# Distributed PLC bus (DPB) technology for robust and reliable DALI PLC communications:

DALI PLC solution offered by iLumTech is powered by DPB - a Distributed PLC bus type of technology. DPB uses a uses narrow-band type of power line communication (N-PLC), known to be one of the preferred types of communications in Smart Grid applications. The main specifications that makes DPB fit for the needed robust and reliable communications are its carrier frequency of 132.5 kHz and BPFK modulation operating at 4800 Baud, thus enabling the compliance with CENELEC EN50065 and FCC part 15 regulatory specifications. The network topology is distributed bus hence the name of DPB, for a Distributed PLC bus, which is also an excellent match to DALI. As communication medium is shared collisions may occur, therefore there is CRC protection of each message. The frame length in DPB is variable – standard length is between 12 and 20 bytes. In case of direct DALI commands the length of frame is 9 bytes – in order to fulfil the requirement of minimum space between two forward frames. DPB protocol supports automatic addressing of PLC devices based on their unique MAC addresses. Each packet contains synchronization byte and HW header which allows for filtering of communication – synchronization byte triggers carrier wave detection and HW header defines which packets are relevant for DALI PLC devices. The rest of the packet contains destination addresses and data payload. The sensitivity of DPB receiver allows for communication range up to 300 m. For better communication performance it is recommended to use filtering on input power line as capacitive load may attenuate the signal strength.
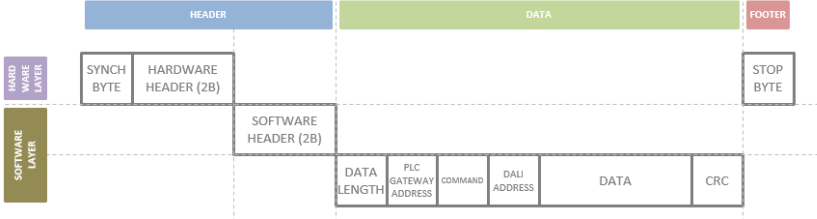
The PLC devices in the system work as bridges between PLC and DALI however it can be easily adopted into communication interface of control gear or control device. In order to fulfil DALI timing requirements it uses buffer method (PLC devices share the information about all DALI devices connected within Distributed PLC network) and the data for backward frame is are read from the memory of PLC device that received query forward frame on its DALI interface. As result the whole system emulates the behaviour of standard wired DALI bus.

The PLC system is based on Master/Slave topology, where single PLC device works as Master. The main role of Master is to manage addressing process (commissioning of PLC devices and commissioning of DALI devices) and to manage the process of exchange of information about DALI devices between the PLC devices. For application details see our DALI PLC brochure.