreo de pares y aplicarlos a varias combinaciones de cables para ayudar a la detección Si está conectado a un cable LAN con equipo activo en el otro extremo, las velocidades de servicio disponibles se identifican y se muestran desde 10M, 100M o 1G, full dúplex o half dúplex. Mientras se prueba el cable, NETcat también comprueba la presencia de Power over Ethernet (PoE) 802.3af Pruebe y solucione problemas de cableado telefónico, de datos y coaxial Detecta pares divididos, cortocircuitos, cables rotos y cruzados La tecnología Step TDR muestra la longitud en corto o circuito abierto de todos los pares Íconos grandes para asegurar un uso fácil con el dedo Pantalla táctil retroiluminada utilizada para controlar todas las funciones Ranuras para pluma touch (stylus) incluida en la unidad principal Generador de tonos con 4 tonos de frecuencia de precisión seleccionables, compatibles con las sondas de procesamiento de señal digital avanzadas Tempo Identifica dispositivos activos en redes 10/100/1000 Base-T Ethernet (802.3) tanto full dúplex como half dúplex	UN	1
8	Fusionadora de Fibra Optica, Sistema de centrado de fibras por el núcleo. Medidor de potencia óptica integrado (longitud de ondas: 850 nm, 1300 nm, 1310 nm, 1490 nm, 1550 nm, 1625 nm; rango de mediciones: -70 dBm…+6 dBm; precisión: < 0,3 dB). Localizador visual de fallas integrado (longitud de ondas: 650 nm; potencia: 15 mW; modos: constante o tono de 2 Hz). 6 motores. Procesador de cuatro núcleos. Pantalla a color grande. Aumento hasta 300 veces. Tiempo de fusión 5 s, tiempo de contracción térmica: 15 s. Capacidad de batería completamente cargada: 240 ciclos (fusión + contracción). Maletín con repisa que se puede utilizar en calidad de mesa de trabajo.	UN	2
9	Marquilladora: Tecnología de impresión Termal Características especiales Pantalla: LCD Color: Gris Salida de la impresora: Monocromo Tipo de controlador: Pulsador Componentes incluidos: pilas AA Medios impresos: Etiquetas 5 tamaños de fuente, 7 estilos de impresión 8 estilos de caja para elegir, puedes crear etiquetas que se adapten a tus necesidades específicas.	UN	3
10	Vfl Localizador Visual De Fallos Láser De 10mw Fibra Óptica	UN	4

11	Rastreador De Cables O Generador De Tonos LP-CT-019	UN	2
12	Pinza de trafico fibra óptica	UN	1
13	Multímetro Digital Trms 110 Plus 600v	UN	2
14	Uni-t Telurómetro Puesta Tierra Avanzado Ut572	UN	1
15	Pinza Amperimétrica True Rms Ca/cc 374fc	UN	2
16	Localizador de circuitos de CA con probador de salida GFCI integrado ET310	UN	2

Para efectos de lo anterior, en constancia firman:

Nombre o Razón Social del Proponente: SINTELCO: SOLUCIONES INTEGRALES DE TELECOMUNICACIONES S.A.S
Cédula de ciudadanía o NIT: 901194783 9
Representante Legal: Hugo Enrique Sarmiento Osorio
País de Origen del Proponente: COLOMBIA
Dirección: DIAGONAL 13 # 1-54 CASA 25
Ciudad: Chía Cundinamarca
Teléfono(s): 3153942169
Teléfono Móvil: 3153942169
Correo Electrónico: sintelcos.a.s@gmail.com

Atentamente,

Firma: _____

Nombre: Hugo Enrique Sarmiento Osorio C.C.: 79.982.017 expedida en Bogotá D.C
Representante Legal

ITEM 1

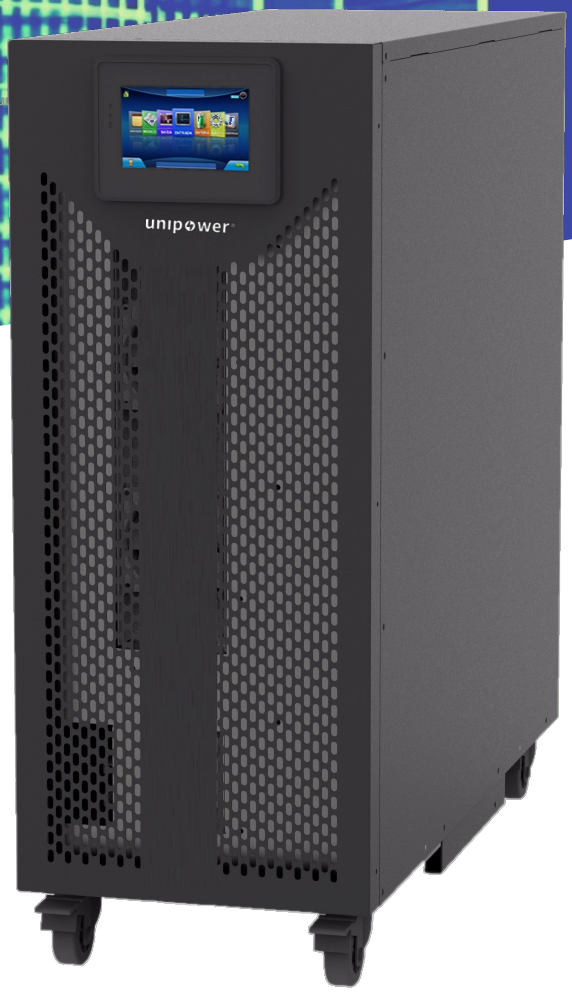
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Línea Corporativa

True online doble conversión

TRES AÑOS EN UPS
GARANTÍA
DOS AÑOS EN BATERÍAS

FMC33-10/40HF



UPS Trifásica
de alta frecuencia 208VAC*
10kVA a 40kVA

*Otros voltajes bajo pedido

FMC33-10/40HF

unipower
Línea Corporativa

True online doble conversión

La serie FMC33HF, es el aliado perfecto para garantizar un suministro de energía confiable y de alta calidad

Utiliza tecnología avanzada de doble conversión que puede eliminar por completo todo tipo de problemas de red y brindar una protección de suministro de energía estable con onda sinusoidal pura.

Cuenta con DSP de alta velocidad para monitorear y corregir cualquier fluctuación en el suministro eléctrico, ofreciendo una protección total ante posibles problemas eléctricos como picos de tensión, caídas de voltaje e interrupciones repentinas.

Además, cuenta con un alto factor de potencia y una baja distorsión de corriente a la entrada que permiten una óptima eficiencia, energía limpia y segura para tus equipos electró-



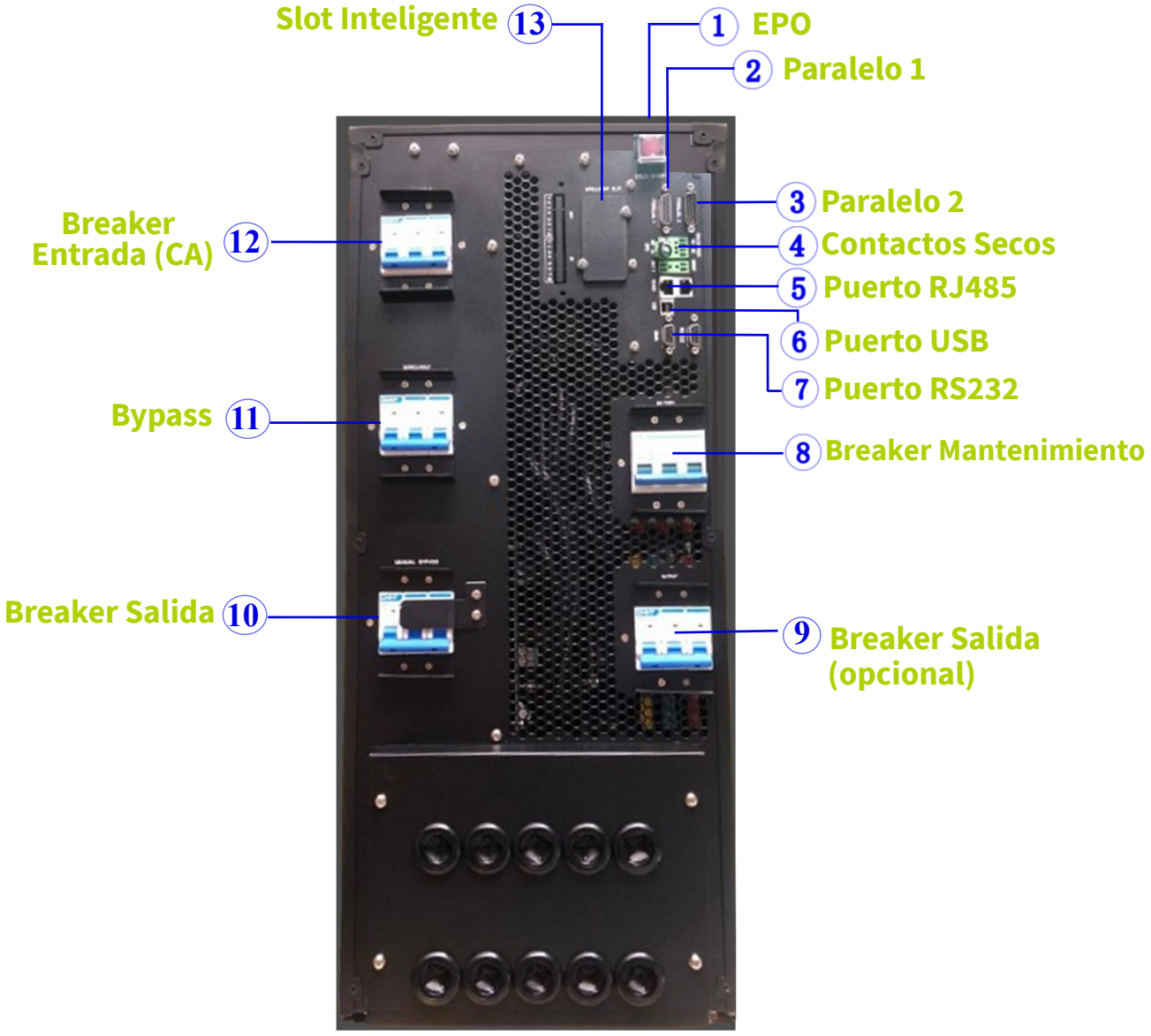
- Paralelo hasta 8 unidades
- Entrada de THDI baja para reducir contaminación en sistema eléctrico
- Eficiencia 95%
- Interfaz de operación amigable, pantalla LCD de alta resolución de 10”
- Gestión de batería con control de carga inteligente
- Tiempo de Transferencia cero
- Bypass Estático Manual

Imagen y medidas de FMC33-20HF
UPS de 20kVA

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Línea Corporativa

FMC33-10/40HF

True online doble conversión



Función de monitoreo inteligente

A través de una tarjeta SNMP opcional, puede controlar y monitorear el UPS de forma remota

Función EPO

El UPS puede apagarse completamente cuando se presiona el EPO. La función REPO (EPO remoto) también está disponible en esta serie de UPS

FMC33-10/40HF

True online doble conversión

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Línea Corporativa



Pantalla LCD

Con la pantalla LCD, el usuario puede obtener fácilmente el estado del UPS y sus parámetros operativos, como voltaje de entrada/salida, porcentaje de frecuencia y carga, porcentaje de batería y temperatura ambiente, etc..

Método de carga inteligente

La línea FMC33HF adopta un método de carga avanzado de tres etapas:

Primera Etapa: carga de corriente constante de alta corriente garantizar al 90%

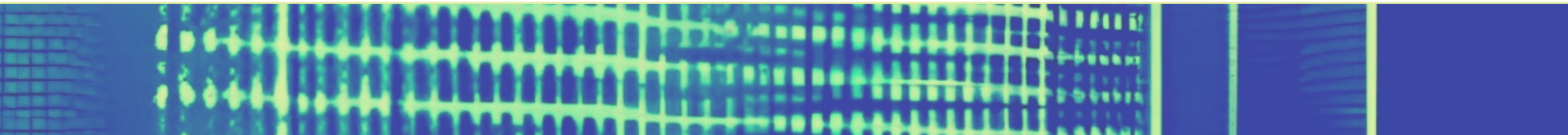
Segunda Etapa: voltaje constante para revitalizar la batería y asegurarse de que las baterías estén completamente cargadas

Tercera etapa: modo flotante.

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Tabla Técnica
FMC33-10/40HF

MODELO	FMC33-10HF	FMC33-20HF	FMC33-30HF	FMC33-40HF
ENTRADA				
Voltaje Nominal	208VAC(3Ph+N+PE)			
Rango de Frecuencia	40Hz-70Hz			
Factor de Potencia	≥0.99			
Distorsión Armónica (THDi)	≤3% (100% carga no lineal)			
Rango voltaje Bypass	120VAC Voltaje Máximo.: +15% Voltaje Min.: -45%			
Rango Sincronización de Frecuencia	±10%			
SALIDA				
Voltaje de Salida	208VAC (3Ph+N+PE)			
Regulación de voltaje	±1%			
Factor de potencia	1			
Frecuencia de salida	**Modo línea**: 50/60 Hz sincroniza con entrada; cuando la frecuencia de entrada es ＞ ±10% (±1%/±2%/±4%/±5% opcional) **Modo Batería**: 50/60 (1±0,02%) Hz			
Factor de cresta	3:1			
Distorsión Armónica (THD)	≤2% con carga lineal ≤4% con carga no lineal			
Eficiencia	⩾95%			
BATERIA				
Voltaje	20 pcs (16-26 pcs opcional)			
Corriente de carga (A)	Max. 15A			
SISTEMA				
Tiempo de Transferencia	AC a Batería: 0ms; AC a bypass: 0ms			
Sobrecarga	Carga ≤110%: hasta 60min, carga ≤125%: hasta 10min, carga ≤150%: hasta 1min			
Alarmas	Sobrecarga, AC Anormal, Falla UPS, Batería baja, etc.			
Retroalimentación	Soporte			
Protecciones	Cortocircuito, sobrecarga, sobretemperatura, batería baja, falla ventiladores.			
Comunicaciones	USB,RS232, RS485, puerto paralelo, puerto REPO, puerto LBS, Retroalimentación entrada inteligente, Slot inteligente, Tarjeta SNMP (opcional), Relay opcional, Modbus, Dry contact, Protocolo Megatec			
AMBIENTALES				
Temperatura de Operación	0℃～40℃			
Temperatura de Almacenamiento	-25℃～55℃(sin baterías)			
Humedad	0～95% (no condensada)			
Altitud	Sin derrateo por debajo de 1500 msnm			
Nivel de Ruido	<58dB			
PHYSICAL				
Dimension ProfundoxAnchoxAlto (mm)	730*250*530		865*250*862	885*440*1200
Peso Neto (kg)	106Kg. sin baterías		120Kg. sin baterías	198Kg. sin baterías
ESTÁNDARES				
Certificaciones	RETIE - IEC62040-1 - UL1778			



ITEM 2

GABINETES DE PISO

FORMATO 19”

REFERENCIA	DIMENSIONES EXTERNAS			
	UND DE RACK	ALTO (CMS)	ANCHO (CMS)	PROF (CMS)
TPI060060060	11	60	60	60
TPI060090060	18	90	60	60
TPI060100060	20	100	60	60
TPI060120060	25	120	60	60
TPI060150060	32	150	60	60
TPI060180060	38	180	60	60
TPI060210060	45	210	60	60
TPI060150080	32	150	60	80
TPI060180080	38	180	60	80
TPI060210080	45	210	60	80
TPI060180100	38	180	60	100
TPI060210100	45	210	60	100





Características:

* PUERTA FRONTAL: En una hoja curva con apertura a 120°.
* PANELES LATERALES Y POSTERIOR: Desmontables por medio de tornillería brístol.
* TECHO: Con perforaciones para el ingreso de cables e instalación de ventilación forzada si se requiere.
* CERRADURA: Maneta abatible con tapa deslizante de un punto de sujeción de 150 mm, dos llaves por cerradura. .
* PARALES: 4 desmontables para la instalación de equipos, ajustables a diferentes profundidades formato 19".
* ÁNGULOS CANASTILLAS: ajustables a diferentes medidas identificables con cada unidad de rack en la parte frontal.

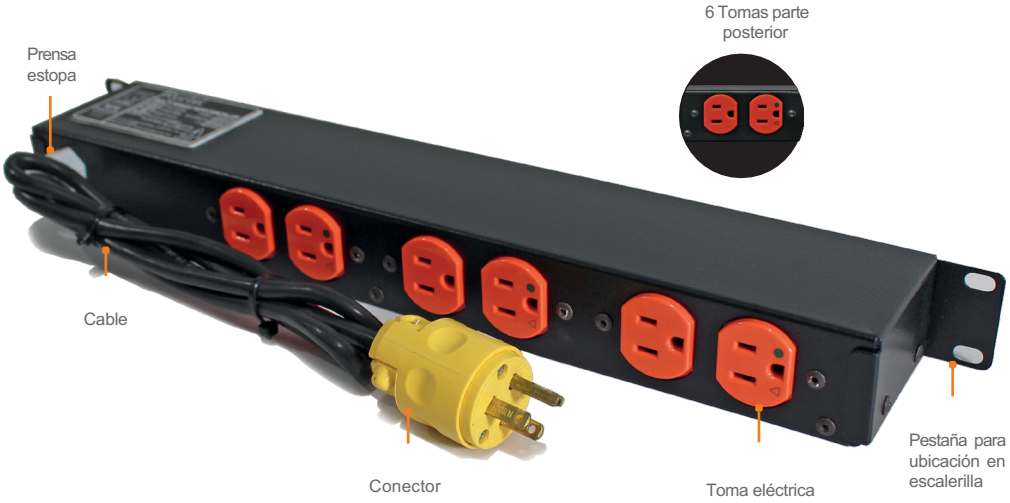
Incluye: Barraje a tierra de 1/8 x 1/2 con 5 puntos de conexión, 4 rodachinas, Cable equipotencial aterrizado a puerta frontal y puerta posterior, Kit de tuercas canastillas con tornillo M6.

Trabajados bajo la norma IP20, IK08 y 400 horas en cámara salina cumpliendo estándares de la EIA/ECA310-E.

ITEM 3

MULTITOMAS 19”

Multitoma



Las multitomas eléctricas horizontales y verticales, también, son ideales para facilitar el suministro de energía eléctrica, y brindar una protección confiable a los equipos instalados. Poseen una carcasa metálica con toma corriente, un fusible de 15 A, y un cable de fuerza 3 x 14 AWG de 1,2 m con clavija de 15 A, certificada tipo levitón. Son compatibles con todos los gabinetes y racks de 19 de acuerdo con el estándar EIA-310-D e incluyen los tornillos de montajes necesarios.

Multitomas

Multitoma

Características

Referencia:	Multitoma
Material:	Lámina de acero Cold Rolled calibre 20.
Color:	Recubrimiento en pintura de aplicación electrostática color Negro microtexturizado de apariencia mate.
Dimensiones externas:	4,5 X 7 X 43 cm
Salidas:	12 salidas.
Peso:	1,7 KG
Unidad de empaque:	por unidad
Contenido:	Cuerpo, tapa, breaker, tomas, prensa estopa, cable y kit de tornillos.

Estándares, normas aplicables y certificaciones:	EIA-310D DIN 41494 1 y 7 UNE 20539 1 y 2 IEC 297 1 y 2 RITEL RETIE

ITEM 4

CCR2116-12G-4S+

10G networking meets the unparalleled power of a modern ARM CPU.

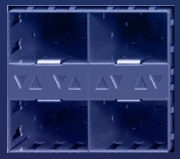
The most powerful CCR so far.



FORGET ABOUT CPU LIMITATIONS!

MASSIVE BGP PERFORMANCE BOOST!

4x



10G SFP+



16-CORE, 2 GHZ ARM CPU



16 GB DDR4 RAM



M.2 PCIE SLOT



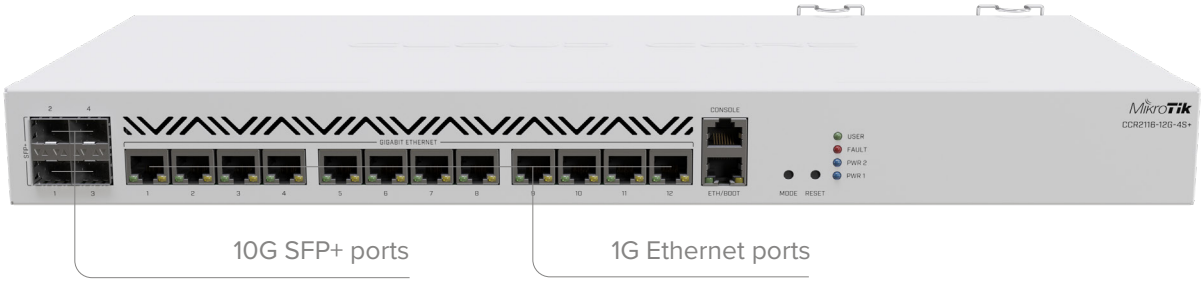
EXCEPTIONAL ENERGY EFFICIENCY: TYPICAL POWER CONSUMPTION – 60W!



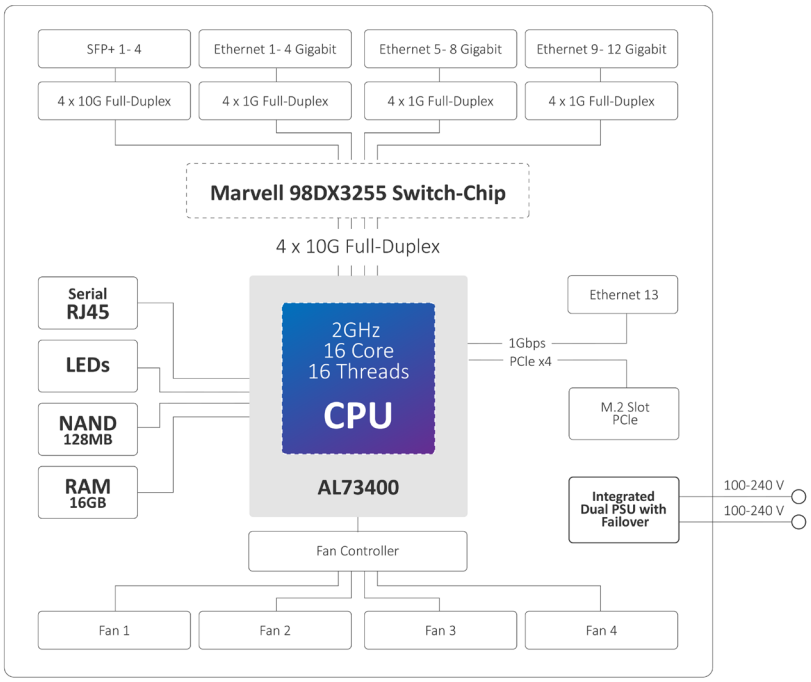
DUAL-REDUNDANT POWER SUPPLY



We wanted to see the full potential of the good old, reliable 10G networking combined with a modern CPU. CCR2116-12G-4S+ allows you to forget about CPU limitations in your setup. Like its younger brother – the amazing CCR2004, this router features the mighty Amazon Annapurna Labs Alpine CPU. But with 16 cores running at 2 GHz, this CCR eats the other one for breakfast. For example, we see at least a 15% increase in single-core performance. And that is the most important aspect when it comes to heavy operations based on per-connection processing. Like queues, for example. CCR2116-12G-4S+ sets a **new standard of single-core performance in the whole MikroTik product family!** And it supports Layer 3 Hardware Offloading!

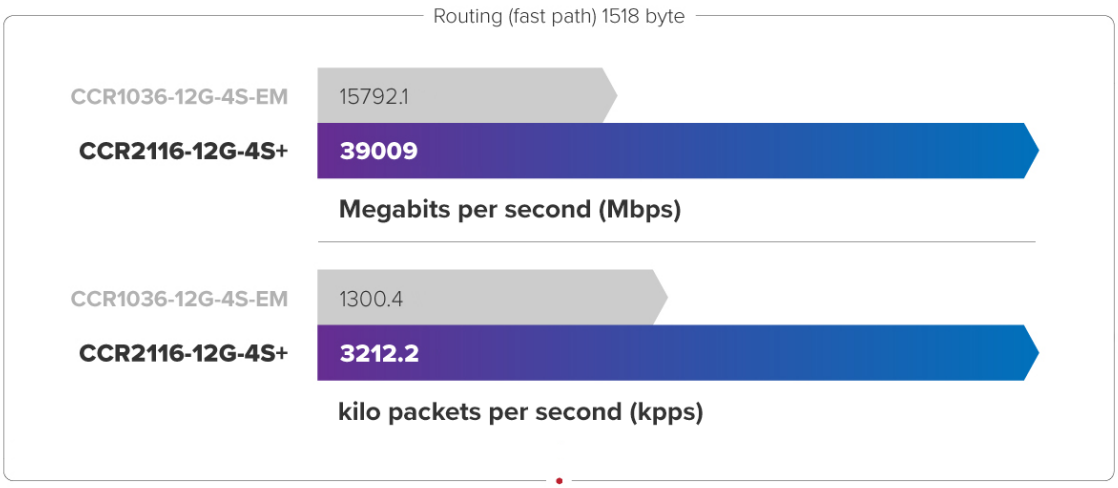


Obviously, you need the right connectivity to harness this power. There are **four 10G SFP+ ports.** They have a separate, full-duplex line connected to the Marvell Aldrin family switch chip. Then we have Gigabit Ethernet ports. 12 of them are running through the Marvel chip. And there is another Gigabit port connected directly to the CPU. For management purposes.



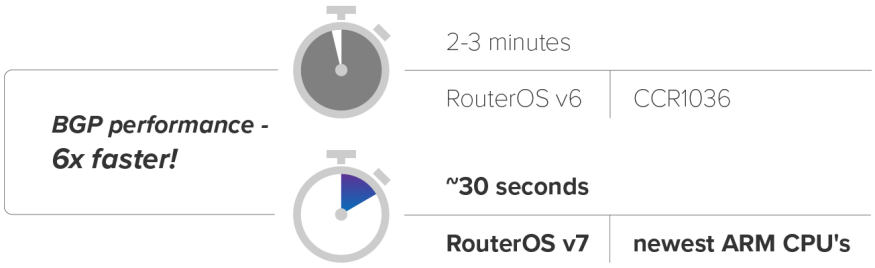
Each group of 4 ports has a separate full-duplex connection to the switch chip. No bottlenecks here. You can expect switch-like throughput in most setups.

The new generation of processors offers mind-blowing performance. If we look at the CCR1036 - the powerhouse with a 36 core CPU, the **new CCR2116 can easily double the performance. 16 cores vs 36 cores. Double the performance. Or even more.**



An average performance increase of 150%!

There is also an M.2 PCIe slot. It supports SSD`s up to 8 terabytes. This could be extremely useful for all kinds of Container apps (coming soon in v7). But we are very excited to see what kinds of interesting use-cases you will come up with.



If you are a rather large ISP, dealing with dynamic routing, massive BGPs, complex firewall rules, and intricate quality of service configurations..This is the right device for you. Combination of raw power and utility with the reliable 10G networking. And yes, like with any ISP-level device, we've included a **dual-redundant power supply.** So you have one less thing to worry about.

CCR2116-12G-4S+: technology tested by time, built for the future.

Specifications

Product code	CCR2116-12G-4S+
CPU	AL73400 2 GHz
CPU architecture	ARM 64bit
CPU core count	16
Size of RAM	16 GB
RAM type	DDR4
Storage	128 MB, NAND
Number of 1G Ethernet ports	13
Number of 10G SFP+ ports	4
Number of M.2 slots	1
Operating system	RouterOS (License level 6)
Switch chip model	98DX3255
Dimensions	443 x 199 x 44 mm
Operating temperature	-20°C to +60°C

Powering

Number of AC inputs	2
AC input range	100-240 V
Power adapter nominal voltage	12 V
Power adapter nominal current	10.8 A
Max power consumption (without attachments)	60 W
Max power consumption	72 W

Certification & Approvals

Certification	CE, FCC, IC

Included parts



2 Power cords



Rackmount bracket white



Fastening set

ITEM 5

tp-link

JetStream

10-Gigabit L2+ Managed Switch Datasheet

MODELS: TL-SX3008F/TL-SG3210XHP-M2/TL-SG3428X/TL-SG3428XMP



Overview

TP-Link's JetStream L2+ managed switches provide high performance, powerful L2 and L2+ features like static routing, enterprise-level QoS, advanced security strategies and a bundle of ISP features. The 10-gigabit ports ensure high-speed data transfer, and their backward compatility with gigabit products reserves room for network upgrades, therefore guarantees stable and long-term usability. The IP-MAC-Port Binding (IMPB) and Access Control List (ACL) functions protect against broadcast storm, ARP and Denial-of-Service (DoS) attacks, etc. Quality of Service (QoS, L2 to L4) provides enhanced traffic management capabilities to move your data smoother and faster. The OAM function helps facilitate network management. Moreover, the easy-to-use web management interfaces, along with CLI, SNMP and Dual Image mean faster setup and configuration with less downtime. TP-Link JetStream L2+ 10-gigabit managed switches provide a reliable, secure solution for enterprise, campus and ISP networks.

Omada Solution



Hospitality

High Quality and Full Coverage Wi-Fi



Education

High-Density Wi-Fi



Retail

Social Marketing for O2O



Office

Wireless and Wired Connections

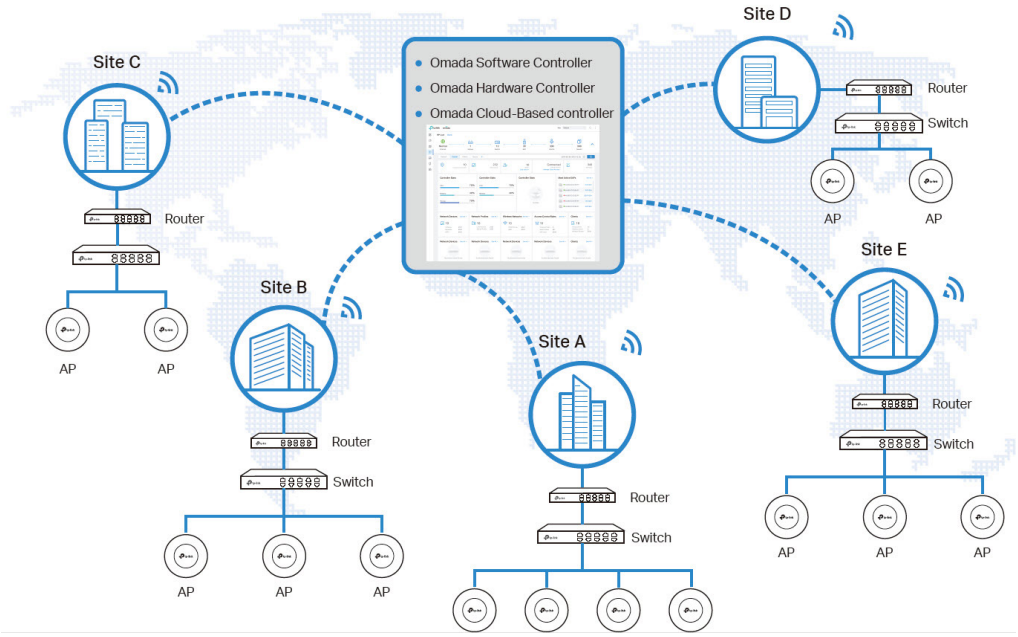


Catering

Full Wi-Fi Coverage in High-Density Environment

Software Defined Networking (SDN) with Cloud Access

Omada Software Defined Networking (SDN) platform integrates network devices, including access points, switches and gateways, providing 100% centralized cloud management. Omada creates a highly scalable network——all controlled from a single interface. Seamless wireless and wired connections are provided, ideal for use in hospitality, education, retail, offices, and more.



Higher Efficiency

- Centralized Cloud Management
- Zero-Touch Provisioning
- AI-Driven Technology
- Auto Channel Selection and Power Adjustment
- Multi-Tenant Privilege Assignment
- Easy and Intelligent Monitoring

Higher Security

- Separate Management and User Data
- Abundant Security Functions

Higher Reliability

- 99.99% SLA Availability
- Reliable Connections with High-Density Clients

Hassle-Free Centralized Cloud Management

100% centralized cloud management of the whole network from different sites——all controlled from a single interface anywhere, anytime.



- No additional training needed
- Unlimited scalability
- Batch management
- Devices still work even when not connected to the Cloud

Zero-Touch Provisioning for Efficient Deplyment[1]

Omada zero-touch provisioning allows remotely deployment and configuration of multi-site networks, so there's no need to send out an engineer for on-site configuration. The Omada Cloud ensures efficient deployment with lower costs.



1. Zero-Touch Provisioning is supported when using Omada Cloud-Based Controller

AI-Driven Technology for Stronger Performance and Easy Network Maintenance

Intelligent Network Analysis, Warning, and Optimization*

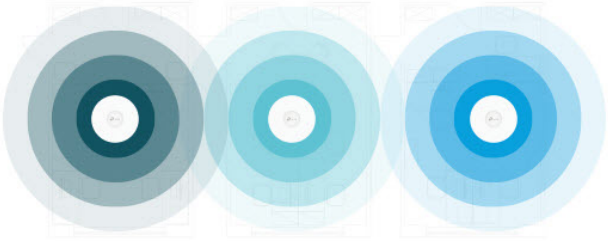
- Analyzes potential network problems and sends optimization suggestions for higher network efficiency
- Locates network faults, warns and notify users, and generates solutions to reduce network risk



*Intelligent Network Analysis, Warning, and Optimization are being developed and are scheduled to be released in 2020

Auto Channel Selection and Power Adjustment

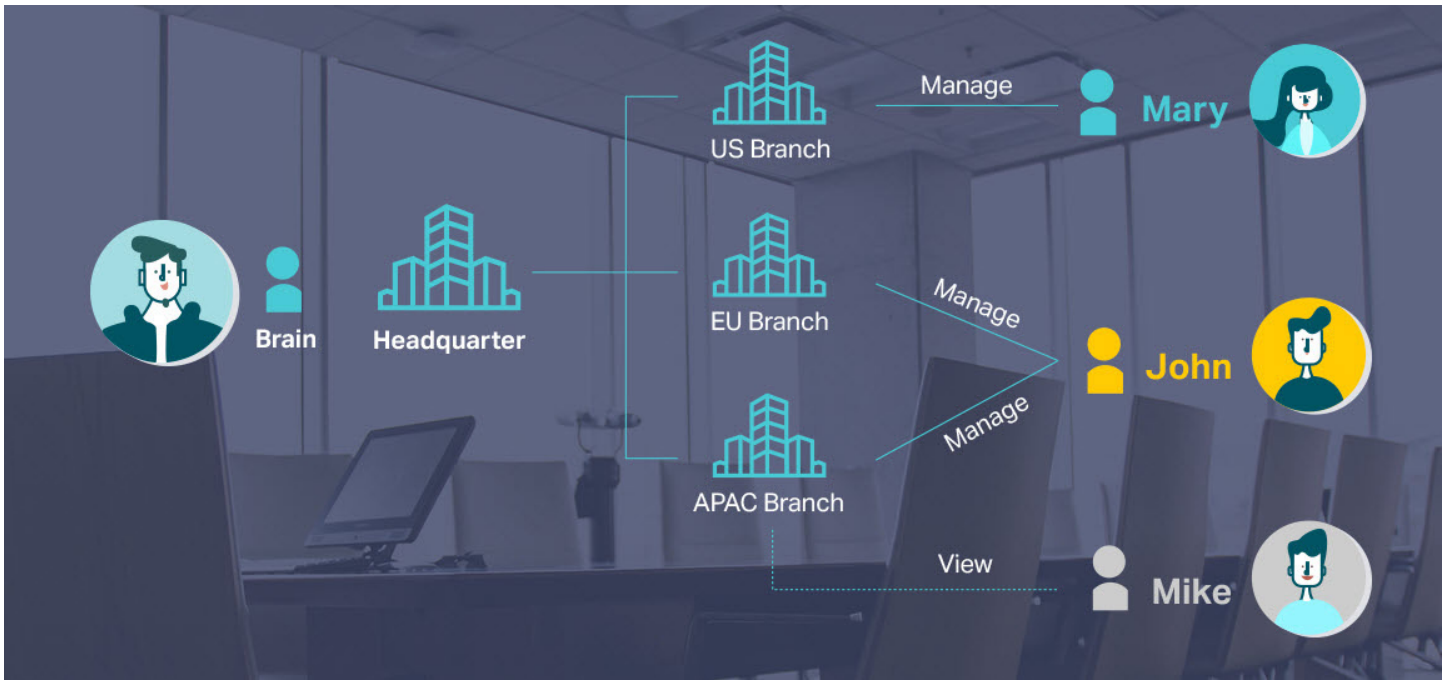
Provides powerful wireless performance while greatly reducing Wi-Fi interference by automatically adjusting the channel settings and transmission power levels of neighboring APs in the same network.



Channel 1 Channel 11 Channel 6

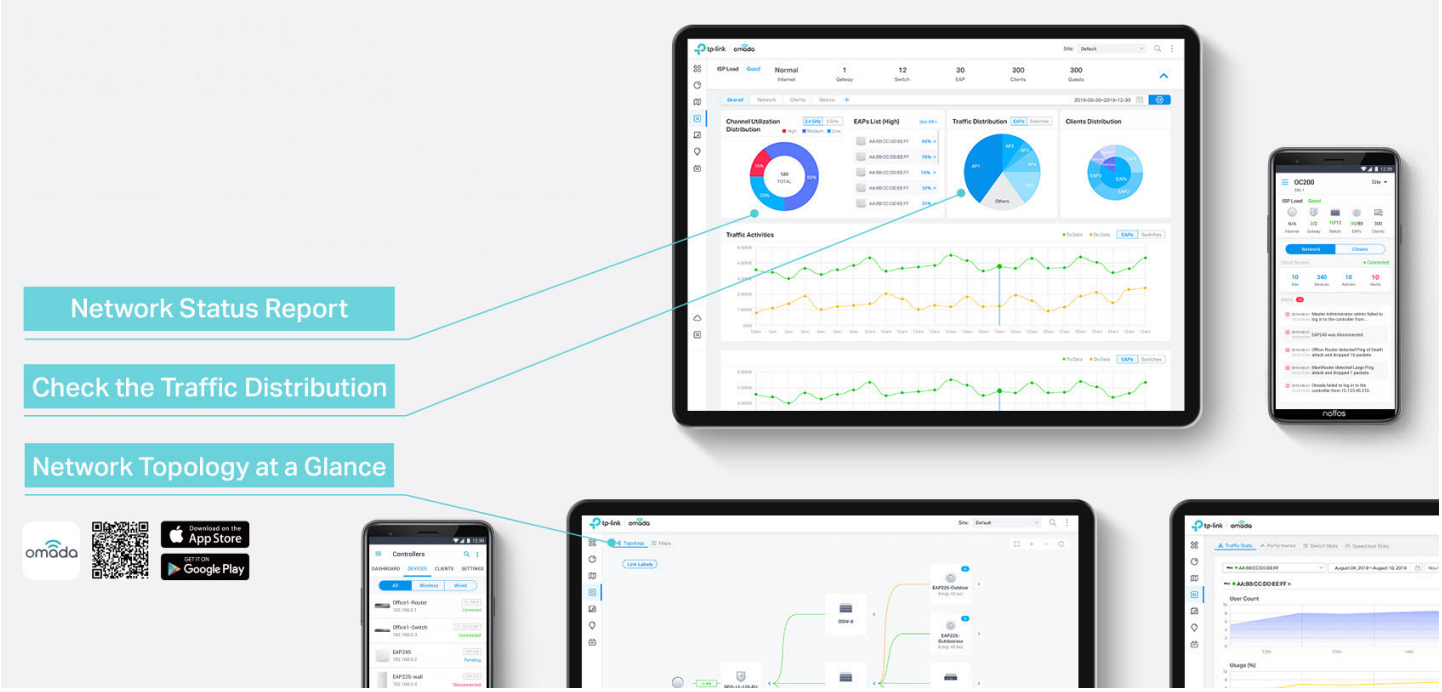
Assign Different Management Roles

Multi-user privilege assignment is available to increase management efficiency and security. Multi-person management, multi-level permissions, and the ability to add admins as needed, enable flexible network operation and maintenance.

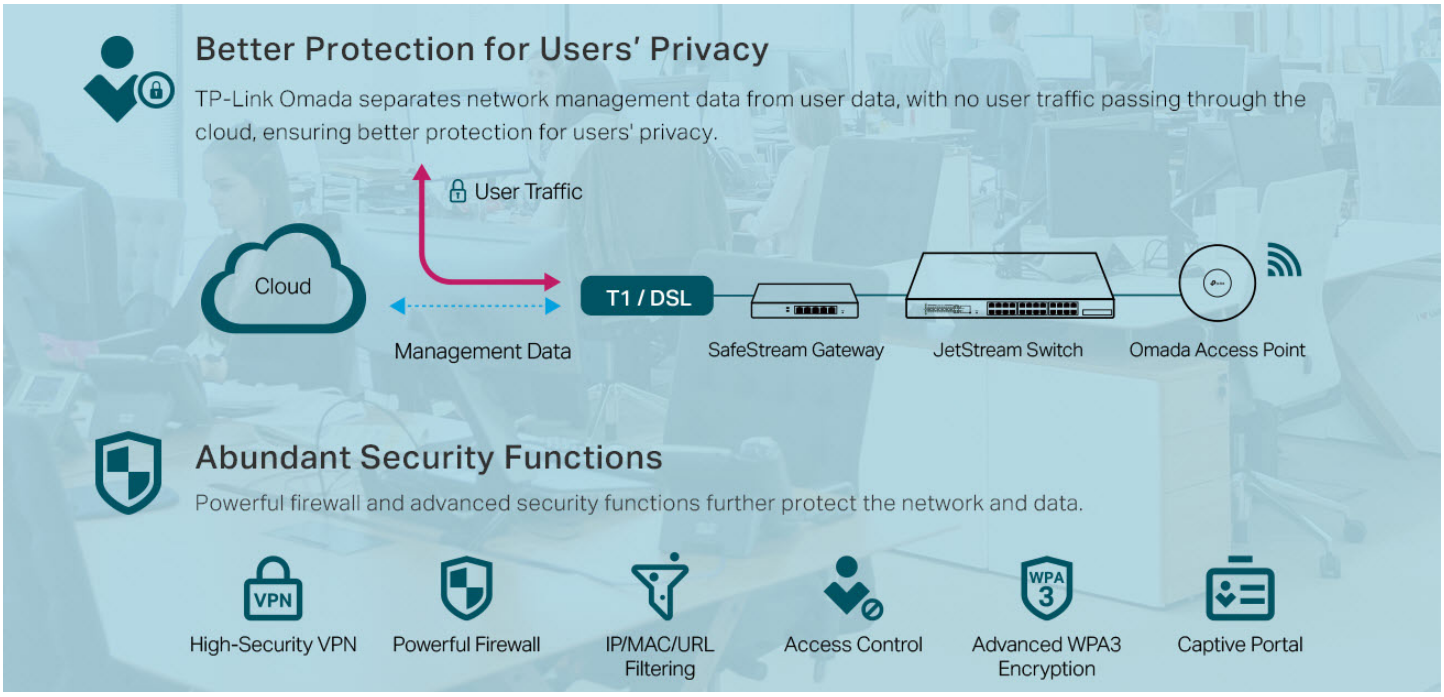


Easy and Intelligent Network Monitoring

The easy-to-use dashboard makes it easy to see your real-time network status; check network usage and traffic distribution; receive network condition logs, abnormal event warnings, and notifications; or even track key data for better business results. Network topology helps IP admins quickly see and troubleshoot connection at a glance.

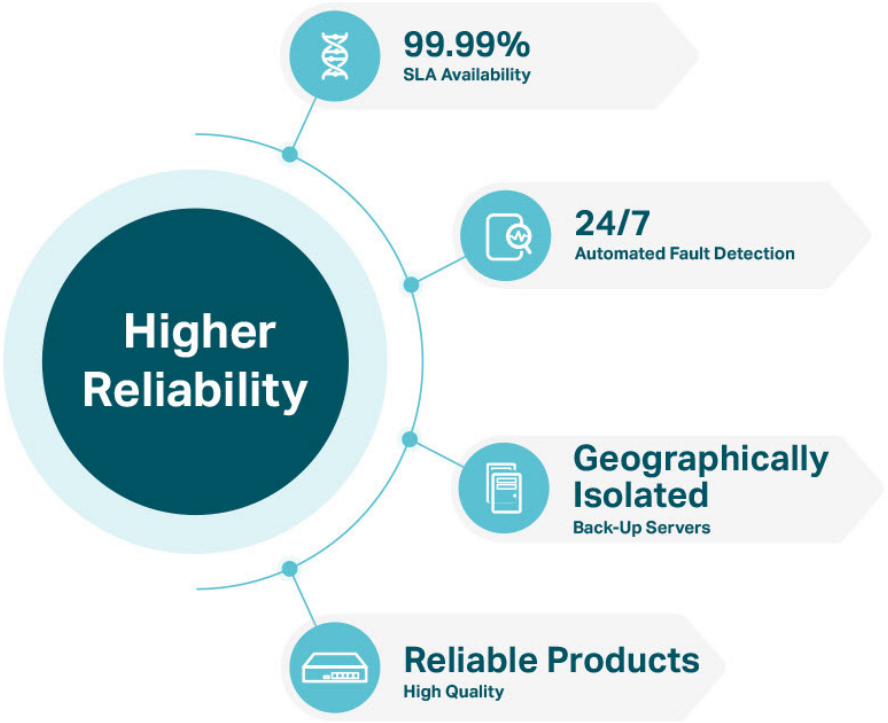


Comprehensive Protection for the Whole Network



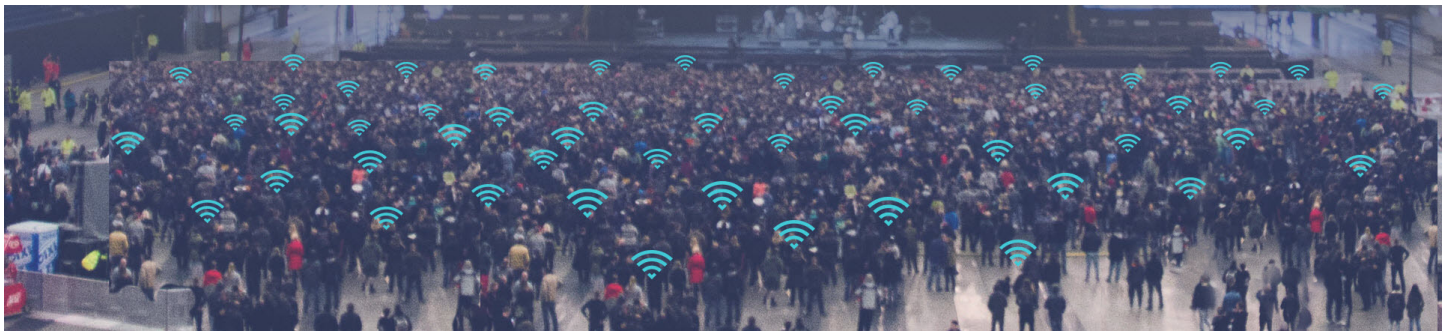
Multiple Factors Guarantee Higher Reliability

Higher reliability of cloud service is guaranteed with 99.99% SLA availability, 24/7 automated fault detection, geographically isolated backup servers, and reliable product quality. Your network functions even if management traffic is interrupted.



Reliable Connections Even with High-Density Clients

Equipped with enterprise chipsets, dedicated antennas, advanced RF functions, auto channel selection, and power adjustment, Omada Wi-Fi 6 and Wi-Fi 5 APs have high concurrency capacities for remarkable performance in high-density environments.



Switch Product Features

Networking Security

The L2+ managed switches provide IP-MAC-Port Binding, Port Security, Storm control and DHCP Snooping which protect against broadcast storms, ARP attacks, etc. It integrates some typical DoS attacks to select. You can protect these attacks more easily ever than before. In addition, the Access Control Lists (ACL, L2 to L4) feature restricts access to sensitive network resources by denying packets based on source and destination MAC address, IP address, TCP/UDP ports and even VLAN ID. Moreover, the switch supports 802.1X authentication, which is used in conjunction with a RADIUS/TACACS+ server to require some authentication information before access to the network is allowed.

Advanced QoS features

To integrate voice, data and video service on one traffic based on a variety of means including IP or MAC address, TCP or UDP port number, etc. to ensure that voice and video are always clear, smooth and jitter free. In conjunction with the Voice VLAN the switch supporting, the voice applications will operate with much smoother performance.

Abundant L2+ features

The L2+ managed switches support a complete lineup of L2 features, including 802.1Q VLAN, Port Mirroring, STP/RSTP/MSTP, Link Aggregation Control Protocol and 802.3x Flow Control function. Any more, the switch provides advanced features for network maintenance. Such as Loopback Detection, Cable Diagnostics and IGMP Snooping. IGMP snooping ensures the switch intelligently forward the multicast stream only to the appropriate subscribers while IGMP throttling & filtering restrict each subscriber on a port level to prevent unauthorized multicast access. Moreover, L2+ managed switches support L2+ feature-static routing, which is a simple way to provide segmentation of the network with internal routing through the switch and helps network traffic for more efficient use.

ISP Features

The L2+ managed switches support a bundle of ISP features such as 802.3ah OAM, DDM, sFlow, QinQ, L2PT PPPoE ID Insertion, IGMP authentication etc. 802.3ah OAM and Device Link Detection Protocol (DLDP) functions improve monitor and troubleshoot Ethernet networks, help facilitate network management. DDM(Digital Diagnostic Monitoring) function helps view the status of SFP modules inserting to the Switch and to configure alarm settings, warning settings, temperature threshold settings, voltage threshold settings, bias current threshold settings, TX power threshold settings, and Rx power threshold settings.

Enterprise Level Management Features

TP-Link's new L2+ managed switches are easy to use and manage. It supports various user-friendly standard management features, such as intuitive web-based Graphical User Interface (GUI), industry-standard Command Line Interface (CLI), SNMP (v1/v2c/v3), and RMON. This allows the switch to provide valuable status information and send reports on abnormal events. It also supports Dual Image and Dual Configuration to provide improved reliability and network uptime.

IPv6 Support

The L2+ managed switches support various IPv6 functions such as Dual IPv4/IPv6 Stack, MLD Snooping, IPv6 ACL, DHCPv6 Snooping, IPv6 Interface, Path Maximum Transmission Unit (PMTU) Discovery and IPv6 Neighbor Discovery, which guarantees your network is ready for the Next Generation Network (NGN) without upgrading your network equipment.

Specifications

Hardware Features & Performance

Product Picture		
Model		TL-SX3008F
General	Interface	8 10GE SFP+ Slots
	Console	1 RJ45 Console Port, 1 Micro-USB Console Port
	Flash	32 MB
	DRAM	256 MB
	Port Standard	IEEE 802.3z: 1000BASE-X Gigabit Ethernet (Optical fiber) IEEE 802.3ae: 10 Gigabit Ethernet over fiber
Performance	Switching Capacity	160 Gbps
	Packet Forwarding Rate	119.04 Mpps
	MAC Address Table	32K
	Packet Buffer	16 Mbit
	Transmission Method	Store and Forward
	Number of IP Interfaces	16
	Number of Static Routers	48 (IPv4, IPv6)
	Jumbo Frame	9 KB
Physical & Environmet	Power Supply	100-240 V AC~50/60 Hz
	Max Power Consumption	15.46 W (220 V/50 Hz)
	Max Heat Dissipation	52.75 BTU/hr (220 V/50 Hz)
	Standby Power Consumption	5.91 W (110 V/60 Hz)
	Dimensions (W x D x H)	17.3 × 7.1 × 1.7 in (440 × 180 × 44 mm)
	Fan Quantity	Fanless
	Installation	Rack Mountable
	Operating Temperature	0 °C to 45 °C (32 °F to 113 °F)
	Storage Temperature	-40 °C to 70 °C (-40 °F to 158 °F)
	Operation Humidity	10% to 90% RH, non-condensing
	Storage Humidity	5% to 90% RH, non-condensing
	Certification	CE, FCC, RoHS

Hardware Features & Performance

Product Picture		
Model		TL-SG3210XHP-M2
General	Interface	8 100/1000Mbps/2.5Gbps RJ45 Ports 2 10GE SFP+ Slots
	Console	1 RJ45 Console Port, 1 Micro-USB Console Port
	Flash	32 MB
	DRAM	128 MB
	Port Standard	IEEE 802.3i:10BASE-T Ethernet; IEEE 802.3u:100BASE-X Fast Ethernet; IEEE 802.3ab:1000BASE-T Gigabit Ethernet; IEEE 802.3z:1000BASE-X Gigabit Ethernet (Optical fiber) IEEE 802.3ae: 10 Gigabit Ethernet over fiber
PoE	PoE Standard	802.3af/at
	PoE Ports	8, up to 30 W
	PoE Power Budget	240 W
Performance	Switching Capacity	80 Gbps
	Packet Forwarding Rate	59.52 Mpps
	MAC Address Table	16K
	Transmission Method	Store and Forward
	Packet Buffer	12 Mbit
	Number of IP Interfaces	16
	Number of Static Routers	48 (IPv4, IPv6)
	Jumbo Frame	9 KB
Physical & Environmet	Power Supply	100-240 V AC~50/60 Hz
	Max Power Consumption	17.24 W (110V/60Hz) (no PD connected) 291.49 W (110V/60Hz) (with 240 W PD connected)
	Max Heat Dissipation	58.82 BTU/hr (110 V/60 Hz) (no PD connected) 994.56 BTU/hr (110 V/60 Hz) (with 240 W PD connected)
	Standby Power Consumption	17.24 W (110 V/60 Hz)
	Dimensions (W x D x H)	17.3 × 7.1 × 1.7 in (440 × 180 × 44 mm)
	Fan Quantity	2
	Installation	Rack Mountable
	Operating Temperature	0 °C to 50 °C (32 °F to 122 °F)
	Storage Temperature	-40 °C to 70 °C (-40 °F to 158 °F)
	Operation Humidity	10% to 90% RH, non-condensing
	Storage Humidity	5% to 90% RH, non-condensing
	Certification	CE, FCC, RoHS

Hardware Features & Performance

Product Picture			
Model		TL-SG3428X	TL-SG3428XMP
General	Interface	24 10/100/1000Mbps RJ45 Ports 4 10GE SFP+ Slots	
	Console	1 RJ45 Console Port, 1 Micro-USB Console Port	
	Flash	32 MB	
	DRAM	256 MB	
	Port Standard	IEEE 802.3i:10BASE-T Ethernet; IEEE 802.3u:100BASE-X Fast Ethernet; IEEE 802.3ab:1000BASE-T Gigabit Ethernet; IEEE 802.3z:1000BASE-X Gigabit Ethernet (Optical fiber) IEEE 802.3ae: 10 Gigabit Ethernet over fiber	
PoE	PoE Standard	-	802.3af/at
	PoE Ports	-	24, up to 30W
	PoE Power Budget	-	384 W
Performance	Switching Capacity	128 Gbps	
	Packet Forwarding Rate	95.23 Mpps	
	MAC Address Table	16K	
	Transmission Method	Store and Forward	
	Packet Buffer	12 Mbit	
	Number of IP Interfaces	16	
	Number of Static Routers	48 (IPv4, IPv6)	
	Jumbo Frame	9 KB	
Physical & Environmet	Power Supply	100-240 V AC~50/60 Hz	
	Max Power Consumption	23.6 W (110V/60Hz)	34.4 W (110V/60Hz) (no PD connected) 465.8 W (110V/60Hz) (with 384 W PD connected)
	Max Heat Dissipation	80.52 BTU/hr (110 V/60 Hz)	117.38 BTU/hr (110 V/60 Hz) (no PD connected) 1589.31 BTU/hr (110 V/60 Hz) (with 384 W PD connected)
	Standby Power Consumption	8.67 W (110 V/60 HZ)	20.80 W (110 V/60 Hz)
	Dimensions (W x D x H)	17.3 × 7.1 × 1.7 in (440 × 180 × 44 mm)	17.3 × 13.0 × 1.7 in (440 × 330 × 44 mm)
	Fan Quantity	Fanless	2
	Installation	Rack Mountable	
	Operating Temperature	0 °C to 45 °C (32 °F to 113 °F)	
	Storage Temperature	-40 °C to 70 °C (-40 °F to 158 °F)	
	Operation Humidity	10% to 90% RH, non-condensing	
	Storage Humidity	5% to 90% RH, non-condensing	
	Certification	CE, FCC, RoHS	

Software Features

Model	TL-SX3008F/TL-SG3210XHP-M2/TL-SG3428X/TL-SG3428XMP	
SDN Support	• Support Omada Hardware Controller (OC200/ OC300), Software Controller, Cloud-Based Controller • Automatic Device Discovery • Batch Configuration • Batch Firmware Upgrading	• Intelligent Network Monitoring • Abnormal Event Warnings • Unified Configuration • Reboot Schedule • ZTP (Zero-Touch Provisioning)*
L3 Features	• 16 IPv4/IPv6 Interfaces • Static Routing - 48 static routes • Static ARP - 128 static entries • 512 ARP Entries	• Proxy ARP • Gratuitous ARP • DHCP Server • DHCP Relay - DHCP interface relay - DHCP VLAN relay • DHCP L2 Relay
L2 Features	• Link Aggregation - Static link aggregation - 802.3ad LACP - Up to 8 aggregation groups and up to 8 ports per group • Spanning Tree Protocol - 802.1d STP - 802.1w RSTP - 802.1s MSTP - STP Security: TC Protect, BPDU Filter, BPDU Protect, Root Protect, Loop Protect	• Loopback Detection - Port based - VLAN based • Flow Control - 802.3x Flow Control - HOL Blocking Prevention • Mirroring - Port Mirroring - CPU Mirroring - One-to-One - Many-to-One - Tx/Rx/Both
L2 Multicast	• Supports 1000 (IPv4, IPv6) IGMP groups • IGMP Snooping - IGMP v1/v2/v3 Snooping - Fast Leave - IGMP Snooping Querier - IGMP Authentication • IGMP Authentication • MVR	• MLD Snooping - MLD v1/v2 Snooping - Fast Leave - MLD Snooping Querier - Static Group Config - Limited IP Multicast • Multicast Filtering: 256 profiles and 16 entries per profile
VLAN	• VLAN Group (802.1q VLAN) - Max 4K VLAN Groups • 802.1Q Tagged VLAN • MAC VLAN • Protocol VLAN: Protocol Template 16, Protocol VLAN 16	• Private VLAN • GVRP • VLAN VPN - VLAN Mapping - VLAN Replace • Voice VLAN
QoS	• 8 priority queues • 802.1p CoS/DSCP priority • Queue scheduling - SP (Strict Priority) - WRR (Weighted Round Robin) - SP+WRR • Bandwidth Control - Port/Flow based Rating Limiting	• Smoother Performance • Action for Flows - QoS remark (802.1P Remark, DSCP Remark)

* Zero-Touch Provisioning is supported when using Omada Cloud-Based Controller

Software Features

Model	TL-SX3008F/TL-SG3210XHP-M2/TL-SG3428X/TL-SG3428XMP	
ACL	• MAC ACL - Source MAC - Destination MAC - VLAN ID - User Priority - Ether Type • IP ACL -Source IP - Destination IP - Fragment - IP Protocol - TCP Flag	- TCP/UDP Port - DSCP/IP TOS - User Priority • Combined ACL • IPv6 ACL • Policy - Mirroring - Redirect - Rate Limit - QoS Remark • ACL apply to Port/VLAN • Time-based ACL
Security	• IP-MAC-Port Binding -512 Entries - DHCP Snooping - ARP Inspection - IPv4 Source Guard • IPv6-MAC-Port Binding -512 Entries - DHCPv6 Snooping - ND Detection - ND Snooping - IPv6 Source Guard • DoS Defend • DHCP Filter • Static/Dynamic Port Security - Up to 64 MAC addresses per port • Broadcast/Multicast/Unknown-unicast Storm Control - kbps/ratio/pps control mode	• 802.1X - Port base authentication - Mac base authentication - VLAN Assignment - MAB - Guest VLAN - Support RADIUS authentication and accountability • AAA (including TACACS+) • Port Isolation • Secure web management through HTTPS with SSLv3/TLS 1.2 • Secure Command Line Interface (CLI) management with SSHv1/SSHv2 • IP/Port/MAC based access control
ISP Features	• 802.3ah Ethernet Link OAM • L2PT (Layer 2 Protocol Tunneling) • PPPoE ID Insertion	• Device Link Detect Protocol (DLDP) • sFlow • DDM
Management	• Web-based GUI • Command Line Interface (CLI) through consoleport, telnet • SNMPv1/v2c/v3 - Trap/Inform - RMON (1, 2, 3, 9 groups) • SDM Template • DHCP/BOOTP Client • 802.1ab LLDP/LLDP-MED	• DHCP Auto Install • Dual Image, Dual Configuration • CPU Monitoring • Cable Diagnostics • EEE* • Password Recovery • SNTP • System Log
IPv6 Support	• IPv6 Dual IPv4/IPv6 • Multicast Listener Discovery (MLD) Snooping • IPv6 ACL • IPv6 Interface • Static IPv6 Routing • IPv6 neighbor discovery (ND) • Path maximum transmission unit (MTU) discovery • Internet Control Message Protocol (ICMP) version 6 • TCPv6/UDPv6	• IPv6 applications - DHCPv6 Client - Ping6 - Tracert6 - Telnet (v6) - IPv6 SNMP - IPv6 SSH - IPv6 SSL - Http/Https - IPv6 TFTP

*TL-SX3008F does not support this feature.

Software Features	
Model	TL-SX3008F/TL-SG3210XHP-M2/TL-SG3428X/TL-SG3428XMP
MIBs	• MIB II (RFC1213) • Interface MIB (RFC2233) • Ethernet Interface MIB (RFC1643) • Bridge MIB (RFC1493) • P/Q-Bridge MIB (RFC2674) • RMON MIB (RFC2819) • RMON2 MIB (RFC2021) • RADIUS Accounting Client MIB (RFC2620) • RADIUS Authentication Client MIB (RFC2618) • Remote Ping, Traceroute MIB (RFC2925) • Support TP-Link Private MIB

Ordering Information

Host Switch

Model	Description
TL-SX3008F	JetStream 8-Port 10GE SFP+ L2+ Managed Switch
TL-SG3210XHP-M2	JetStream 8-Port 2.5GBASE-T and 2-Port 10GE SFP+ L2+ Managed Switch with 8-Port PoE+
TL-SG3428XMP	JetStream 24-Port Gigabit and 4-Port 10GE SFP+ L2+ Managed Switch with 24-Port PoE+
TL-SG3428X	JetStream 24-Port Gigabit L2+ Managed Switch with 4 10GE SFP+ Slots

SFP/SFP+ Modules

Model	Description
TL-SM311LS	Gigabit SFP module, Single-mode, LC interface, Up to 20km distance
TL-SM311LM	Gigabit SFP module, Multi-mode, LC interface, Up to 550m distance
TL-SM321A	Gigabit WDM Bi-Directional SFP Module, single-mode, LC connector, TX: 1550 nm/RX: 1310 nm, 20 km
TL-SM321A-2	Gigabit WDM Bi-Directional SFP Module, single-mode, LC connector, TX: 1550 nm/RX: 1310 nm, 2 km
TL-SM321B	Gigabit WDM Bi-Directional SFP Module, single-mode, LC connector, TX: 1310 nm/RX: 1550 nm, 20 km
TL-SM321B-2	Gigabit WDM Bi-Directional SFP Module, single-mode, LC connector, TX: 1310 nm/RX: 1550 nm, 2 km
TL-SM5110-LR	10GBase-LR SFP+ LC Transceiver, single-mode, LC connector, 1310nm, 10 km
TL-SM5110-SR	10GBase-SR SFP+ LC Transceiver, multi-mode, LC connector, 850nm, 300 m

MC Series Media Converter

Model	Description
MC210CS	Gigabit Single-Mode Media Converter, up to 20 km, chassis mountable
MC200CM	Gigabit multi-mode SC SFP Transceiver, up to 550 m, chassis mountable
MC200L	Gigabit SFP slot supporting mini-GBIC modules, chassis mountable
TL-MC1400	14-slot power supply chassis for TP-LINK MC Series Media Converter, 19-inch rack-mountable

FC Series Media Converter

Model	Description
TL-FC111A-20	100Mbps Single-Mode WDM Media Converter, up to 20 km, TX:1550nm, RX:1310nm, chassis mountable
TL-FC111B-20	100Mbps Single-Mode WDM Media Converter, up to 20 km, TX:1310nm, RX:1550nm, chassis mountable
TL-FC311A-2	Gigabit Single-Mode WDM Media Converter, up to 2 km, TX:1550nm, RX:1310nm, chassis mountable
TL-FC311B-2	Gigabit Single-Mode WDM Media Converter, up to 2 km, TX:1310nm, RX:1550nm, chassis mountable
TL-FC311A-20	Gigabit Single-Mode WDM Media Converter, up to 20 km, TX:1550nm, RX:1310nm, chassis mountable
TL-FC311B-20	Gigabit Single-Mode WDM Media Converter, up to 20 km, TX:1310nm, RX:1550nm, chassis mountable
TL-FC1400	14-slot power supply chassis for TP-LINK FC Series Media Converter, 19-inch rack-mountable

Some models featured in this guide may be unavailable in your country or region. Visit TP-Link website for local sales information: www.tp-link.com.

PoE budget calculations are based on laboratory testing. Actual PoE power budget is not guaranteed and will vary as a result of client limitations and environmental factors.

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ITEM 6

tp-link

Omada

Business Class Wi-Fi Solution

MODELS: EAP330/EAP320/EAP245/EAP225/EAP225-Outdoor
EAP115/EAP110/EAP110-Outdoor/EAP115-Wall



Omada Controller Software



EAP330
EAP320
EAP225 V3
EAP115
EAP110



EAP245

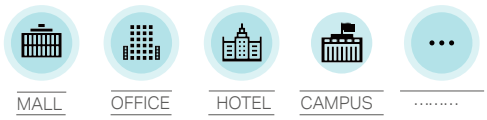


EAP225-Outdoor
EAP110-Outdoor



EAP115-Wall

Omada Solution





Omada Controller Software

Business-Class Wi-Fi Solution

Omada access points provide a business-class wireless network solution that's flexible, manageable, secure, and easy-to-deploy. The free Omada Controller software allows users to manage hundreds of EAPs at multiple sites, all from a single location. The ability to control, adjust and visualize the entire network from any connected PC makes centralized business Wi-Fi management more efficient than ever before. Omada EAPs also feature captive portal and advanced RF management functions, which make them ideal for demanding, high-traffic environments such as campuses, hotels, malls and offices.

Highlights

Impressive Performance:

Enterprise-class chipsets, 802.11ac Wi-Fi standard, MU-MIMO Technology, and TurboQAM combine to ensure outstanding performance and reliability.

Extensive Scalability:

With the ability to manage hundreds of access points at once, simply add more EAPs at any time to expand the network.

Centralized Management:

The Omada Controller software allows users to easily manage hundreds of Omada EAPs.

Cost Efficiency:

The Omada Controller software is completely free and eliminates the need for expensive hardware controllers.

Omada Controller

Free: No Additional Expense **Easy:** No Special Training Required

Convenient, Effective Management

Manage Multiple Sites from a Single Location

The Omada Controller software allows network administrators to monitor and manage hundreds of Omada EAPs at multiple sites, from any connected PC within the network. This dramatically enhances scalability and makes remote network management more convenient.



Captive Portal - Customizable Guest Authentication

Captive portal helps maintain only authorized guests to use the network, presenting devices with a convenient, user-friendly authentication method to grant Wi-Fi access. The addition of SMS and Facebook authentication simplifies the captive portal even further to simplify connectivity and boost your business.

Scheduled Reboot

With the scheduled reboot function, Omada EAPs can reboot themselves automatically at specified time to ensure network stability.

Access Control

Access control allows you to maintain a list of blocked IPs, which helps to protect internal communications and private data on the network.

Real-Time Status Monitoring

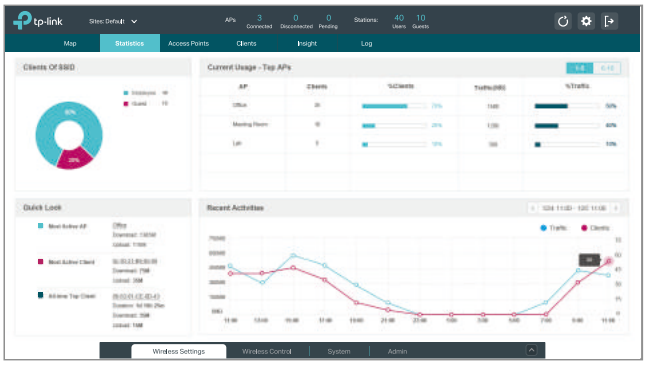
Customized Map

The customized map feature makes managing your EAP network more convenient. You can upload floor plans and create a clear visual model that reflects your network and its coverage area.



Statistics

The built-in data visualization tools allow you to analyze network traffic statistics for all connected APs. Graphic representations make recent client and network traffic figures easier to understand.



Access Point

Provides a list of all EAPs, arranged by status, and offers real-time traffic data for each EAP, including the number of connected clients and the amount of data that each client consumes.

Client

Lists all clients, including users and guests, allowing you to view each client's basic information and statistics in real time. This includes data rate, active time, and download/upload traffic.

Product Features

Easy-Mount Design

The Ceiling Mount EAP's elegant appearance and easy-mount design promote fast installation on any wall or ceiling surface, and allow it to blend in seamlessly with most interior decorating styles. The slimline, inconspicuous Wall Plate EAP can be easily installed into any standard EU-type Ethernet wall box.

PoE Power Supply

With IEEE 802.3af/at PoE or Passive PoE, you can use Ethernet cables to transfer both electrical power and network data, making deployment more flexible and removing the need to install additional power cabling.

Business-Class Hardware Design

Enterprise-class chipsets offer outstanding performance and support longer running time, higher client capacity and greater range. Dedicated high-power amplifiers, specialized antennas and professionally designed RF shields ensure excellent wireless performance.

Advanced RF Management

MU-MIMO, Airtime Fairness, Beamforming, and Band Steering Technologies guarantee optimal RF performance for business-level applications.

Easy Centralized Management

Configure and monitor hundreds of Omada EAPs with ease using the Omada Controller software.

Omada Business Class Wi-Fi Solution

802.11ac Access Points

Picture					
Model	EAP330	EAP320	EAP245	EAP225 V3	EAP225-Outdoor
Product	AC1900 Wireless Dual Band Gigabit Access Point	AC1200 Wireless Dual Band Gigabit Access Point	AC1750 Wireless Dual Band Gigabit Access Point	AC1350 Wireless MU-MIMO Gigabit Ceiling Mount Access Point	AC1200 Wireless MU-MIMO Gigabit Indoor/Outdoor Access Point
Speed	2.4GHz: 600Mbps 5GHz: 1300Mbps	2.4GHz: 300Mbps 5GHz: 867Mbps	2.4GHz: 450Mbps 5GHz: 1300Mbps	2.4GHz: 450Mbps 5GHz: 867Mbps	2.4GHz: 300Mbps 5GHz: 867Mbps
Ethernet Port	2 Gigabit Ports	1 Gigabit Port	1 Gigabit Port	1 Gigabit Port	1 Gigabit Port
Power Supply	802.3at PoE +	802.3at PoE +	802.3at PoE +	802.3af & 24V Passive PoE	802.3af & 24V Passive PoE
Internal Antennas	2.4GHz: 3x6dBi 5GHz: 3x7dBi	2.4GHz: 2x5dBi 5GHz: 2x6dBi	2.4GHz: 3x4dBi 5GHz: 3x4dBi	2.4GHz: 3x4dBi 5GHz: 2x5dBi	2 Dual-Band Omni Antennas 2.4GHz: 2*3dBi 5GHz: 2*4dBi

802.11n Access Points

Picture				
Model	EAP115	EAP110	EAP110-Outdoor	EAP115-Wall
Product	300Mbps Wireless N Access Point	300Mbps Wireless N Access Point	300Mbps Wireless N Outdoor Access Point	300Mbps Wireless N Wall-Plate Access Point
Speed	2.4GHz: 300Mbps	2.4GHz: 300Mbps	2.4GHz: 300Mbps	2.4GHz: 300Mbps
Ethernet Port	1 10/100Mbps Ethernet Port	1 10/100Mbps Ethernet Port	1 10/100Mbps Ethernet Port	2 10/100Mbps Ethernet Ports
Power Supply	802.3af & 9V/0.6A DC	24V Passive PoE	24V Passive PoE	802.3af
Internal Antennas	2x4dBi	2x4dBi	2x3dBi (External Detachable)	2x1.8dBi

Specifications

802.11ac Indoor Access Points

Model		EAP330	EAP320
Name		AC1900 Wireless Dual Band Gigabit Access Point	AC1200 Wireless Dual Band Gigabit Access Point
Main Design	LAN Interfaces	Gigabit Ethernet (RJ-45) Port *2	Gigabit Ethernet (RJ-45) Port *1
	Wi-Fi Standards	IEEE 802.11a/b/g/n/ac	
	Maximum Data Rate	Up to 600Mbps (2.4GHz) + 1300Mbps (5GHz)	Up to 300 Mbps (2.4GHz) + 867Mbps (5GHz)
	Internal Antennas	2.4GHz: 3 * 6dBi, 5GHz: 3 * 7dBi	2.4GHz: 2 * 5dBi, 5GHz: 2 * 6dBi
	Transmit Power	CE: <20dBm (2.4GHz, EIRP), <23dBm (5GHz, EIRP) FCC: <29dBm	CE: <20dBm (2.4GHz, EIRP), <23dBm (5GHz, EIRP) FCC: <26dBm
Centralized Management	Omada Controller Softaware	•	
	Web-based Management	HTTP/HTTPS	
Security	Captive Portal Authentication	•	
	Access Control	•	
	Rogue AP Detection	•	
	Wireless Encryption	WEP, WPA/WPA2-Personal/Enterprise Encryption	
	802.1X Support	•	
Wireless Function	Multiple SSIDs	16 (8 on each radio)	
	Automatic Channel Assignment	•	
	QoS(WMM)	•	
	Airtime Fairness	•	
	Beamforming	•	
	Band Steering	•	
	Rate Limit	•	
	Load Balance	•	
	Reboot Schedule	•	
	Wireless Schedule	•	
Support Data Rates	802.11ac	5GHz: 6.5 Mbps to 1300Mbps (MCS0-MCS9, NSS = 1 to 3 VHT20/40/80) 2.4GHz(QAM256): 78Mbps to 600Mbps (MCS8-MCS9 VHT20/40, NSS=1 to 3)	5GHz: 6.5 Mbps to 867Mbps (MCS0-MCS9, NSS = 1 to 3 VHT20/40/80) 2.4GHz(QAM256): 78Mbps to 300Mbps (MCS8-MCS9 VHT20/40, NSS=1 to 3)
	802.11n	6.5 Mbps to 300 Mbps (MCS0 - MCS15, VHT 20/40)	
	802.11g	6, 9, 12, 18, 24, 36, 48, 54 Mbps	
	802.11b	1, 2, 5.5, 11 Mbps	
	802.11a	6, 9, 12, 18, 24, 36, 48, 54 Mbps	
Physical & Environment	Power Supply	PoE (802.3at-compliant, 36-57V 0.7A)or external 12VDC/2.5A power supply	PoE (802.3at-compliant, 36-57V 0.7A) or external 12VDC/1.5A power supply
	Maximum Power Consumption	17.7W	14.03W
	Mounting	Ceiling/Wall mounting (Kits included)	
	Certifications	CE, FCC, RoHS	
	Dimensions (W x D x H)	8.7 x 7.6 x 1.4in. (220.5 x193.5x 36.5 mm)	
	Environment	Operating Temperature: 0°C~40°C (32°F~104°F); Storage Temperature: -40°C~70°C (-40°F~158°F); Operating Humidity: 10%~90% non-condensing; Storage Humidity: 5%~90% non-condensing;	

802.11ac Indoor Access Points

Model		EAP245	EAP225 V3
Name		AC1750 Wireless Dual Band Gigabit Access Point	AC1350 Wireless MU-MIMO Gigabit Ceiling Mount Access Point
Main Design	LAN Interfaces	Gigabit Ethernet (RJ-45)Port*1	
	Wi-Fi Standards	IEEE 802.11a/b/g/n/ac	
	Maximum Data Rate	Up to 450 Mbps (2.4GHz) + 1300Mbps (5GHz)	Up to 450 Mbps (2.4GHz) + 867Mbps (5GHz)
	Internal Antennas	2.4GHz: 3 * 4dBi, 5GHz: 3 * 4dBi	2.4GHz: 3 * 4dBi, 5GHz: 2 * 5dBi
	Transmit Power	CE: <20dBm (2.4GHz, EIRP), <23dBm (5GHz, EIRP) FCC: <20dBm (2.4GHz),<27dBm (5GHz)	CE: <20dBm (2.4GHz, EIRP), <23dBm (5GHz, EIRP) FCC: <24dBm(2.4GHz),<22dBm(5GHz)
Centralized Management	Omada Controller Softaware	•	
Security	Captive Portal Authentication	•	
	Access Control	•	
	Rogue AP Detection	•	
	Wireless Encryption	WEP, WPA/WPA2-Personal/Enterprise Encryption	
	802.1X Support	•	
Wireless Function	Multiple SSIDs	16 (8 on each band)	
	Automatic Channel Assignment	•	
	QoS(WMM)	•	
	MU-MIMO	-	•
	Airtime Fairness	-	•
	Beamforming	-	•
	Band Steering	•	•
	Rate Limit	•	
	Load Balance	•	
	Reboot Schedule	•	
	Wireless Schedule	•	
Support Data Rates	802.11ac	5G:6.5 Mbps to 1300Mbps(MCS0-MCS9,NSS = 1 to 2 VHT20/40/80) 2.4G:78Mbps to 450Mbps (MCS8-MCS9 VHT20/40,NSS=1 to 3)	5G:6.5 Mbps to 867Mbps(MCS0-MCS9,NSS = 1 to 2 VHT20/40/80) 2.4G:78Mbps to 450Mbps (MCS8-MCS9 VHT20/40, NSS=1 to 3)
	802.11n	6.5 Mbps to 450Mbps (MCS0-MCS15,VHT20/40)	6.5 Mbps to 450 Mbps (MCS0 - MCS15, VHT 20/40)
	802.11g	6, 9, 12, 18, 24, 36, 48, 54 Mbps	
	802.11b	1, 5.5, 11Mbps	
	802.11a	6, 9, 12, 18, 24, 36, 48, 54 Mbps	
Physical & Environment	Power Supply	PoE (802.3at-compliant, 36-57V 0.4A) or external 12VDC/1.5A power supply	802.3af/A PoE or 24V Passive PoE (+4,5pins; -7,8pins. PoE Adapter Included)
	Maximum Power Consumption	12.7W	12.6W
	Mounting	Ceiling/Wall mounting (Kits included)	
	Certifications	CE, FCC, RoHS	
	Dimensions (W x D x H)	7.1 x 7.1 x 1.9in.(180 x 180 x 47.5mm)	205.4 x 181.6 x 37.4mm
	Environment	Operating Temperature: 0°C~40°C (32°F~104°F); Storage Temperature: -40°C~70°C (-40°F~158°F); Operating Humidity: 10%~90% non-condensing; Storage Humidity: 5%~90% non-condensing;	

802.11n Indoor Access Points

Model		EAP115	EAP110
Name		300Mbps Wireless N Access Point	300Mbps Wireless N Access Point
Main Design	LAN Interfaces	10/100Mbps Ethernet Port*1	
	Wireless Frequency	2.4GHz	
	Wi-Fi Standards	IEEE802.11b/g/n	
	Maximum Data Rate	300 Mbps	
	Internal Antennas	2 * 4dBi	
	Transmit Power	CE: < 19dBm (EIRP), FCC: <21dBm	
Centralized Management	Omada Controller Softaware	•	
Security	Captive Portal Authentication	•	
	Access Control	•	
	Rogue AP Detection	•	
	Wireless Encryption	WEP, WPA/WPA2-Personal/Enterprise Encryption	
	802.1X Support	•	
Wireless Function	Multiple SSIDs	8	
	Automatic Channel Assignment	•	
	QoS(WMM)	•	
	Airtime Fairness	-	
	Beamforming	-	
	Band Steering	-	
	Rate Limit	•	
	Load Balance	•	
	Reboot Schedule	•	
	Wireless Schedule	•	
Support Data Rates	802.11n	6.5 Mbps to 300 Mbps (MCS0 - MCS15, VHT 20/40)	
	802.11g	6, 9, 12, 18, 24, 36, 48, 54 Mbps	
	802.11b	1, 2, 5.5, 11 Mbps	
	802.11a	-	
Physical & Environment	Power Supply	PoE (802.3af-compliant, 36-57V 0.15A) or external 9V / 0.6A DC power supply	24V Passive PoE (+4,5pins; -7,8pins. PoE Adapter Included)
	Maximum Power Consumption	2.8W	
	Mounting	Ceiling/Wall mounting (Kits included)	
	Certifications	CE, FCC, RoHS	
	Dimensions (W x D x H)	189.4 x 172.3 x 29.5mm	
	Environment	Operating Temperature: 0°C~40°C (32°F~104°F); Storage Temperature: -40°C~70°C (-40°F~158°F); Operating Humidity: 10%~90% non-condensing; Storage Humidity: 5%~90% non-condensing;	

802.11ac Outdoor Access Points

Model		EAP225-Outdoor
Name		AC1200 Wireless MU-MIMO Gigabit Indoor/Outdoor Access Point
Main Design	LAN Interfaces	Gigabit Ethernet(RJ-45) Port*1
	Wireless Frequency	2.4GHz/5GHz
	Wi-Fi Standards	IEEE 802.11a/b/g/n/ac
	Maximum Data Rate	Up to 300Mbps(2.4GHz)+867Mbps(5GHz)
	Antennas	2 Dual-Band Omni Antennas (2.4G: 3dBi, 5G: 4dBi)
	Transmit Power	CE: < 20dBm (2.4GHz, EIRP), <23dBm (5GHz, EIRP) FCC: <30dBm (2.4GHz, EIRP), <30dBm (5GHz, EIRP)
Centralized Management	Omada Controller Softaware	•
Security	Captive Portal Authentication	•
	Access Control	•
	Wireless MAC Adress Filtering	•
	Wireless Isolation between Clients	•
	SSID to VLAN Mapping	•
	Rogue AP Detection	•
	WEP Encryption	64/128/152-bit
	WPA/WPA2-Personal Encryption	•
	WPA/WPA2-Enterprise Encryption	•
	802.1X Support	•
Wireless Function	Multiple SSIDs	16(8 for each band)
	Enable/Disable Wireless Radio	•
	Automatic Channel Assignment	•
	Transmit Power Control	Adjust transmit Power on dBm
	QoS(WMM)	•
	MU-MIMO	•
	Airtime Fairness	•
	Beamforming	•
	Band Steering	•
	Rate Limit	•
	Load Balance	•
	Reboot Schedule	•
	Wireless Schedule	•
	Wireless Statistics	Based on SSID/AP/Client
Support Data Rates	802.11n	6.5 Mbps to 300Mbps (MCS0-MCS15,VHT20/40)
	802.11g	6, 9, 12, 18, 24, 36, 48, 54 Mbps
	802.11b	1,5.5,11 Mbps
	802.11a	6, 9, 12, 18, 24, 36, 48, 54 Mbps
	802.11ac	5G: 6.5 Mbps to 867Mbps (MCS0-MCS9, NSS=1 to 2 VHT20/40/80) 2.4G: 78 Mbps to 300Mbps (MCS8-MCS9, NSS=1 to 3 VHT20/40)
Physical Properties	Power Supply	802.3af/A PoE or 24V Passive PoE (+4,5pins; -7,8pins. PoE Adapter Included)
	Maximum Power Consumption	10.5W
	Mounting	Pole / Wall /Fast Mounting (Kits included)
	Certifications	CE, FCC, RoHS
	Dimensions (W x D x H)	214.9 x 46 x 26.7mm
	Environment	Operating Temperature: -30°C~70°C (-22°F~158°F) Storage Temperature: -40°C~70°C (-40°F~158°F) Operating Humidity: 10%~90% non-condensing Storage Humidity: 5%~90% non-condensing

802.11n Outdoor Access Points

Model		EAP110-Outdoor
Name		300Mbps Wireless N Outdoor Access Point
Main Design	LAN Interfaces	10/100Mbps Ethernet Port*1
	Wireless Frequency	2.4GHz
	Wi-Fi Standards	IEEE 802.11b/g/n
	Maximum Data Rate	Up to 300Mbps
	Antennas	2*3 dBi
	Transmit Power	CE: < 20dBm (EIRP), FCC: < 22dBm
Centralized Management	Omada Controller Softaware	•
Security	Captive Portal Authentication	•
	Access Control	•
	Wireless MAC Adress Filtering	•
	Wireless Isolation between Clients	•
	SSID to VLAN Mapping	•
	Rogue AP Detection	•
	WEP Encryption	64/128/152-bit
	WPA/WPA2-Personal Encryption	•
	WPA/WPA2-Enterprise Encryption	•
	802.1X Support	•
Wireless Function	Multiple SSIDs	8
	Enable/Disable Wireless Radio	•
	Automatic Channel Assignment	•
	Transmit Power Control	Adjust transmit Power on dBm
	QoS(WMM)	•
	Rate Limit	•
	Load Balance	•
	Reboot Schedule	•
	Wireless Schedule	•
	Wireless Statistics	Based on SSID/AP/Client
Support Data Rates	802.11n	6.5 Mbps to 300Mbps (MCS0-MCS15,VHT20/40)
	802.11g	6, 9, 12, 18, 24, 36, 48, 54 Mbps
	802.11b	1, 5.5, 11 Mbps
	802.11a	-
Management	LED ON/OFF Control	•
	Management MAC Access Control	•
	Web-based Management	HTTP/HTTPS
	Telnet	•
	SNMP	v1,v2c
	System Logging	Local/Remote Syslog
	Email Alerts	•
Physical & Environment	Power Supply	24V Passive PoE (+4,5pins; -7,8pins. PoE Adapter Included)
	Maximum Power Consumption	3.1W
	Button	Reset Button
	Mounting	Pole/Wall mounting (Kits included)
Others	Certifications	CE,RoHS
	Dimensions (W x D x H)	216 x 46 x 27mm
	Environment	Operating Temperature: -30°C~65°C (-22°F~149°F); Storage Temperature: -40°C~70°C (-40°F~158°F); Operating Humidity: 10%~90% non-condensing; Storage Humidity: 5%~90% non-condensing;

802.11n Wall-Plate Access Points

Model		EAP115-Wall
Name		300Mbps Wireless N Wall-Plate Access Point
Main Design	LAN Interfaces	10/100Mbps Ethernet Port *2
	Wireless Frequency	2.4GHz
	Wi-Fi Standards	IEEE 802.11 b/g/n
	Maximum Data Rate	Up to 300Mbps
	Antennas	2*1.8dBi
	Transmit Power	CE: < 20dBm
	Power over Ethernet (PoE)	IEEE 802.3af
Centralized Management	Cluster	-
	Max APs in One Cluster	-
	Web-Based Management	HTTP/HTTPS
	Omada Controller Softaware	•
Security	Captive Portal Authentication	•
	Access Control	•
	Wireless MAC Adress Filtering	•
	Wireless Isolation between Clients	•
	SSID to VLAN Mapping	•
	Rogue AP Detection	•
	802.1X Support	•
	Encryption	WEP, WPA/WPA2-PSK, WPA/WPA2-Enterprise
Wireless Function	Multiple SSIDs	8
	Automatic Channel Assignment	•
	Transmit Power Control	Adjust transmit Power on dBm
	QoS(WMM)	•
	Airtime Fairness	-
	Band Steering	-
	Beamforming	-
	Rate Limit	•
	Load Balance	•
	Reboot Schedule	•
	Wireless Schedule	•
Support Data Rates	802.11n	6.5Mbps to 300Mbps(MCS0-MCS15, HT20/40)
	802.11g	6,9,12,18,24,36,48,54Mbps
	802.11b	1,2,5.5,11Mbps
	802.11a	-
Management	LED ON/OFF Control	•
	Management MAC Access Control	•
	Web-based Management	•
	Telnet	•
	SNMP	v1,v2c
	System Logging	Local/Remote Syslog
	Email Alerts	•
Physical & Environment	Power Supply	IEEE 802.3af PoE
	Maximum Power Consumption	2.8W
	Mounting	Wall Plate Mouting
Others	Certifications	CE,RoHS
	Dimensions (W x D x H)	3.4 × 3.4 × 1.2 in. (86.8 × 86.8 × 30.2 mm)
	Environment	Operating Temperature: 0°C~40°C (32°F~104°F); Storage Temperature: -40°C~70°C (-40°F~158°F); Operating Humidity: 10%~90% non-condensing; Storage Humidity: 5%~90% non-condensing;

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ITEM 7



NETcat® Pro2
NC-500

STRUCTURED WIRING TROUBLESHOOTER

TESTING | TROUBLESHOOTING | ACCURACY



Product Features:

One Touch Testing Verifies Network Cabling and Service.

The NETcat® Pro2 is a digital tool for fast, accurate checking of cables, wiring and network service. Operated using a back-lit touch screen display, the NETcat® Pro2 tests wiring continuity and proper pair allocation, measures the length of cables, determines if network service is available and identifies Power over Ethernet (PoE) cables.

When used with the NC-510 Accessory Kit, containing seven (7) expansion remote test modules, the NETcat® Pro2 can uniquely test coax or twisted pair jacks from a central location eight (8) at a time. Using a fingertip or the built-in stylus, the screen can be used to control and display a range of tests from fault finding to TDR length measurement. The display can be set to English, Spanish, French or German language.

Ordering Information:

CAT. NO.	DESCRIPTION
NC-500	NETcat Pro2 Digital VDV Wiring Troubleshooter
NC-510	NETcat Pro Accessory Kit w/carry case and seven (7) digital remotes
PA901074	F-Type (female) to BNC (male) adapter
PA9675	F-Type (female) to F-type (female) 2 pack barrel adapters

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TEMPO® COMMUNICATIONS

Renewed Vision. Innovation Forward.

NETcat® Pro2 NC-500

Fast and Accurate

Specifications:

Dimensions:	3.3" x 1.4" x 6.7" (8.5 cm x 3.5 cm x 17 cm)
Weight:	0.45 lb. (200 g)
Power Requirements:	9V Alkaline Battery (PP3)
Display LCD:	Dot Pixels: 128 x 128 dots
Viewing Area:	60.0 x 58.4
Backlight:	White LED
Buttons:	LCD touch-screen, single momentary contact push button
Operating Temperature:	0°C to 50°C
Storage Temperature:	-20°C to 70°C
Interface Connections:	RJ45 shielded jacks, F-type threaded female coaxial connectors
TDR Calibrations:	User selectable based on a known cable length. Range: 50 to 2,000 ft. - 40% to 100% in step of 1%.
Length:	2,000 ft. Maximum
Resolution:	1 ft.
Accuracy to Open/Short:	±4% or 2 ft. - whichever is greater
Remote Identifier:	2,000 ft. (609.6 meters) maximum distance
Wiremap:	358 ft. (100 meters) maximum distance
Memo Pad Size:	60 Characters
NVP Library-Twisted Pair Cables:	5 preset and 5 user definable
NVP Library-COAX Cables:	5 preset and 5 user definable

Key Features:

- Identifies active network devices on 10/100/1000 Base-T Ethernet (802.3) networks.
- Identifies PoE (source device detection).
- Memo Pad/reminder feature - stored in non-volatile memory.
- Field replaceable "F" type connector.

Other Features:

- NVP cable library allows for 5 commonly used fixed and 5 user selectable cable types - stored in non-volatile memory.
- Graphical touch screen display with contrast adjustment and backlight.
- Tests shielded twisted pair (STP), unshielded twisted pair (UTP) and coaxial cables.
- 0-2,000 foot (600 Meter) cable length via TDR.
- Patch cable and remote jack wire-map.
- Detects shorts, opens, reversed, crossed and split pairs.
- Office identification using remote ID units.
- Troubleshoots and verifies a wide range of networks.
- Remote jack ID and verification.
- Generate four distinct, precision tones for tracing low-loss cables like Cat 5.
- Operates on a single 9V battery, with low battery indicator.
- Compatible with Tempo precision digital probes.

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TC5503 07/20
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ITEM 8

OPTICAL FIBER FUSION SPLICER

AI-9
PRODUCT MANUAL

SIGNAL FIRE TECHNOLOGY CO., LTD.



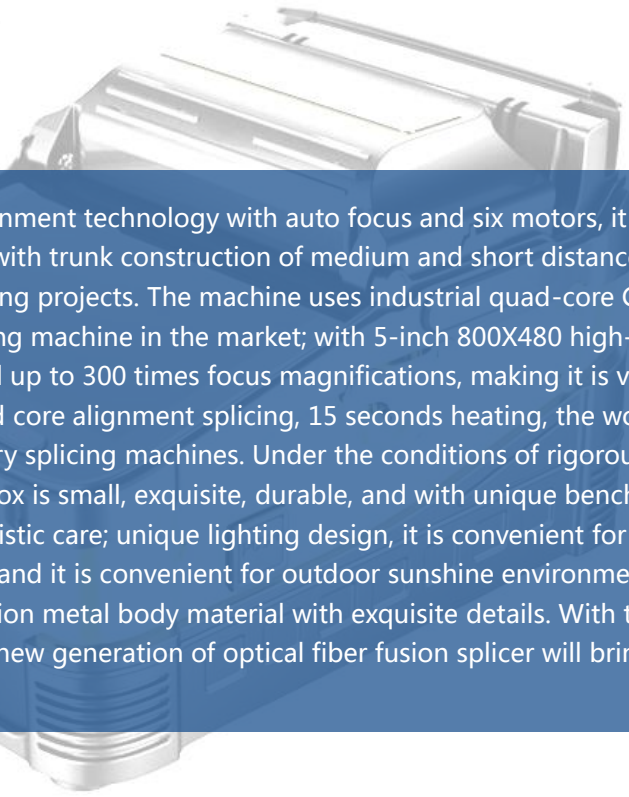
OPTICAL FIBER FUSION SPLICER



NEW PRODUCT LAUNCH

CLASSIC MASTERPIECE

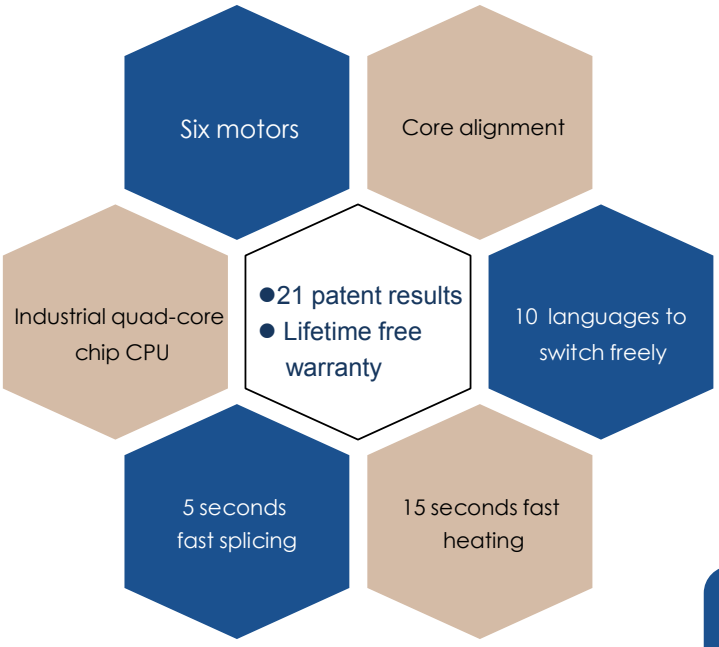
OPTICAL FIBER FUSION SPLICER



Signal Fire AI-9 use the latest core alignment technology with auto focus and six motors, it is a new generation of fiber fusion splicer. It is fully qualified with trunk construction of medium and short distance, FTTH project, security monitoring and other fiber cable splicing projects. The machine uses industrial quad-core CPU, fast response, is currently one of the fastest fiber splicing machine in the market; with 5-inch 800X480 high-resolution screen, the operation is simple and intuitively; and up to 300 times focus magnifications, making it is very easy to observe the fiber with naked eyes. 5 seconds speed core alignment splicing, 15 seconds heating, the working efficiency increased by 50% compared to ordinary splicing machines. Under the conditions of rigorous testing, the performance is still outstanding; toolbox is small, exquisite, durable, and with unique bench design. The design of operating platform reflects the humanistic care; unique lighting design, it is convenient for night construction or repair. Screen brightness is adjustable and it is convenient for outdoor sunshine environment operation. The core parts are using imported brands, aviation metal body material with exquisite details. With the combination of advanced technology and design, the new generation of optical fiber fusion splicer will bring you a reliable and comfortable user experience.

MASTERPIECE
HIGH-END LUXURY

Signal fire
OPTICAL FIBER FUSION SPLICER



● Once splicing reaches to 50,000 times free replacement a new machine

METAL BODY
AESTHETIC DETAILS

OPTICAL FIBER FUSION SPLICER



VFL: Always on / flashing / off

Power Meter:

850nm/1300nm/1310nm/1490nm /1550nm/1625nm Six states

BUILT-IN POWER METER AND VFL

Effectively measure connection loss, verify continuity, and help assess fiber link transmission quality.

OPTICAL FIBER FUSION SPLICER

10 LANGUAGES TO SWITCH FREELY

Covers the global major user market


CHINESE


ENGLISH


FRENCH


RUSSIAN


ITALIAN


PORTUGUESE


POLISH

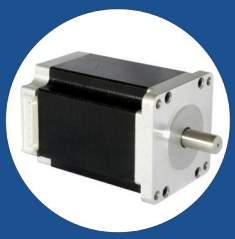

SPANISH


THAI


ARABIC

OPTICAL FIBER FUSION SPLICER

CORE PARTS QUALITY ASSURANCE



Siemens stepper motor



Roth ROUST linear guide



Sanyo lithium battery



Aviation metal material

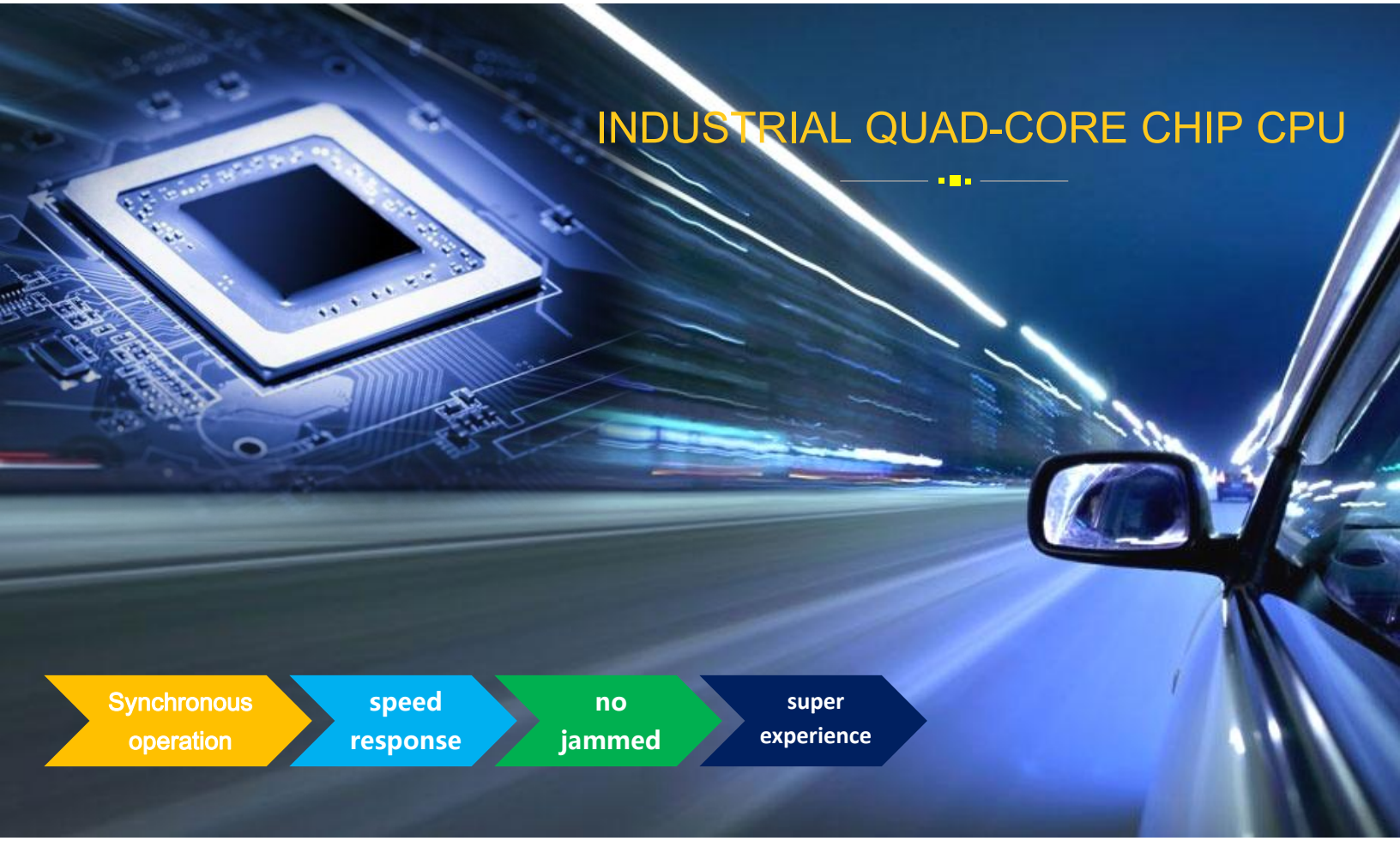
THE TOOLBOX

COMES WITH A STOOL TO FACILITATE THE CONSTRUCTION WORKERS.

OPTICAL FIBER FUSION SPLICER



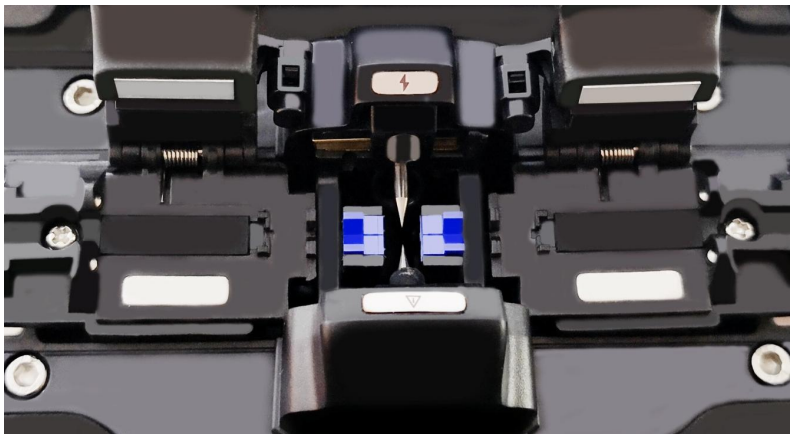



INDUSTRIAL QUAD-CORE CHIP CPU
Synchronous operation
speed response
no jammed
super experience

OPTICAL FIBER FUSION SPLICER

3 IN 1 FIBER HOLDER

SM, MM, bare fiber, pigtail, rubber-insulated, multi fiber cable



THE BATTERY POPUP AUTOMATICALLY



7800 mA high-capacity lithium battery

- charging time ≤ 3.5 hours
- continuous splicing and heating about 200 times



Press to popup the battery

Show good performance in plateau, desert, and extreme cold environment







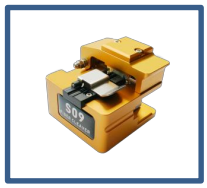
OPTICAL FIBER FUSION SPLICER

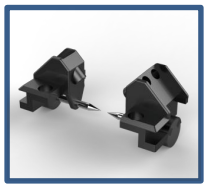
BASIC PARAMETER

Fiber alignment	Core/cladding alignment / Manual alignment	Built-in lighting	easy for night operation
Splicing time	5S	Tension Test	Standard 2N
Heating time	15S	Fiber holders	3 in 1 fiber holder, SM, MM, bare fiber, pigtail, rubber-insulated, multi fiber cable
Heating mode	Automatic heating (Preheating)	Magnification	300 for X or Y view, 150 for X or Y view
Focus mode	Six motors Auto focus	Screen	5 inch TFT color display
Applicable Fibers	SM(G.652&G.657)、MM (G.651) 、DS(G.657)、NZDS (G.655)	Splicing Mode	Normal / high precision splicing
Splice Loss	0.025dB (SM) 、0.01dB (MM) 0.04dB (DS/NZDS)	Splicing method	Fully automatic、Step by step splicing
Control technology	Real-time control and calibration of fusion ARC	Splicing record storage	Synchronize to the phone, the server to cloud storage unlimited
Return loss	Better than 60DB	Built-in battery	7800 mA high-capacity lithium battery, charging time ≤ 3.5 hours, continuous splicing and heating about 200 times
Fiber diameter	Cladding Diameter：80-150μm Coating Diameter：100-1000μm	Power supply	Input AC100-240V 50 / 60HZ, output DC13.5V / 4A, the current power mode can be identified, real-time detection of battery power
Fiber Cleave Length	Coating less than 250μm：8-16mm Coating less than 250-1000μm:16mm	Operating Conditions	Temperature -15 ~ +50 ℃, humidity: <95% RH (no condensation) Working altitude: 0 ~ 5000m. Resist max. wind speed: ≤ 15m / s
Software update Length	Automatically update、 Update by a key	Shrinkable tube	60mm、50mm、40mm、25mm
Boot time	1 second	Product protection	Waterproof, dust proof, shock-resistant
Visual Fault Locator	Power:15mw,2hzflashing And Constantly Bright Mode	Optical Power Meter	Wavelength:850nm、1300nm、1310nm、1490nm、1550nm、1625nm Measuring Range:-70 ~ +6db Absolute Error:<0.3db(-50dbm ~ +3dbm Range)

OPTICAL FIBER FUSION SPLICER

Accessories in the tool box


Fiber Cleaver

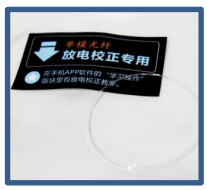

Spare electrode


Wire stripping pliers


Miller stripper


Hex key


carrying case



Fiber for
ARC calibration


Strap


Power Adapter

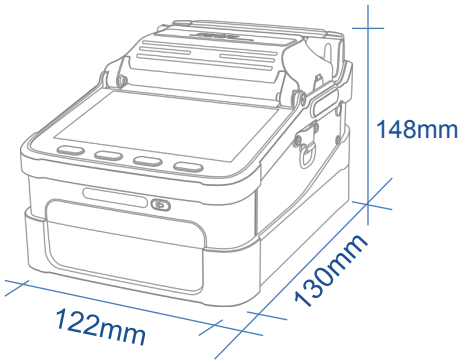

Alcohol Bottle

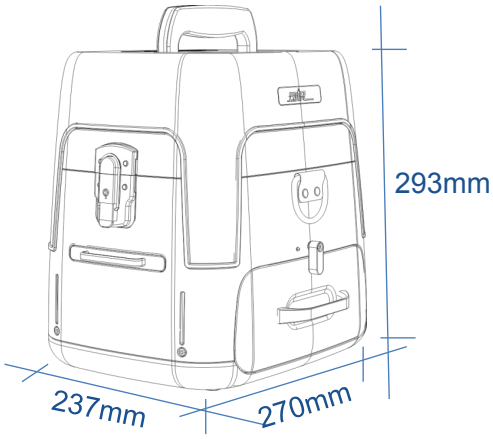

Brush

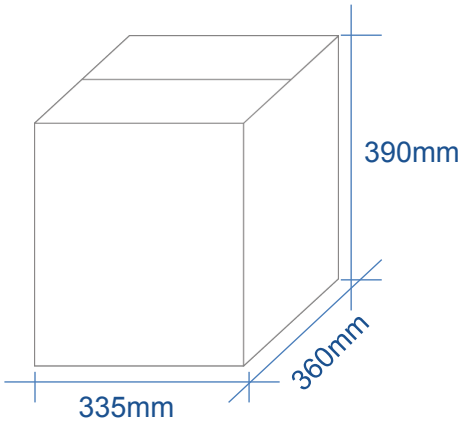

User’ s manual
Quality Certificate
Warranty Card

OPTICAL FIBER FUSION SPLICER

SIZE







ITEM 9

DYMO®

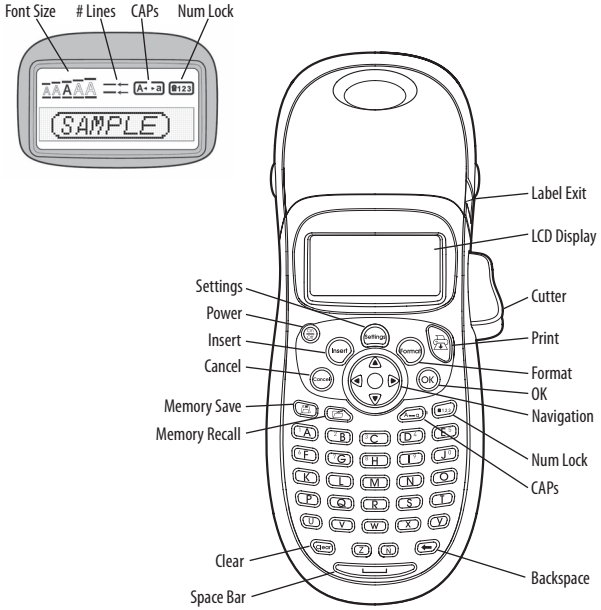


LetraTag®
LT-100H

Quick Reference Guide

W001835_C Rev. 03/16

Getting to Know Your Label Maker



About Your New Label Maker

With your new DYMO LetraTag® label maker, you can create a wide variety of high-quality, self-adhesive labels. The label maker uses DYMO LetraTag (LT) 1/2 inch (12 mm) label cassettes. LT label cassettes are available in a variety of colors and materials such as paper, plastic, metallic, magnetic, and iron-on.

Visit **www.dymo.com** for a complete User Guide, and for information on obtaining labels for your label maker.

Product Registration

Visit **www.dymo.com/registration** to register your label maker online.

Getting Started

Follow the instructions in this section to print your first label.

1 Inserting the Batteries

1. Remove the battery compartment cover.
2. Insert the batteries following the polarity markings (+ and –).
3. Replace the cover.

(!) Remove the batteries if the label maker will not be used for a long period of time.

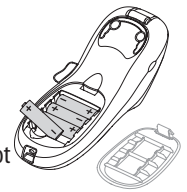


Figure 1

2 Inserting the Label Cassette

1. Press and release the label cassette cover to open the label compartment. See Figure 2.
2. Insert the cassette with the label positioned between the print head and pinch roller.
3. Press firmly until cassette clicks into place.
4. Close the label cassette cover and press (On/Off) to turn on the power.

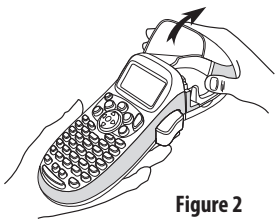


Figure 2

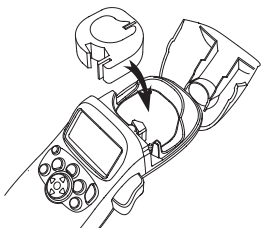


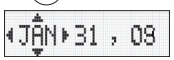
Figure 3

3 Selecting a Language

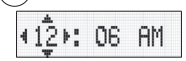
1. Press (Settings).
2. Use the up or down arrow key to select **Language** and press (OK).
3. Use the up or down arrow key to select the language you want and press (OK).

4 Setting the Date and Time

1. Press (Settings).
2. Select **Set Date** and press (OK). The default date is displayed.



3. Use the left or right arrow key to move the cursor over each setting (month, day, and year) and use the up or down arrow key to increase or decrease the value.
4. When finished, press (OK). The default time is displayed.



5. Use the left or right arrow key to move the cursor over each setting (hours and minutes) and use the up or down arrow key to increase or decrease the value.
6. When finished, press (OK).

5 Printing Your First Label

1. Enter text to create a simple label.
2. Press (Print).
3. Press the cutter button to cut the label.
4. Remove the paper backing from the label to expose the adhesive, and then attach the label.

Designing Your Label

▶ Changing the Font Size

Five font sizes are available for your labels: Extra Small, Small, Medium, Large, and Extra Large.

1. Press the (Format) key.
2. Select **Size** and press (OK).
3. Select the desired font size and then press (OK).

▶ Adding Font Styles

You can choose from six different font styles:

AaBb	Normal	AaBb	Outline
AaBb	Bold	AaBb	Shadow
AaBb	Italic	AaBb	Vertical

1. Press (Format).
2. Select **Style** and press (OK).
3. Select a font style and press (OK).

▶ Creating Two-Line Labels

1. Type the text for the first line and press (Insert).
2. Select **Second Line** and press (OK). A multi-line symbol is inserted at the end of the first line, but will not print on the label.
3. Type the text for the second line.

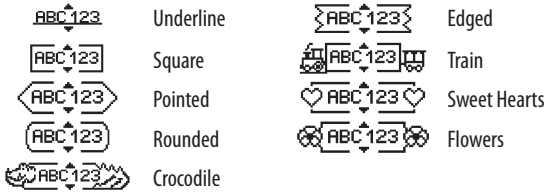
Continued ▶

Adding the Date

1. Press Insert.
2. Select **Date** and press OK.

Adding Box and Underline Styles

You can highlight your text by choosing a box or underline style.



1. Press Format.
2. Select **Borders**, and press OK.
3. Select underline or a box style and press OK.

Adding International Characters

The label maker supports the extended Latin character set using RACE technology. Similar to using a mobile phone keypad, when you hold down a letter key for longer than one second, you will scroll through variations on that letter. To insert the character, release the key when the desired character appears.

Adding Symbols

The label maker supports the symbols shown below.

Row	Position in Row				
A	€	$	¢	£	¥
B	@	&	#	%	‰
C	!	?	¡	¿	_
D	'	"	,	.	;
E	’	:	/	\	|
F	+	-	*	÷	√
G	^	~	≈	=	≠
H	±	<	>	≤	≥
I	(	)	{	}	•
J	[	]	°	§	∞
K	α	β	γ	δ	ε
L	η	λ	μ	π	ρ
M	σ	ω	Δ	Θ	∑
N	Φ	Ω	½	¼	¾
O	0	1	2	3	4
P	5	6	7	8	9
Q	0	1	2	3	4
R	5	6	7	8	9
S	©	®	™	CE	♻

Row	Position in Row				
T		↑	↓	→	←
U	☺	☹	😐	♥	❀
V		☎		✂	
W					
X	⚠				
Y			✉		
Z					
AA					
AB					
AC					
AD				♪	♫
AE			✓	✗	
AF					
AG					
AH					
AI					
AJ					
AK					
AL					
AM					

Adding Symbols (continued)

1. Press Insert, select **Symbols**, and press OK. The first row of symbols shown in the table appears in the display.
2. Use the arrow keys to move to the desired symbol. The left and right arrows move horizontally along a row of symbols. The up and down arrow keys scroll vertically through the rows of symbols.
3. When you locate the symbol, press OK to add the symbol to your label.

Previewing Your Label

1. Press Settings.
2. Select **Preview** and press OK.

Clearing the Display

- Press Clear to clear all label text and formatting from the display.

Storing Label Text

You can store up to nine specific labels you use frequently.

1. Press Save.
2. Select a memory location and press OK.

Recalling Stored Labels

1. Press Open.
2. Select a label to recall and press OK.

To clear a memory field, first recall a label and then press Clear.

1-Year Warranty for your DYMO Product

Your electronic DYMO product is sold with a 1-year warranty from the date of purchase against defects in material and workmanship. DYMO will repair or replace your product free of charge on the following conditions:

1. Products returned under this warranty must be accompanied by a description of the defect together with a copy of the product's proof of purchase and your full contact and delivery details: name, telephone, complete address – street, house number, postal code, city, country.
2. Products returned to DYMO must be adequately packaged. DYMO will accept no liability for goods lost or damaged in transit from the customer.
3. Products must have been used strictly in accordance with operating instructions supplied. DYMO will have no liability for defects caused by accident, misuse, alteration or neglect.
4. DYMO accepts no liability for any consequential loss, damage or expense of any kind resulting from the machines or accessories or the use thereof, save that liability for death or bodily injury caused by such products is not excluded.
5. DYMO label printers are designed for use only with DYMO-branded labels. This warranty does not cover any malfunction or damage caused by the use of third-party labels.

This warranty does not affect your statutory rights as a consumer.

What to do if your product is defective

DYMO offers you the following service options:

- **DYMO Web site**: In most situations a visit to www.dymo.com will give you the right assistance. In the Customer Support area, you will find information about your DYMO product, such as Frequently Asked Questions and solutions to known problems. The User Guide also gives you additional information.
- **Dealer**: Your DYMO dealer can help you to determine the exact nature of the problem and assist you further.
- **DYMO Help Desk**: You can also contact the DYMO Help Desk where an associate will help you to determine the exact nature of the problem and advise you what to do next:

  US 1 877 724 8324

  Intl +44 203 564 8356
- **Repair Center**: You can send your defective product to a DYMO repair center (please see the above-mentioned conditions 1 and 2 on how to replace a defective product). The address of your nearest DYMO repair center can be found at **www.dymo.com** or you can contact the DYMO Help Desk

DYMO

A Newell Rubbermaid Brand

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DISTRIBUTED BY: DYMO, ATLANTA, GA 30328
CUSTOMER CARE: 877-724-8324

ITEM 10

LOCALIZADOR VISUAL DE FALLAS VFL PARA FIBRA ÓPTICA DE 10MW



El localizador Visual de Fallas de 10mW es una herramienta de campo diseñada para poder determinar la continuidad de la fibra óptica y sus conexiones, emite un haz de luz de 650nm de color rojo que, al ser acoplado al cable de fibra óptica, viaja a través de su núcleo, permitiendo identificar si existe discontinuidades, curvaturas pronunciadas, mal acoplamiento o fisuras en la fibra.

1. **APLICACIONES:**

- Mantenimiento de redes de telecomunicaciones,
- Mantenimiento de redes CATV,
- Entornos de laboratorio,
- Identificación de discontinuidades, curvaturas, malos acoplamientos, etc.

2. **ESPECIFICACIONES:**

Tipo:	10mW
Longitud de onda:	650nm± 20nm
Potencia de salida:	Más de 10mw
Distancia dinámica:	Menos de 10km
Conector:	2,5mm Universal connector
Tamaño de empaquetado:	210*73*30mm
Peso:	120g
Fuente de alimentación:	AA * 2(no incluido)
Material de la carcasa:	De aluminio
Características:	Onda continua y modo pulsado, potencia de salida constante
Temperatura de trabajo:	-10 grados centígrados + 50 grados centígrados, menos de 90% RH
Temperatura de almacenamiento:	20 grados centígrados + 60 grados centígrados, menos de 90% RH

2.5MM UNIVERSAL CONNECTOR APPLICABLE TO SC FC ST INTERFACE

CONNECTOR

SC interface



FC interface



ST interface



To test 1.25mm LC interface
Fc-lc adapter to be
purchased separately

(Note: adapter is not standard)



Antiskid handle hand feel and drape

—.

Standard 2.5mm interface



Stable and strong

Good penetration effect

The beam concentration effect is good, and the long-distance optical fiber can be easily penetrated.



(Caution: Do not look directly at the laser output port to avoid damage to the retina of the eye)

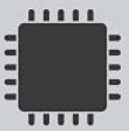
High color value Strong enough

Product introduction

High-quality laser head easily penetrates optical fiber and has excellent stability.

Can quickly detect on-off of a line

...



Quality laser chip



Aluminum alloy material



Support multiple interfaces



Replaceable battery



Product information

Product name	Visual Fault Locator
luminous power	>10mW
Wavelength	650nm ±10nm
Interface	2.5mm universal connector
usage temperature	0~+60°C
storage temperature	-20~+70°C
Battery type	No.5 battery 2
battery life	>13 hour
Appearance	175*26*26mm
Weight	160g



since the international air does not allow contains flammable and explosive goods, so the unity does not contain the battery delivery



List: Visual Fault Locator, ceramic core, battery, hanging rope, convenient bag, packing box

ITEM 11

MULTI-PURPOSE LINES OF COMMUNICATION
SCANNING & TESTING DEVICE

INSTRUCTION MANUAL **LPCT019**

WIRE TRACKER

Your wire finder expert



NEWS

WIRE TRACKER!

Find wire on all types of connected ***operating***
Ethernet switch/Router/PC terminal

The list of package

Parts of emitter



Wire finding indicator

Wire sequence indicator

Function switchover button

DIP switch

Testing indicator

RJ11 socket

RJ45 socket

Parts of receiver



Probe

Signal indicator

Inching button

Wire sequence indicator

Earphone jack

Spotlight switch

Volume

Accessories



RJ11 telephone cable

RJ45 network cable

Cable with crocodile clamp

Earphone

9V battery

Telephone wire finding function

LPCT019





1. Directly insert telephone wire with RJ11 plug into the RJ11 socket of the wire tracker's emitter;
2. Push DIP switch of emitter to position of "SCAN" then wire finding indicator "STATUS" flashes meaning normal work of emitter;
3. Press downward the inching button, use the probe of receiver to find target wire at the other end;
4. During testing, function switchover button can be pressed for switchover of dual-tone.

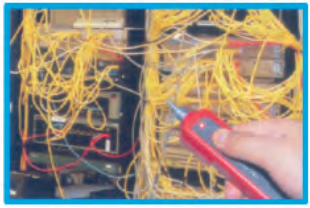
Rapidly find the target wire from among plenty of telephone wires

CASE I

Find wire on switch



Connect emitter with port of telephone wire to be found



Find it with receiver at the other end

CASE II

Find wire on patch panel



Connect emitter with port of telephone wire to be found



Find it with receiver at the other end

Compare the volume of the "tout" sound and the brightness of the signal indicator. Then you can find the target wire which has the highest volume and brightest indicator.

Network wire finding function

LPCT019





1. Directly insert network wire with RJ45 plug into the RJ45 socket of the wire tracker's emitter;
2. Push DIP switch of emitter to position of "SCAN" then wire finding indicator "STATUS" flashes meaning normal work of emitter;
3. Press downward the inching button, use the probe of receiver to find target wire at the other end;
4. During testing, function switchover button can be pressed for switchover of dual-tone.

Rapidly find the target wire from among plenty of network wires

CASE I

Find wire on router



Connect emitter with port of network wire to be found



Find it with receiver at the other end

CASE II

Find wire on net bar



Connect emitter with port of network wire to be found



Find it on the switch

Compare the volume of the "tout" sound and the brightness of the signal indicator. Then you can find the target wire which has the highest volume and brightest indicator.

Electric wire finding function

LPCT019





1. Directly insert telephone wire with crococile clamp and RJ11 plug into the RJ11 socket of the wire tracker' s emitter;
2. Push DIP switch of emitter to position of " SCAN" then wire finding indicator "STATUS" flashes meaning normal work of emitter;
3. Press downward the inching button, use the probe of receiver to find target wire at the other end;
4. During testing, function switchover button can be pressed for switchover of dual-tone.

Rapidly find the target wire from among plenty of network wires

CASE Note: The equipment is prohibited to be used on heavy-current wires



Connect emitter with electric wire to be found



There is no electric drill required!!!



How to find the wire from among so many wires?
It is so slow by using a multimeter.

Compare the volume of the "tout" sound and the brightness of the signal indicator.
Then you can find the target wire which has the highest volume and brightest indicator.

Network wire
Collation function

LPCT019



1. Insert RJ45 plug at two ends of the network wire into the corresponding sockets at emitter and receiver.
2. Push function switchover button on emitter to the position of "TEST", testing indicator "VERIFY" flashes meaning normal work of emitter.
3. According to 16 wire sequences, judge the characteristics of short-circuit, breaking circuit, open circuit and crossing.
4. During testing, function switchover button can be pressed for switchover of fast and slow levels.

Network wire sequence collation

CASE Note: The equipment is prohibited to be used on heavy-current wires

Support direct wire collation of operating switch



It's so simple that there is no cable tester required for testing wire now

It can take place of cable tester

It can rapidly test open circuit/short circuit and crossing through the 16 status indicators. The test result is accurate and the result is dispiayed clearly and directly.



Automatic scan mode,rapidly testing, It can test correspondingly double-twisted cables 1,2,3,4,5,6,7,8 and G,meanwile,can judge wrong connection,short circuit and opencircuit.

Others function

LPCT019

Open circuit or short circuit testing function

Push DIP switch on emitter to position of "TEST", and long press function switchover button on emitter for 2 seconds, "VERIFY" indicator will change "flash" to "lighting" insert the crystal plug with crocodile clamp into RJ11, clamp the two ends to be tested with crocodile clamps, in case of short circuit, "1" -shape indicator of emitter will light up, otherwise it will not light up, resistance of the line can be indicated be brightness of status indicators: the lighter the indicator, the smaller the resistance; the darker the indicator, the bigger the resistance.

DC level testing function

Push DIP switch on emitter to position of "SCAN", and long press function switchover button on emitter for 2 seconds, "STATUS" indicator will turn off and "VERIFY" indicator flashes, insert the crystal plug with crocodile clamp into RJ11, clamp the two ends to be tested with crocodile clamps, in case that "STATUS" indicator lights up in red , it means the end clamped with red clamp is positive pole, in case that "STATUS" indicator lights up in green, it means the end clamped with red clamp is negative pole, electric level can be judged by brightness of the status indicators; the lighter the indicator, the smaller the resistance; the darker the indicator, the bigger the resistance.



Can test positive and nega tive pole of DC electric level

Low voltage alarm function

Push DIP switch on emitter to position of "SCAN", in case that battery level is lower than 6.0V, "STATUS" and "VERIFY" indicators will light up at the same time, it means battery replacement is needed.



Earphone function

In noisy environment, earphone can be used to prevent interference from the outside.

Volume adjusting function

While find the wire, volume knob can be rotated for moderate level of sound.

Spotlight function

You can easily work as usual while putting on the light switch at night and in the dark.



Energy-saving

Inching switch can automatically delay power-off.
The continuous lifespan of battery is over 50 hours.



Applicable users:

Telecom post bureau/net bar/telecom engineering companies / network engineering companies/power supply/ army and other departments requiring wire.

Applicable scope:

Wire engineering of telecom network and regular maintenance work; network line engineering of computer; other wire engineering and maintenance.

Specification of product

Item	Specification	
Product name	Wire tracker	
Power supply	DC, 9V battery	
The max working current	Emitter	≤10mA
	Receiver	≤30mA
Signal transmission format	Multi-frequency impulse	
Signal output electric status	8Vp-p	
Distance of signal transmission	≥3km	
Appearance dimension	Emitter	126X49X34,mm
	Receiver	175X42X27,mm
	Whole set	270X165X45,mm
Weight	Emitter	0.060kg
	Receiver	0.072kg
	Whole set	0.420kg

The list of package

1. Emitter	1 piece	6. Cable with crocodile clamp	1 piece
2. Receiver	1 piece	7. RJ45 network cable	1 piece
3. 9V battery	2 pieces	8. Instruction manual	1 piece
4. Earphone	1 piece	9. Toolkit	1 piece
5. RJ11 telephone cable	1 piece	10. Color box	1 piece

ITEM 12



Orientek

Model Number	TFI-40
Wavelength Recognition Range	800nm to 1700nm
Signal Recognition Type	CW,270 Hz ± 5%,1 kHz ± 5%,2 kHz ± 5%
Detector Type	ϕ1mm InGaAs 2 pcs
Adapted fiber type	Universal Holder for ϕ0.25(Bare Fiber),ϕ0.9,ϕ2.0,ϕ3.0 Cable
Signal Direction	Left & Right LED
Optical Power Reading Range	-40 dBm to 10 dBm
Signal Frequency Range	270Hz,1kHz,2kHz
Power Type	AA*2
Operating Temperature Range	-10℃ to 60℃
Storage Temperature Range	-25℃ to 70℃
Dimension	219mm*45mm*28mm
Weight	235g
VFL function	
Power range	1mW
Testing distance	3-5km
Wavelength	650nm
Laser type	LD
LED light	Support

Multi-in-one fixture



2.0/3.0mm jump cable



0.9mm fiber cable



Bare fiber cable

PRODUCT LIST:





ITEM 13

DATOS TÉCNICOS

Multímetro de verdadero valor eficaz Fluke 110



Multímetro compacto de verdadero valor eficaz para instalaciones eléctricas precisas y resolución de problemas

El Fluke 110 es un instrumento versátil que permite realizar medidas eléctricas y solucionar problemas. Un instrumento que goza de la confianza de instaladores eléctricos en aplicaciones comerciales y domésticas para resolución de problemas y mantenimiento. El 110 está diseñado para un uso profesional cuando se requiere la precisión del verdadero valor eficaz.

Características principales:

- Verdadero valor eficaz de tensión CA para medidas precisas en señales no lineales
- Pantalla LED grande retroiluminada blanca para trabajar en áreas poco iluminadas
- Resistencia y continuidad
- Mín/Máx/Promedio para registrar fluctuaciones de la señal
- Clasificación de seguridad CAT III 600 V.



CLASIFICACIÓN DE SEGURIDAD

CAT III 600 V

GARANTÍA

3 años

PROFESIONAL, PRECISO, FÁCIL DE USAR

El 110 es un instrumento adecuado para todas las medidas eléctricas esenciales.

- Un instrumento ideal para la resolución de problemas mediante pruebas "pasa/no pasa"
- Con un diseño ergonómico y compacto que permite su uso con una sola mano
- Se entrega con una funda con soportes para sondas que facilitan su almacenamiento
- Con selección manual y automática de rango
- Encaja en el colgador magnético ToolPak™ opcional para un uso manos libres

Especificaciones

La precisión se garantiza durante 1 año tras la calibración para una temperatura de funcionamiento de 18 °C a 28 °C y una humedad relativa del 0% al 90%. Las especificaciones de precisión tienen este formato: ±([% de lectura] + [cuentas])

Especificaciones generales	
Tensión máxima (entre cualquier terminal y tierra)	600 V
Seguridad	IEC 61010-1: Grado de contaminación 2; IEC 61010-2-033: CAT III 600 V
Pantalla	Digital: 6000 cuentas, 4 actualizaciones/s
Gráfico de barras	33 segmentos, 32 actualizaciones/s
Temperatura	
Funcionamiento	-10 °C a 50 °C
Almacenamiento	−40 °C a 60 °C
Batería	9 V alcalina, IEC 6LR61
Autonomía de la batería	400 h, sin retroiluminación

Precisión

Medida	**Rango**	**Resolución**	**Precisión ±([% de la lectura] + [cuentas])**
Milivoltios CC	600,0 mV	0,1 mV	0,5% + 2
Tensión CC	6,000 V 60,00 V 600,0 V	0,001 V 0,01 V 0,1 V	0,5% + 2
Verdadero valor eficaz de[1] milivoltios CA	600,0 mV	0,1 mV	1,0% + 3 (CC, 45 Hz a 500 Hz) 2,0% + 3 (500 Hz a 1 kHz)
Verdadero valor eficaz de[1] tensión CA	6,000 V 60,00 V 600,0 V	0,001 V 0,01 V 0,1 V	1,0% + 3 (CC, 45 Hz a 500 Hz) 2,0% + 3 (500 Hz a 1 kHz)
Continuidad	600 Ω	1 Ω	Reproducción de sonido a < 20 Ω, se apaga a > 250 Ω; si detecta circuitos abiertos o cortocircuitos de 500 µs de duración o más.
Ohmios	600,0 Ω 6,000 kΩ 60,00 kΩ 600,0 kΩ 6,000 MΩ 40,00 MΩ	0,1 Ω 0,001 kΩ 0,01 kΩ 0,1 kΩ 0,001 MΩ 0,01 MΩ	0,9% + 1 5% + 2

[1]Todos los rangos de tensión CA se especifican del 1% al 100%. Dado que no se especifican las entradas inferiores a un 1% del rango, es normal que en este multímetro y en otros multímetros de verdadero valor eficaz se muestren lecturas que no sean cero cuando los cables de prueba no estén conectados a un circuito o se realice un cortocircuito con ambos cables. Factor de cresta de tensión de ≤ 3 a 4.000 cuentas, disminuye linealmente hasta 1,5 a escala completa. La tensión CA están acoplada a CA.

Información para pedidos

Multímetro **FLUKE-110** para aplicaciones eléctricas

Incluido

Juego de cables de prueba TL75 Hard Point™ y batería de 9 V (instalada).

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12/2019 6012900a-es

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ITEM 14

UT572
Advanced Earth Resistance Tester

UT572 is for measuring earth resistance and soil resistivity. It can automatically check interface connection and detect interference voltage/frequency. UT572 can perform 2/3/4-wire measurements for different on-site applications, such as power equipment wiring and lightning protection equipment.





UT572

Specifications	Range	Accuracy
Certificates	**CE, UKCA**	
Earth resistance (Re)	4Ω	±(3%+15)
	40Ω/400Ω/4kΩ/40kΩ	±(3%+5)
Soil resistivity (ρ)	4Ω	±(3%+15)
	40Ω/400Ω/4kΩ/40kΩ	±(3%+5)
Disturbance voltage (Ust)	50V (DC voltage/40Hz~500Hz)	±(3%+3)
Disturbance frequency (Fst)	40Hz~500Hz	±(1%+2)
Data storage	20	
Category ratings	CAT III 600V	

Features	
2/3/4-wire test	Data hold
Earth resistance test frequency: 94/128Hz	LCD backlight
Soil resistivity test distances: 1~40m	Auto power off
Earth resistance RH and RS test	Low battery indication: ≤9.5V
Compensating resistance RK test	

Characteristics	
Standard accessories	Batteries, simple test leads with alligator clips (double plugs x 1, single plug x 1), earth spike x 4, standard test leads with alligator clips (40m red x 1, 20m red x 1, 20m black x 1, 10m yellow x 1, 5m green x 1), elastic strap
Optional accessories	1.5V battery (LR6) x 8
Display	125 x 37mm
Product size	210 x 175 x 90 mm
Product net weight	1.1kg
Standard individual packing	Gift box, carrying bag, toolbox, English manual
Standard quantity per carton	2pcs
Standard carton measurement	475 x 378 x 335mm
Standard carton gross weight	14kg

ITEM 15

DATOS TÉCNICOS

Pinzas amperimétricas inalámbricas de CA/CC de verdadero valor eficaz Fluke serie 370 FC



FLUKE CONNECT®

REGISTRO Y OBSERVACIÓN DE LAS TENDENCIAS DE LAS MEDICIONES

Transmita los resultados de manera inalámbrica con la aplicación para mediciones Fluke Connect®

TRABAJE DE FORMA SEGURA

Capte mediciones fuera del área del arco eléctrico con conectividad Bluetooth a sus dispositivos Apple o Android

FILTRO DE PASO BAJO

El filtro de paso bajo integrado para VFD (incluido en los modelos Fluke 376 FC y 375 FC) permite realizar mediciones precisas de los accionadores de motor

VERDADERO VALOR EFICAZ

Verdadero valor eficaz de tensión y corriente para obtener mediciones exactas en señales no lineales

GARANTÍA

Tres años

La nueva serie 370 FC (376 FC, 375 FC y 374 FC) de Fluke ofrece un rendimiento avanzado para la solución de problemas. La sonda de corriente flexible iFlex® permite que las conexiones de los cables sean más sencillas en espacios reducidos. Además, las tres pinzas ahora forman parte de la familia de herramientas de prueba inalámbricas de Fluke Connect®. Ahora usted puede:

- Registrar y observar las tendencias de las mediciones para localizar las fallas intermitentes
- Transmitir los resultados de manera inalámbrica con la aplicación para mediciones Fluke Connect®
- Crear y enviar informes directamente desde el terreno
- Captar mediciones fuera del área del arco eléctrico con conectividad Bluetooth a sus dispositivos Apple o Android

Características del producto

- Conecte el medidor al smartphone con la aplicación para mediciones Fluke Connect, con el fin de incrementar el poder para solucionar problemas de su pinza
- Lea mediciones en el teléfono a una distancia segura, con menos equipos de protección individual (EPP) mientras que el medidor se lleva todos los riesgos
- Registre los resultados directamente en el teléfono y en Fluke Cloud™
- Capte los fallos intermitentes mientras realiza otras tareas con las capacidades de registro de los modelos Fluke 376 FC y 375 FC
- Cree y comparta informes desde el terreno mediante correo electrónico o hable en tiempo real con las videollamadas ShareLive™



Todas las marcas registradas son propiedad de sus respectivos propietarios



- La sonda de corriente flexible iFlex expande el rango de medición a 2500 A CA; proporciona acceso a grandes conductores ubicados en espacios reducidos (viene incluida con el modelo 376 FC y es compatible con los modelos 375 FC y 374 FC)
- La correa magnética para colgar TPAK (incluida con el modelo 376 FC y compatible con los modelos 375 FC y 374 FC) permite colgar cómodamente la pinza cuando se utilizan las sondas
- El filtro de paso bajo integrado para accionadores de frecuencia variable (VFD, por sus siglas en inglés) (incluido en los modelos Fluke 376 FC y 375 FC) permite realizar mediciones precisas de los accionadores de motor
- La exclusiva tecnología para mediciones de arranque para filtrar el ruido y captar la corriente de arranque del motor exactamente como la percibe la protección de circuitos
- Categoría de seguridad eléctrica CAT IV 600 V, CAT III 1000 V
- Tres años de garantía
- Estuche de transporte flexible



Capacidad de las mediciones

- Mediciones de corriente de 1000 A CA y CC (376 FC); 600 A CA y CC (375 FC y 374 FC)
- Mediciones de corriente de 2500 A CA con la sonda de corriente flexible iFlex®
- Medición de tensión de 1000 V CA y CC
- Verdadero valor eficaz de tensión y corriente para obtener mediciones exactas en señales no lineales
- Mediciones de frecuencia de hasta 500 Hz con mordaza y tecnología iFlex (376 FC y 375 FC)
- Mediciones de resistencia de hasta 60 kΩ (376 FC y 375 FC) o 6.000 Ω (374 FC), con detección de continuidad
- Grabación de arranque mín., máx. y promedio para capturar las variaciones automáticamente
- Rango de medición de 500 mV CC para interactuar con otros accesorios (376 FC y 375 FC)
- Mediciones de capacitancia de 1000 µF

Cuadro de comparación

	Fluke 376 FC	Fluke 375 FC	Fluke 374 FC
Clasificación CAT	CAT III 1000 V, CAT IV 600 V	CAT III 1000 V, CAT IV 600 V	CAT III 1000 V, CAT IV 600 V
Intervalo de A CA	999,9 A con mordazas de pinza 2500 A con pinza de corriente flexible iFlex®	600 A con mordazas de pinza 2500 A con pinza de corriente flexible iFlex® opcional	600 A con mordazas de pinza 2500 A con pinza de corriente flexible iFlex® opcional
Intervalo de A de CC	999,9 A	600 A	600 A
Máxima resolución	0,1 A	0,1 A	0,1 A
Intervalo de V CA	1000 V	1000 V	1000 V
Intervalo de V CC	1000 V	1000 V	1000 V
Rango de mV CC	500 mV	500 mV	
Rango de ohmios	60,00 kΩ	60,00 kΩ	6.000 Ω
Frecuencia	5–500,0 Hz	5–500,0 Hz	
Capacitancia	1 µF / –1000 µF	1 µF / –1000 µF	1 µF / –1000 µF
Desactivación automática	•	•	•
Verdadero valor eficaz	•	•	•
Retención de pantalla	•	•	•
Mediciones de arranque	•	•	•
Luz de fondo	•	•	•
CC a cero	•	•	•
Valores mínimo y máximo	•	•	•
Filtro de paso bajo para VFD	•	•	
Registro	•	•	
Pinza de corriente flexible iFlex®	Se incluye	Opcional	Opcional
Compatible con Fluke Connect®	•	•	•

Especificaciones

Especificaciones generales	
Tensión máxima entre cualquier terminal y tierra	1000 V
Tipo de batería	2 baterías alcalinas AA, NEDA 15A, IEC LR6
Temperatura	En funcionamiento: –10 °C a +50 °C (14 °F a 122 °F) Almacenamiento: –40 °C a +60 °C (–40 °F a + 140 °F)
Humedad de funcionamiento	Sin condensación (< 10 °C [50 °F]), ≤90 % HR (a 10 °C hasta 30 °C [50 °F a 86 °F]), ≤75 % HR (a 30 °C hasta 40 °C [86 °F hasta 104 °F]), ≤45 % RH (a 40 °C hasta 50 °C [104 °F hasta 122 °F])
Altitud	En funcionamiento: 3000 m (9842 pies) Almacenada: 12 000 m (39 370 pies)
Dimensiones	24,9 cm (9,8 pulg.) x 8,5 cm (3,3 pulg.) x 4,5 cm (1,7 pulg.)
Peso	395 g (13,9 oz)
Apertura de la mordaza	34 mm (1,3 pulg.)
Diámetro de la sonda de corriente flexible	7,5 mm (0,29 pulg.)
Longitud del cable de la sonda de corriente flexible (desde la cabeza hasta el conector de aparatos electrónicos)	1,8 m (70,8 in)
Seguridad	IEC 61010–1, grado de contaminación 2 IEC 61010–2–032: CAT III 1000 V/CAT IV 600 V IEC 61010–2–033: CAT III 1000 V/CAT IV 600 V
Clasificación IP	IEC 60529: IP30, en reposo
Certificación de radiofrecuencia	FCC ID:T68–FBLE IC:6627A–FBLE

Continuación de las especificaciones generales	
Compatibilidad electromagnética (EMC)	Internacional: IEC 61326-1: Portátil, entorno electromagnético, IEC 61326-2-2 CISPR 11: Grupo 1, Clase A Corea (KCC): Equipo de Clase A (equipo de comunicación y difusión industrial) EE. UU. (FCC): 47 CFR 15 subsección B. Este producto se considera un dispositivo exento según la cláusula 15.103.
Coeficientes de temperatura	Sumar 0,1 x la precisión especificada por cada grado centígrado por arriba de 28 °C o por debajo de 18 °C

Función	Rango	Resolución	Exactitud	Factor de cresta	Nivel de activación
Corriente CA por medio de mordaza	374 FC y 375 FC: 600,0 A 376 FC: 999,9 A	0,1 A	2 % ± 5 dígitos (10 Hz a 100 Hz)	3 a 500 A (solo en los modelos 375 FC y 376 FC) 2,5 a 600 A 1,42 a 1000 A (solo en 376 FC) Agregar un 2 % para C.F. >2	
Corriente CA a través de la sonda de corriente flexible	2500 A	374 FC y 375 FC: 0,1 A (≤ 600,0 A), 1 A (≤ 2500 A) 376 FC: 0,1 A (≤ 999,9 A), 1 A (≤ 2500 A)	3 % ± 5 dígitos (5 Hz a 500 Hz)	3,0 a 1100 A (solo en los modelos 375 FC y 376 FC) 2,5 a 1400 A 1,42 a 2500 A Agregar un 2 % para C.F. >2	
Corriente de CC	374 FC y 375 FC: 600,0 A 376 FC: 999,9 A	0,1 A	2 % ±5 dígitos		
Tensión de CA	1000 V	0,1 V (≤600,0 V) 1 V (≤1000 V)	1,5 % ±5 dígitos (20 Hz a 500 Hz)		
Tensión de CC	1000 V	0,1 V (≤600,0 V) 1 V (≤1000 V)	1 % ±5 dígitos		
mV CC	500,0 mV	0,1 mV	1 % ±5 dígitos		
Frecuencia mediante la mordaza	375 FC y 376 FC: 5,0 Hz a 500,0 Hz	0,1 Hz	0,5 % ±5 dígitos		5 Hz a 10 Hz, ≥10 A 10 Hz a 100 Hz, ≥5 A 100 Hz a 500 Hz, ≥10 A
Frecuencia a través de la sonda de corriente flexible	375 FC y 376 FC: 5,0 Hz a 500,0 Hz	0,1 Hz	0,5 % ±5 dígitos		5 Hz a 20 Hz, ≥25 A 20 Hz a 100 Hz, ≥20 A 100 Hz a 500 Hz, ≥25 A
Resistencia	374 FC: 6000 Ω 375 FC y 376 FC: 60 kΩ	374 FC: 0,1 Ω (≤600 Ω), 1 Ω (≤6000 Ω) 375 FC y 376 FC: 0,1 Ω (≤600 Ω), 1 Ω (≤6000 Ω), 10 Ω (≤60 kΩ)	1 % ±5 dígitos		
Capacitancia	1.000 µF	0,1 µF (≤100 µF), 1 µ F (≤1000 µF)	1 % ±4 dígitos		

Información para realizar pedidos

Pinza amperimétrica inalámbrica de verdadero valor eficaz de 600 A CA/CC **374 FC**
Pinza amperimétrica inalámbrica de verdadero valor eficaz de 600 A CA/CC **375 FC**
Pinza amperimétrica inalámbrica de verdadero valor eficaz de 1000A CA/CC **376 FC** con iFlex®

Se incluye

Sonda de corriente flexible iFlex® de 18 pulgadas (solo en el modelo 376 FC)
Correa magnética para colgar **TPAK** (solo en 376 FC)
Estuche de transporte flexible
Puntas de prueba **TL75**
Dos pilas alcalinas AA
Tarjeta de instrucciones revestida
Hoja de información sobre seguridad

Accesorios opcionales

Correa magnética para colgar **TPAK** (incluida con 376 FC)
Sonda de corriente flexible iFlex® de 18 pulgadas (incluida con 376 FC)





Cree y mantenga prácticas de mantenimiento preventivo con facilidad para ayudarle a supervisar su complejo mundo con el sistema de software y con las herramientas de prueba inalámbricas Fluke Connect®.

- Aumente al máximo el tiempo de actividad y tome decisiones seguras de mantenimiento con datos confiables que puede rastrear.
- Guarde las mediciones en Fluke Cloud™ y asócielas con un activo para que su equipo pueda consultar tanto las mediciones históricas como las actuales desde un solo lugar.
- Colabore con facilidad con la opción de compartir sus datos con otras personas mediante correos electrónicos y videollamadas ShareLive™.
- Realice transferencias de mediciones en un solo paso y de manera inalámbrica con las mediciones AutoRecord™, que eliminan la necesidad de utilizar portapapeles y papeleos.
- Consulte las vistas de resumen de todos los activos en el tiempo para identificar fácilmente las fallas correlativas o periódicas, con el fin de hacer que la priorización del trabajo de mantenimiento sea más sencilla.
- Genere informes con tipos distintos de mediciones para proporcionar el estado de las recomendaciones de trabajo.

Obtenga más información en **flukeconnect.com**

Descargue la aplicación en:

Download on the App Store | ANDROID APP ON Google play

El smartphone no está incluido en la venta.

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08/2015 6005995A_LAES

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ITEM 16

Detector digital de cortacircuitos con probador de tomacorrientes GFCI



El detector de cortacircuitos ET310 de Klein Tools con probador de tomacorrientes GFCI integrado es un detector de cortacircuitos digital que se usa para ubicar el cortacircuitos correcto en un panel al que se conecta un tomacorrientes o accesorio eléctrico. El transmisor se conecta al tomacorrientes o al accesorio eléctrico en el circuito, mientras que el receptor se usa para escanear los cortacircuitos en el panel. El transmisor también cuenta con probador de tomacorrientes GFCI.

Especificaciones

Tipo:	Probador electrónico	**Aplicación:**	Ubica cortacircuitos en el panel, prueba dispositivos GFCI
Características especiales:	El transmisor se acopla en el receptor; transmisor integrado; probador de tomacorrientes GFCI en el receptor	**Longitud total:**	10,96" (27,8 cm) (con el transmisor acoplado en el receptor)
Altura total:	2,16" (5,5 cm) (con el transmisor acoplado en el receptor)	**Ancho total:**	1,39" (3,5 cm) (con el transmisor acoplado en el receptor)
Material:	Carcasa de PC y PC-ABS con componentes electrónicos	**Baterías:**	1 de 9 V
Estándar:	CAT II 120 V	**Incluidas:**	Transmisor, receptor, manual del usuario y batería de 9 V para el receptor
Peso:	7,2 oz (204 g)		