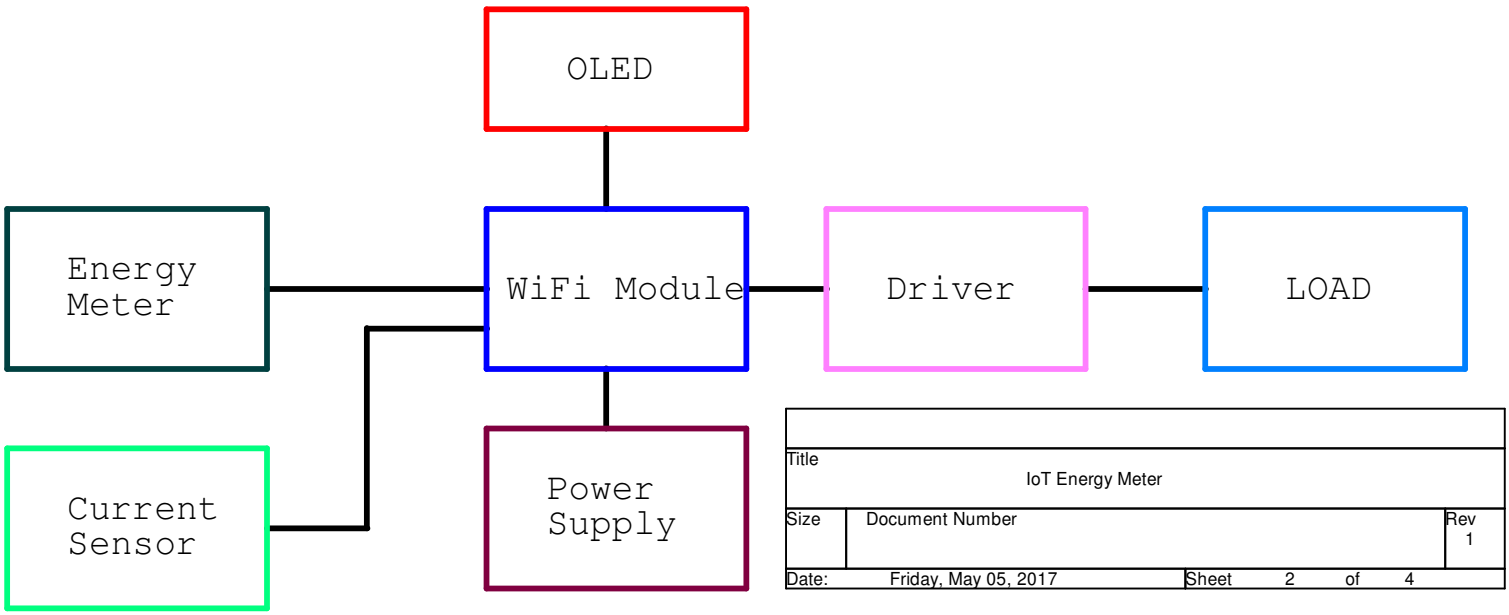
PROJECT OBJECTIVE

The Internet-of-Things Energy Meter (IEM) is a device fixed on top of the regular household power meter that provides detailed information about the electricity usage. Modern power meters have a LED blinking every time a watt-hour is used, the IEM detects these flashes using a interrupt, counts them, then the data is stored to the cloud.

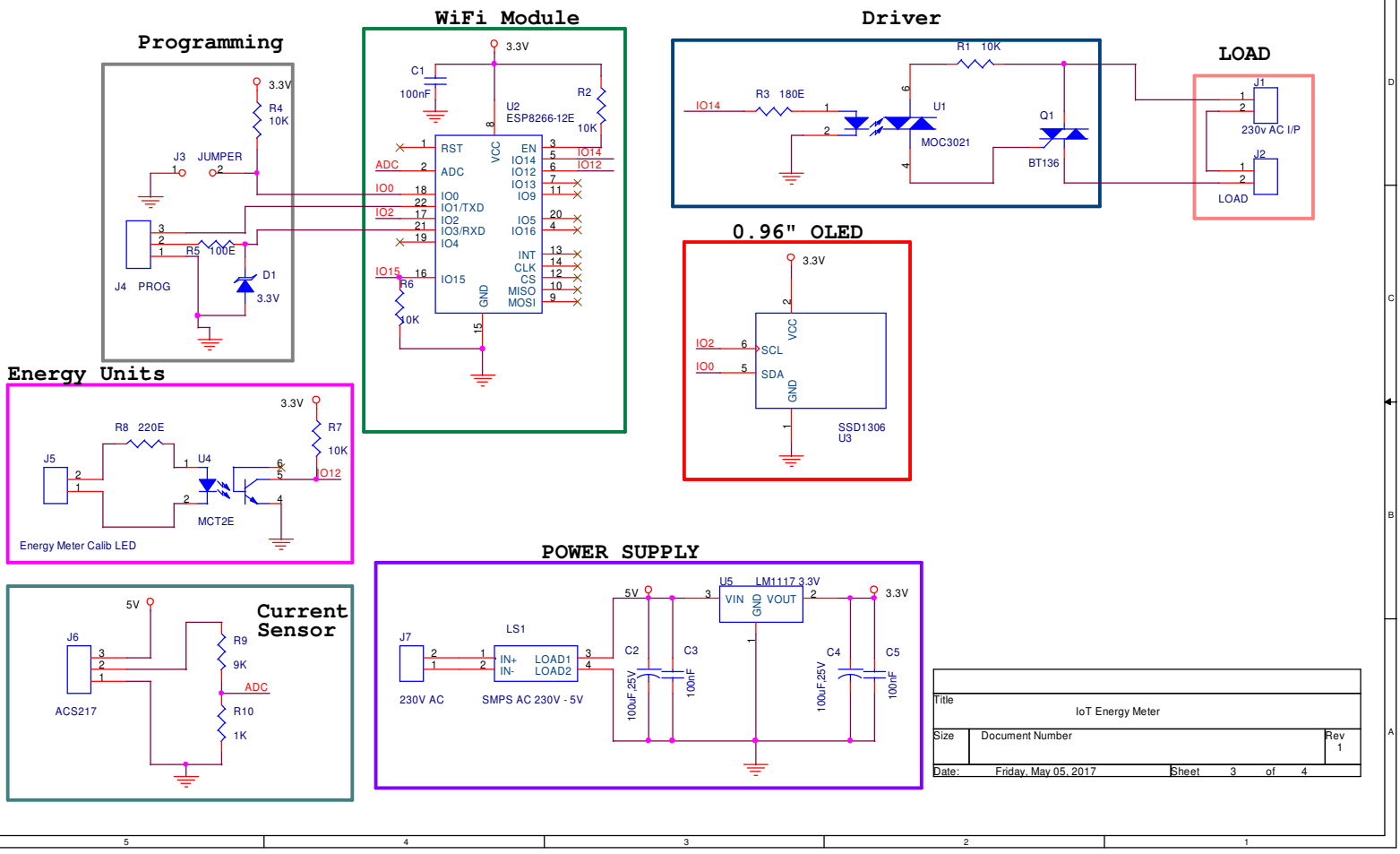
Usually power companies provide very rough electricity usage data, the IEM provides data with a minute resolution. Knowing the household electricity usage allows to extrapolate statistics and can give precise numbers about the costs.

Title	IoT Energy Meter	
Size	Document Number	Rev 1
Date: Friday, May 05, 2017	Sheet 1 of 4	

FUNCTIONAL BLOCK DIAGRAM



Title: IoT Energy Meter		
Size	Document Number	Rev 1
Date: Friday, May 05, 2017	Sheet 2 of 4	


Programming
3.3V
R4
10K
J3 JUMPER
J4 PROG
R5 100E
D1
3.3V
WiFi Module
3.3V
C1
100nF
U2
ESP8266-12E
R2
10K
RST
ADC
IO0
IO1/TXD
IO2
IO3/RXD
IO4
IO15
GND
VCC
EN
IO14
IO12
IO13
IO9
IO5
IO16
INT
CLK
CS
MISO
MOSI
R6
10K
Driver
R1 10K
IO14
R3 180E
U1
MOC3021
Q1
BT136
LOAD
J1
230v AC I/P
J2
LOAD
0.96" OLED
3.3V
IO2
IO0
SCL
SDA
VCC
GND
SSD1306
U3
Energy Units
3.3V
R8 220E
R7
10K
J5
U4
IO12
MCT2E
Energy Meter Calib LED
Current Sensor
5V
J6
R9
9K
ADC
R10
1K
ACS217
POWER SUPPLY
J7
LS1
IN+
IN-
LOAD1
LOAD2
230V AC
SMPS AC 230V - 5V
5V
U5 LM1117 3.3V
VIN
GND
VOUT
3.3V
C2
100uF 25V
C3
100nF
C4
100uF 25V
C5
100nF
Title
IoT Energy Meter
Size
Document Number
Rev
1
Date: Friday, May 05, 2017
Sheet 3 of 4