

PHILIPS

PoE Switch

Connected Lighting



Product Guide

LCN5228 PoE switch

The Philips PoE switch is an intelligent, fully managed PoE switch, specifically designed for PoE lighting applications.

Optimized for use in ceilings, or to be mounted to walls the Philips PoE switch is fanless to ensure longevity in conditions where a PoE switch may not usually be placed.

- Extend a highly secure, intelligent, managed infrastructure with a single Ethernet cable from the wiring closet
- Fully managed switch with Web Interface
- Low standby power (see AC mains input)
- High operating efficiency
- Star or ring topology can be supported with Spanning tree configuration
- Attractive, small form factor and fanless operation fit in confined spaces where multiple cable runs could be challenging
- Enhanced limited lifetime hardware 3 year warranty

Standards

Networking

- IEEE 802.3 Ethernet
- IEEE 802.3i 10Base-T Ethernet
- IEEE 802.3u 100Base-TX Fast Ethernet
- IEEE 802.3ab 1000Base-TX
- IEEE 802.3az Energy Efficient Ethernet
- IEEE 802.3x Flow Control and Back pressure
- IEEE 802.3af Power over Ethernet (PoE)
- IEEE 802.3at Power over Ethernet Plus (PoE+)
- IEEE802.1d Spanning Tree Protocol (Network redundancy)
- IEEE802.1D-2004 Rapid Spanning Tree Protocol (Network redundancy)
- IEEE 802.1p standard Class of service
- IEEE802.1Q standard VLAN
- IEEE802.3ad Link Aggregation Control Protocol (LACP)
- IEEE802.1x Port based Network Access Control
- IEEE802.1AB Link Layer Discovery Protocol

Management features

- Configuration: CLI (industry standard), Web, Telnet, SNMP v1/v2c/v3, RMON
- Configuration/Firmware Upload/Download in HTTP interface
- TFTP Configuration/Firmware upload and download support
- SNMP MIB: MIB-II, Bridge MIB, VLAN MIB, SNMP MIB, PoE MIB, RMON MIB (see MIB list)
- Port mirroring: online traffic monitoring
- Port Trunk: IEEE802.3ad Link Aggregation Control Protocol (LACP)
- Broadcast storm control
- Rate Control: Per Port Bandwidth/Rate Control
- Security: MAC Address filtering, IEEE802.1x Port-based security, MAC-based security
- Bridge Multicast Groups: 512
- VLAN: IEEE802.1Q VLAN, Port-based VLAN, Tag-based VLAN, MAC-based VLAN: VLAN entries: 4K
- IGMP Snooping: IPv4 IGMP snooping, IPv6 IGMP MLD Snooping

Immunity

- IEC 61000-4-2 ed1.2: 2001: Electrostatic Discharge: Test level 3: 6kV contact, 8kV air
- IEC 61000-4-3 ed3.0 +A1: Radiated radio frequency, electromagnetic field immunity: Level 3
- IEC 61000-4-4 ed2.0: Electrical fast transient/burst immunity: Level 3
- IEC 61000-4-5 ed2.0: Shock waves, 1.2us on single phase current network: Surge: Level 3
- IEC 61000-4-6 ed 2.2: Conducted disturbances induced by RF fields: Level 3
- IEC 61000-4-8 ed 2.0 Electromagnetic Compatibility – Part 4.8
- IEC 61000-4-11 ed 2: Voltage dips, short interrupts, voltage variations

Safety standards

- IEC/EN 60950-1 Information technology equipment – Safety – Part 1: General requirements
- UL2108 Low-voltage lighting systems, power units, luminaires and fittings
- NEC, National Electrical Code (NFPA 70)
- UL 2043 Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-Handling Spaces (Plenum)
- Use of LCA5221, Mains Connection Kit, is required.
- Hi-Pot according to IEC60950
- PoE switch is protected against overheating
- Isolation primary/secondary: SELV output

System standards

Banned substances: RoHS and Reach are included in Philips requirement CSO-BP01-2011-001

Specifications

Mechanical

Weight basic PoE switch (without accessories)	3.75 lbs (1.7 Kg)
Dimensions basic PoE switch part	H x D x W = 15.55" x 4.64" x 2.60" (395 x 118 x 66 mm)
Thermal (no fan, approved for ceiling mounting)	Passive cooling
Fixation (see Installation Guide)	wall- , ceiling- and rack-mounted
Vibration test unpacked (IEC 60068-2-6 test Fc)	5-500 Hz, 5 m/s ² /1.5 mm
Bump test unpacked (IEC 60068-2-29 test Eb)	10g/16ms/100 bumps in each direction
Drop test unpacked (IEC 60068-2-31 test Ec)	Free fall, procedure 1100 mm

AC Mains input

Connector (socket) type (strain relief possibility)	IEC60320 C14 connector
Voltage range (+/- 10% of nominal)	Nominal: 100V AC – 240V AC Min/Max: 90V AC – 264V AC
Frequency range	Nominal: 50 Hz – 60 Hz Min/Max: 47 Hz – 63 Hz
Rated current (In)	100V AC: 2.75A 240V AC: 1.25A
Power factor at 100% load	115V AC: > 0.90 230V AC: > 0.90
Harmonics of the input current (class A)	According to IEC 61000-3-2 ed3.0 +A1 +A2: Limits for harmonic current emissions
Inrush current (cold start 25° C)	115V AC: < 30A 230V AC: < 60A
Standby power:	
No Powered Devices (PDs) connected	
AC mains input	100 VAC
without EEE	< 11 W (< 1.4 W / port)
with EEE	8.8 W (1.1 W / port)
Uplink ports (9 and/or 10) must be active	
AC mains input	240 VAC
without EEE	< 10 W (< 1.25 W/port)
with EEE	7.9 W (<1 W/port)

* EEE = Energy Efficient Ethernet

Outputs

Number of PoE ports 10/100Base-T (alternative B according IEEE802.3at standard.)	8
Number of uplink ports 10/100/1000Base-T (RJ-45 connectors, according Ethernet standards)	2
Console port (RJ-45 (180° rotated) CLI command based configuration and FW upgrade)	1
PoE Output Voltage per port at Tamb=45° C and 100% load (min. according IEEE802.3at standard: 50V)	Min/max.: 54V/57V
PoE Output current per port (according IEEE802.3at standard)	Min/max: 10mA/600mA
Total PoE output power (PoE power budget)	Max.: 240W
PoE Output power per port (according IEEE802.3at standard: 30W – 34.2W)	Max.: 32W

Efficiency

Efficiency at 100% load, nom. (100% PoE load is 240W)	100V AC: 88% 230V AC: 90%
Efficiency at 50% load, nom. (50% PoE load is 120W)	100V AC: 86% 230V AC: 88%

Initialization

PoE power after power on (ports have to be connected to PoE luminaires)	≤ 5 seconds
Boot-time of device	<70 seconds

LED indicators

The LEDs of the switch are useful to monitor the activity and performance of the switch.

Power saving mode can be configured for LEDs, however it is not recommended to turn off the status- and power- LEDs. Power saving mode is OFF by default.

Power LED

Power ON	Solid green
Power OFF or power fail	OFF

Status LED

During Power ON	Green blinking (during startup)
Powered ON	OFF
Failure	Green blinking after about 120 seconds(replace device)

Port LEDs

1G	
Link	Green solid
Act	Green blink
No connection	Off
100M	
Link	Green solid
Act	Green blink
No connection	Off
10M	
Link	Orange solid
Act	Orange blink
No connection	Off
PoE	
Power feeding	Orange solid
Failure detection	Orange slow blink
No connection	Off

Environmental Ranges

Ingres Protection (IP) minimum	IP20, indoor dry location
Operating temperature	0 - 45° C
Storage temperature	-40 - 85° C
Relative humidity	5 - 95% (non-condensing)
Operating altitude	up to 6561 ft. (2000 m)
Audible noise level	< 24 dB(A)

Reliability

Lifetime (according to IPC9592B. Elcap life and de-rating considered at 40° C ambient temperature and 80 % load condition.)	10 years
Maximum failure rate during lifetime of 10 years	< 5 %
Maximum failure rate (2 years)	< 0.3 %
Maximum solder joint temperature (40° C ambient, 100% load)	110° C
Temperature shock test (according IEC 60068-2-14 test Na)	2000 cycles -20° C/+100° C

Generated disturbances and EMI

IEC 61000-3-2 ed3.0 +A1 + A2 (limits for harmonic current emissions)	Class A
CISPR22/EN55022	Class A
FCC	Class A
CISPR24/EN55024	
IEC 61000-3-3: ed2: 2008 (Electromagnetic Compatibility - Limitation of voltage fluctuation and flicker in low voltage supply systems for equipment rated up to 16A)	Class C

MIB list

MIB II	RFC 1213
SNMPv2-MIB	RFC 3418
IF MIB	RFC 2863
Bridge MIB	RFC 1493
EtherLike-MIB	RFC 3635
Q-BRIDGE-MIB	RFC 2674
RSTP MIB	draft-ietf-bridge-rstpmib-03.txt
IP-MIB	RFC 2011
IP-FORWARD-MIB	RFC 2096
TCP-MIB	RFC 2012
UDP-MIB	RFC 2013
RMON	RFC 2819
POWER-ETHERNET-MIB	RFC 3621
SNMP-COMMUNITY-MIB	RFC 3584
SNMP-MPD-MIB	RFC 3412
SNMP-NOTIFICATION-MIB	RFC 3413
SNMP-TARGET-MIB	RFC 3413

MIB list (continued)

SNMP-USER-BASED-SM-MIB	RFC 3414
SNMP-USM-AES-MIB	RFC 3826
SNMP-VIEW-BASED-ACM-MIB	RFC 3415
SNMP-FRAMEWORK-MIB	RFC 3411
IPV6-MIB	RFC 2465
BasicSetting (factory default)	Private MIB
PoE (poeStatusTemp, poeStatusVoltage poeStatusCurrent all per port)	Private MIB
monitorandDiag (macAddressTable, portmirroring, eventLog)	Private MIB
Save (eventWarningInfo, eventNotifications)	Private MIB
Warning	Private MIB
Warm Start Trap (SNMPv2-MIB)	Trap list
Authentication Failure Trap (SNMPv2-MIB)	Trap list
Link Up/Down Trap (IF MIB)	Trap list
Topology Change Trap (Bridge MIB)	Trap list
New Root Trap (Bridge MIB)	Trap list
Rising Alarm Trap (RMON)	Trap list
Falling Alarm Trap (RMON)	Trap list
pethPsePortOnOff-Notification (POWER-ETHERNET-MIB)	Trap list
pethMainPowerUsageOn- Notification (POWER-ETHERNET-MIB)	Trap list
pethMainPowerUsageOff- Notification (POWER-ETHERNET-MIB)	Trap list

Available packages

LCN5228/00 Philips PoE switch (1 piece)	24.76" x 21.62" x 12.04" (629 x 549.2 x 306 mm) (cardboard, 7.71 lbs (3.5 Kg))
LCA5221/00 US mains connection kit (8 pieces)	15.30" x 12.78" x 12.38" (388.5 x 324.8 x 314.5 mm) (cardboard, 7.71 lbs (2.084 Kg))
LCA5223/00 Rack mount bracket (19") (8 pieces)	13.17" x 11.35" x 14.72" (334.5 x 288.5 x 374 mm) (cardboard, 3.42 lbs (1.552 Kg))
LCA5224/00 T-bar mounting bracket (8 pieces)	24.01" x 16.06" x 14.11" (610 x 408 x 358.5 mm) (cardboard, 11.48 lbs (5.208 Kg))
LCA5222/00 RJ45 protection cover (8 pieces)	15.70" x 15.17" x 13.14" (399 x 385.5 x 334 mm) (cardboard, 7.81 lbs (3.546 Kg))

Ordering data

LCN5228/00 Philips PoE switch (1 piece)	9137 003 66003
LCA5221/00 US mains connection kit (8 pieces)	9137 003 69503
LCA5223/00 Rack mount bracket (19") (8 pieces)	9137 003 69703
LCA5224/00 T-bar mounting bracket (8 pieces)	9137 003 69803
LCA5222/00 RJ45 protection cover (8 pieces)	9137 003 69603

