

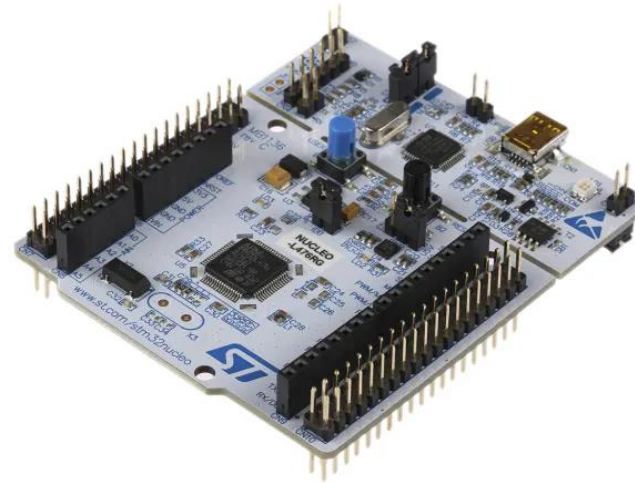


DeSEnet Demo

Sensor Hardware

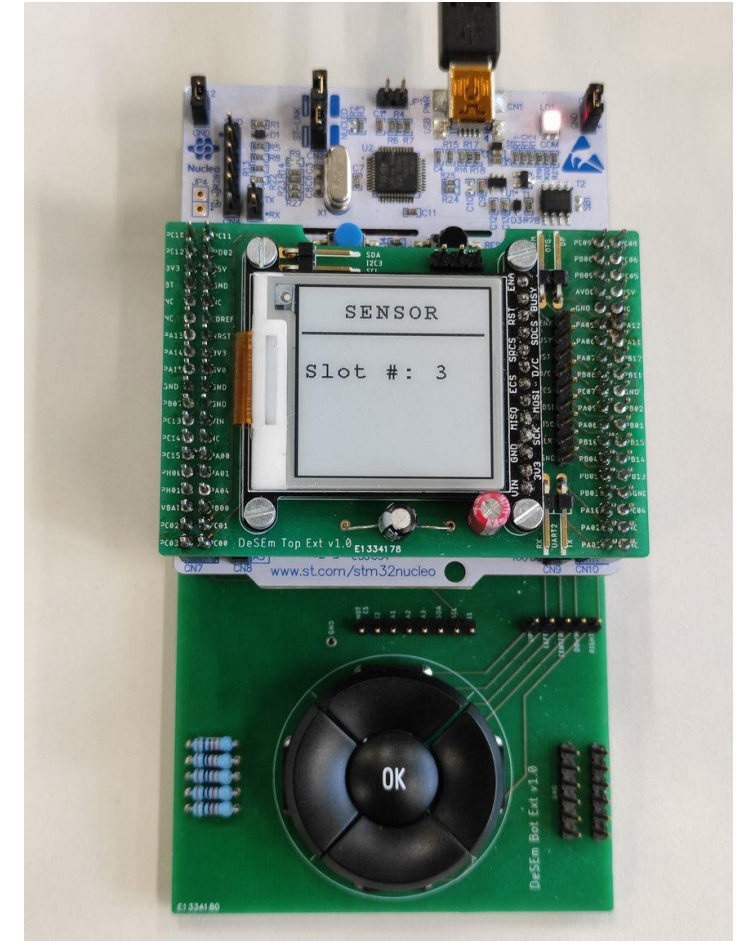
Nucleo STM32L476RG:

- 32-bit ARM Cortex-M4
- 128 kB RAM / 1 MB FLASH
- On-board SWD programmer



Extension Cards:

- ePaper display 200 x 200 pixels (monochrome)
- 3-axis accelerometer (LIS3DH)
- 2.4GHz transceiver from Nordic (nRF24L01+)
- Navigation switch (5 buttons)



Simulation Topology

Runs entirely on PC



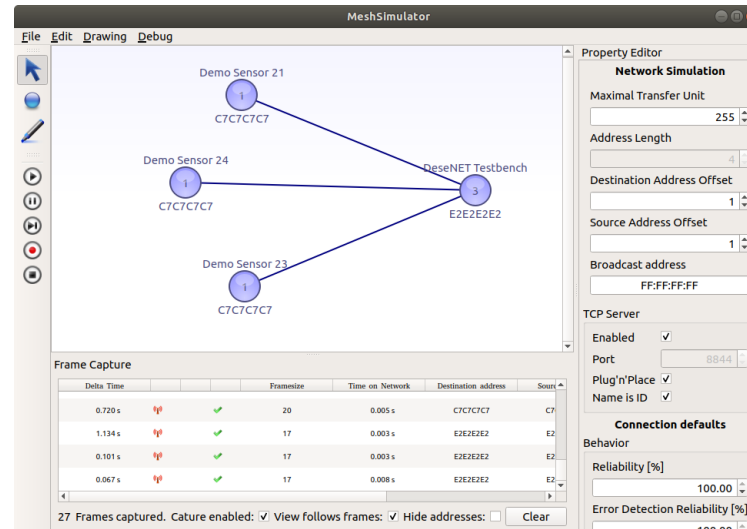
Sensor #21



Sensor #23

TCP / IP

TCP / IP



Mesh Simulator

DeseNET-Testbench - MeshSim virtual Network interface

Clear nodes list Clear Console

Node ID	MPDU cycle delay	Status	Joystick	Accelerometer
21	1139 ms	7 errors		
23	1245 ms	8 errors		
24	1313 ms	12 errors		

Log messages:

```

[ERROR 17:07:51.268] Received MPDU from sensor 24 to late: 1351 ms (Should be between 1250 and 1300 ms)
[ERROR 17:07:53.292] Received MPDU from sensor 24 to late: 1317 ms (Should be between 1250 and 1300 ms)
[ERROR 17:07:55.311] Received MPDU from sensor 24 to late: 1306 ms (Should be between 1250 and 1300 ms)
[ERROR 17:07:57.334] Received MPDU from sensor 21 to late: 1151 ms (Should be between 1100 and 1150 ms)
[ERROR 17:07:57.334] Received MPDU from sensor 24 to late: 1301 ms (Should be between 1250 and 1300 ms)
[ERROR 17:07:59.352] Received MPDU from sensor 21 to late: 1151 ms (Should be between 1100 and 1150 ms)
[ERROR 17:07:59.352] Received MPDU from sensor 23 to late: 1255 ms (Should be between 1200 and 1250 ms)
[ERROR 17:07:59.352] Received MPDU from sensor 24 to late: 1317 ms (Should be between 1250 and 1300 ms)
[ERROR 17:08:03.386] Received MPDU from sensor 23 to late: 1252 ms (Should be between 1200 and 1250 ms)
[ERROR 17:08:03.386] Received MPDU from sensor 24 to late: 1312 ms (Should be between 1250 and 1300 ms)
[ERROR 17:08:05.402] Received MPDU from sensor 24 to late: 1313 ms (Should be between 1250 and 1300 ms)
    
```

Gateway Simulation Next Beacon: 2013 ms Slot Duration: 50 ms SV Groups... Send Single Beacon Send Beacons continuously

Testbench

TCP / IP

Practical / Real Topology

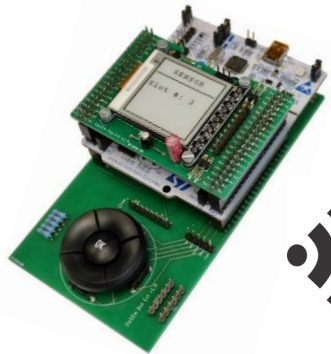
Testbench running on teachers PC



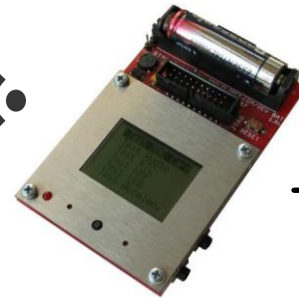
Sensor #21



Over the air
transmission

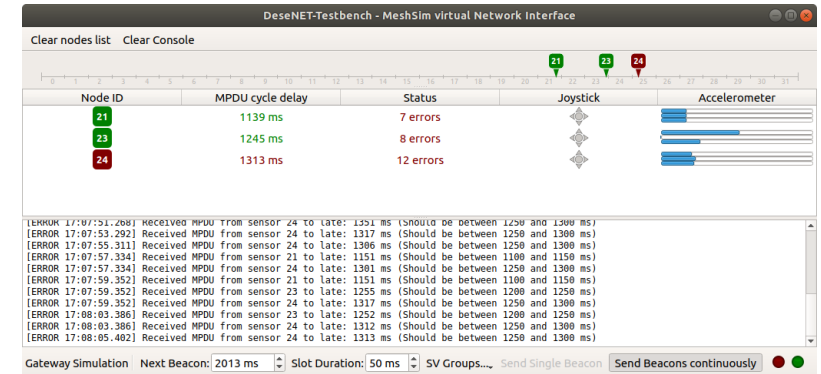


Sensor #23



Gateway

USB Cable



Testbench

Desenet-Sensor Project / Development Environment

Two Platforms:

- **Qt MeshSim** (Qt Creator)
- **Nucleo STM32L4** (STM32CubeIDE)

Same project for both platforms

