PoE - Power over Ethernet

Power over Ethernet (PoE) is the term for the standard **IEEE 802.3af**, which enables end appliances that have less then 12.95 Watt power consumption to also be supplied with electricity directly through the Ethernet cable.

> ⚠️ **When searching for a suitable PoE switch for operating your Snom phones, search for a switch that supports "PoE 802.3af".**

> 🛇 **Attention:** In order to buy your switch sufficiently dimensioned, please consider the total wattage of the device, which is available for PoE. Include in your planning the number of Snom phones and their maximum used wattage, according to your PoE class (**1**, **2** or **3**).

Specification

In the strictly speaking sense, **PoE** today usually refers to the IEEE standard **802.3** Clause 33 "**DTE Power over MDI**", which was first introduced in June 2003 as **IEEE 802.3af-2003**. There is also a newer standard **IEEE 802.3at-2009** - also known as PoE+ or PoE plus before standardization - which increases the maximum power output from 15.4 W to 25.5 W. This new standard is called IEEE 802.3at-2009. Previously, there were already several manufacturer-specific implementations that were also traded under the name Power over Ethernet. In addition, there are still proprietary variants.

The standard divides the devices involved into

- **Power suppliers** (*Power Sourcing Equipment*, **PSE**) and
- **- consumer** (*Powered Devices*, **PD**).

The supply voltage is **48 V**, the maximum current consumption of the terminal devices is **350 mA (802.3af, type 1)** or **600 mA (802.3at, type 2)** in continuous operation (400 mA are permitted for a short time when switched on)

- The maximum power output is **15.4 watts**. The **af standard** assumes that **12.95 watts** of usable power may be left over or consumed after line losses in order not to exceed the maximum power output. The free wire pairs in the Ethernet cable for 10BASE-T and 100BASE-TX are often used for power transmission. If this is not possible (e.g. because ISDN is routed over the line or with Gigabit Ethernet), the signal-carrying wires can also be used. The data lines decoupled by means of transmitters are DC voltage-free without PoE, so that the DC voltage can be coupled in and out ("under the signal") without interfering with the data transmission. The respective mode is determined by the **PSE**, the loads must support both operating modes, loads that only support one operating mode are not permitted.
- The standards organization **IEEE** has further increased the transmittable supply power and now also supports 10GBASE-T. The standard IEEE **802.3bt-2018** (also **4PPoE**) provides five new power levels from 40 W (Class 5) over two line pairs up to 100 W (Class 8+) over all four line pairs. Up to 960 milliamperes flow over each wire pair. This enables new applications, such as the operation of high-performance WLAN antennas and surveillance cameras.

Comparison of PoE standards

IEEE-Standard	PoE (802.3af-2003)	PoE Plus (802.3at-2009)	4-paar PoE (802.3bt-2018)
Output voltage in V (DC)	**36–57**	42,5–57	42,5–57
Output current Operation in mA (DC)	**350**	600	2× 960
Output current Start mode in mA (DC)	**400**	400	?
Power of the (PSE) supply in W	**max. 15,4**	max. 30	45; 60; 75; 90
Power at end device (PD) in W	**max. 12,95**	max. 25,5	40; 51; 62; 71
PSE-Class	**1; 2; 3**	4	5; 6; 7; 8
supported devices (PD-Type)	**1**	1 und 2	1; 2; 3; 4
Used wire pairs	**2**	2	2 und 4

Available Performance Classes and Classification Signature

Class	Available power on the supplied device	classification signature

0	0,44–12,96 W	0 to 4 mA
1	0,44–3,84 W	9 to 12 mA
2	3,84–6,49 W	17 to 20 mA
3	6,49–12,95 W	26 to 30 mA
4	12,95–25,50 W (only 802.3at/Typ 2)	36 to 44 mA

Source: https://de.wikipedia.org/wiki/Power_over_Ethernet

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>
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> - Visit the Snom Forum
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