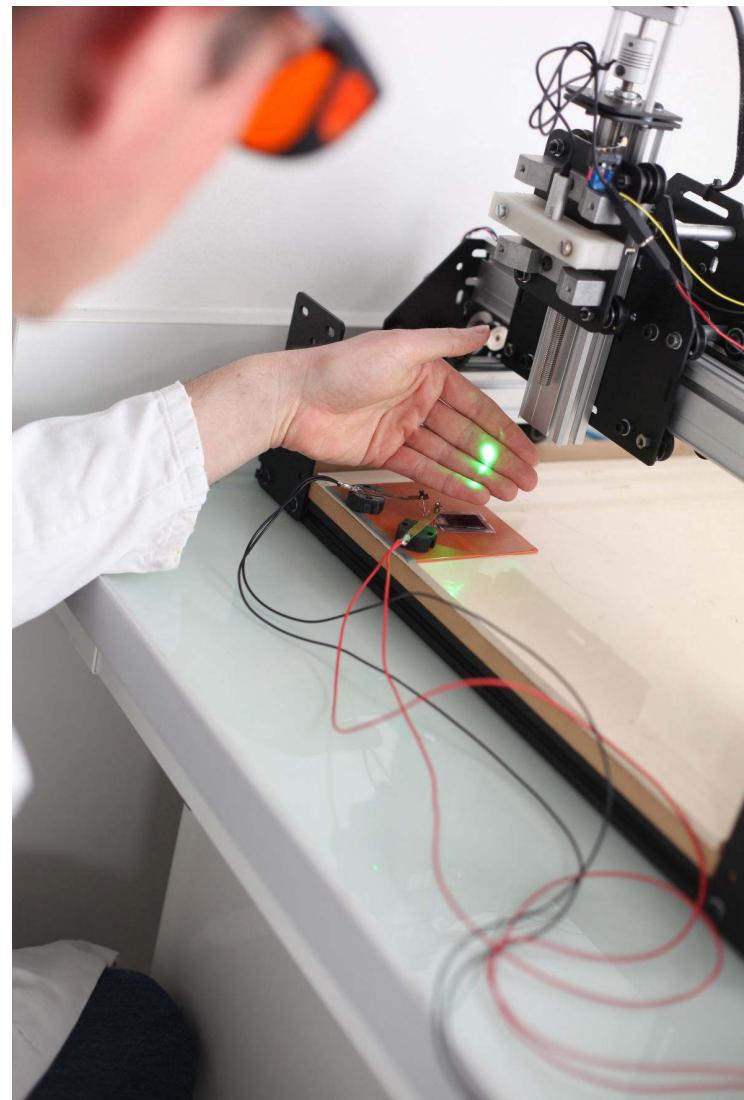
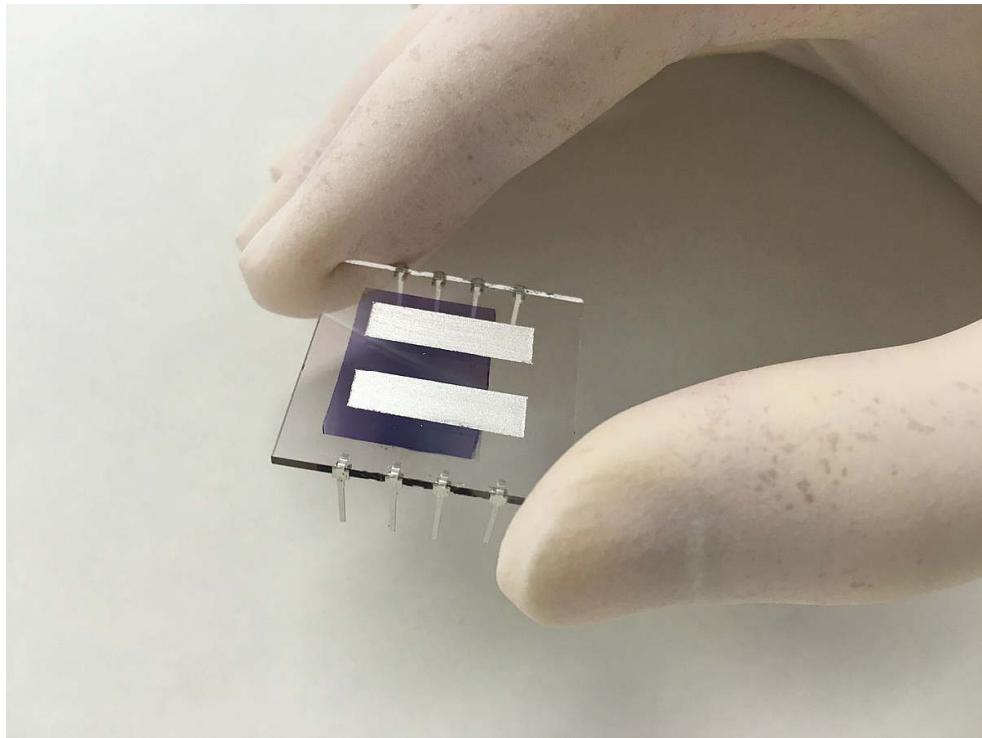


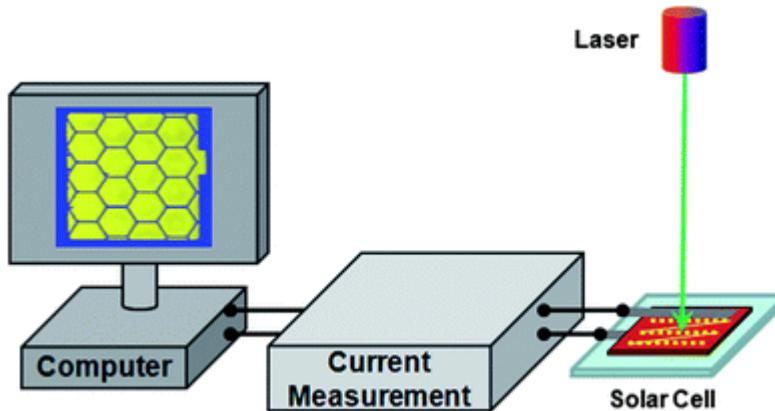
Caractérisation locale de cellules photovoltaïques

Nicolas CHARVIN
LEPMI – Université Savoie Mont-Blanc
AlpesVIEW 2016
Grenoble, le 18 novembre 2016

Cellules PV organiques

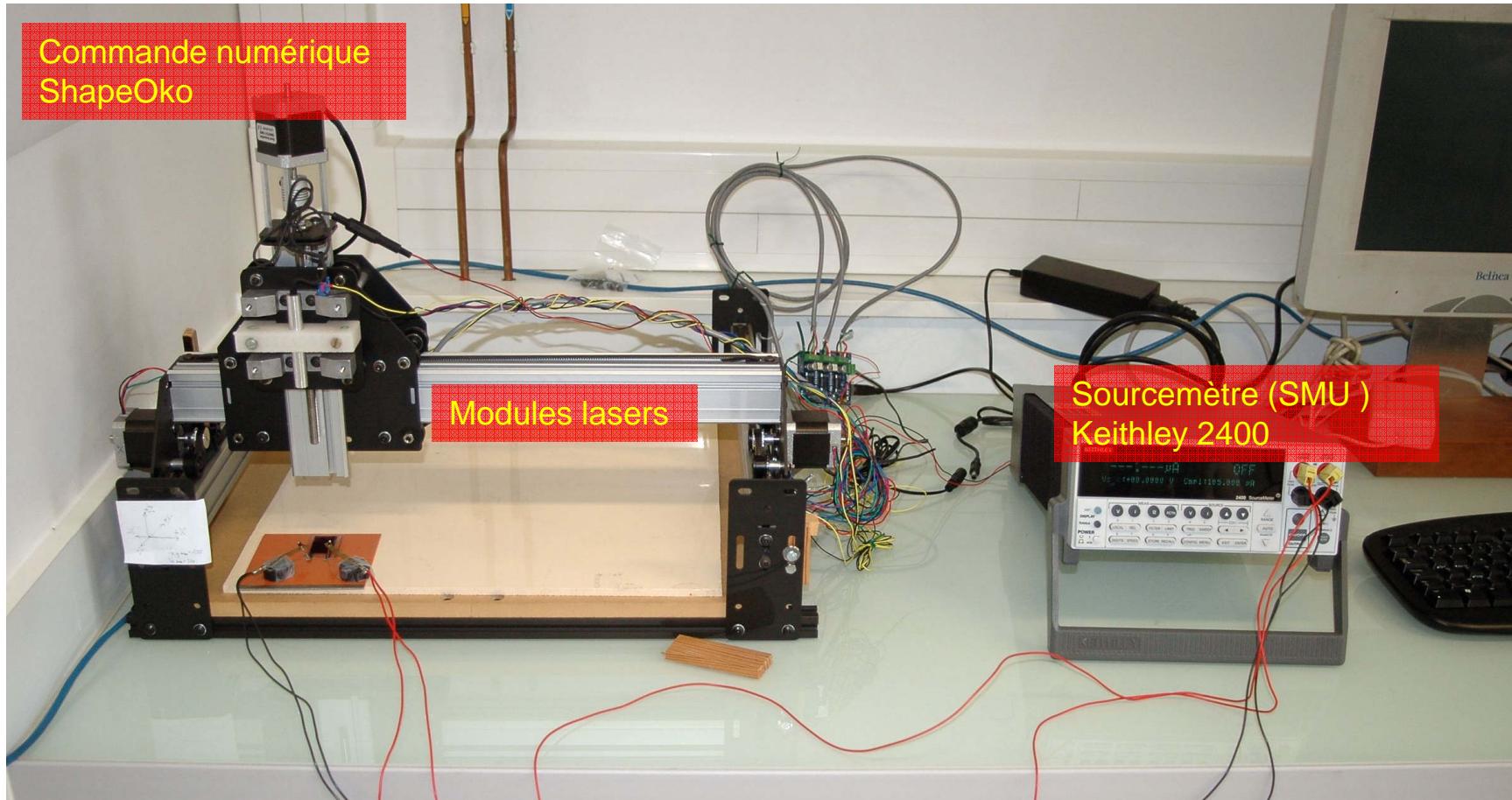


Manip LBIC (laser-beam induced current)



- *Mesure du courant électrique produit par l'éclairage local d'une cellule PV.*
- *Détection de défauts locaux liés au vieillissement de la couche active ou du matériau d'encapsulation*
- *Systèmes commerciaux : résolution spatiale < 60 µm*

Installation



CNC Shapeoko



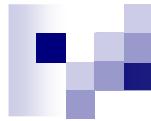
Surface de travail: 45 x 45 cm

Pilotage : interpréteur de G-Code +
drivers de moteurs pas à pas

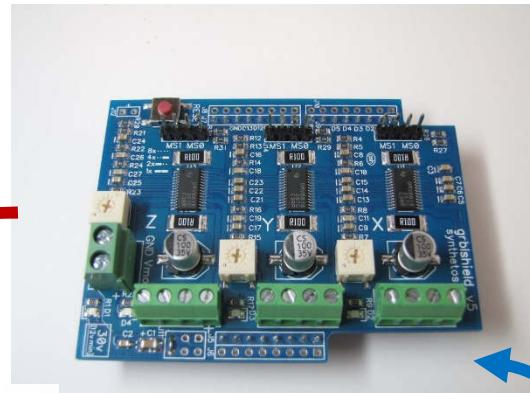
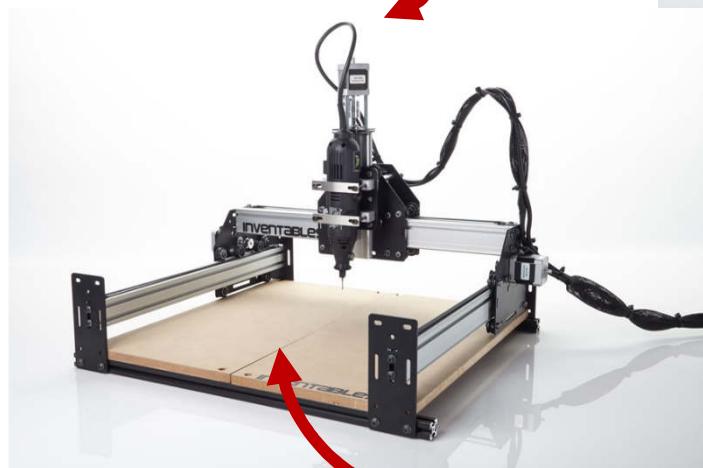
A monter soi-même

Résolution ~ 0,3 à 0,5 mm

~ 1000 € (2013)



Déplacement du porte-outils



Arduino + GRBL (logiciel interpréteur de G - code)
+
Gshield (pilote de moteur pas à pas)

Communication RS-232



Mesure du courant induit par le spot du laser sur la cellule PV



SMU Keithley 2400

Communication GPIB

G-Code (commandes d'usinage)

G90 (absolute mode)

G21 (mm)

G1 F900 X10.00 Y10.00

G1 F900 X11.00 Y10.00

G1 F900 X12.00 Y10.00

.

.

G1 : déplacement linéaire

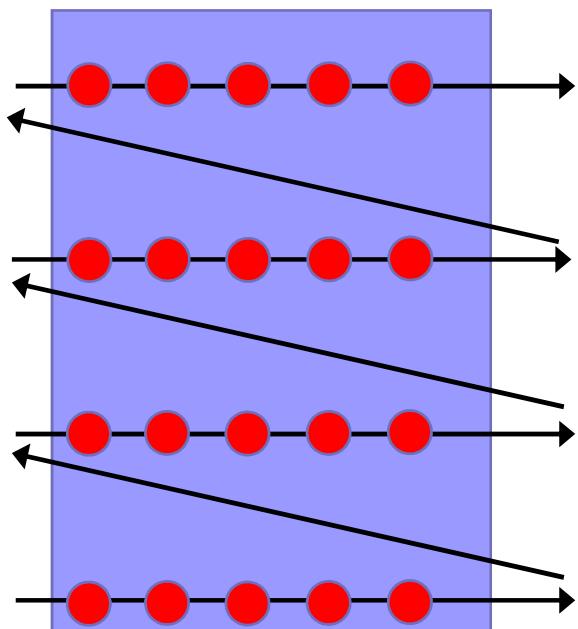
F300 : avance (vitesse, en mm/min)

X Y Z: position d'arrivée (en absolu ou relatif)

L'interpréteur G-Code reçoit ces commandes, et actionne les moteurs en conséquence.

Envoi des commandes par bloc ou ligne par ligne

Balayage de la cellule



;Script de déplacement, avec mesure élec.

...

G1 F900 X10.00 Y10.00

SMU

G1 F900 X11.00 Y10.00

SMU

G1 F900 X12.00 Y10.00

...

Face-avant

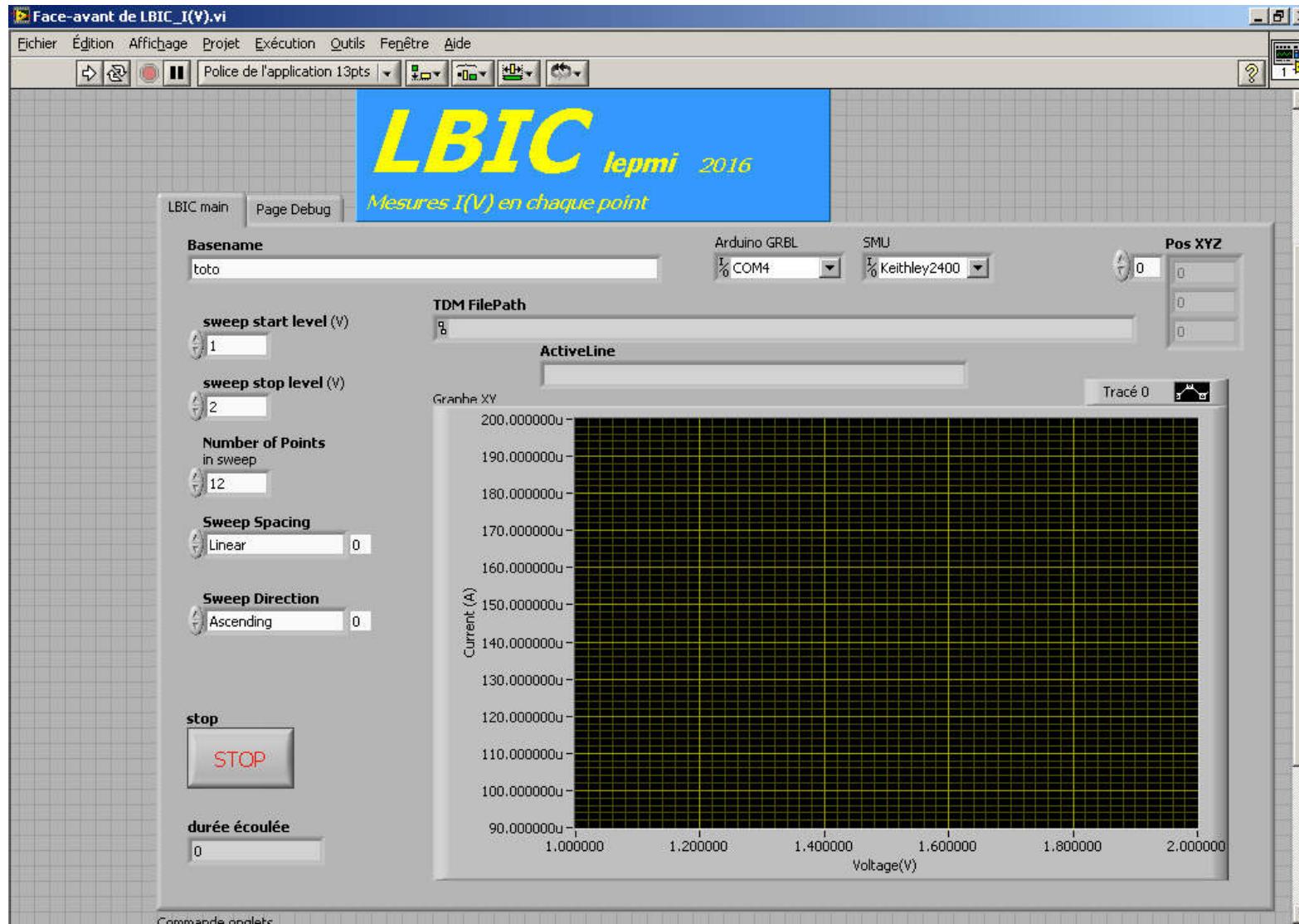


Diagramme - 1

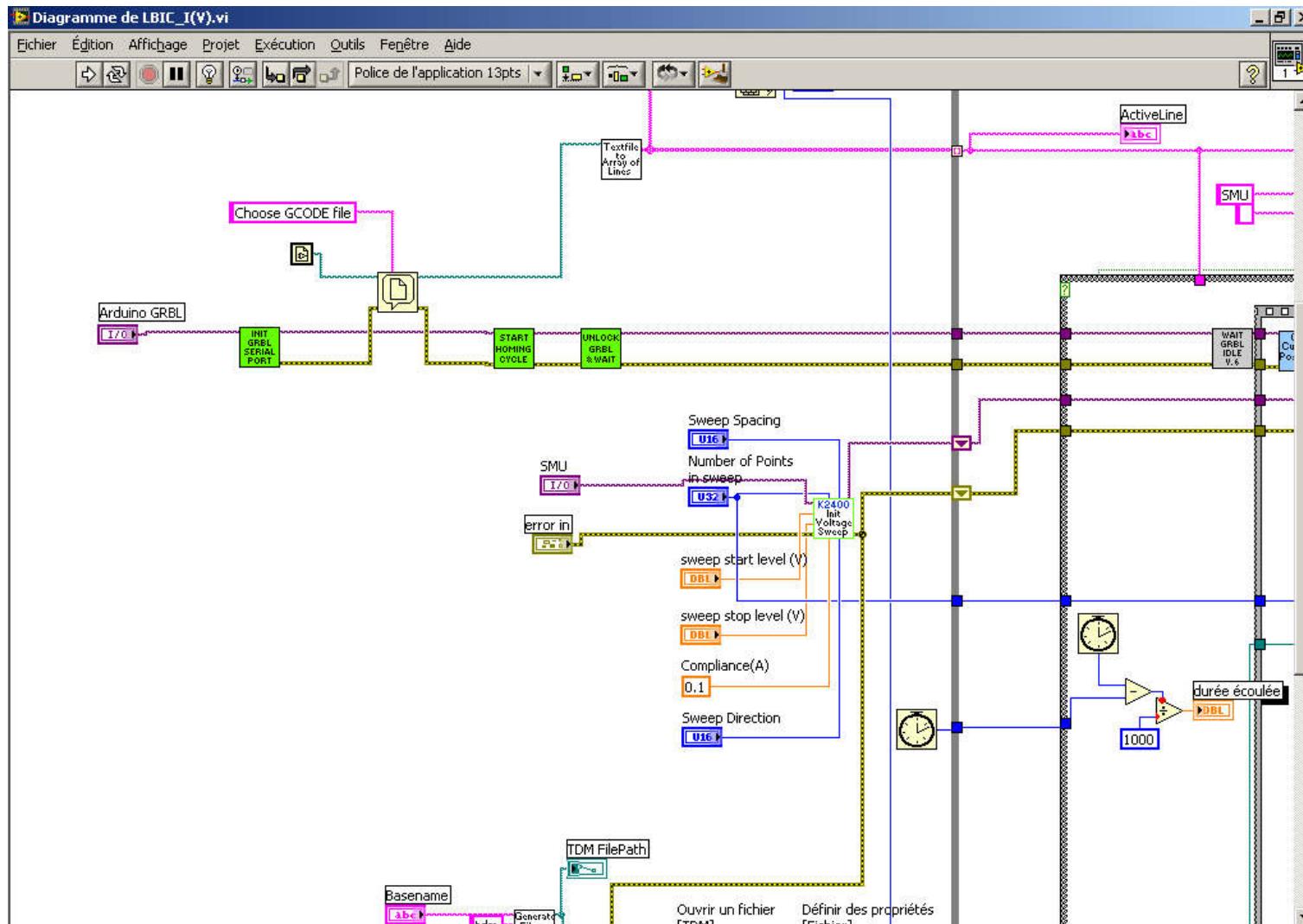
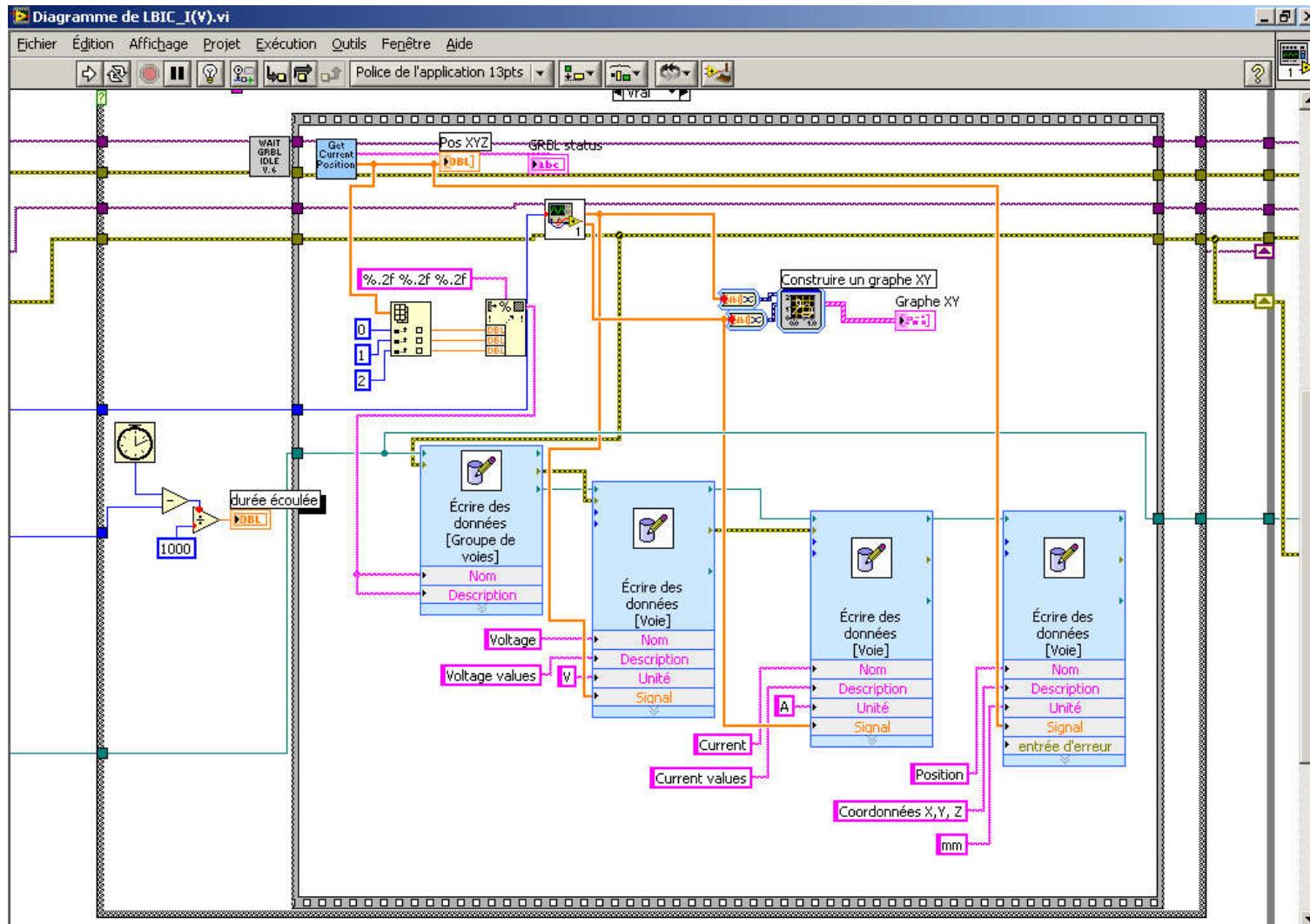
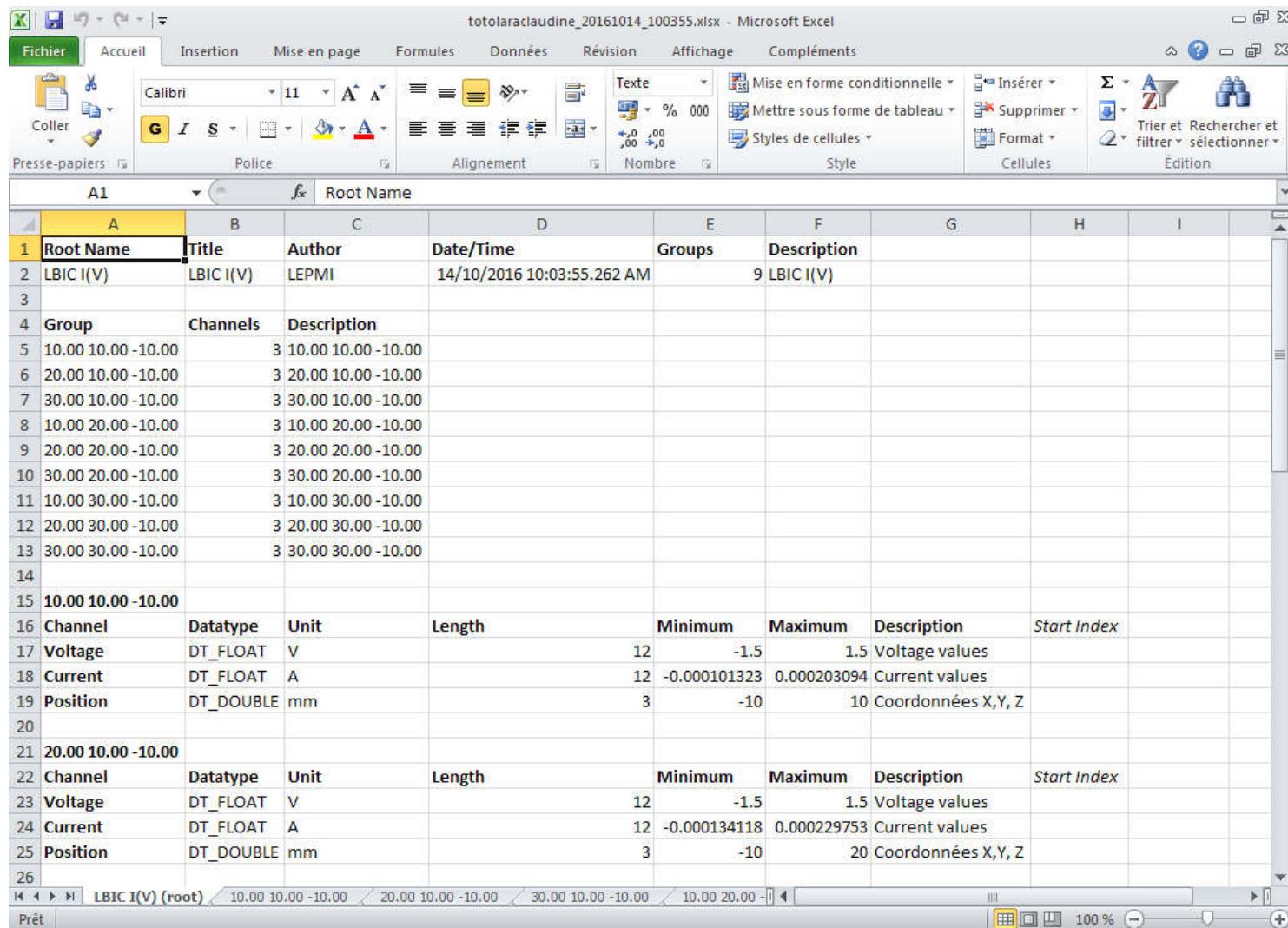


Diagramme - 2

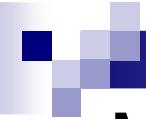


Import TDM sous Excel (*TDM Excel Add-On*)

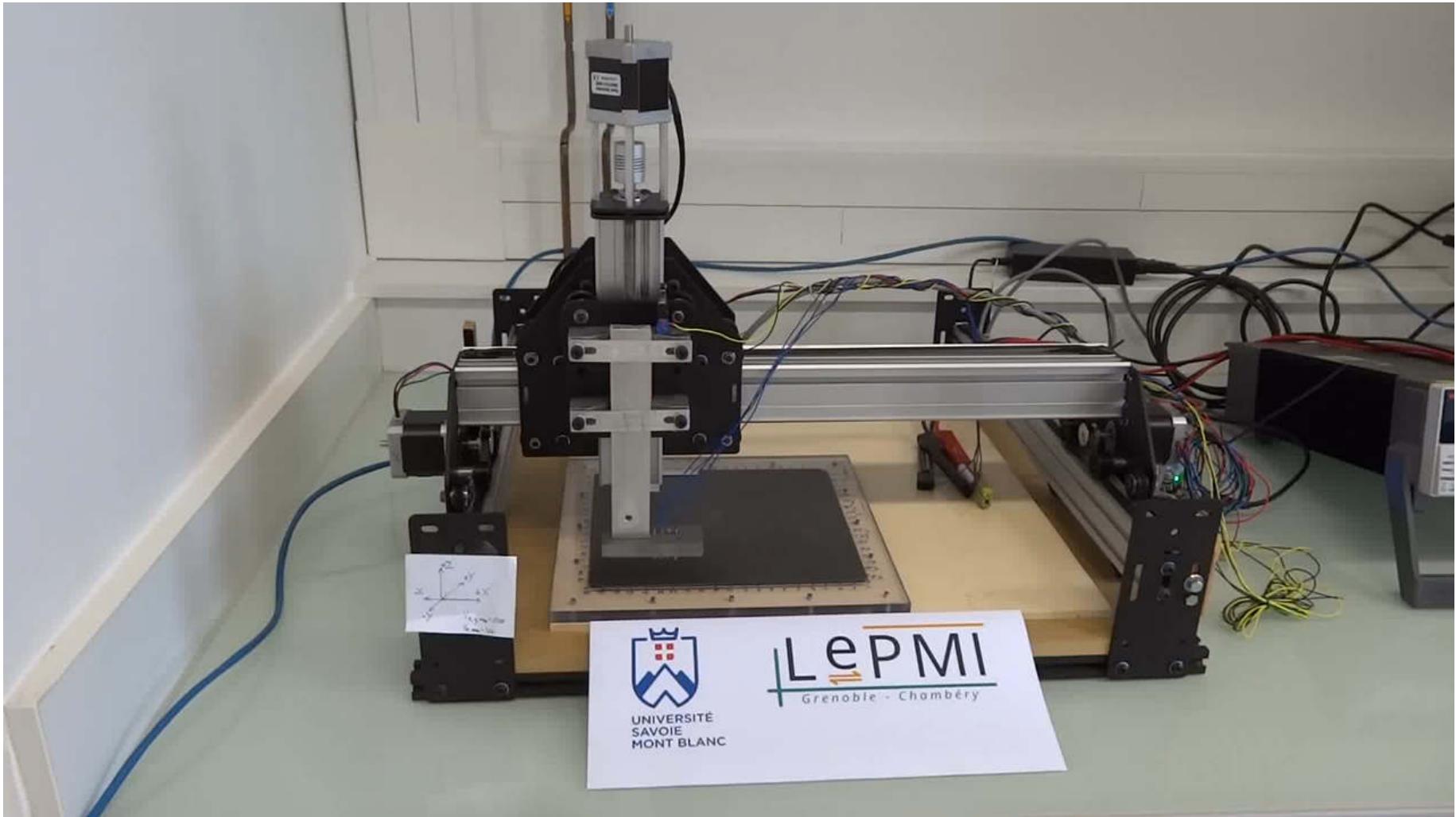


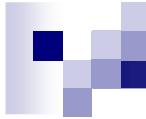
The screenshot shows a Microsoft Excel spreadsheet titled "totolaraclaudine_20161014_100355.xlsx - Microsoft Excel". The data is organized into several tables:

- Root Name:** A table with columns: A (Root Name), B (Title), C (Author), D (Date/Time), E (Groups), F (Description). The first row contains "Root Name" and "LBIC I(V)".
- Group:** A table with columns: A (Group), B (Channels), C (Description). The first row contains "Group" and "Channels". Rows 5 to 13 list channels: "10.00 10.00 -10.00", "20.00 10.00 -10.00", "30.00 10.00 -10.00", "10.00 20.00 -10.00", "20.00 20.00 -10.00", "30.00 20.00 -10.00", "10.00 30.00 -10.00", "20.00 30.00 -10.00", and "30.00 30.00 -10.00".
- 10.00 10.00 -10.00:** A detailed table with columns: A (Channel), B (Datatype), C (Unit), D (Length), E (Minimum), F (Maximum), G (Description), H (Start Index). It lists "Voltage" (DT_FLOAT, V, 12, -1.5, 1.5, "Voltage values"), "Current" (DT_FLOAT, A, 12, -0.000101323, 0.000203094, "Current values"), and "Position" (DT_DOUBLE, mm, 3, -10, 10, "Coordonnées X,Y, Z").
- 20.00 10.00 -10.00:** A detailed table with columns: A (Channel), B (Datatype), C (Unit), D (Length), E (Minimum), F (Maximum), G (Description), H (Start Index). It lists "Voltage" (DT_FLOAT, V, 12, -1.5, 1.5, "Voltage values"), "Current" (DT_FLOAT, A, 12, -0.000134118, 0.000229753, "Current values"), and "Position" (DT_DOUBLE, mm, 3, -10, 20, "Coordonnées X,Y, Z").



Merci de votre attention





Face-avant

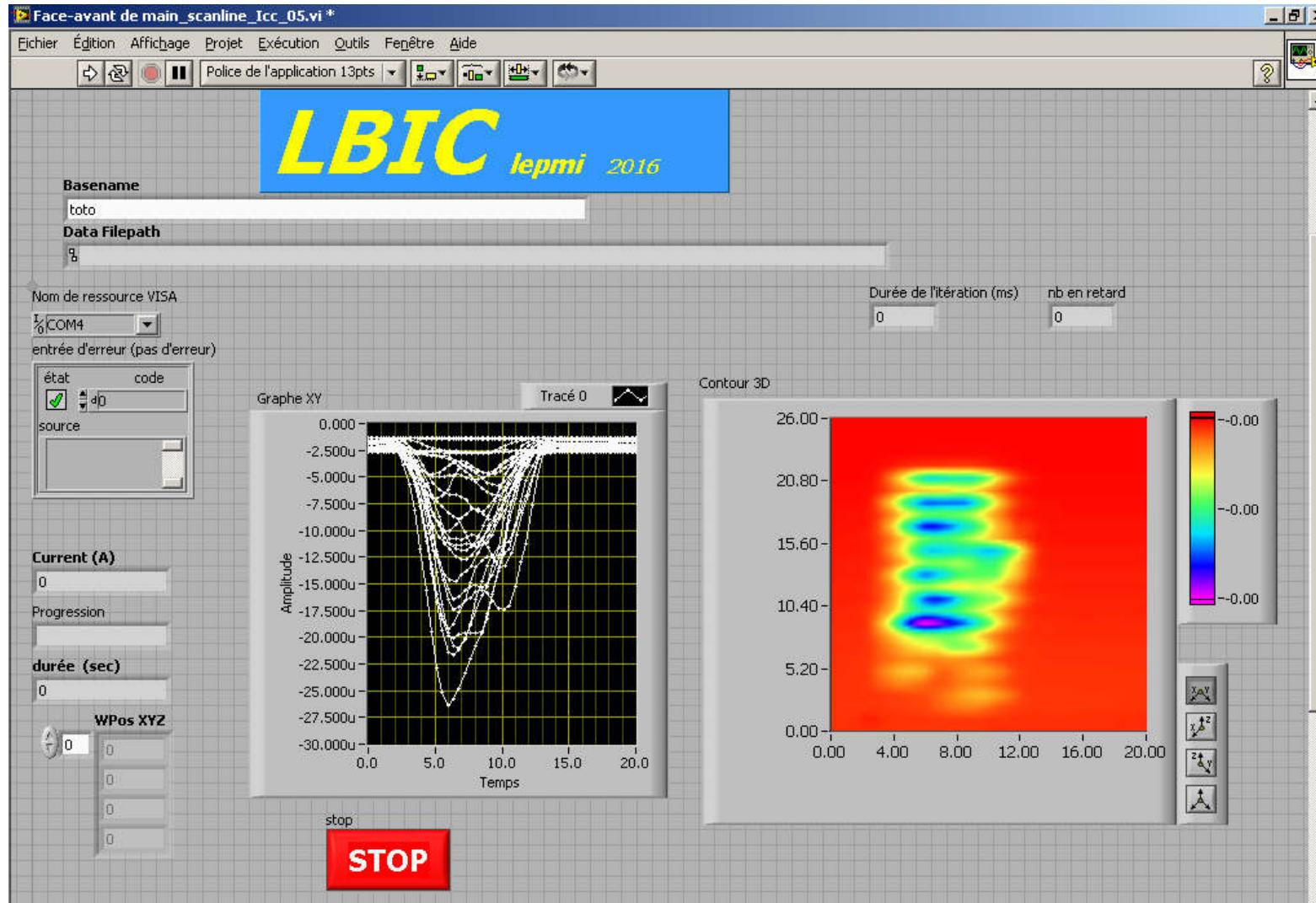


Diagramme - 1

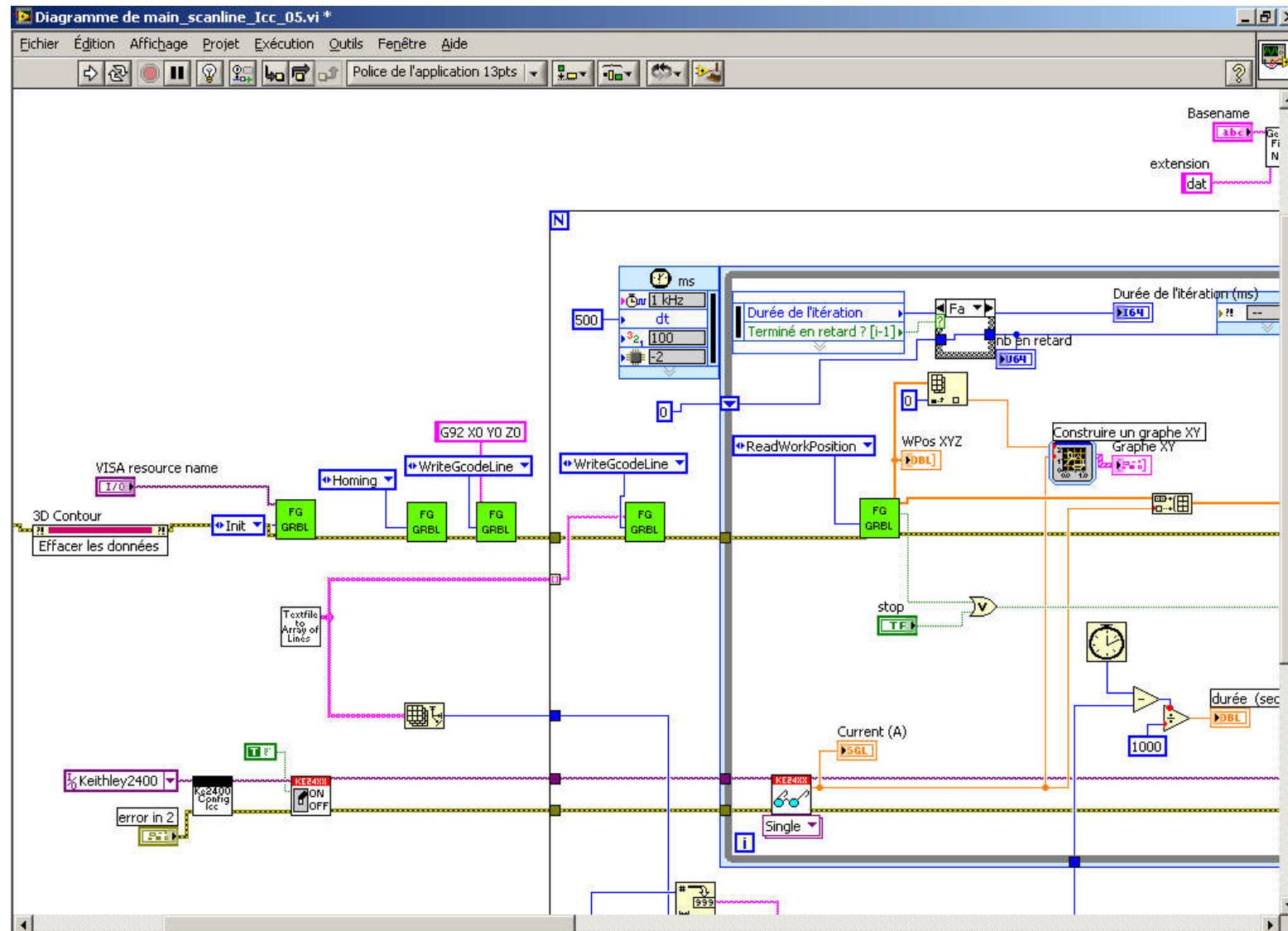
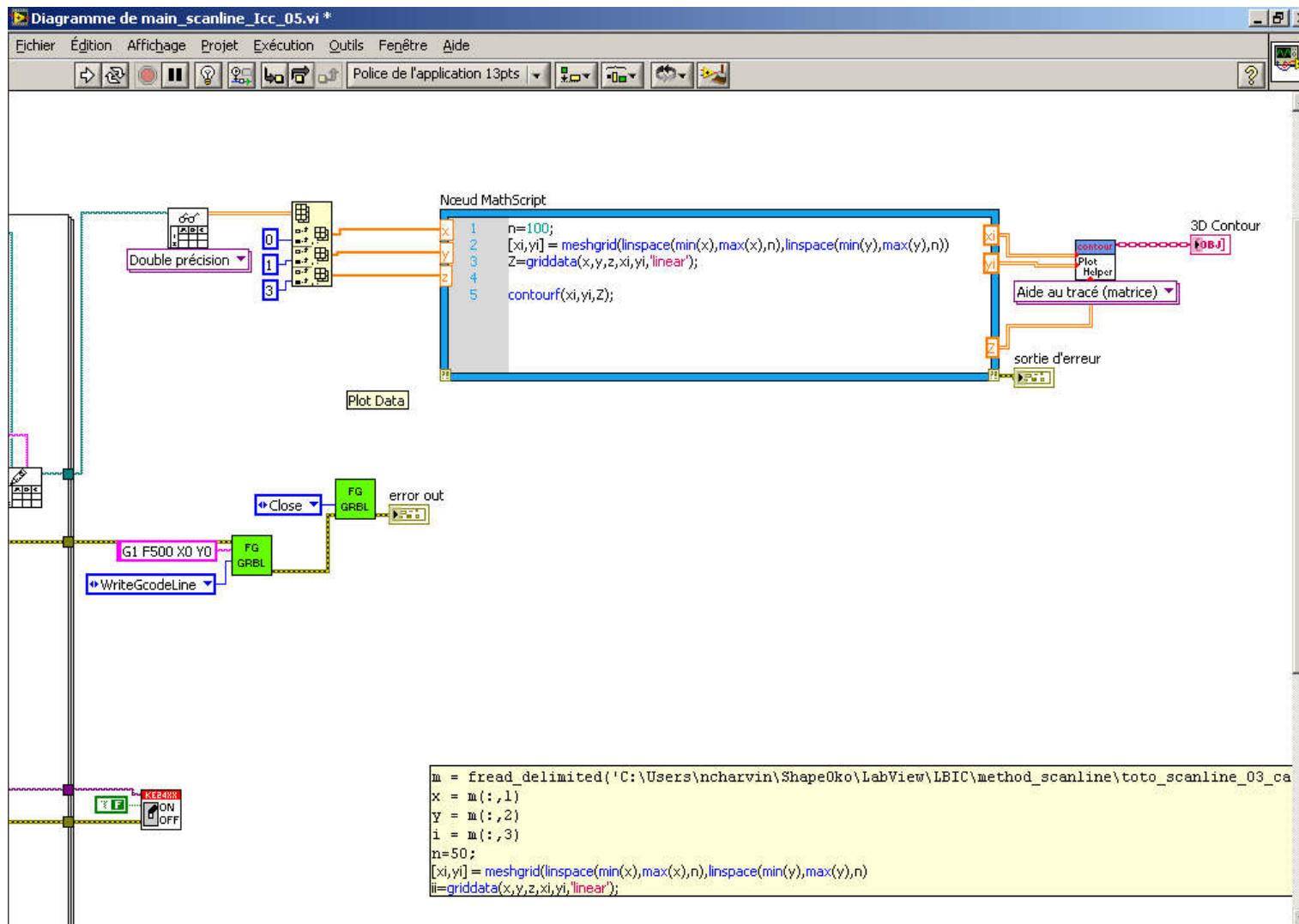


Diagramme - 2



Résultats

