The Things Network LoRAWAN workshop: Creating a working IoT solution
Saturday March 11th 13.00 – 17.00 (doors open 12.30) @ www.designhuis.nl

https://www.meetup.com/Eindhoven-Internet-of-Things/

We have LoRaWAN gateways, we have built sensor nodes, and now we will connect the hardware and software to create a complete IoT solution. Following a step-by-step guide, developed by community expert Frank Beks, that will include The Things Network LoRaWAN, Node Red and ESP8266 WiFi. We will connect the sensor, the node, the back-end cloud service, data storage and display, mobile connection and motor control.

This workshop is aimed at all community members, whether you have previously built your own TTN node or not. No hardware soldering required. **To follow the workshop you will need to bring your own hardware and software – see below for information and parts list.**

Want to join without bringing your own hardware? Everyone is welcome but it will be more fun to build. There will be a limited number of Nodes and Sensors available to enable a few individuals (or small groups) to follow the workshop using their own laptops. Please contact the organizers for more information.

Recommended hardware parts list, software and sources:
Note: All software requirements will be discussed during the workshop and detailed in the step-by-step instructions. If any steps are unfamiliar you can wait to be guided through installation during the workshop.

Software

Every participant will need to bring his or her own laptop (or share), ideally with the following software installed:

Arduino IDE Please install the latest version 1.8.1
https://www.arduino.cc/en/Main/Software

Arduino Sensor Libraries to download
https://github.com/claws/BH1750
and i2c universal sensory library (via library manager in Arduino IDE)

OPTIONAL Node Red (see below)
https://nodered.org/docs/getting-started/installation
Cloud hosting of Node Red
One option discussed during the workshop will be hosting Node Red in the cloud using IBM Blue Mix. You can create your own account: https://console.ng.bluemix.net/registration/

It is also possible to use a local installation of Node Red on your laptop during the workshop using the installation link above for your operating system.

TTN LoRaWAN node

TTN Node
We will use the TTN node built during the last workshop and described in this TTN lab story by Frank Beks https://www.thethingsnetwork.org/labs/story/workshop-creating-a-ttn-node

If soldering electronics is not your thing you can also join with a prebuilt node such as the Nexus: https://webshop.ideetron.nl/Nexus

As mentioned above, we will have a small number of nodes and sensors available to borrow during the workshop. Please register your interest to the workshop organizers via the meetup site to be sure of a set. This will not include the control and display hardware components.

FT232RL 3.3v-5v TTL USB Serial Port Adapter (to program the node and the ESP8266)
http://www.tinytronics.nl/shop/Communicatie/FT232RL-3.3v-5v-TTL-USB-Serial-Port-Adapter
(Note: this was used to program the node during the last workshop, one is enough to program both the node and the ESP (don't forget to bring a USB cable: Mini-USB female to USB))

Sensors

We will work with the sensors used in the previous workshop.
If you did not join this workshop see links below in case you wish to purchase one or both:

TH06 i2c Humidity and Temperature Sensor
https://webshop.ideetron.nl/TH06

BH1750 Light Sensor
http://www.tinytronics.nl/shop/BH1750-16bit-Digitale-I2C-Licht-Sensor-Module

Note the following components were not part of the previous workshop

Control

To create a complete IoT solution we will not only read sensor data from The Things Network node but also trigger the control of a motor via WiFi. For this the following parts will be needed:

ESP8266-12 board with battery holder
http://www.tinytronics.nl/shop/ESP8266-12-board-met-Batterijhouder

Relay
http://www.tinytronics.nl/shop/5V-relais-1-channel-hoog-actief

Servo
http://www.tinytronics.nl/shop/SG90-Mini-Servo

Display

The sensor data can also be directly monitored on a display (optional)
OLED Display 128x64 pixels
http://www.tinytronics.nl/shop/0.96-inch-OLED-Display-128*64-pixels-blauw

Extras

Wires to connect the components
Wires female-female 10cm
http://www.tinytronics.nl/shop/Kabels/Prototype-draden/DuPont-Jumper-draad-Female-Female-10cm-10-draden

Wires male-female 10cm
http://www.tinytronics.nl/shop/Kabels/Prototype-draden/DuPont-Jumper-draad-Male-Female-10cm-10-draden

Summary parts and price indication (excl btw)

Supplier option: Ideetron

Nexus prebuilt LoRaWAN node	€ 31,25
TH06 i2c Humidity and Temperature Sensor	€ 2,45
	€ 33.65 subtotal

Supplier option: TinyTronics

BH1750 Light Sensor	€ 3,50
ESP8266-12 board with battery holder	€ 8,00
3v FTDI adapter	€ 6,00 (also needs usb cable not included)
Relay	€ 2,50
Servo	€ 4,00
OLED Display 128x64 pixels	€ 7,00 optional
Wires female-female 10cm	€ 0,50
Wires male-female 10cm	€ 0,50
	€ 32.00 subtotal

Lorna Goulden and Frank Beks