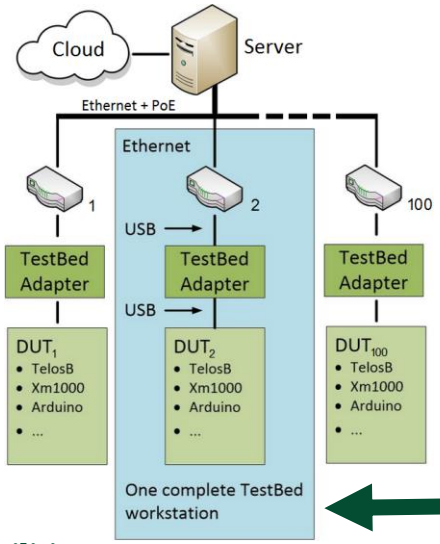
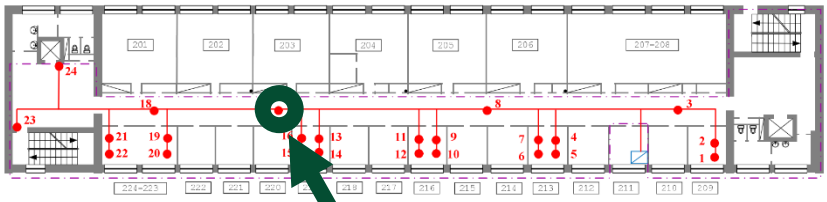
EDI Wireless Sensor Network TestBed

EDI TestBed is a **100+ node heterogeneous** sensor network and **wireless sensor network testbed** (distributed around 7 floor building (inside & outside)) **for validation and research** in sensor network & wireless network protocols. Additionally, 50 mobile nodes are available on site. They can be used for example in-vehicle placement.

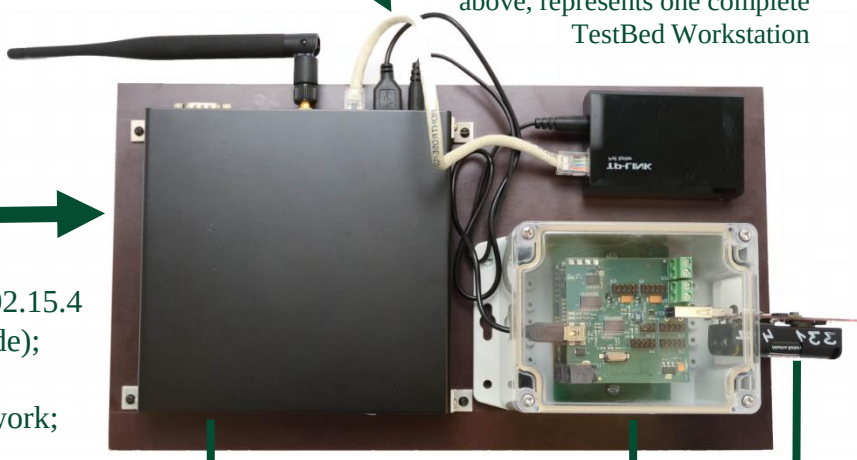
TestBed's architecture



One of the floors of the building



Each «**RED DOT**», in the picture above, represents one complete TestBed Workstation



Capabilities:

- Testing of IEEE 802.11a/b/g/n/p, IEEE 802.15.4 and other protocols (depends on WSN node);
- Fully reconfigurable routers;
- Remote reprogramming of the whole network;
- Energy measuring and remote debugging capabilities for the sensor nodes through a custom adapter;
- Control and management through either OMF or, alternatively, a simple web-based interface.

Router

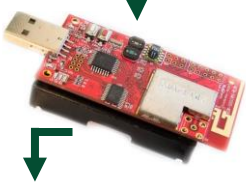
EDI TestBed Routers (PCEngines Alix 2d2, Carambola 2) serves as a bridge between Ethernet and USB. On each router, *MansOS* operating system software, which is developed in EDI, is installed.
Each router has at least one USB port to connect TestBed adapter.
It's possible to test different types of Wi-Fi, for example, for car segment - 802.11p.

EDI mote

Specifically designed for this particular TestBed. It is intended to test and debug embedded devices, especially wireless sensor nodes. It has many features to extend testability for embedded devices:

- Remote reprogramming.
- Emulate battery discharging;
- Measure consumed current;
- Measure – digital, analog signals;
- Generate – digital, analog signals;
- Store measured data on SD cards;

EDI mote **is** designed to be scalable and modular. Through USB port it is possible to reprogram and communicate with it.



Device Under Test (DUT)

EDI TestBed includes 100 static Advantic System XM1000 sensor nodes. There is a possibility to connect custom sensor nodes that meet the following specification:

Required features:

- power supply: 1.6V to 5V (PWR input header or USB);
- max. power consumption: 3W;

Optional features:

- supports programming via USB;
- has externally available GPIO;

Each sensor node is connected to the **EDI mote** for reprogramming / communication.
Power input can be switched remotely.

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