SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

An Autonomous Institution

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Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

COURSE NAME :19EE603 IoT for Electrical Engineers

III YEAR /VI SEMESTER

Unit 3- Communication Interface

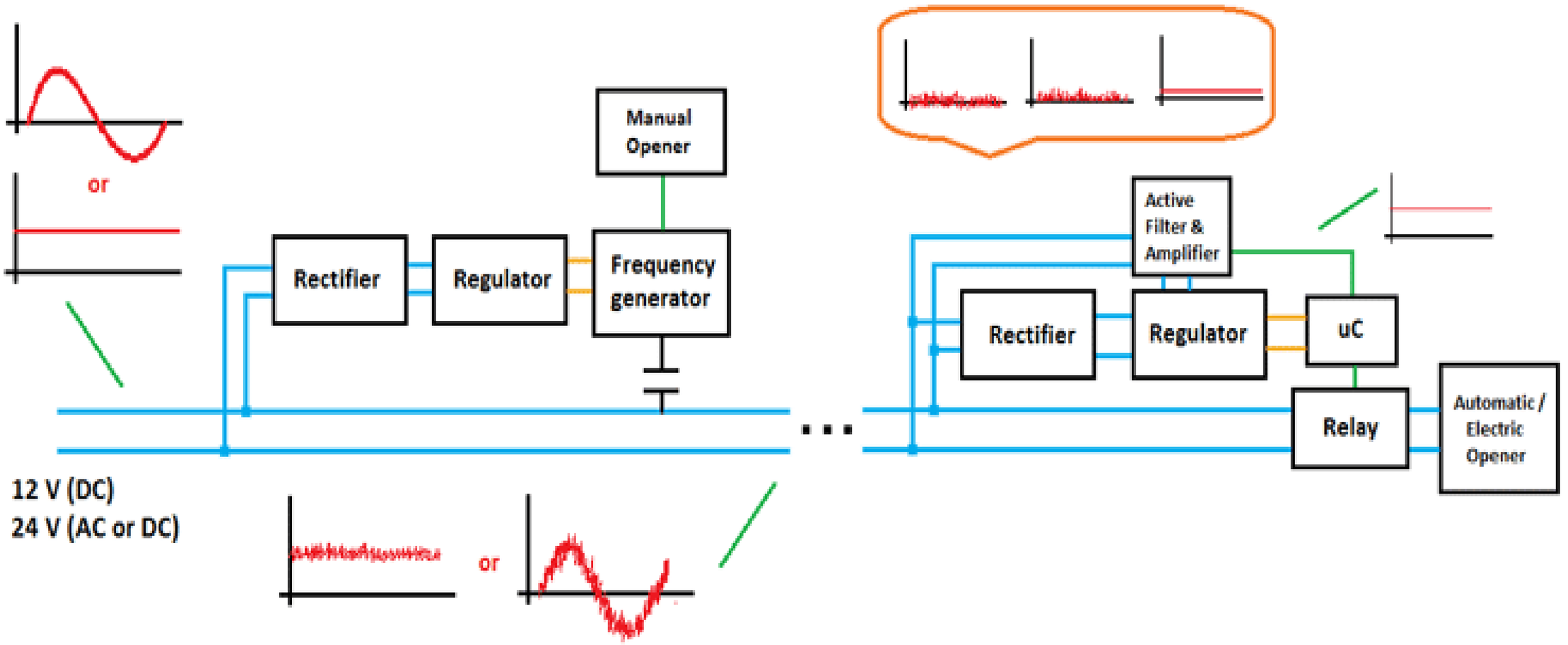
Broadband over Power Line

What is BPL??

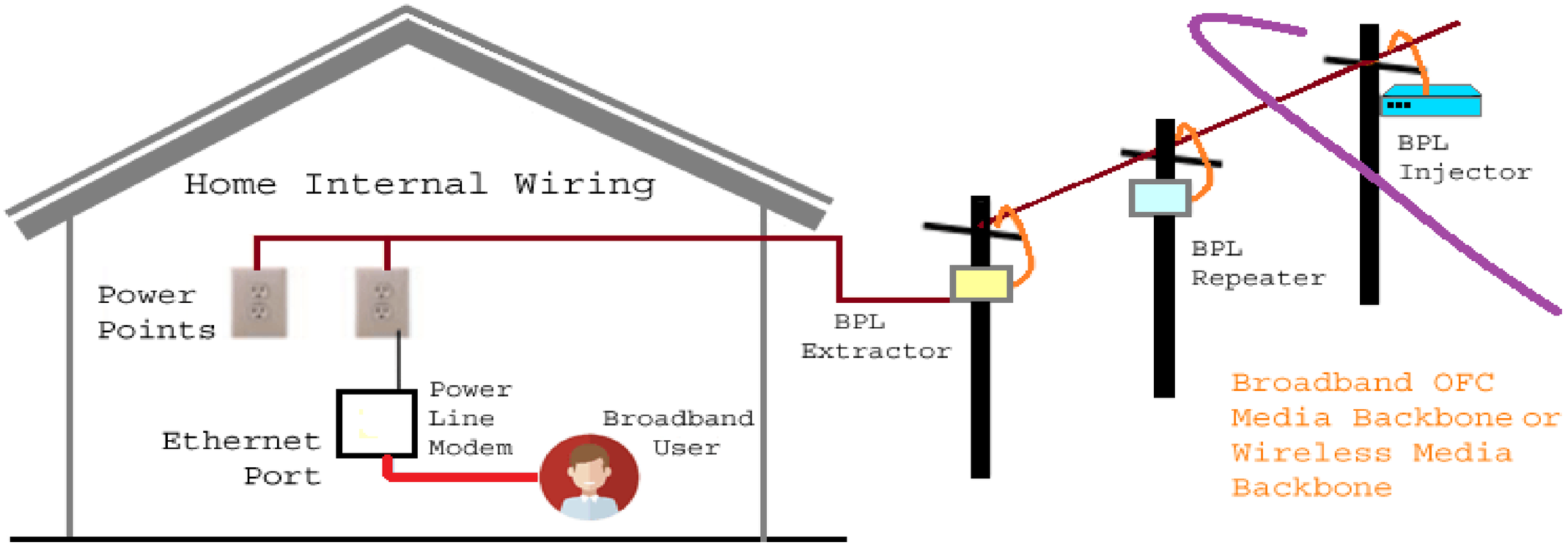
BPL

- Broadband over Power Lines (BPL) is a technology that transmits high-speed data and internet access over existing power lines, offering a potential alternative to traditional broadband infrastructure

PLC – Working


or
Manual Opener
Rectifier
Regulator
Frequency generator
12 V (DC)
24 V (AC or DC)
or
Active Filter & Amplifier
Rectifier
Regulator
uC
Relay
Automatic / Electric Opener

PLC Working - Continued



PLC

Power line Communications (PLC), also known as **Power Line Telecommunications** (PLT) is the communication technology which **uses the existing public and private wiring for the transmission of the signals**.

Using PLC communication signals, high-speed data, voice and video are transmitted over low-voltage power lines.

- PLC is a technology which has been in use since years but came now in more demand after the launch of new communication technologies which are being supported by PLC i.e. PLC would be a reliable communication medium for applications like Internet-of-things (IoT) and Smart Grids.

PLC - Continued

- The method of **transferring power and data** for communication through the same existing network of wires from one end to the other end is said as **Power Line Communication**.
- It **provides broadband data communications on conductors** which are already in use for the transmission of electric power using a modular signal.
- Now, this can be done through the home or premises wiring and may also be done through the existing electric power distribution system.
- Modulation scheme for **PLC is OFDM with PSK modulation**

BPL (Broadband over Power Line)

- **BPL (Broadband over Power Line)** is also known as power-line Internet which supports PLC technology to allow Internet access through the transmission lines.
- The BPL technology with PLC is often used in remote locations where there is low amount of Internet access by cable or PDSL connections.

Uses of PLC

- The PLC is used for transmitting radio programs, utility company control switching mechanisms, transmission line protection, and automatic meter reading.
- Apart from that, there are also some automotive uses where the data, voice, and music are sent over direct current (DC) battery power line with some special filters to remove the line noise from the final output.
- The term Power Line Communication **(PLC)** is known with a **various name** like as **power line carrier, power-line digital subscriber line (PDSL), power line telecom (PLT), power line networking (PLN), mains communication, and broadband over power lines (BPL).**

Advantages and Disadvantages

Advantages

- Low Implementation Cost
- Large Reach
- Lower Running Cost
- Indoor High Speed

Disadvantages

- Low transmission speed
- Sensitivity to disturbance
- Nonlinear distortion and Cross-modulation between channels
- Large size
- The high price of capacitors and inductors used in the PLC system.

Applications

- PLC is widely used in technologies like Smart Grid and micro-inverters.
- Lighting applications (for traffic light control, LED dimming etc.),
- Industrial applications (for irrigation control etc.), machine-to-machine applications (like for vending machines or a hotel's reception-to-room communication), telemetry applications (e.g. offshore oil rigs), transport applications (like for electronics in cars, trains, and airplanes) and many more.

Assessment

- **What is Broadband over Power Line (BPL)?**

  a) A type of wireless communication

  b) A technology that delivers broadband internet over existing electrical power lines

  c) A satellite-based broadband service

  d) A fiber-optic internet service

  Answer: b) A technology that delivers broadband internet over existing electrical power lines

- **BPL operates independently and does not require power lines to function.**

  Answer: False

References

- Hanes David , Salgueiro Gonzalo , Grossetete Patrick , Barton Rob, “IoT Fundamentals: Networking Technologies, Protocols and Use Cases for the Internet of Things”, Cisco Press, 2017.
- Patranabis, D., “Sensors and Transducers”, PHI Learning Private Limited, New Delhi, 3rd Edition, 2009.
- Raj Kamal, “Internet of Things: Architecture and Design Principles”, McGraw Hill Education (India) Private Limited, Chennai, 2017.
- Tripathy, B.K., Anuradha, J., “Internet of Things (IoT): Technologies, Applications, Challenges and Solutions”, CRC Press, 2018.