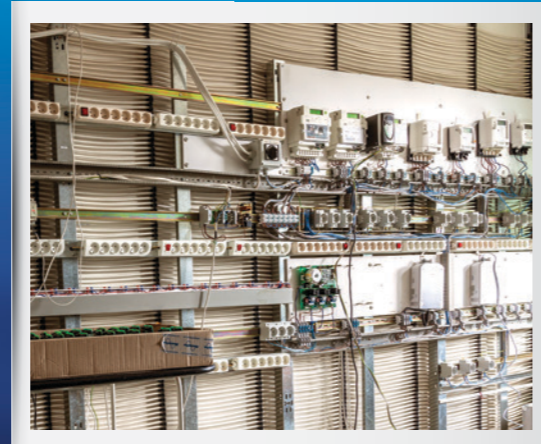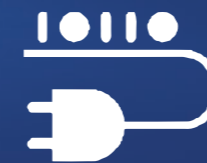# ModemTec

Deployed at PRE

ModemTec is a reliable producer and supplier of comprehensive solutions in the field of medium and low voltage lines diagnostics, and power line communication. ModemTec has production facilities, installation competence and provides premium post-warranty services for its customers in more than 40 countries of the world. Metering International magazine placed ModemTec in the TOP 50 world's most important companies in the area of Smart Metering / Smart Grid.

WE INNOVATE TODAY AND SOLVE THE NEEDS OF TOMORROW.

PLC CLEANER FOR SMART GRIDS

ModemTec

PLC-CLEANER.COM

PLC CLEANER FOR SMART GRIDS

INCREASE YOUR E-METER READINGS

➡ PLC CLEANER BY MODEMTEC IS A UNIQUE DIAGNOSTIC TOOL DESIGNED TO INCREASE COMMUNICATION RELIABILITY READINGS BETWEEN SMART METERS IN BOTH, HIGH- AND LOW- DENSITY AREAS

➡ SUITABLE FOR ANY PLC STANDARDS USED (G3-PLC, PRIME, OSGP, METERS AND MORE, IDIS, ETC…)

➡ SYSTEM SUGGESTS BEST SOLUTION FOR COMMUNICATION IMPROVEMENT

➡ ANALYTICS, REPORTING, CONSULTING AND ADVISORY SERVICES INCLUDED

➡ IDENTIFICATION OF "BOTTLENECKS" THAT DECREASE RELIABILITY OF PLC COMMUNICATION

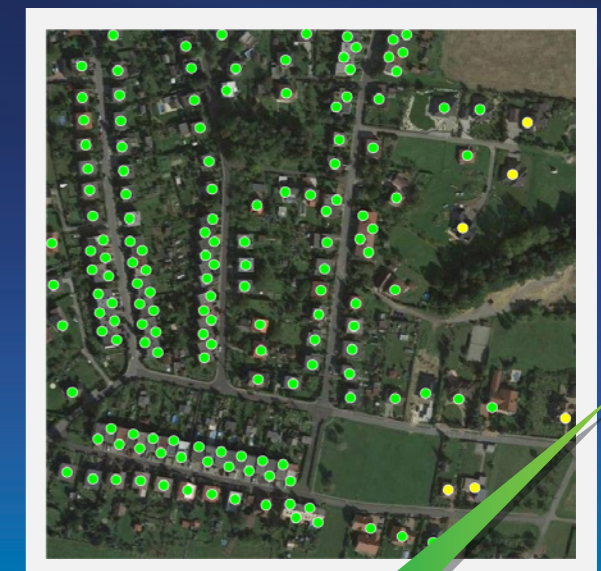➡ NO NEED TO UNINSTALL SMART METERS DEPLOYED

➡ GDPR FRIENDLY SOLUTION

MODEMTEC IN THE WORLD

OUR PARTNERS

PRE · ČEZ · innogy · e·on · Energa GRUPA ORLEN · TENAGA NASIONAL BERHAD · VEOLIA

saudi aramco · hp · LIBERTY · Landis+Gyr manage energy better · Schneider Electric · ŠKODA

LESSONS FROM COMMUNICATION CHANNEL

PLC communication uses the low-voltage distribution network. It is completely irrelevant what standard or proprietary protocol is used. Meter reading systems use the same frequency band and distribution system, which always has similar characteristics and behavior.
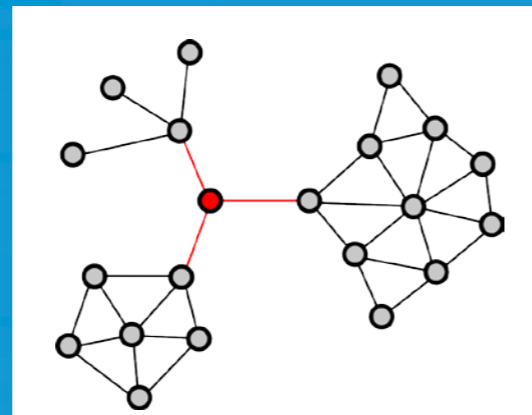
Among the influences that affect data transmission from e-meters in all systems are mainly changes in the topology, impedance, or disturbance of the communication channel. To increase the success of PLC communication, **it is necessary to find out "bottlenecks" of the communication channel.**

As communicating systems must automatically create a communication path, they have built-in support for creating this path using various procedures inside the chip. Not all standards enable to find out the state and progress of these communication path creation mechanisms, and if they do, complete datagrams (for the transmission of measured data on electrical energy and parameters associated with it) containing information about the state of this communication path are not available. In addition, the specific certification of electricity meters does not allow the sharing of information about the communication path.

Communication in the network takes place through a bottleneck - low throughput, the failure of a red node will cause the loss of a large part of the network.

Communication via multiple nodes - better network throughput, in case a green node fails, there is an alternative path.
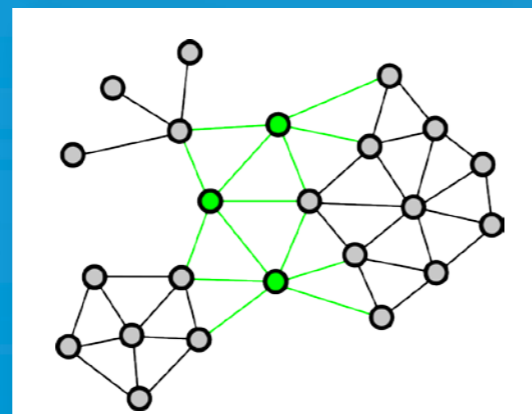
MODEMTEC'S SOLUTION – PLC CLEANER

Since 2001, ModemTec has been dealing with both, the design of PLC communication modems, and their subsequent implementation. Due to this, these products incorporate procedures that provide information on the quality of the received signal, the state of the communication path, and other diagnostic variables such as phase monitoring (recognizing whether it is the phase to which the opposite modem is transmitting or whether it is signal received by crosstalk in the cable line).

As part of the PLC Cleaner solution, these modems are used for communication on low-voltage distribution systems, they are able to detect even the "bottlenecks" of the communication channel and, subsequently, recommend how to remove them. The big advantage of this solution is that it does not matter what standard (G3-PLC, PRIME, OSGP, METERS AND MORE, IDIS...) is deployed in a given location and there is no need to manipulate already installed electricity meters.

HOW PLC CLEANER WORKS

MT49S modems will be deployed in an area characterized by low or no readings. They are accompanied with a secondary 3G/4G/5G communication channel (in addition to the PLC communication itself), in order to obtain information about the behavior of the main communication channel.

HARDWARE

The MT49S modem contains 4 parts:
- Own PLC modem running on the G3-PLC standard
- Sniffer, whose implementation makes it possible to read at least the unencrypted headers of all packets that are intercepted
- spectrum analyzer, which enables long-term monitoring of both, noise and interference in the vicinity of the modem, and PLC traffic (its physical level)
- Packet generator for monitoring network load at the HW level

SOFTWARE

- Back-end: Capture of measurement results at individual points of the monitored energy network with metrics of diagnostic signals and its archiving
- Front-end: Visualization of results linked to already installed equipment, data on newly measured locations...

DEPLOYMENT

For the necessary diagnosis of the network condition, it is necessary to deploy about 10 modems with secondary (3G/4G/5G) communication, for a period of about 10 to 20 days, and the channel diagnostics would be transmitted to the PLC Cleaner system.

After this time, the modems can then be moved to another location (for example, according to the principles of halving the interval). Within a relatively short time, it would thus be possible to have a clear idea of the behavior of the communication channel in a given location, and subsequently deploy corrective tools, which include in particular:

- **PLACING THE REPEATER IN A SUITABLE PLACE**
- **ADDING A CONCENTRATOR TO CREATE A SUBNET**