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Laboratoire
Science et Ingénierie des Matériaux et des Procédés



6^{ème} Journée AlpesVIEW CNRS
8 décembre 2021

La fabrication additive dans tous ses états !

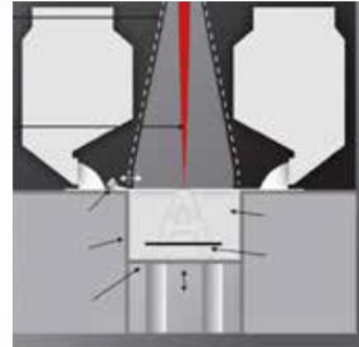


Fabrication additive : Electron Beam Melting

- machine ARCAM A1 EBM
- alliages de titane, nouveaux matériaux (Cu, Al, ...)
- caractérisation in-situ



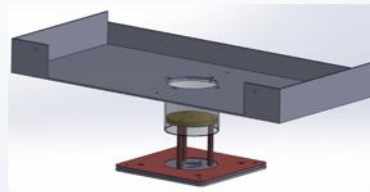
Initial chamber



Max. manufactural size 200 x 200 x 180 mm
60 kg of powder

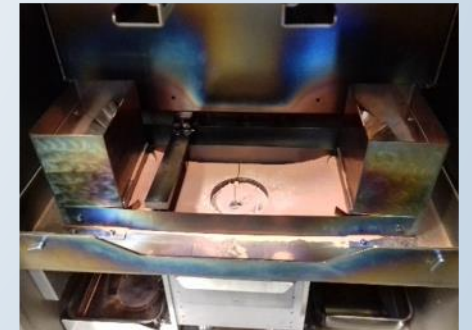
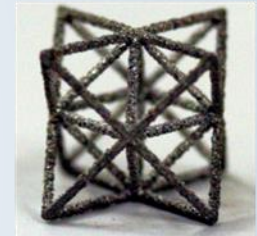
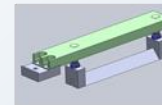


Mini chamber

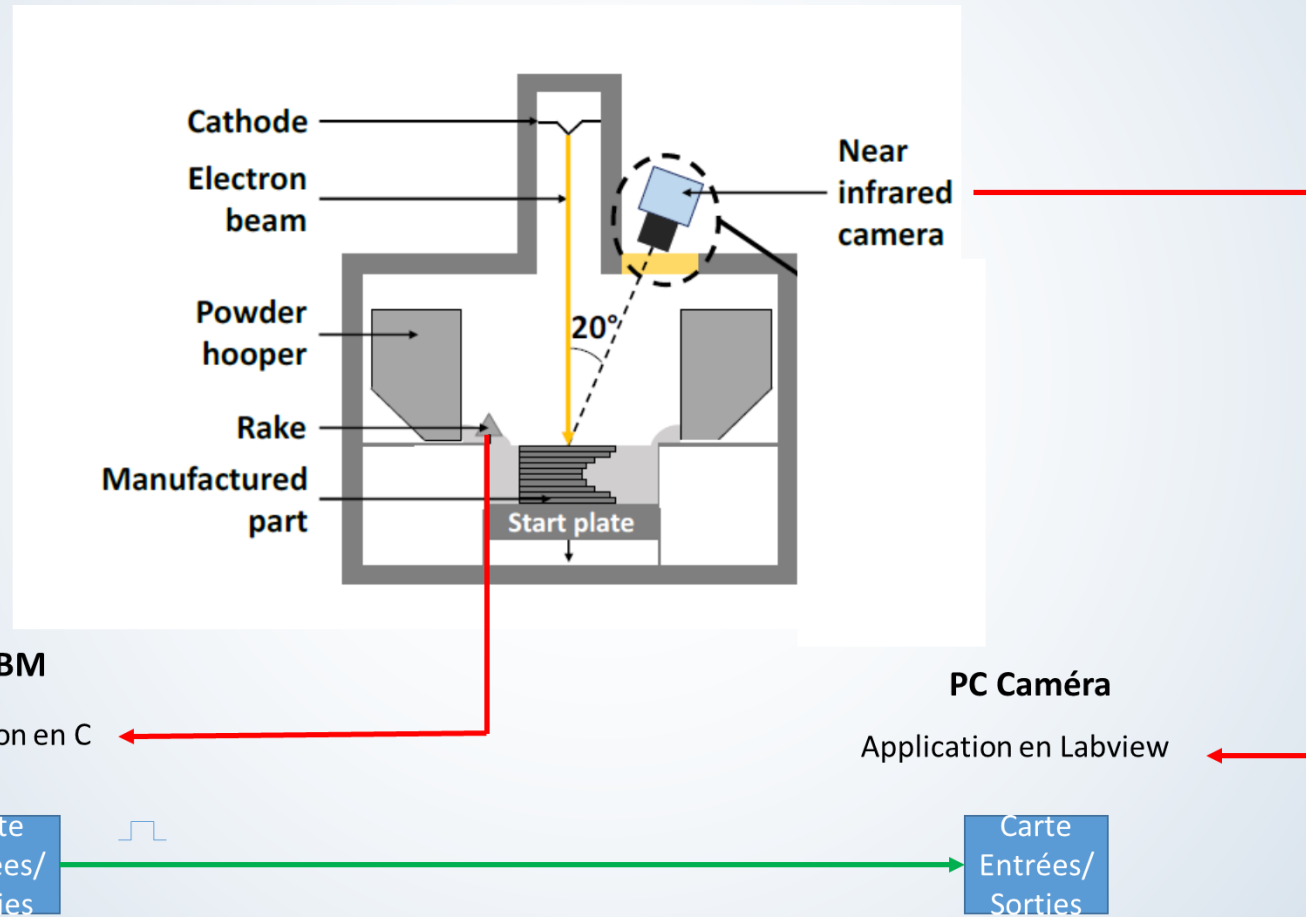


Max. manufactural size 70 x 70 x 180 mm
6 kg of powder

Mini rake



Process de contrôle



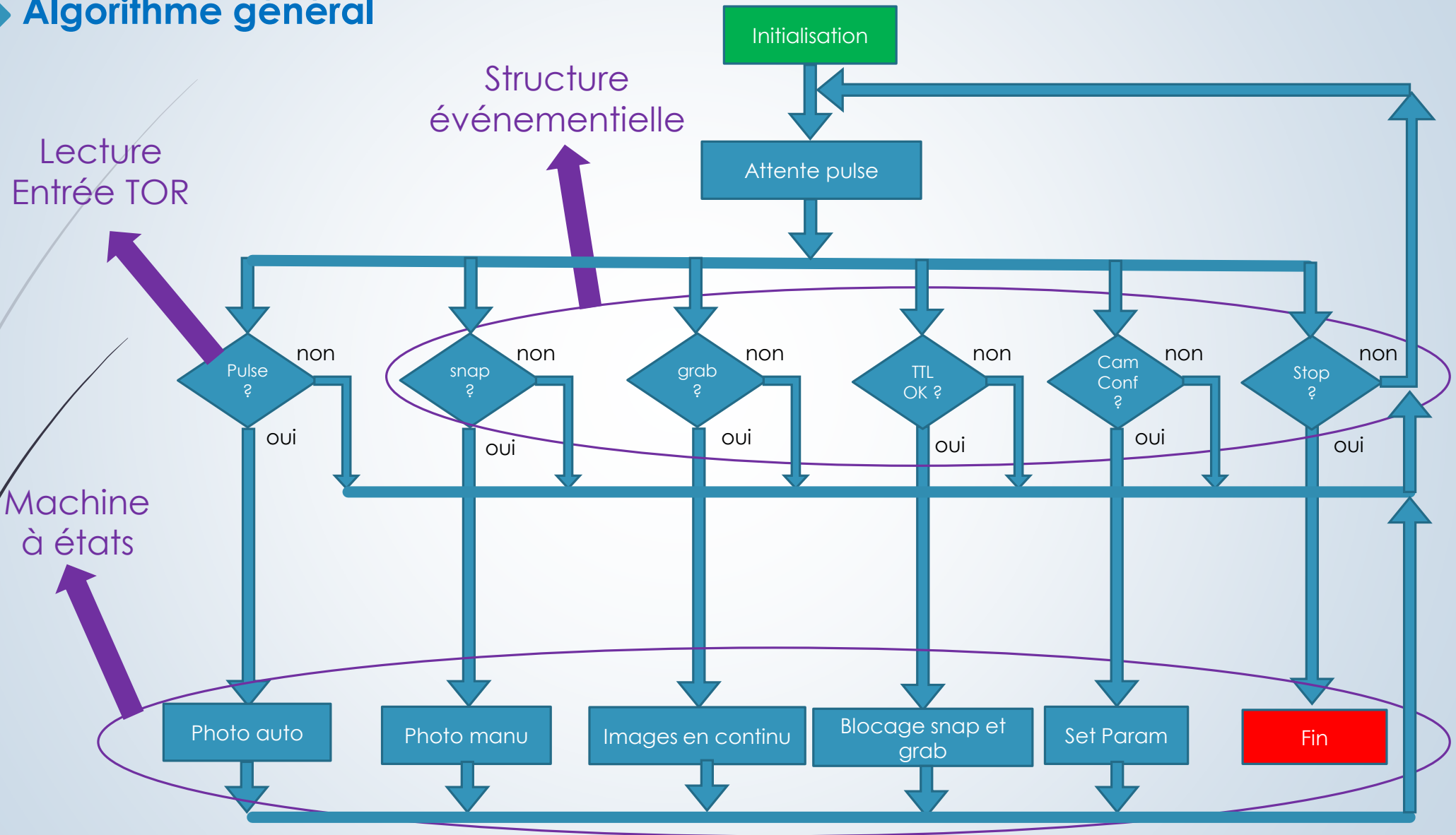


Le programme Labview

La fabrication additive dans tous ses états !

- utilisation carte entrées / sorties TOR non NI.
- structure événementielle,
- machine à états,
- 2 boucles producteur / consommateur pour la gestion de l'acquisition des images et leur sauvegarde,

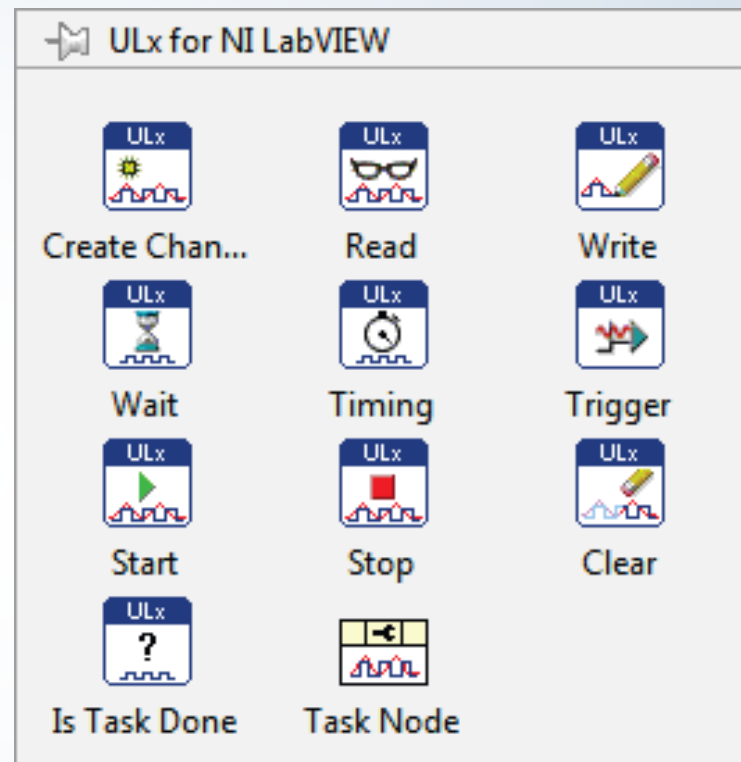
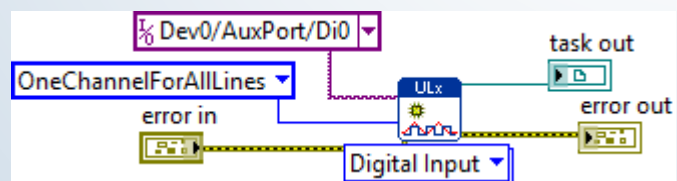
Algorithme général



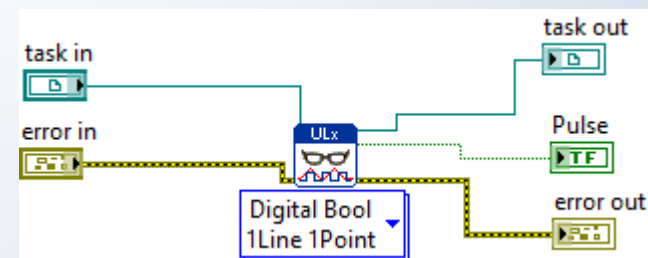
Entrées / sorties TOR



Acquisition de Données USB
(Measurement Computing)



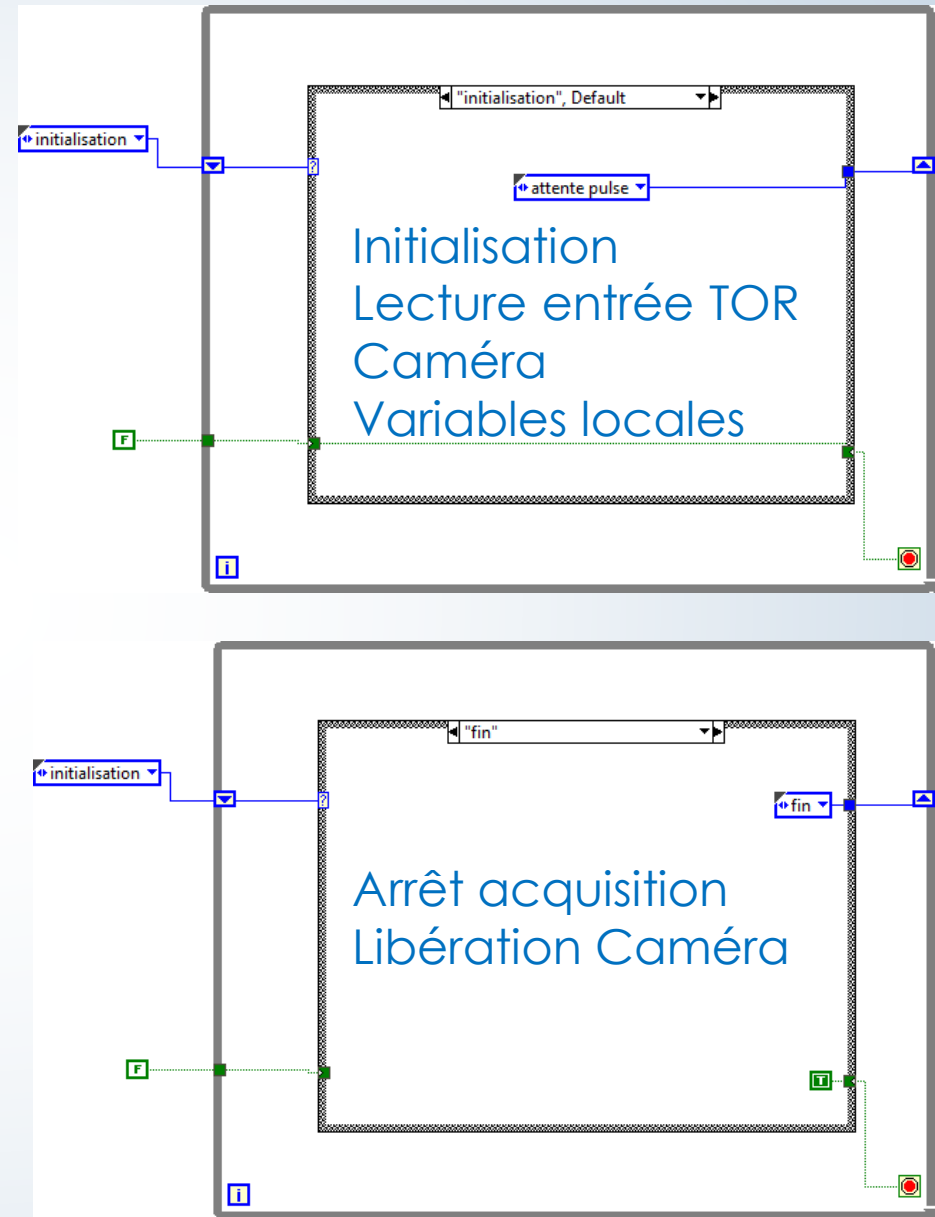
~ NI-DAQmx



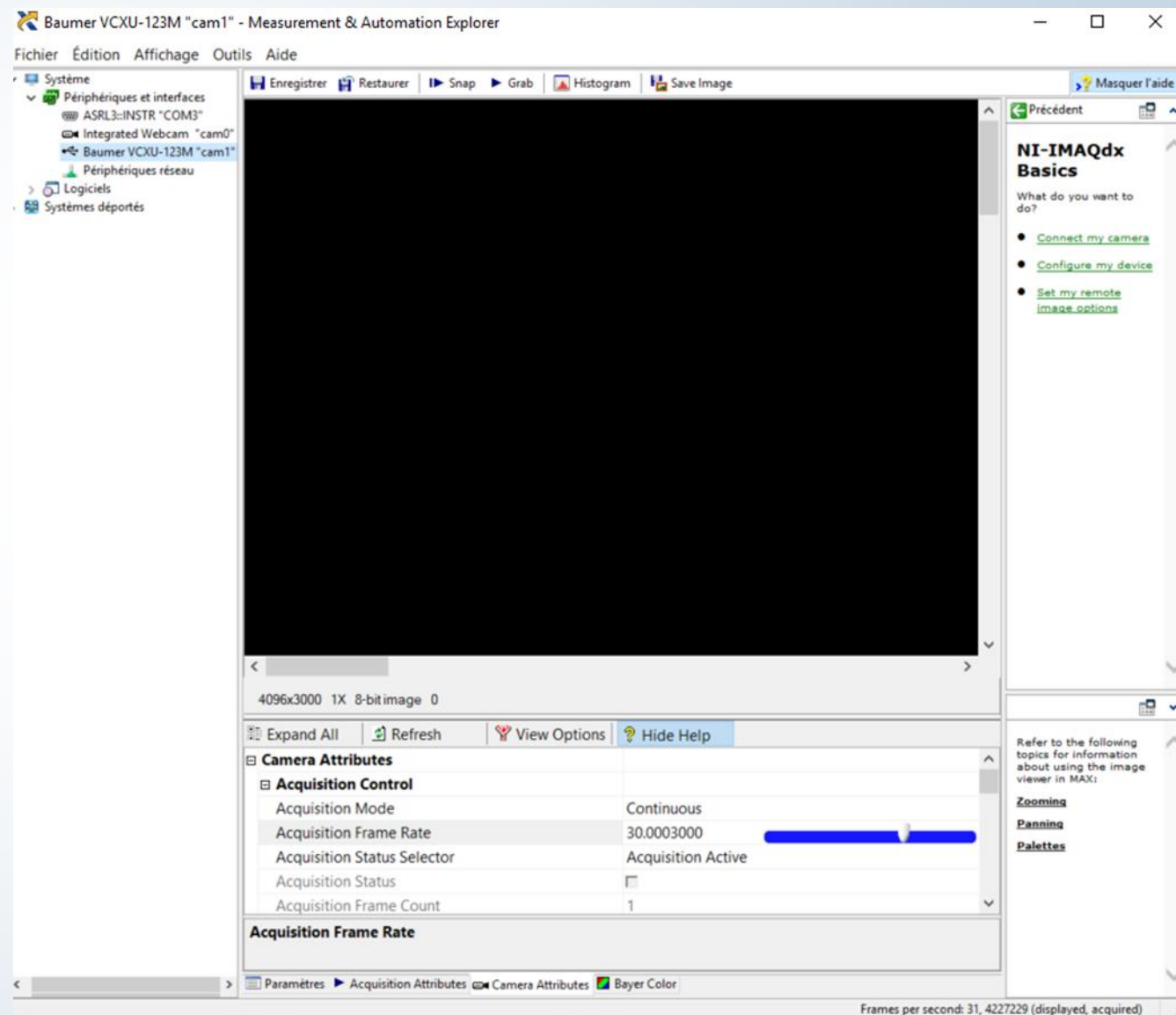
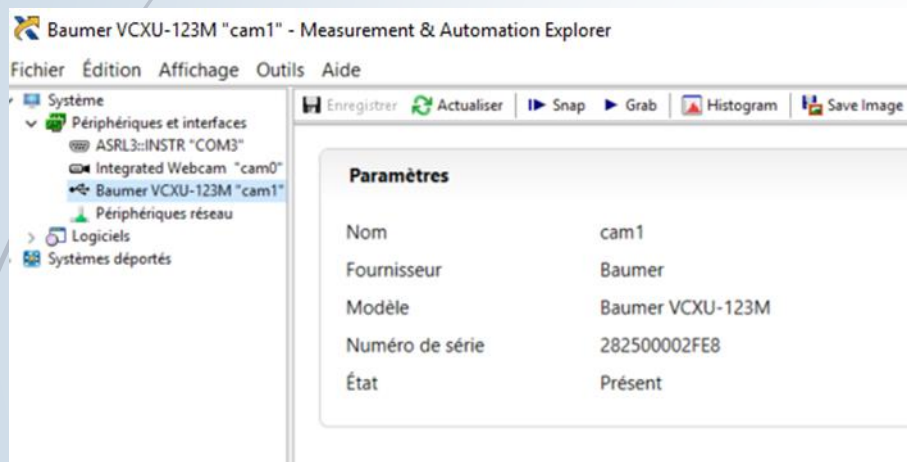
Machine à états

Définition de type → énumération

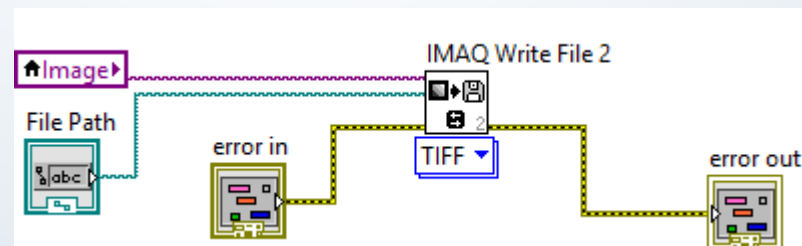
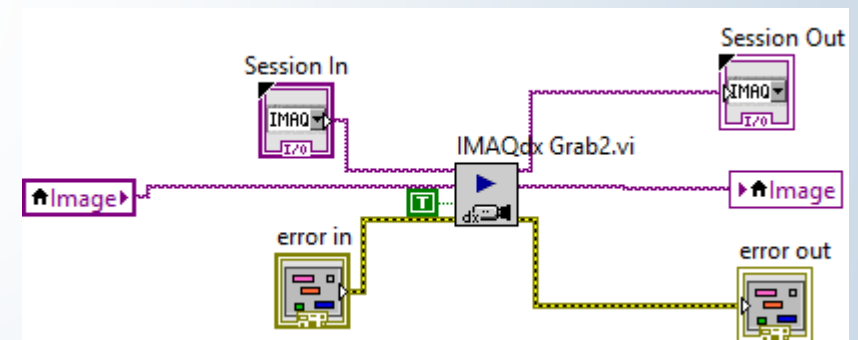
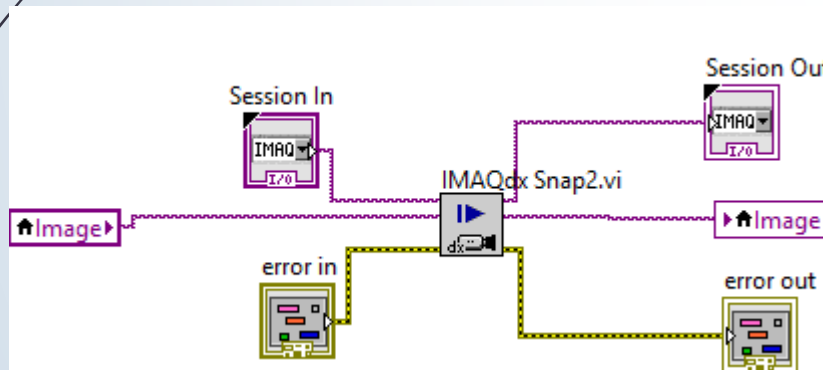
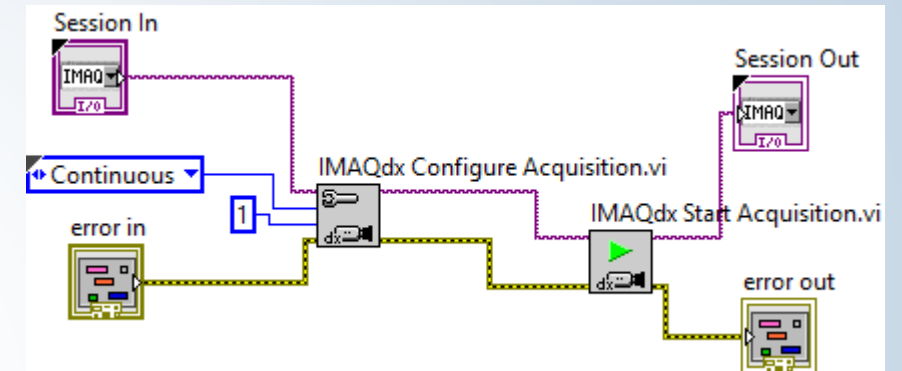
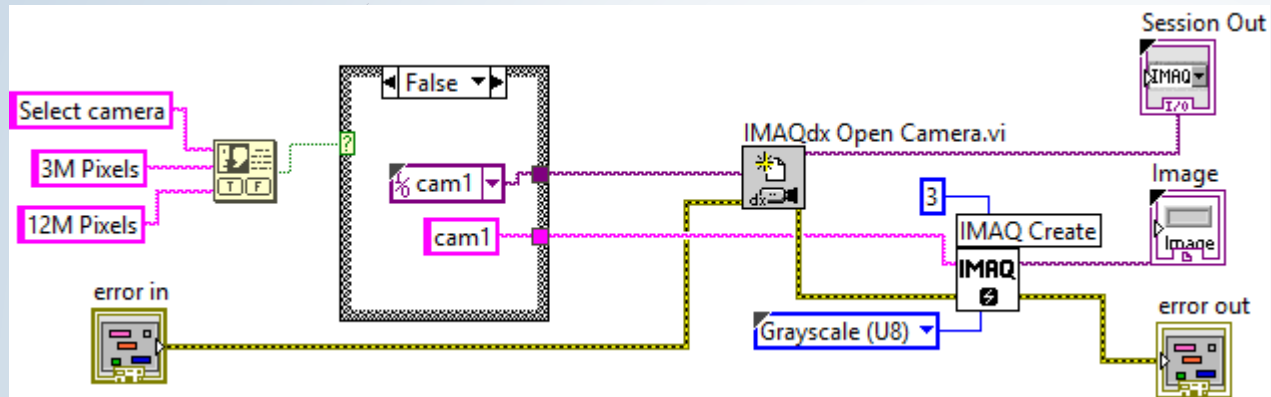
- ✓ initialisation
- attente pulse
- photo auto
- sauvegarde photo
- photo manu
- choix attribut caméra
- valide valeur attribut caméra
- images en continu
- blocage snap et grab
- fin



Connexion Caméra avec NI MAX



Acquisition et sauvegarde d'images



La totale !

The interface displays a large black image window. To the right, the 'Attribute Name' is set to 'CameraAttributes::AcquisitionControl::ExposureTime'. The 'Attribute Value' is 4000. The 'Folder name' is 'Z:\gpm2\Matériels\EBM\Programmes acquisition\'. The 'IsReadable' and 'IsWritable' status indicators are green. The 'Snap', 'Grab', and 'Ready to Generate TTL' buttons are active. The 'error out' status is '0'. The 'source' field is empty. The bottom status bar shows the following values: Buffer Number Out: 0, NB_save: 0, timed out?: 0, # elements in queue: 0, pulse: 0, fin pulse: 0. A 'STOP' button is located at the bottom right.

fin

Attribute Name
CameraAttributes::AcquisitionControl::ExposureTime

IsReadable IsWritable
● ●

Attribute Value
4000

Set attribute

Folder name
Z:\gpm2\Matériels\EBM\Programmes acquisition\

Snap Grab Ready to Generate TTL
● ● ●

Grab On
●

error out
status code
● 0

source

4096x3000 0.25X 8-bit image 0 (0,0)

Buffer Number Out
0

NB_save
0

timed out?
●

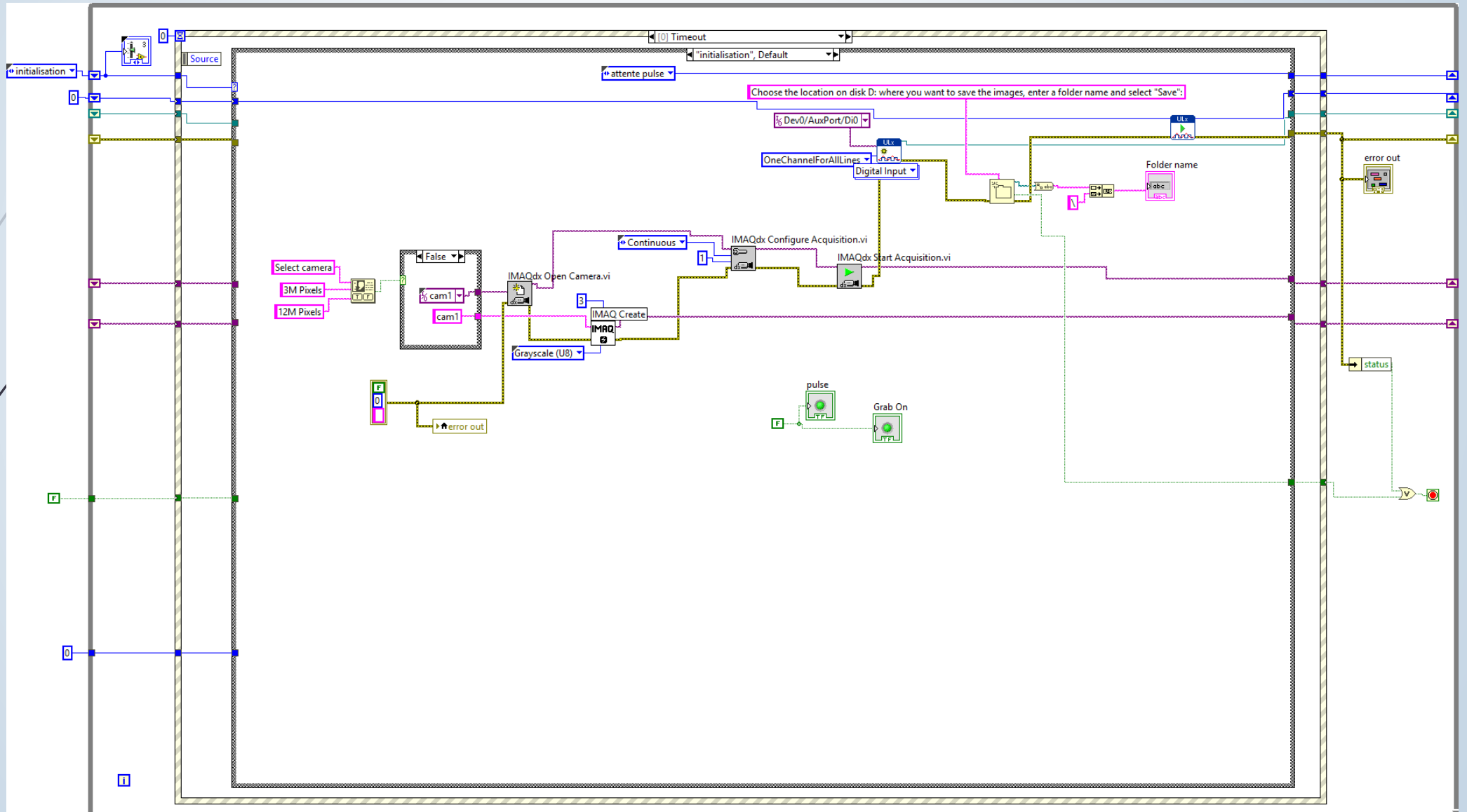
elements in queue
0

pulse
●

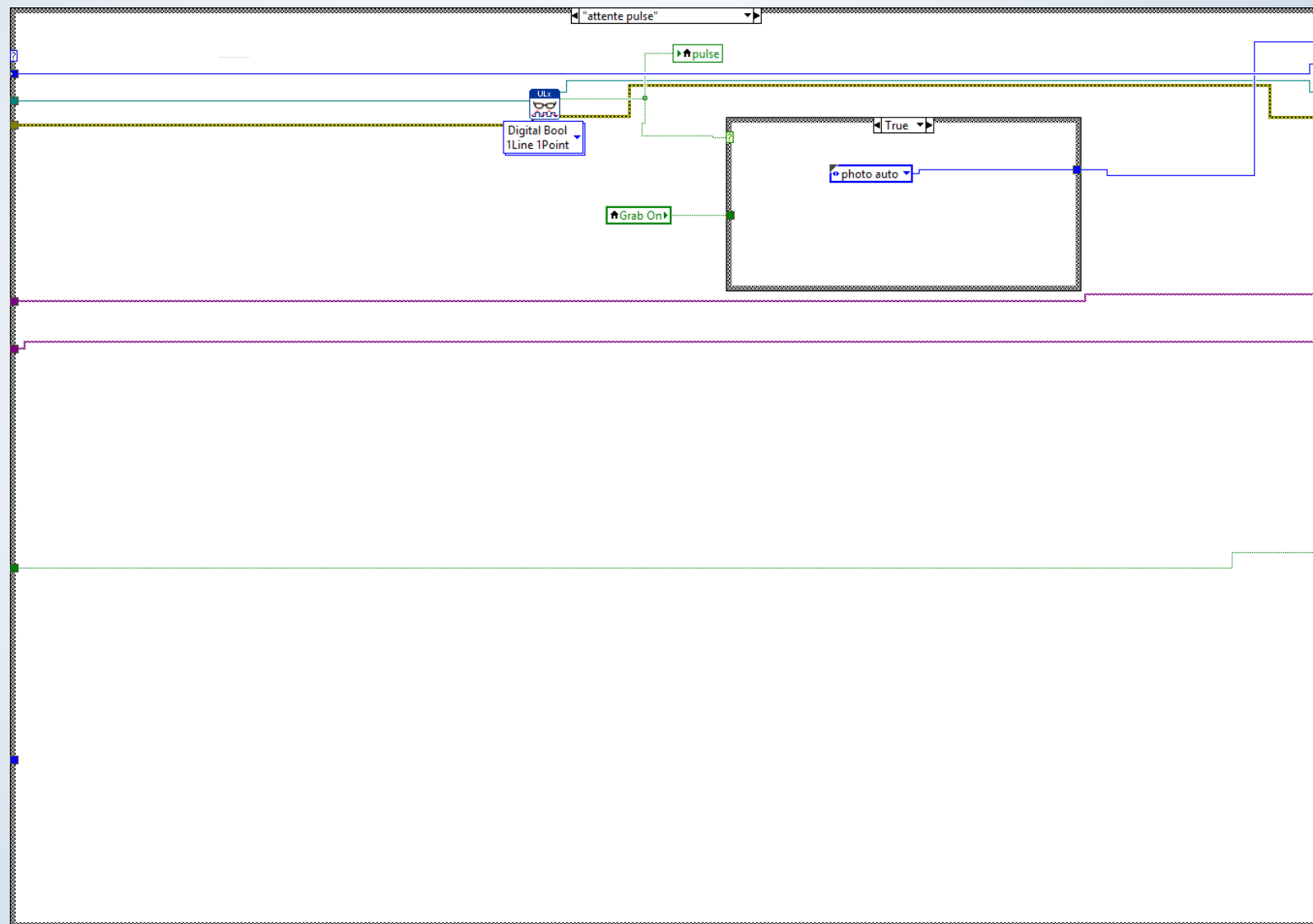
fin pulse
●

STOP

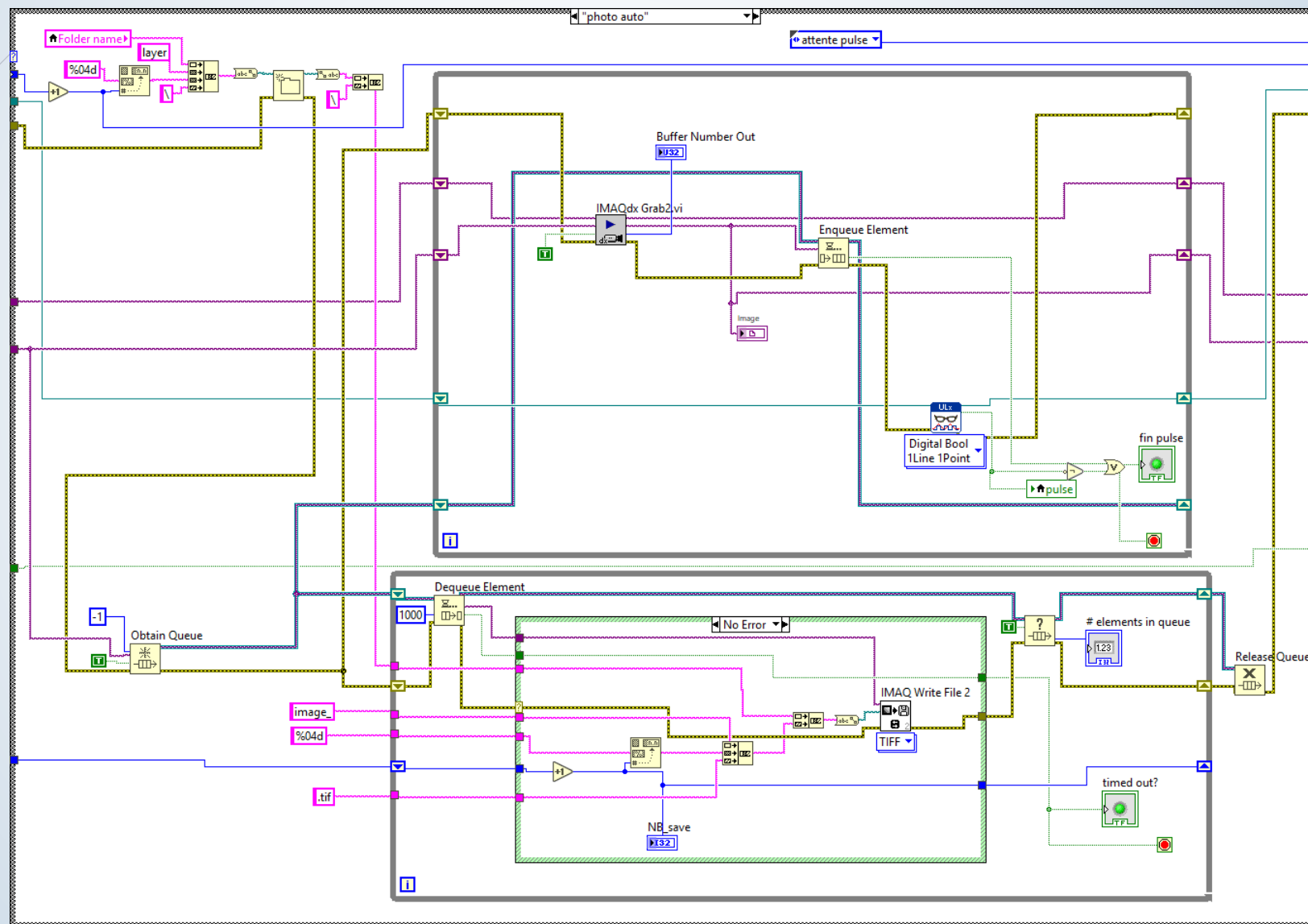
La totale !



Etape d'attente de l'impulsion



Acquisition et sauvegarde d'images



Projet → Application

