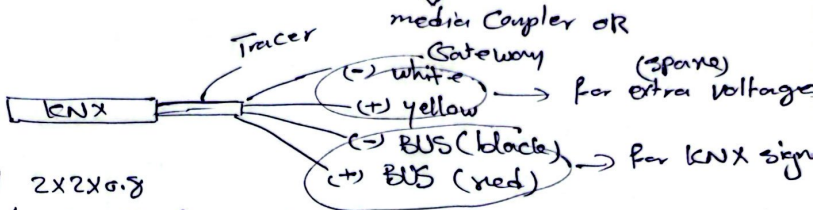
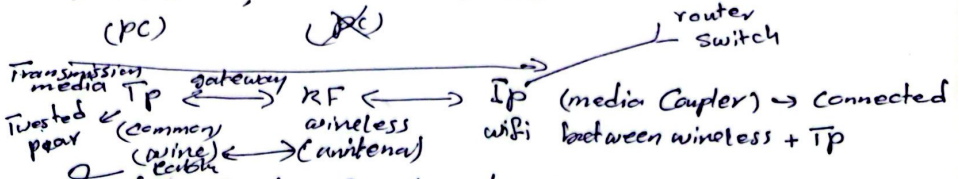


- LENX → open protocol

# Topology :-

S-mode (pc), E-mode  $\rightarrow \overline{EIS}$



⑤  $YCV_M \quad 2 \times 2 \times 0.8$

↳ capable for outdoors

test voltage:  $4\text{ kV}$  wet places, humidity

Ex  $\bar{Y}(t)$   $2 \times 2 \times 0.8$

↳ not capable for outdoors

test voltages: 2.5 kV

area surrounded:  $220\text{V} / 3\text{V}$

Any sensor divided to two parts  $\Rightarrow$  BUS coupling Un  
Applications med

Application software  $\rightarrow$  ETS

## BUS devices

PEI  $\rightarrow$  physical External Interface

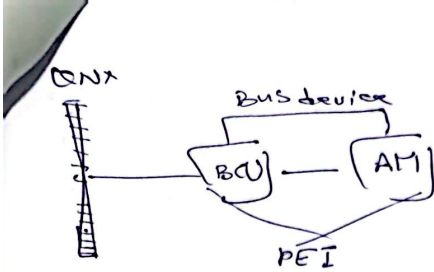
BCU  $\rightarrow$  BUS Coupling Unit

AM  $\rightarrow$  App module

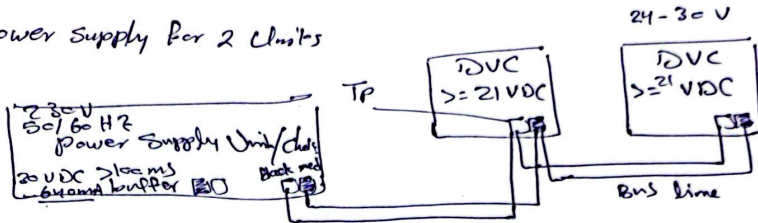
TRC  $\rightarrow$  Transceiver

SR  $\rightarrow$  Shift register

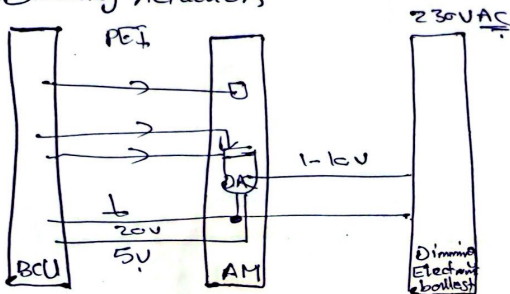
DAC  $\rightarrow$  —



power supply for 2 units



### Dimming Actuators



### Devices

- programming button in KNX device to program every change in Ap x
- BUS devices
  - sensors
  - actuators
  - controllers ✓

- polarity at a connected cable at a certain device is incorrect, the device will delete its Ap x

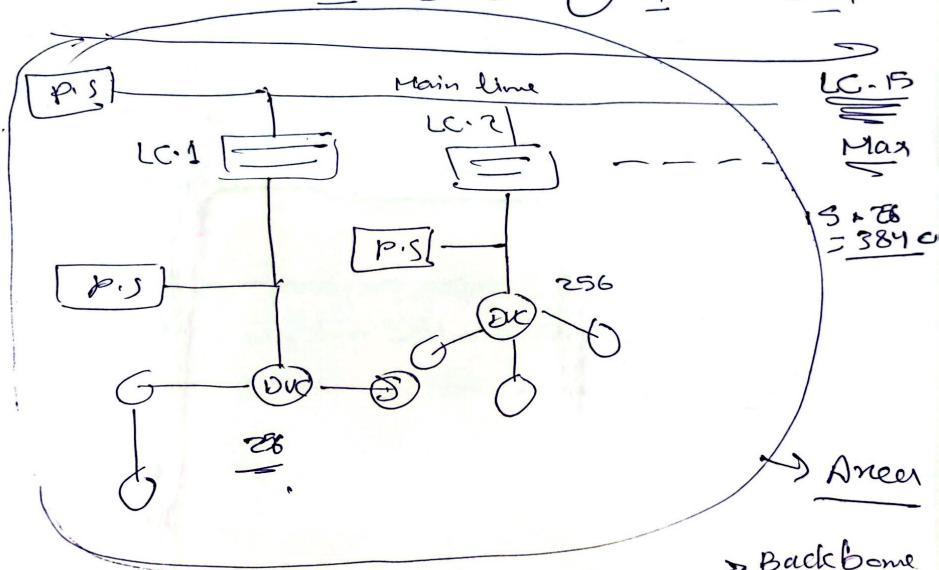
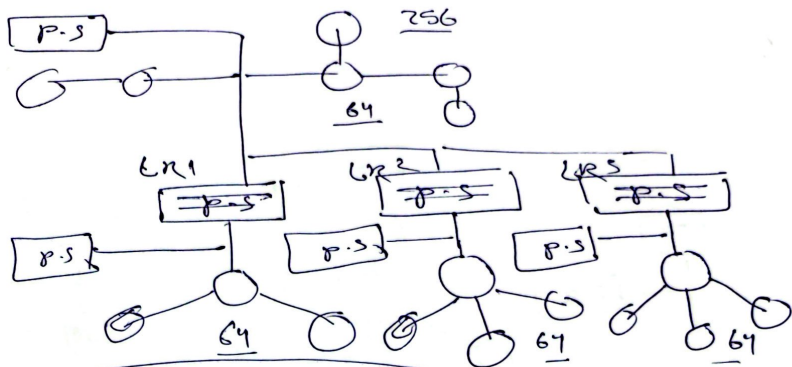
### \* Topology :-

- BC → Backbone Coupler
- LC → Line Coupler
- DVC → BUS device
- LR → Line repeater
- ps/ch → power supply with choke
- S → Brightness Sensor
- RC → counting Counter

2019  $\rightarrow$  256 TP devices

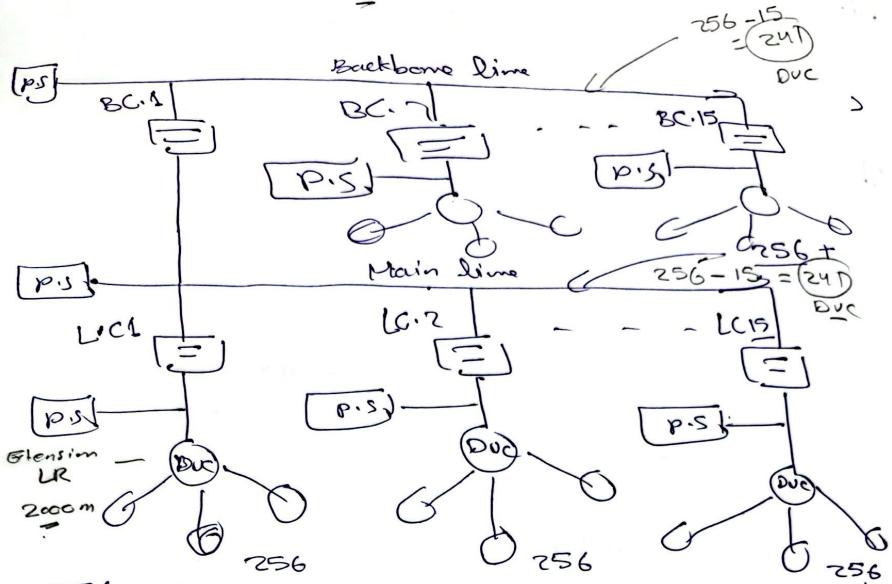
LR  $\rightarrow$  not required if cable length is max. 100m

Cable length  $> 100m \Rightarrow$  256 TP devices  $\Rightarrow$  by using 3 LR



If we need to connect 2 areas  $\rightarrow$  Backbone Coupler

$$\equiv 15 \times 15 \times 256 = 57,600 \text{ DVC}$$



$$256 \times 15 \times 15 = 57,600 \text{ DVC}$$

- Each device takes address  $\rightarrow$  to programming it
- Area  $\rightarrow$  line  $\rightarrow$  Device no.

A.I.DVC  $\rightarrow$  individual address

- If there any line have address Zero  $\rightarrow$  Backbone line
- LR  $\equiv$  LC  $\equiv$  BC  $\rightarrow$  same in hardware

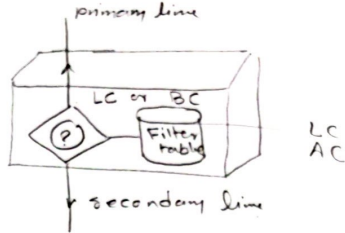
- app SW  $\rightarrow$  differentiate among them
- address

The smallest unit in Topology is Segment.

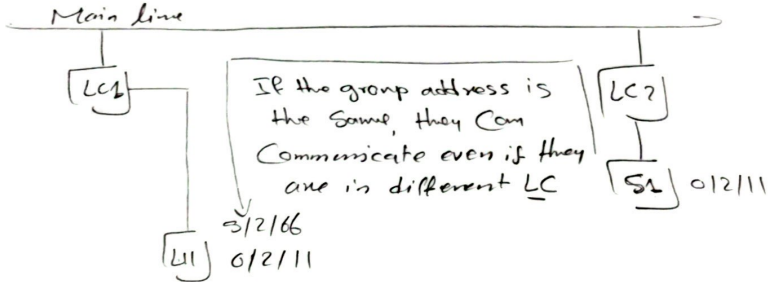
Area → line → line segment, backbone line 1.2 (C)  
 AC LC  
1.1.0 1.15.0

\* Coupler - gate function

Filter table → organize access on bus & also reduce traffic on bus

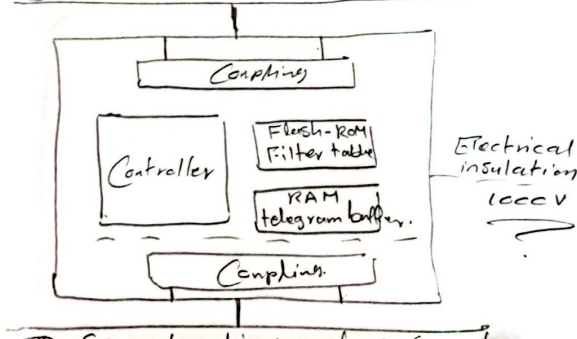


\* Line Crossing telegram

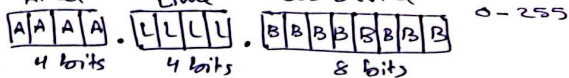


\* Line Coupler : Block diagram

Primary line on bus connectors



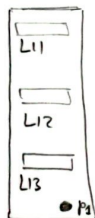
# Individual Address



## Group Address

no. / no. / no. → Sub group address 0-255  
 0 / 2 / 11 (more specific data about functions).

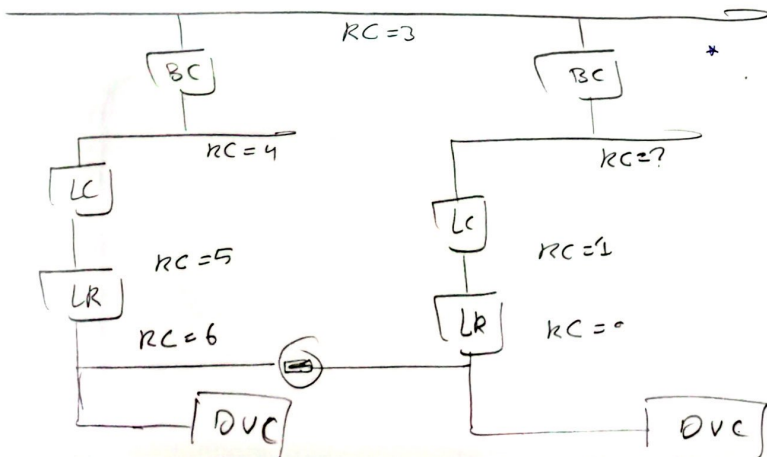
→ n. of Floor 0-31  
 → Functions 0-7  
 ← Middle group address  
 → Lighting AC TV



L11 L12 L13  
 P3: 512/66 512/66 512/66

## Answer Crossing Telegram

Coupler : Routing Center





• We can connect KNX protocol with other protocols using Gateway  $\rightarrow$  other systems.

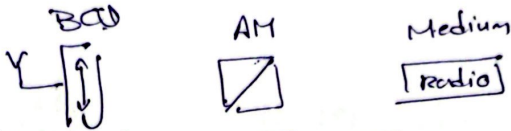
• Connecting lines via LAN networks:

DS  $\rightarrow$  IP router  $\rightarrow$  have coupling functions.  
(wireless)

• KNX Cable speed  $\rightarrow$  9600 bit ~~bps~~ bps

• KNX RF

• KNX RF multi different channels



• Media Coupler  $\rightarrow$  TP + RF

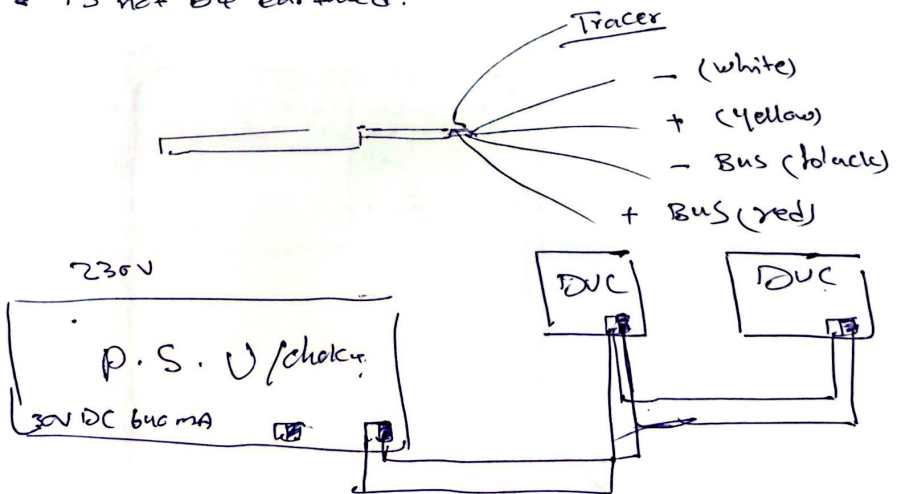
• Line Coupler  $\rightarrow$  TP + TP

• Domain address  $\rightarrow$  exist in MC

• KNX RF data interface  $\rightarrow$  Flash memory  
(S-Mode)

Safety Extra Low Voltage (SELV)

- voltage range  $\leq$  to 120 V DC or 50 V AC
- is not be earthed.

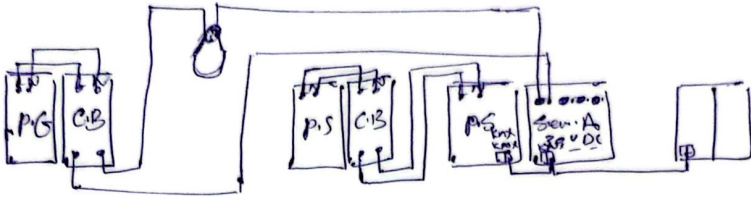
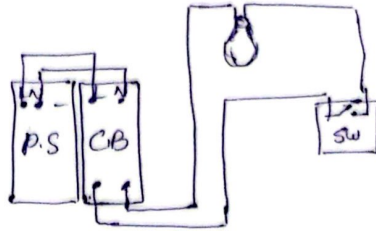


## check list

- Insulation  $\rightarrow$  250 VDC  
 $\rightarrow$  resistance at least 500 k $\Omega$

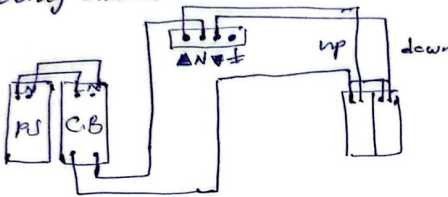
### - Control lamp

- \* power supply 12VX
- \* Lamp
- \* Circuit breaker
- \* Switch (one gang)

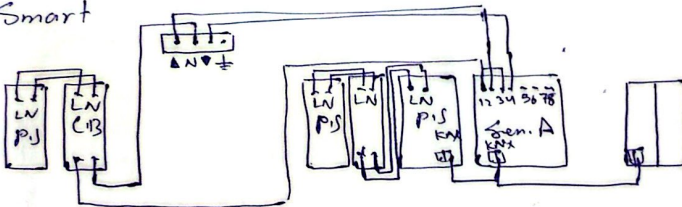


### - Using Shutter

mechanical



### - Smart





Individual address W. Group address

Area Line Device

0-15 0-15 0-255

-/-/-  
0-81 0-7 0-255

Software

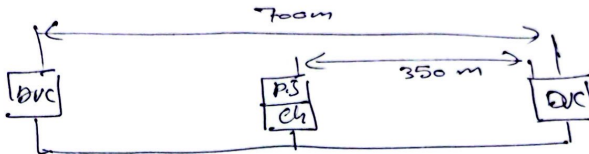
5.7.7

Relative Dimming 4 bits

\* Absolute Dimming 1 byte

14 bytes → highest level can telegram

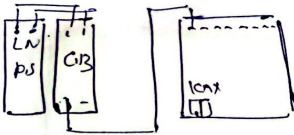
Cable length :-



Max. Dis ≤ 1000m

choke → make voltage more safe.

Ex:-



BCU key

Revit  
Cad

- 1- building structure ✓
- 2- insert devices (AP) ✓
- 3- edit parameters ✓
- 4- Group addresses ✓
- 5- Commissioning ✓
- 6- diagnostics ✓

\* linking devices on the same size.

\* Individual address  
→ usb interface

\* download IA on sensors before putting it on ground,

\* Commissioning to all available devices on line