IoT End Node based on ESP32

Programmations

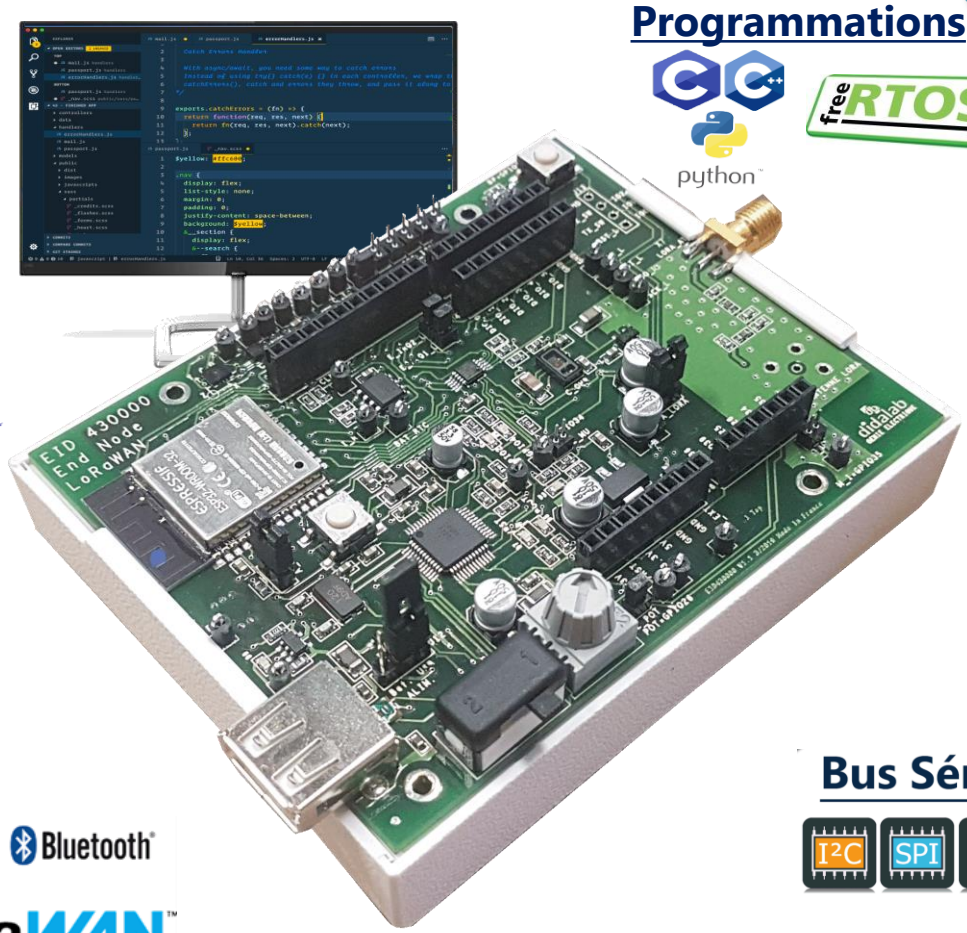
python

Sensors

Bus Série

I²C SPI UART

WiFi Bluetooth LoRaWAN



EID 430

HIGHTLIGHTS

- High level processor « ESP32 »
- Embedded sensors
- Vizualisation of I^2C, SPI frames
- SMA antenna output with -20 dB attenuator
- WIFI, Bluetooth
- Compact
- Consumption measure
- Autonomous (Battery – USB charge)
- Lora Modem
- Compatible with our solution LoRa/LoRaWAN

PEDAGOGICAL AIMS

The Experiments proposed are intended to familiarize the student with the use of different integrated sensors as well as with programming in C/ C++, Python

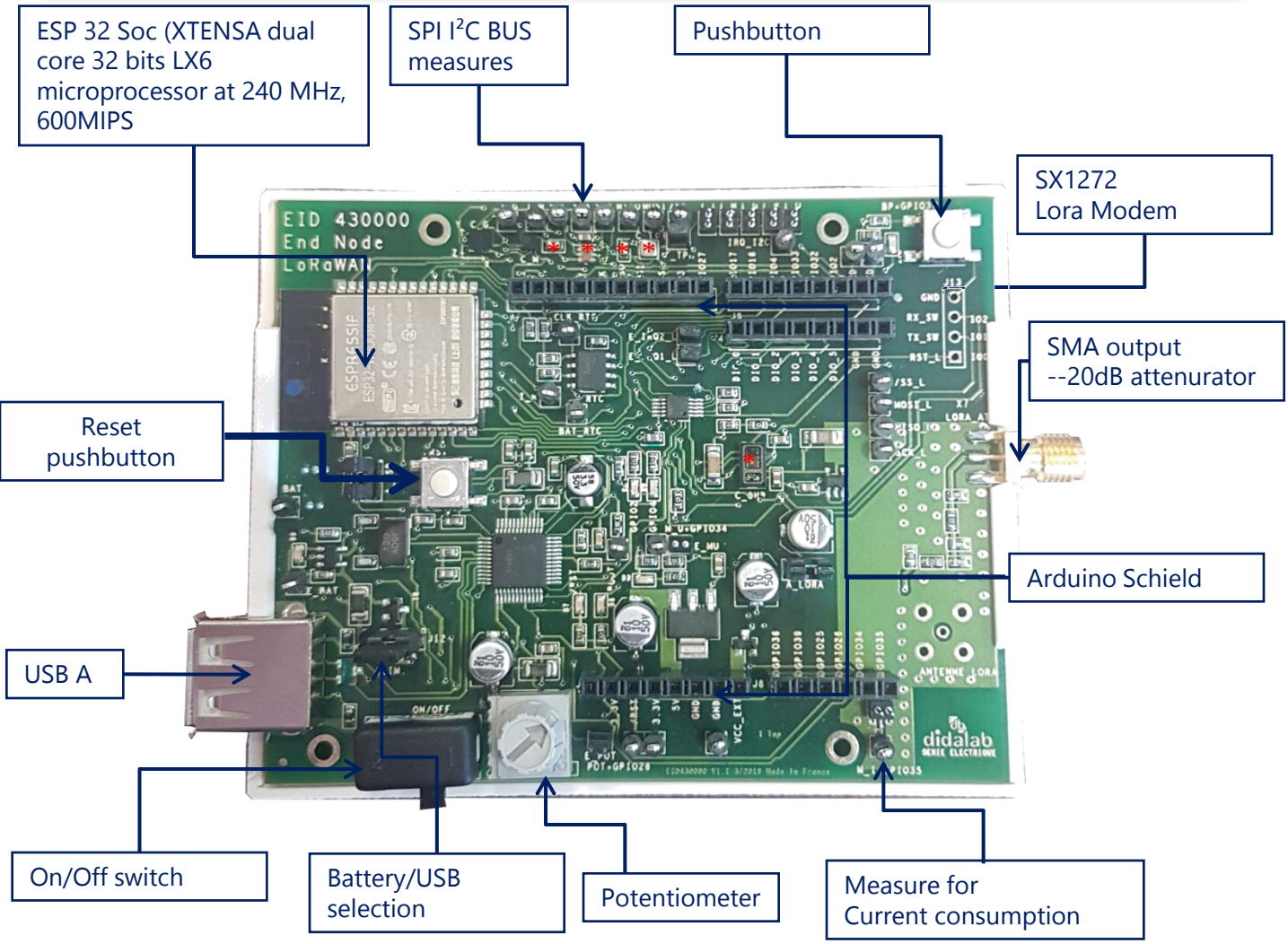
- Elaboration and acquisition of a binary voltage
- Elaboration of binary volage and display of logic levels
- Elaboration, acquisition and measure of an analogic voltage
- Acquisition and measure of luminosity
-
- Acquisition and measure of the intensity of magnetic field
- Acquisition and measure of temperature, humidity and pressure
- Extensions for the LoRa End Device possible via the Arduino shield
- Transmission-Reception of radio frequencies

TARGET TRAINING

- Technical high schools
- Vocational training
- CPGE
- Technical colleges
- Technical universities
- Engineers schools

MADE IN FRANCE FABRICATION FRANÇAISE

EID 430 000: LoRaWAN End Node



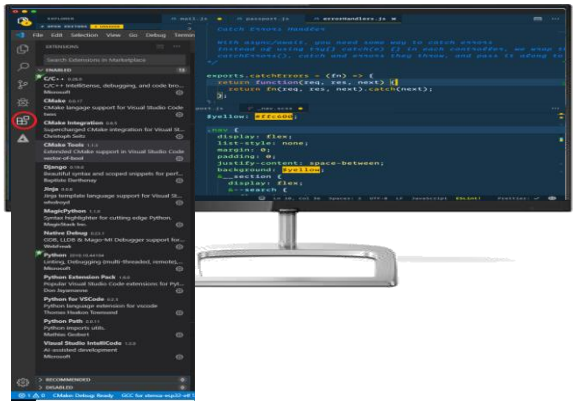
*Embedded sensors

- Hygrometry
- Pressure
- Temperature
- Luminosity
- Heart beat
- Linear acceleration
- Magnetic field

EID 431 000 : Environment for development, C, C++ compilator

Mini PC Vésa with Windows
Quad-Core 1.5 GHz/2.3 GHz turbo, 1 LAN, 500 GB hard disk,
Ram 4 GB DDR3, Mini PCI socket, power supply cord, screen, keyboard, mouse

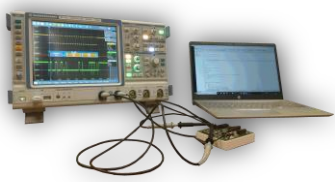
Programmation softwares, installed and configured:
Visual studio Code with the following extensions :
Expressive compiler
Python 2.7



- C/C++ 0.26.1
- CMake 0.0.17
- CMake integration 0.6.5
- CMake Tools 1.2.2
- Django 0.19.0
- Jinja 0.0.8
- Native Debug 0.23.1
- MagicPython 1.1.10
- Python 2019.10.44104
- Python Extension Pack 1.6.0
- Python for VSCode 0.2.3
- Python Path 0.0.11
- Visual Studio IntelliCode 1.2.0

Optional extra : EMD 020 040 : Digital oscilloscope, 4 channels, 100 MHz

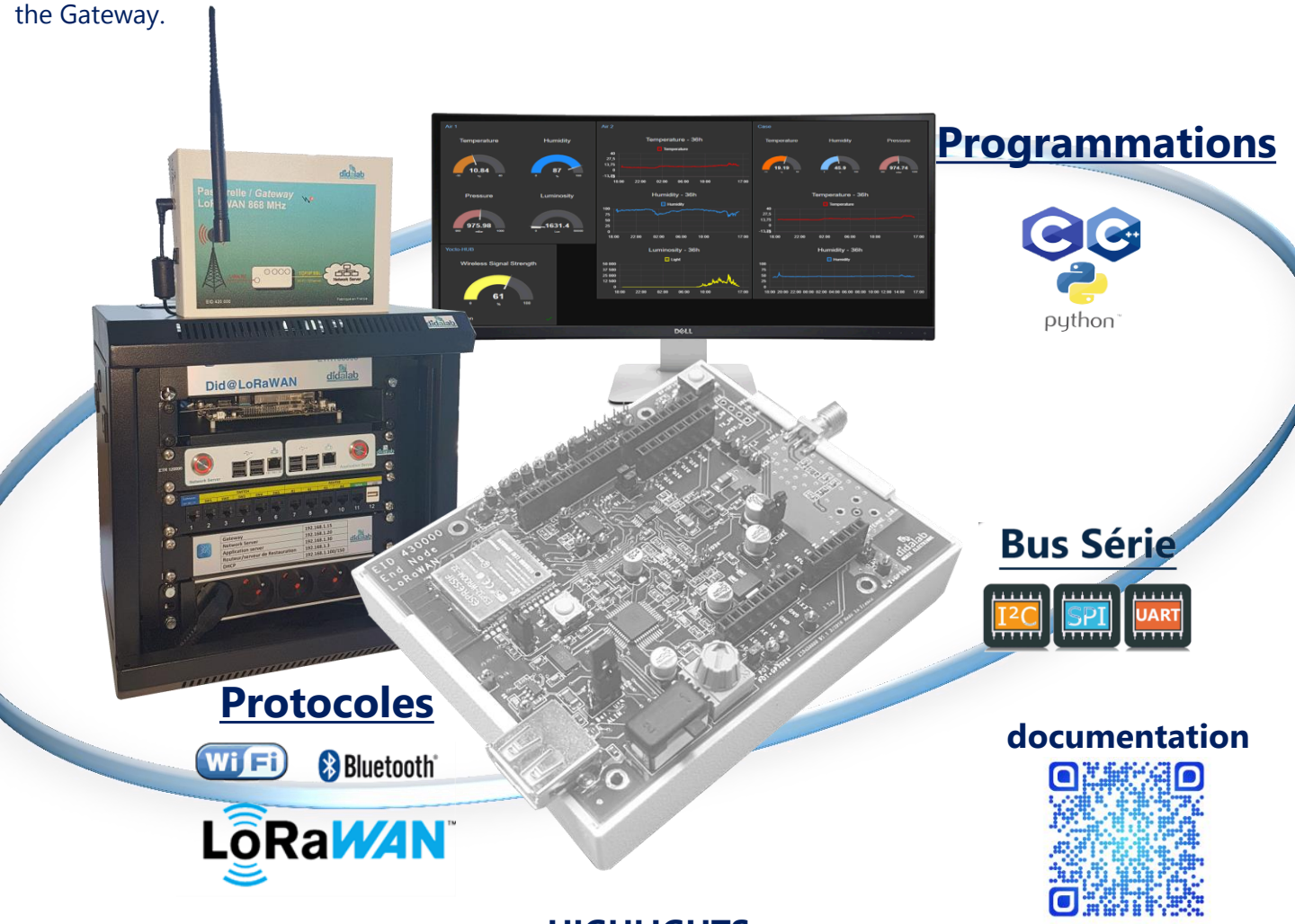
- 4 x 100 MHz
- 2,5 Giga Samples/s
- TFT color screen,
- Serial bus decoder
  - I^2C
  - SPI



EID430A: Basic package IoT END Node , including:		
Reference	Description	Qty
EID430000	LoRa / LoRaWAN End Device module, 868 MHz, including 1 ESP32 with 32 Mbit Flash,1 UART, 2 SPI, 2 I2C, 1 WIFI, 1 Bluetooth, 6 ADC inputs, 2 DAC outputs. Programmation and debug via USB interface. It includes 1 push button, 1 potentiometer, 2 LEDs, 1 temperature sensor, 1 humidity and pressure sensor, 1 luminosity sensor, 1 heart pulse sensor, 1 accelerometer and 3-axis gyroscope sensor, 1 current measure , and 1 shield arduino (with 1 port for power supply, 1 analogue port and 2 digital ports). 1 LoRA / GFSK Modem, 868 MHz (with LoRaWAN stack (Class A, B and C), measure of RSSI and SNR) with 1 embedded antenna and 1 20-dB attenuation output. Power supply: 5V via USB or batteries.	1
EID431000	Programmation unit	1
EGD000006	AA USB cord	1
	Optional extra (not included)	
EMD020040	*Digital oscilloscope, 4 channels, 100 MHz with I^2C SPI frame decoder*	

Additions to the End Node board/ ETR 100 B : Did@LoRaWAN cabinet

Didalab has developed, for the students' use, a set of sensors and concentrators for students to install and implement a complete IoT (Internet of Things) system from the sensor to the server through the Gateway.



Programmations

C C++ python

Bus Série

I²C SPI UART

Protocoles

Wi Fi Bluetooth LoRaWAN

documentation

HIGHLIGHTS

Communicating objects are on the verge of revolutionizing the current use of telecommunication. The miniaturization and the multiple sensors we can propose allow us to envisage a significant growth of this activity in the coming years.
Among the different protocols proposed by the developers, we have chosen the Lora protocol, which presents the most effective technical features concerning the absolutely essential points for this technology and its expansion: **Very low consumption and long distance communication.**

The LoRaWAN network has a star topology. Each element is connected to a single concentrator for supervising and ordering several hundred sensors spread over an area of several kilometers of radius.

PEDAGOGICAL PURPOSES

The proposed Practical Works are intended to familiarize the student with the use of different sensors and the diversity of possible applications. We also highlight the particular technology used by Lora WAN to drastically reduce electrical consumption, but ensure communication of several kilometers between the different elements.

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