

# la machine d'états appliquée à BRETSEL

- B** : Bras
- R** : de Récupération
- E** : d'Echantillons
- T** : Télécommandé
- S** : à Supervision
- EL** : ELectronique

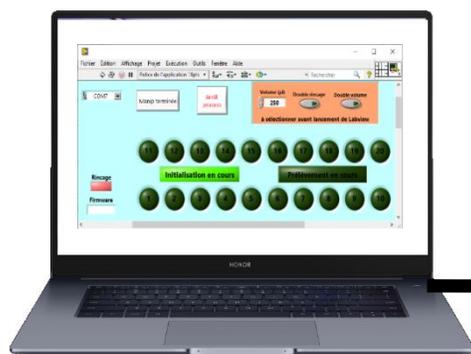


**Performance Anet E12 (Kit)**

Taille impression max.	300 × 300 × 400 mm
Épaisseur min. d'impression	0.1 mm
Précision XY	0.012 mm
Vitesse impression max.	120 mm/s

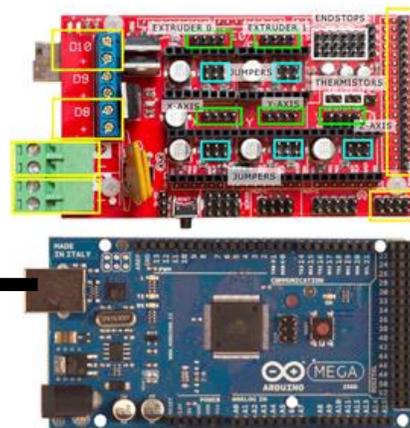
**Hardware**

Dimensions	486 × 500 × 594 mm
Poids	11.7 kg

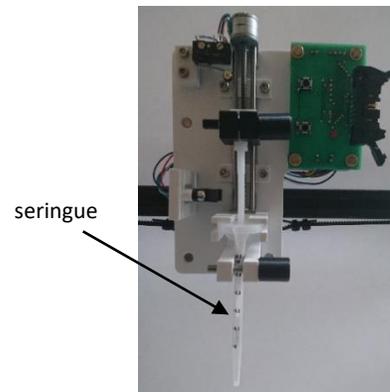


**MAITRE**

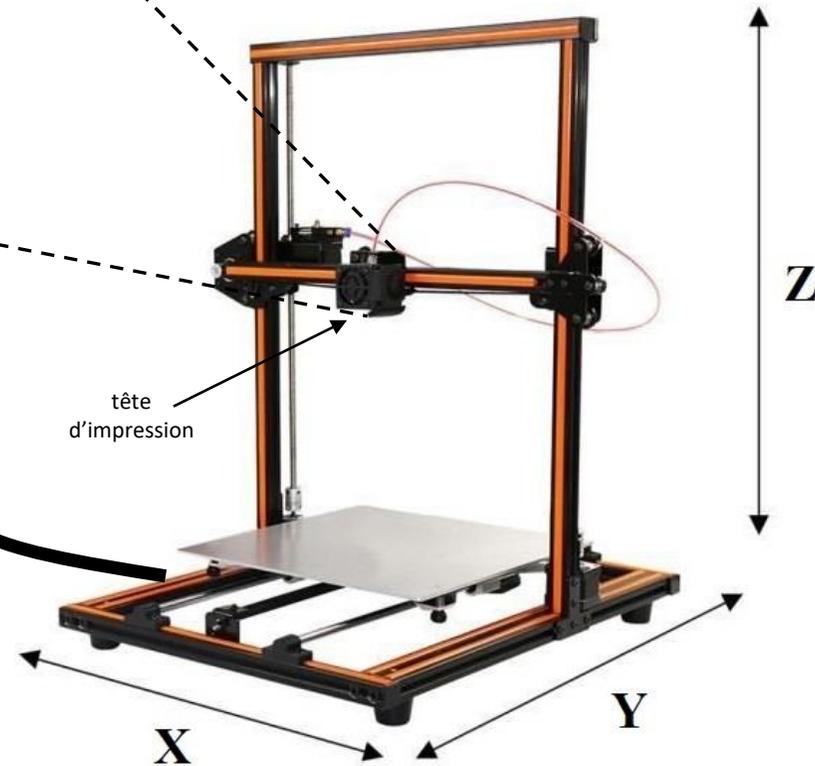
**RAMPS 1.4**  
**Arduino MEGA 2560**



**ESCLAVE**

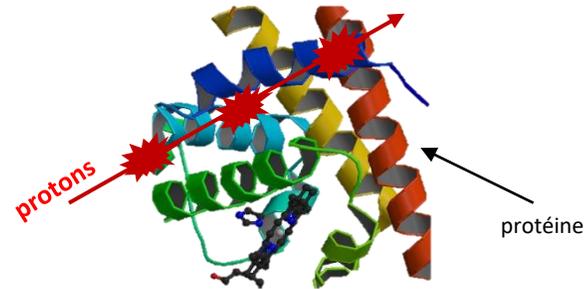


seringue



tête  
d'impression

# Etudier les effets des radiations sur les protéines

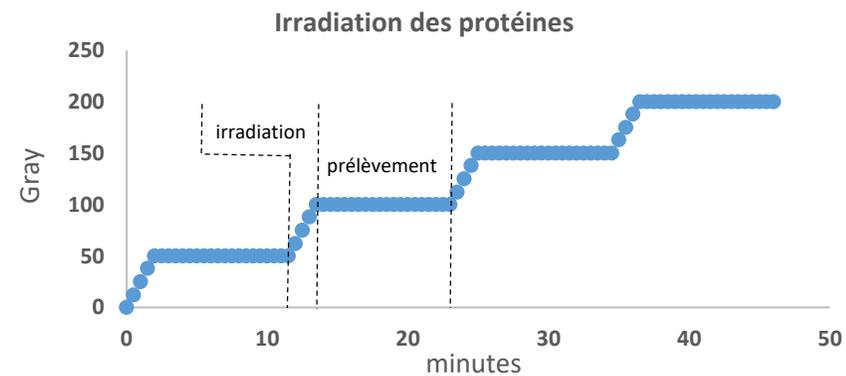
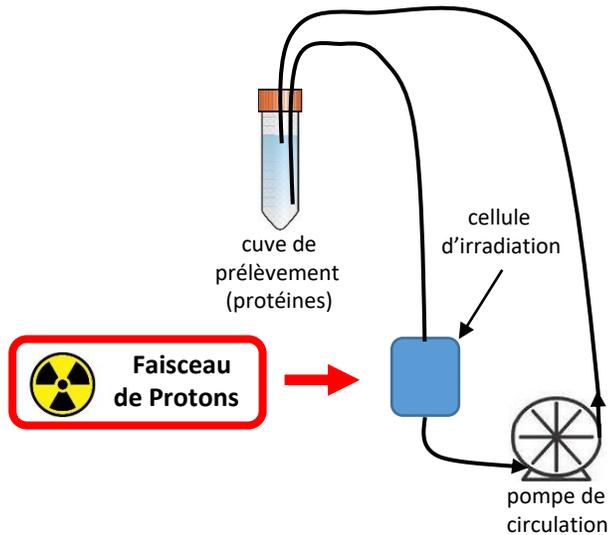


## Objectifs

réduire le temps de prélèvement  
 limiter l'expositions des agents   
 transportable (Japon)  
 coût limité

## Solution

détourner une imprimante 3D → robotique



Salle de contrôle



porte

### Prélèvement manuel

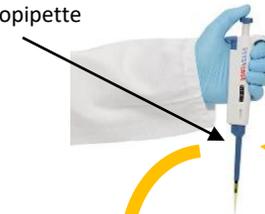
lent (ouverture / fermeture porte)

micropipette

exposition des collègues aux radiations



micropipette



microtubes

cuve de  
prélèvement  
(protéines)



Faisceau  
de Protons

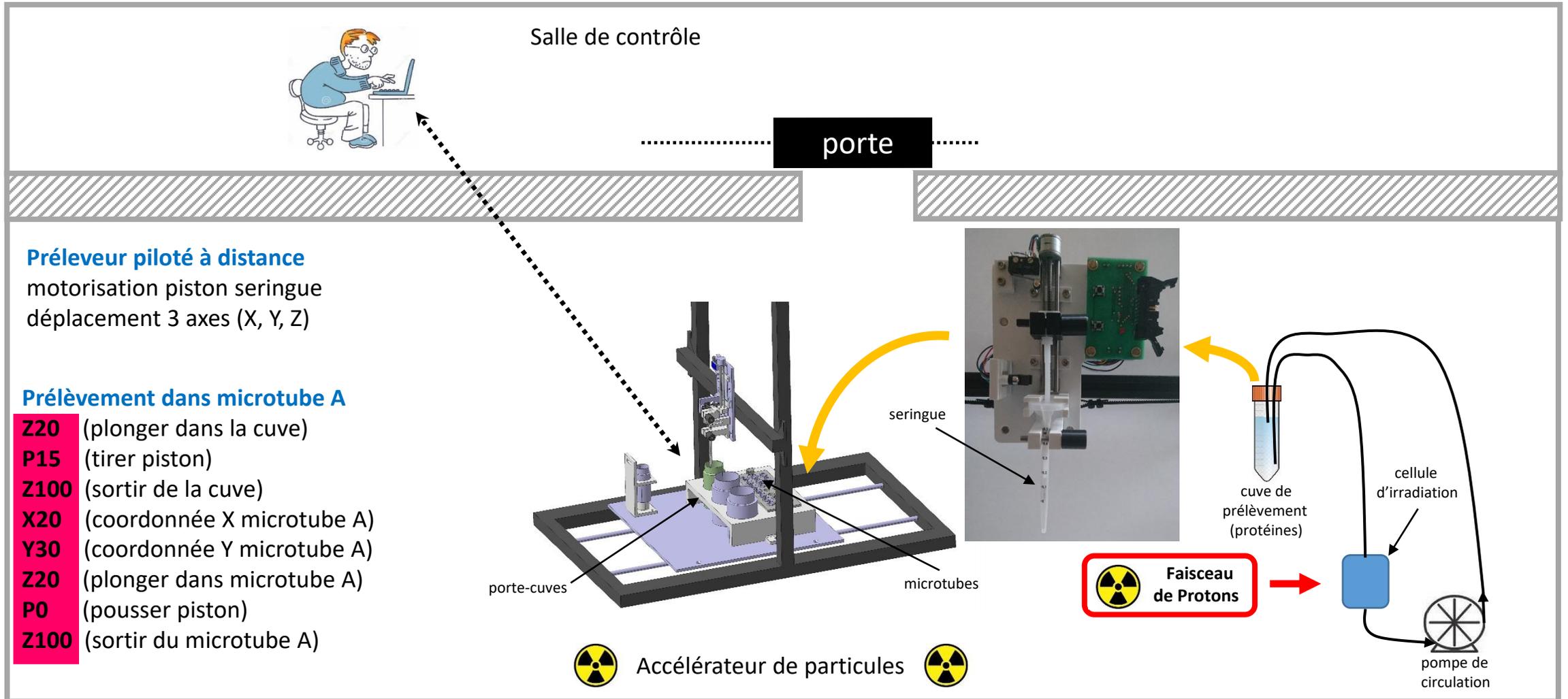
cellule  
d'irradiation

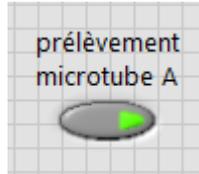
pompe de  
circulation



Accélérateur de particules

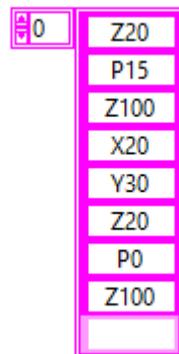




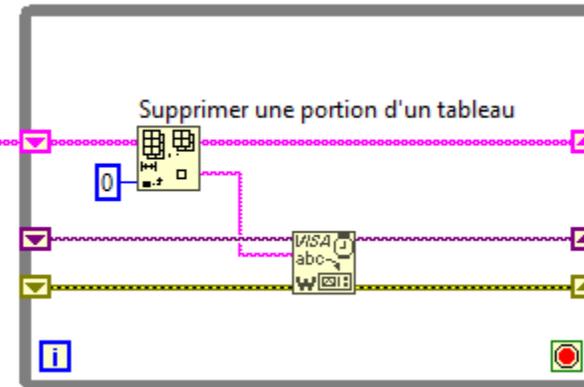


### Prélèvement dans microtube A

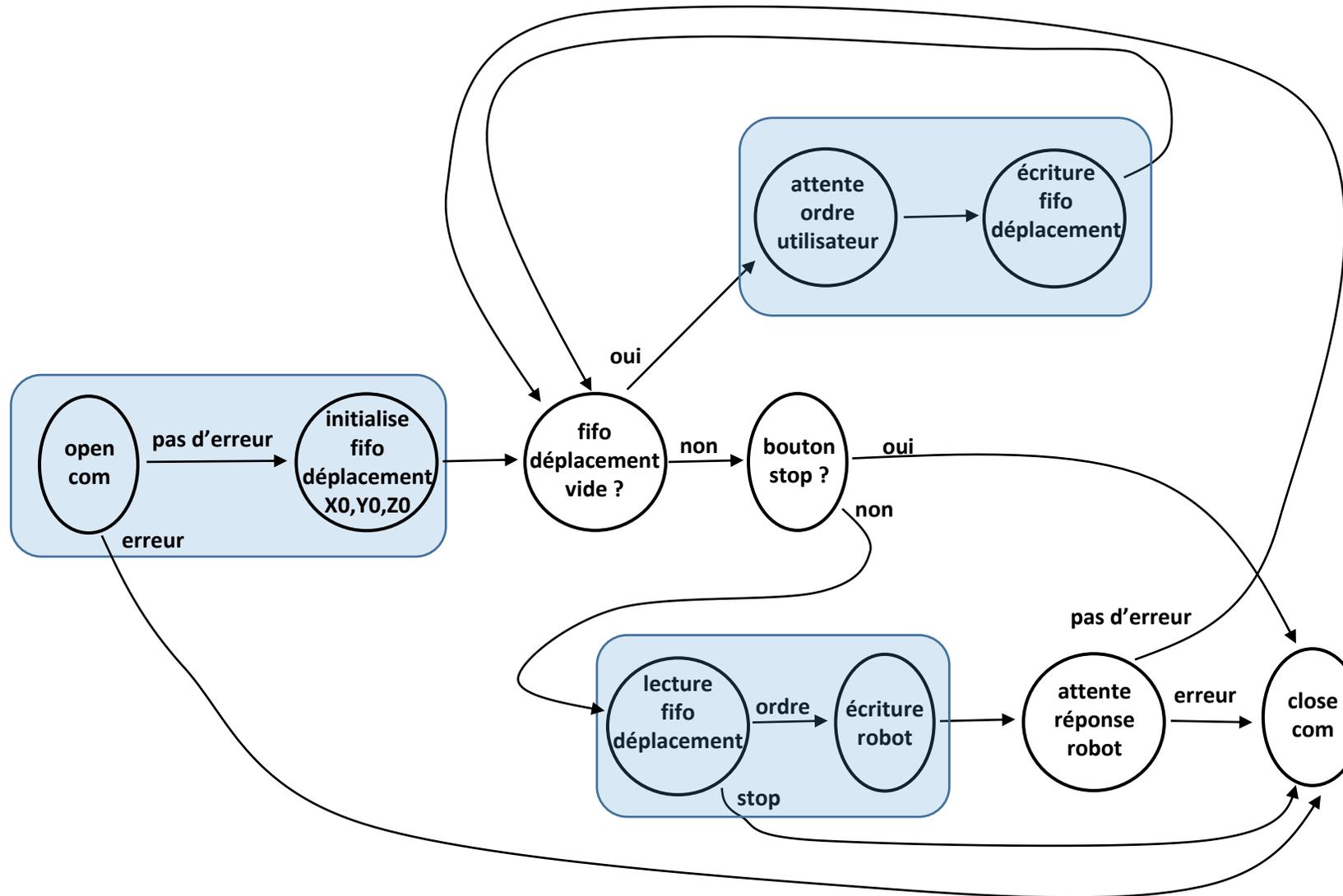
- Z20** (plonger dans la cuve)
- P15** (tirer piston)
- Z100** (sortir de la cuve)
- X20** (coordonnée X microtube A)
- Y30** (coordonnée Y microtube A)
- Z20** (plonger dans microtube A)
- P0** (pousser piston)
- Z100** (sortir du microtube A)



fifo déplacement



# Diagramme d'états



# Machine d'états Labview 1/3

**constante énumération**

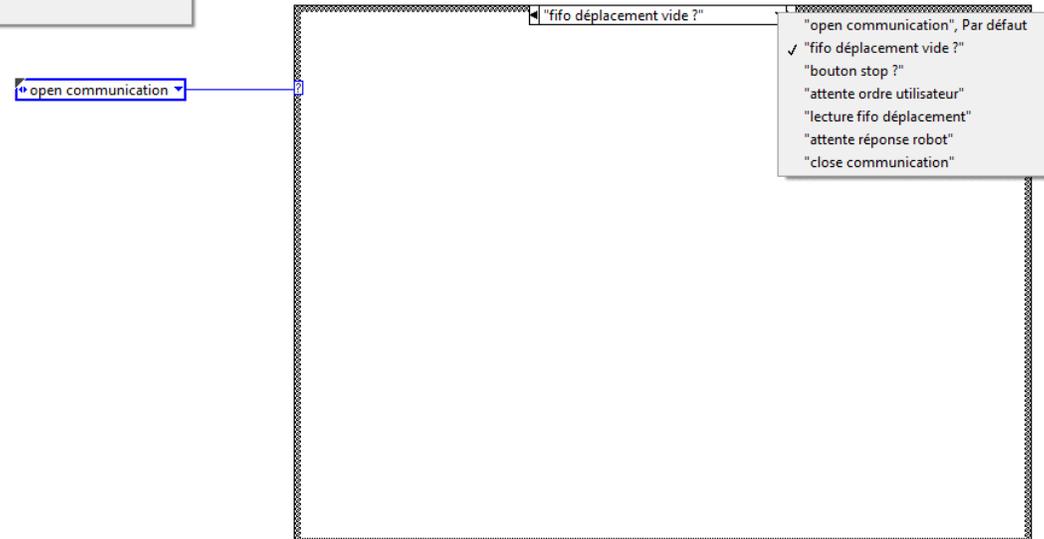
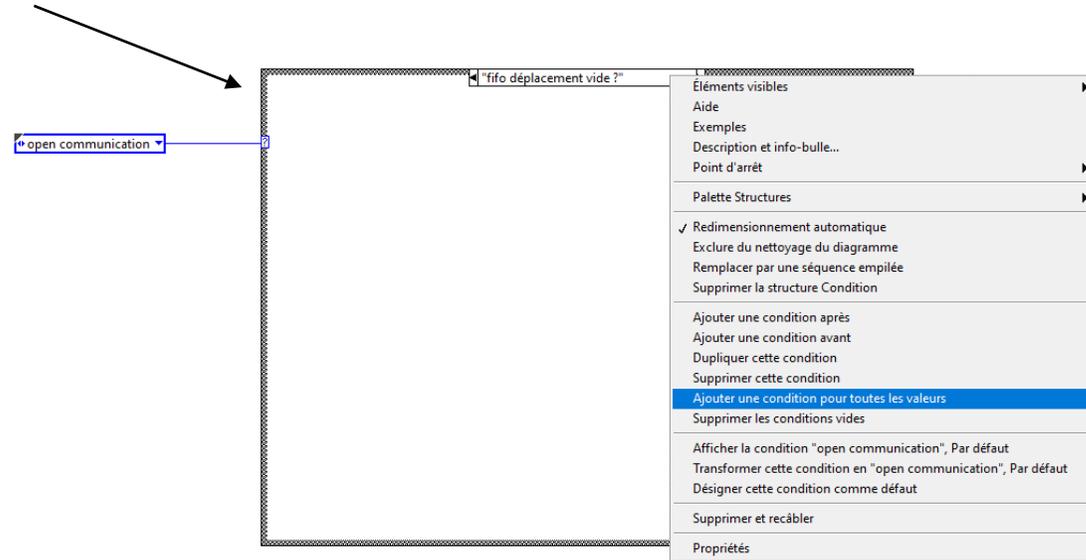
The image illustrates the steps to create and edit an enumeration constant in LabVIEW:

- Context Menu:** A right-click context menu is shown with the option "En faire une déf. de type" (Make an Enum Constant) highlighted.
- Define Command Type Dialog:** A dialog box titled "Déf. de type Commande..." is shown with "Enum états" selected in the "Déf. de type" dropdown.
- Enum States Property Window:** A window titled "Propriétés de l'énum: Enum états" is shown with the "Éditer les éléments" (Edit Elements) tab selected. It contains a table of elements and values.
- Edit Elements Sub-menu:** A sub-menu is shown with "Éditer les éléments..." (Edit Elements...) highlighted.

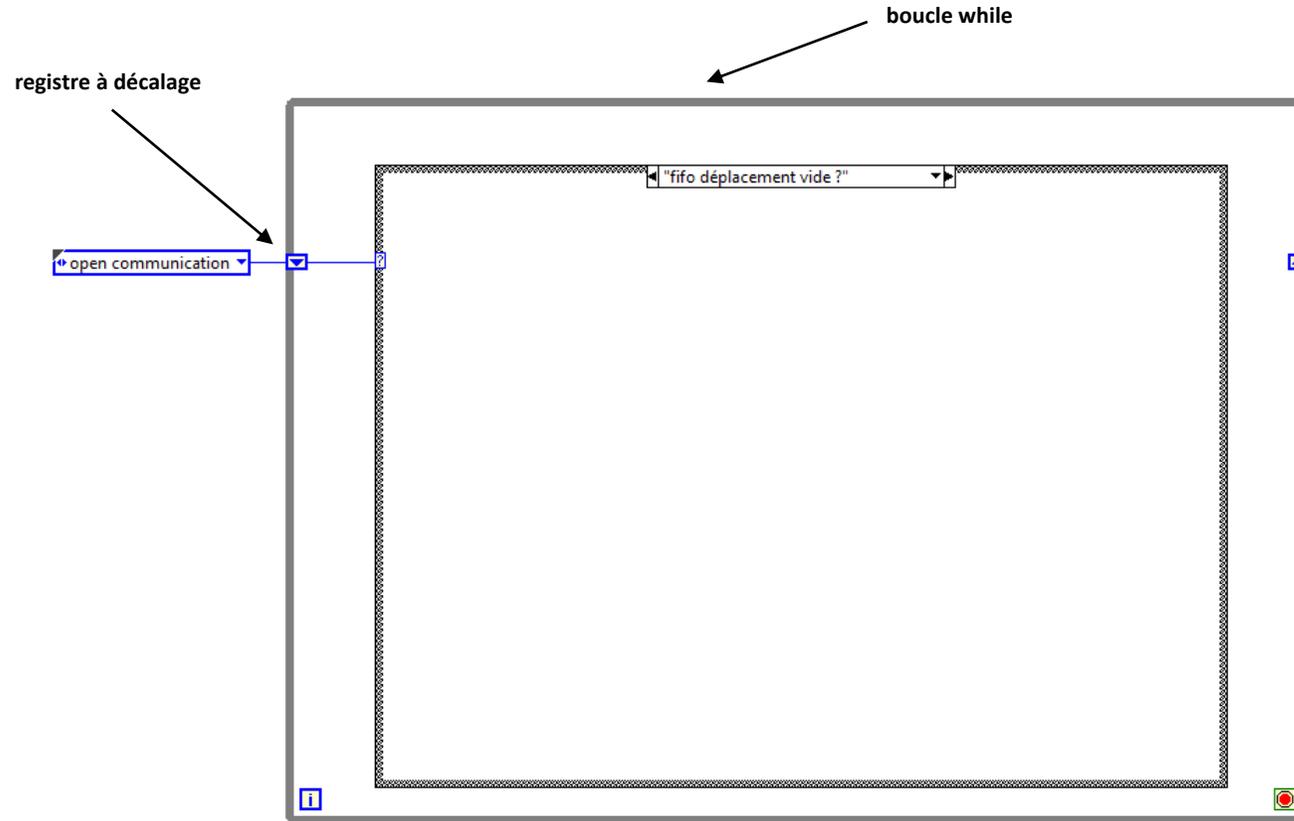
Éléments	Valeurs
open communication	0
fifo déplacement vide ?	1
bouton stop ?	2
attente ordre utilisateur	3
lecture fifo déplacement	4
attente réponse robot	5
close communication	6

# Machine d'états Labview 2/3

structure condition

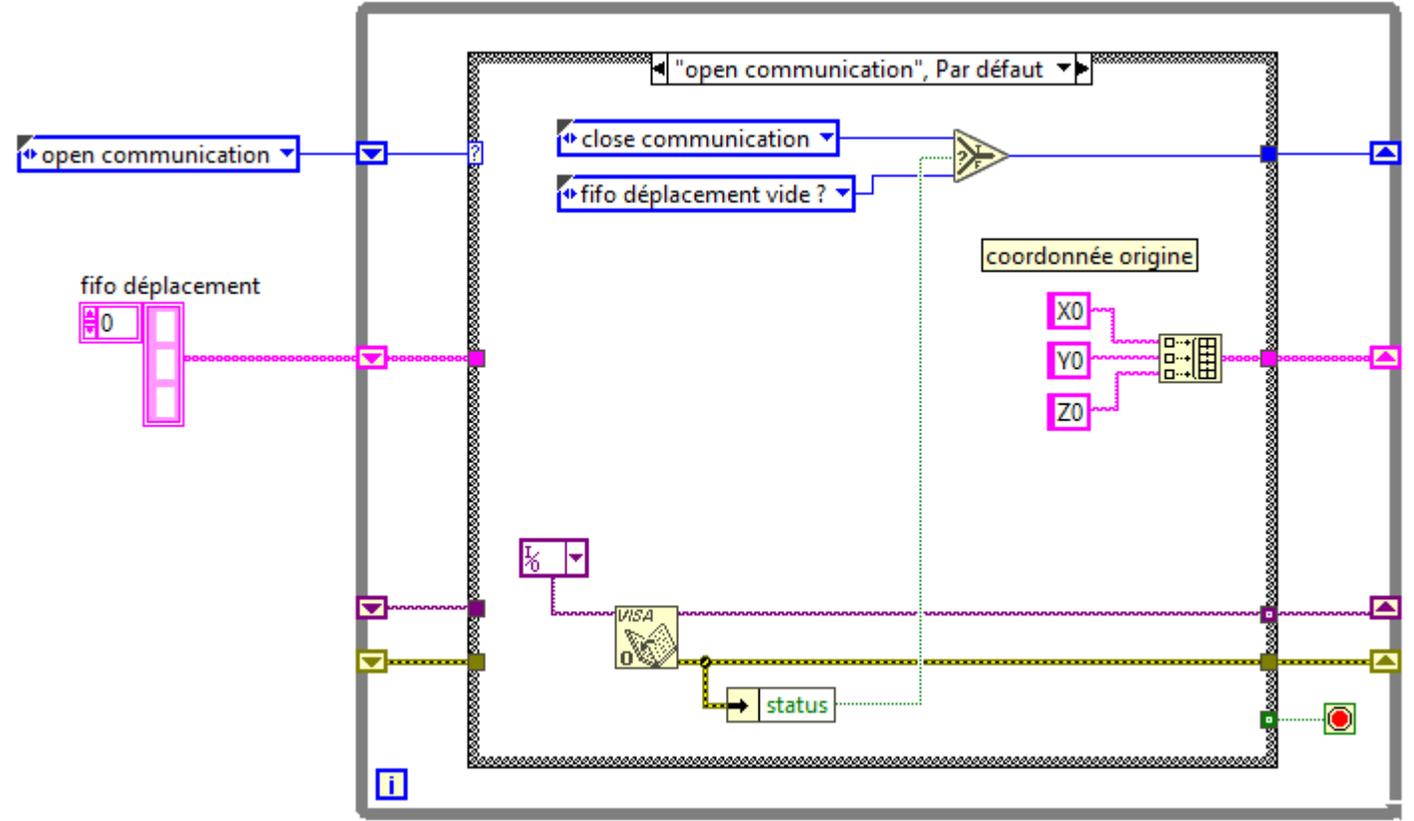
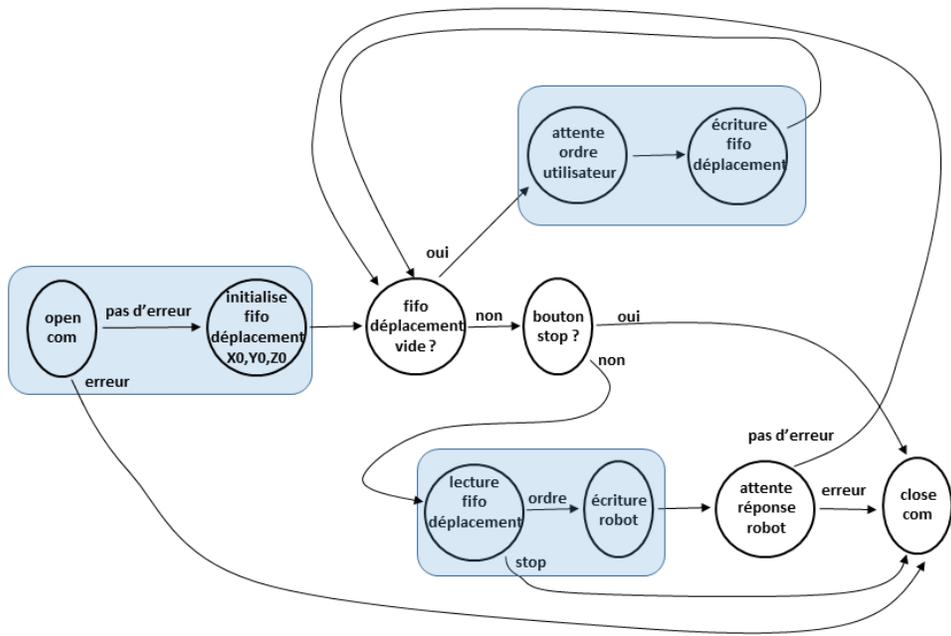


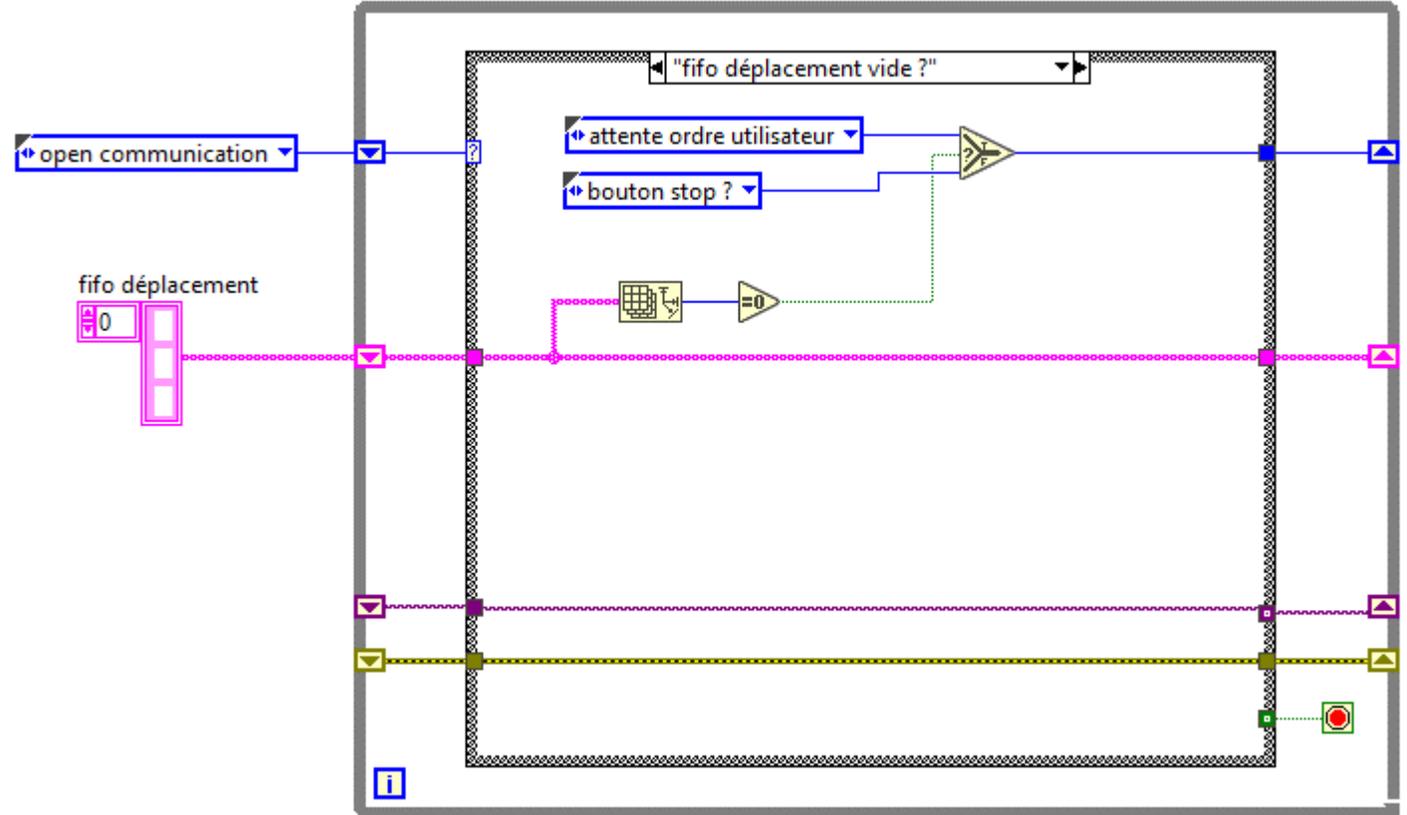
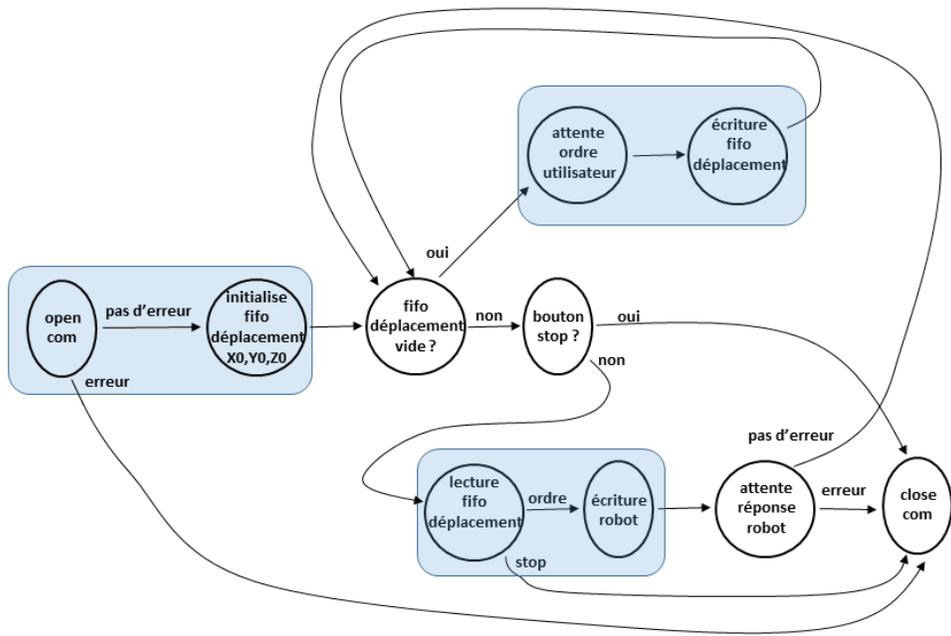
# Machine d'états Labview 3/3

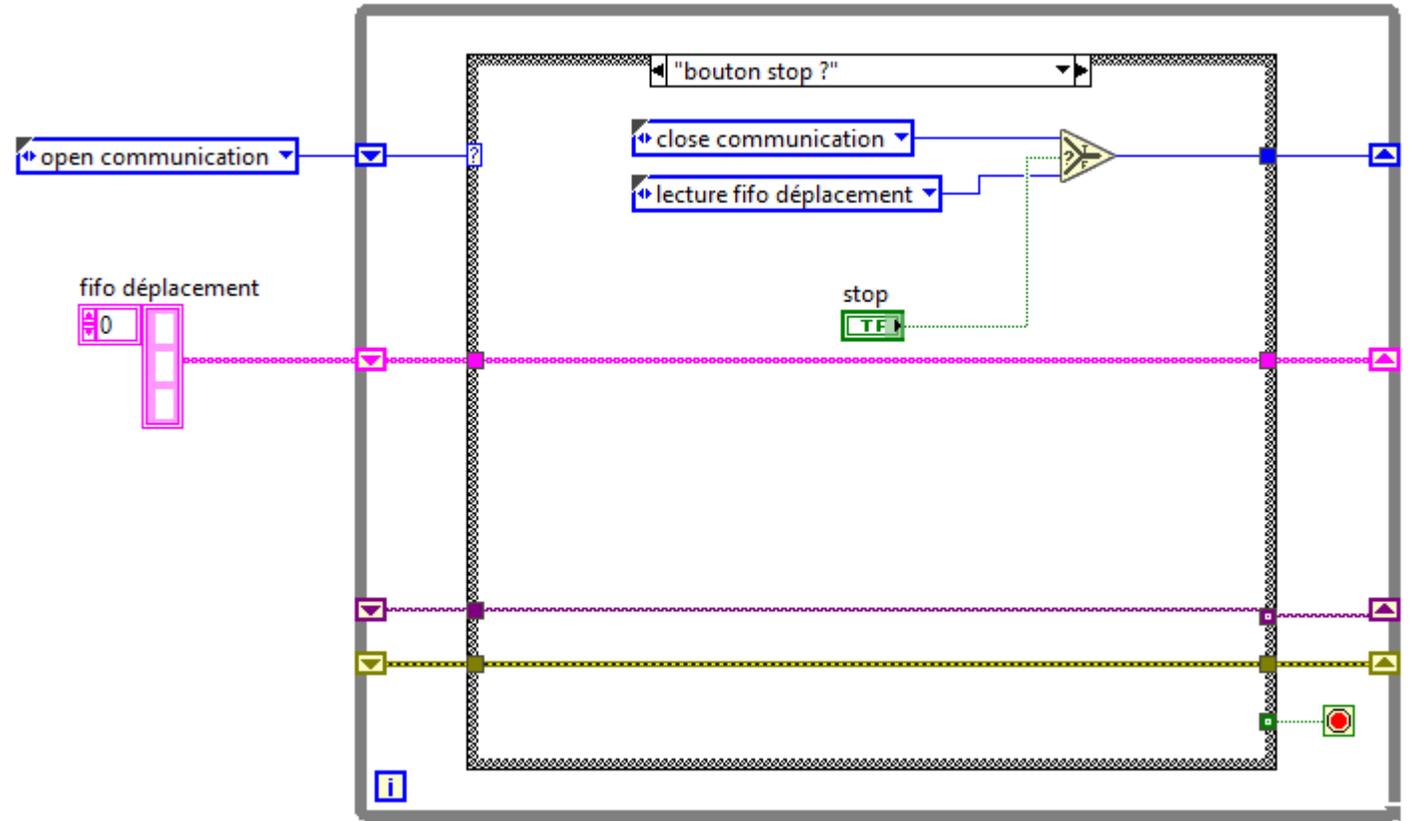
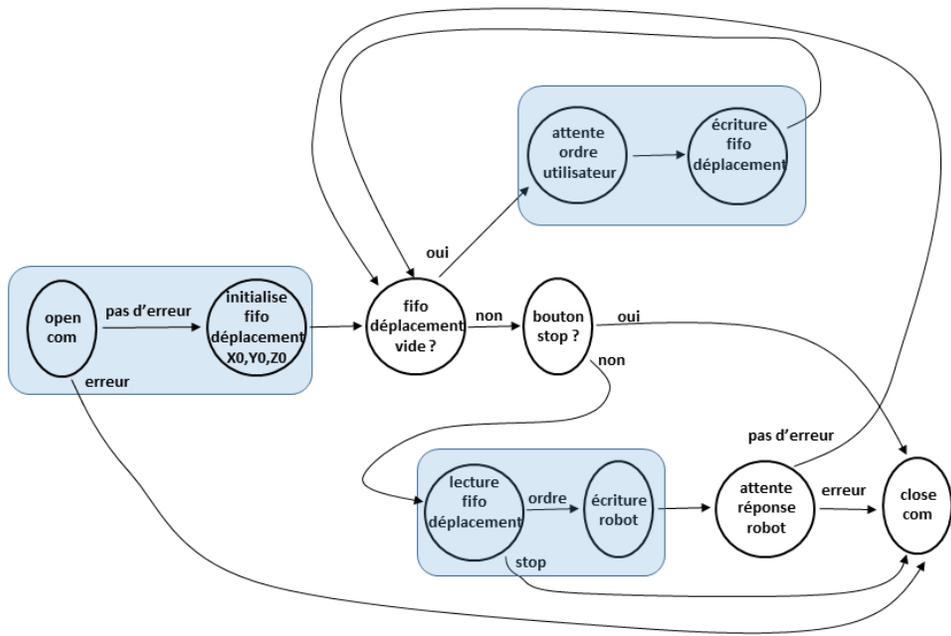


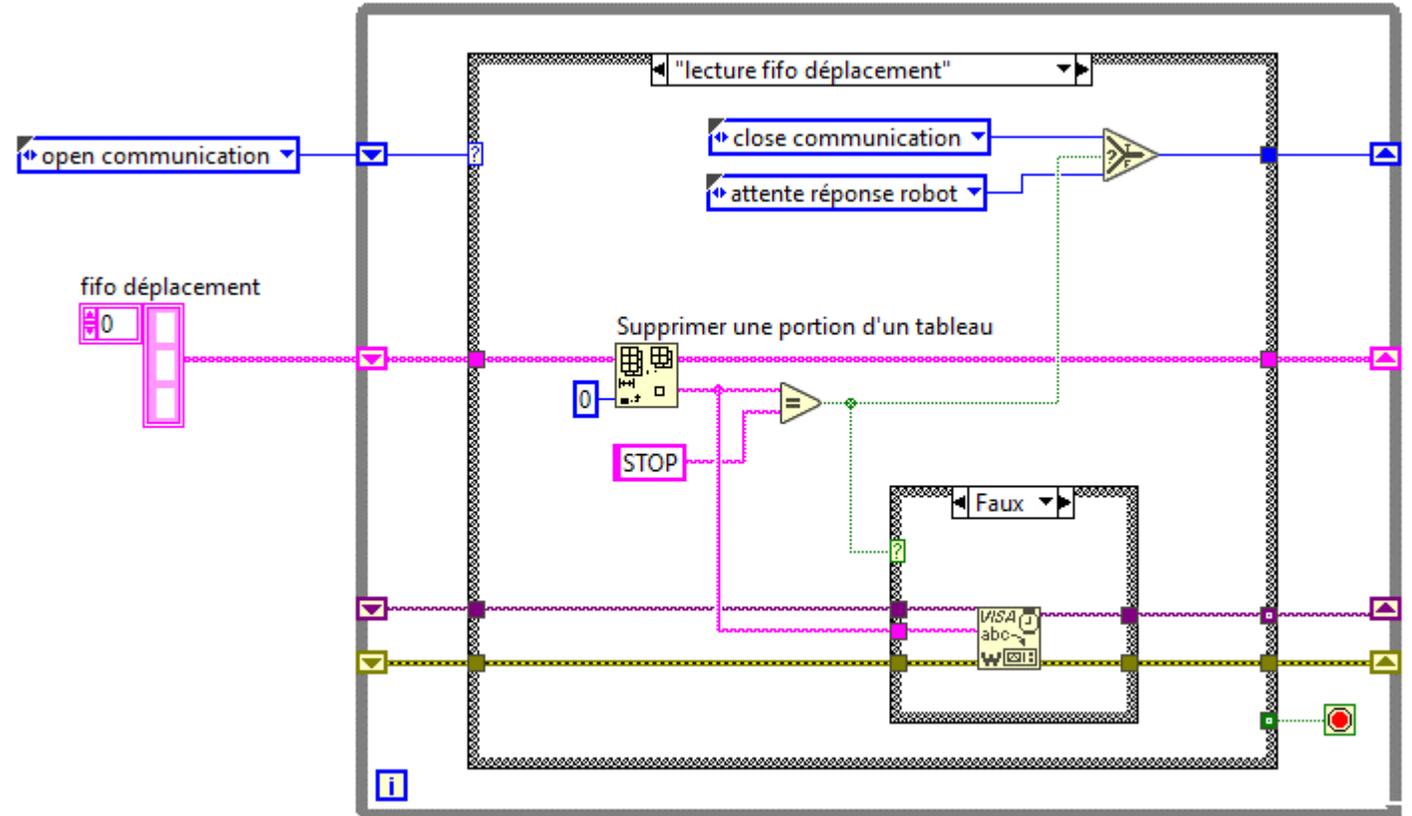
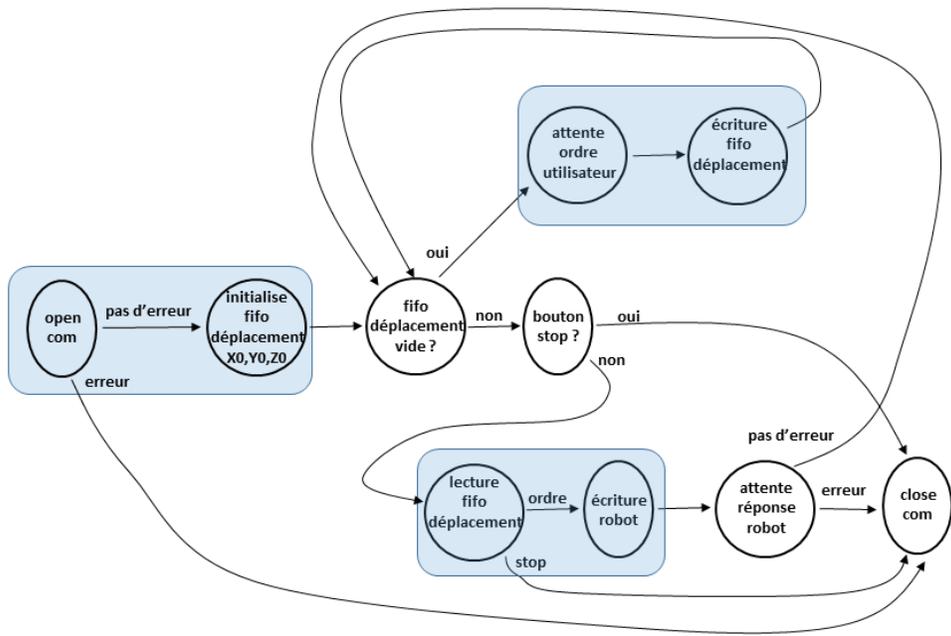
constante énumération  
structure condition  
boucle while  
registre à décalage

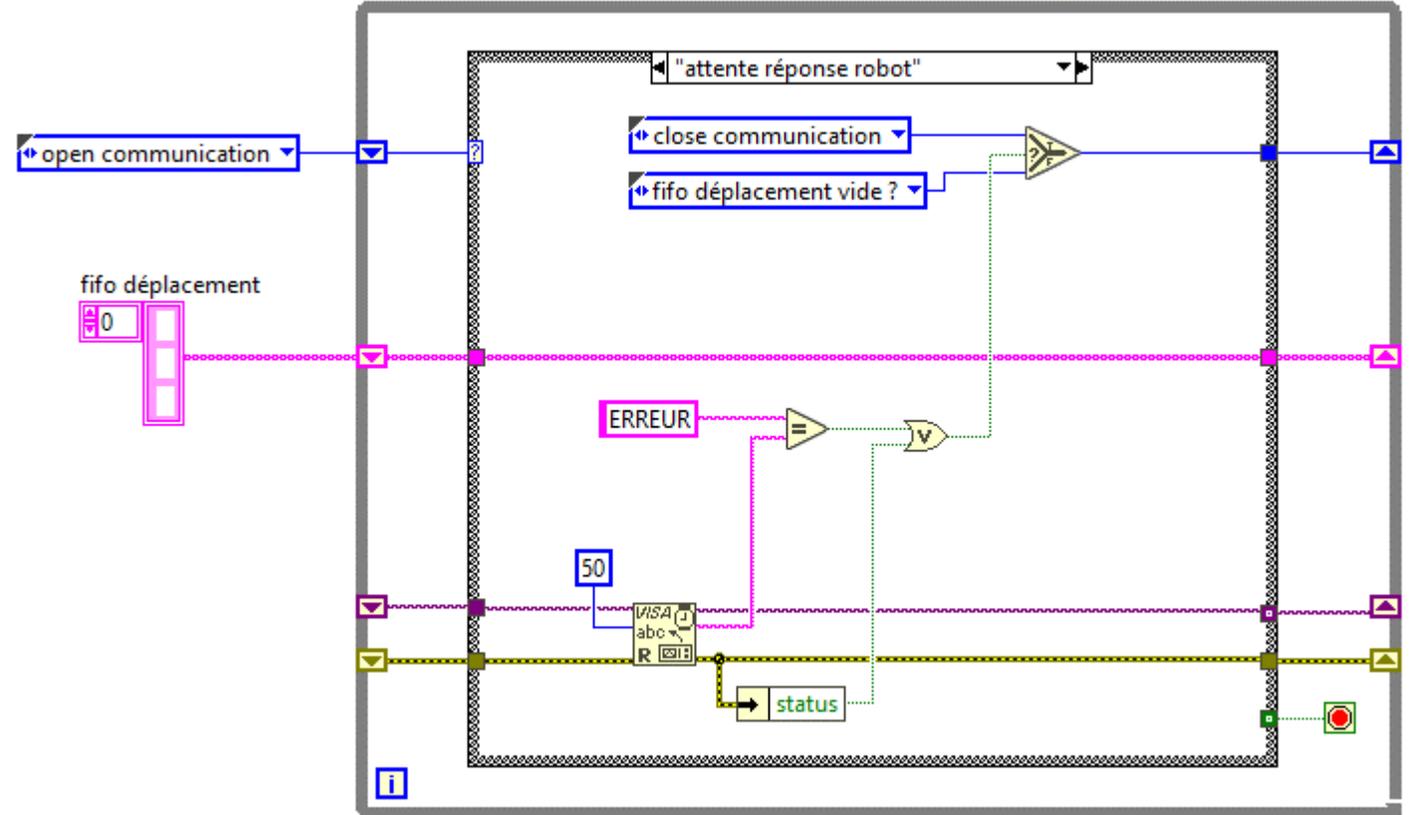
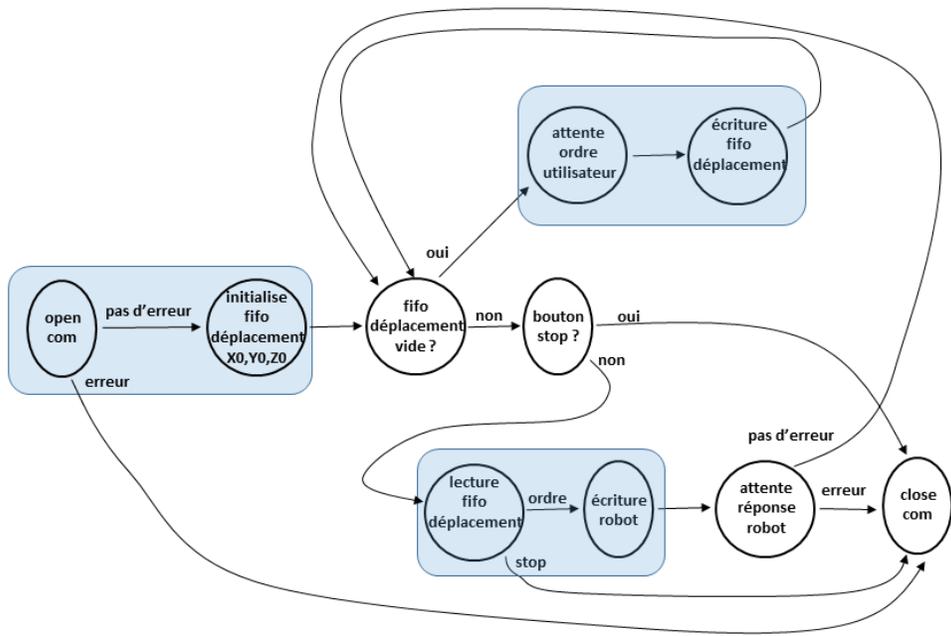
**y a plus qu'à...**

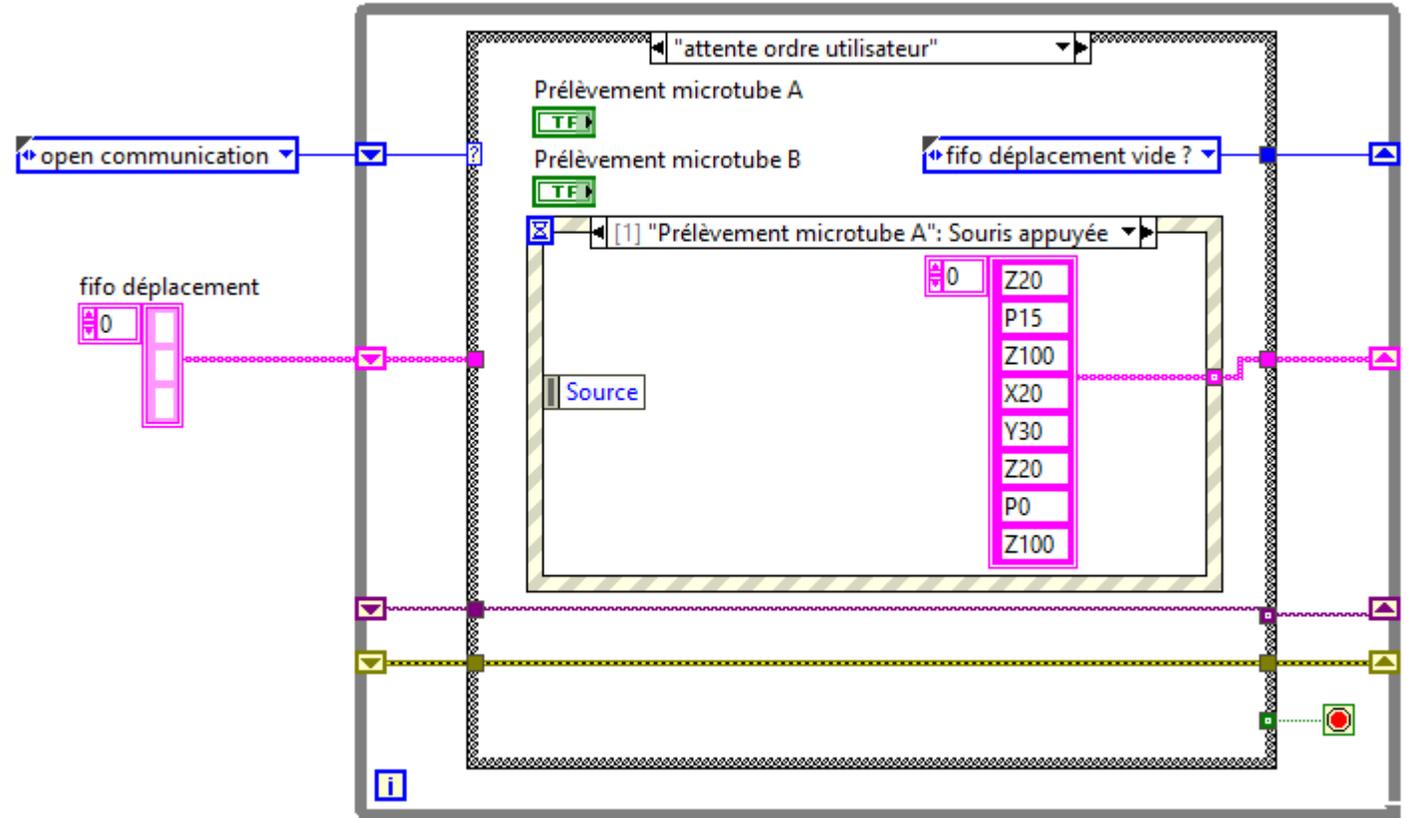
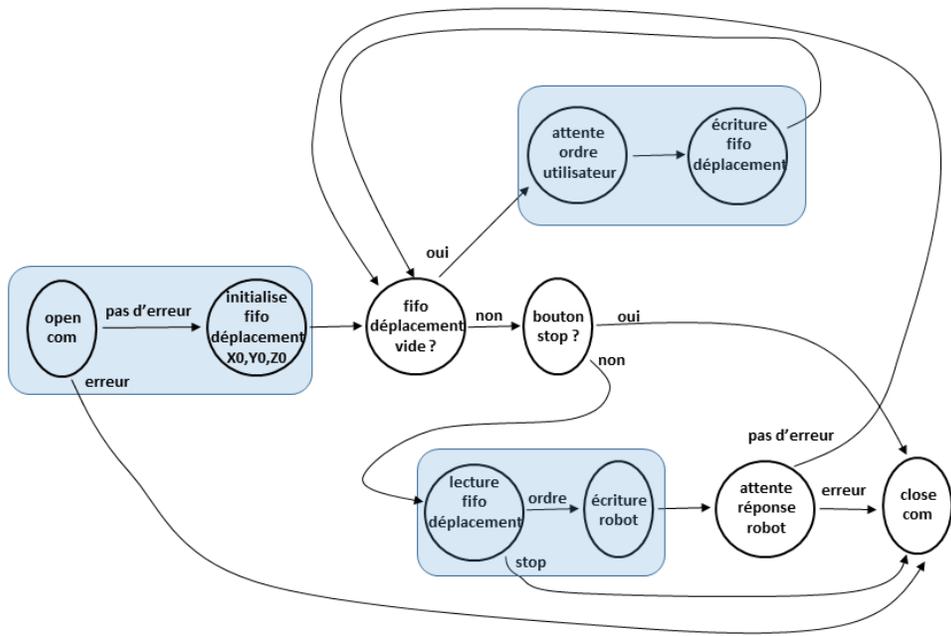


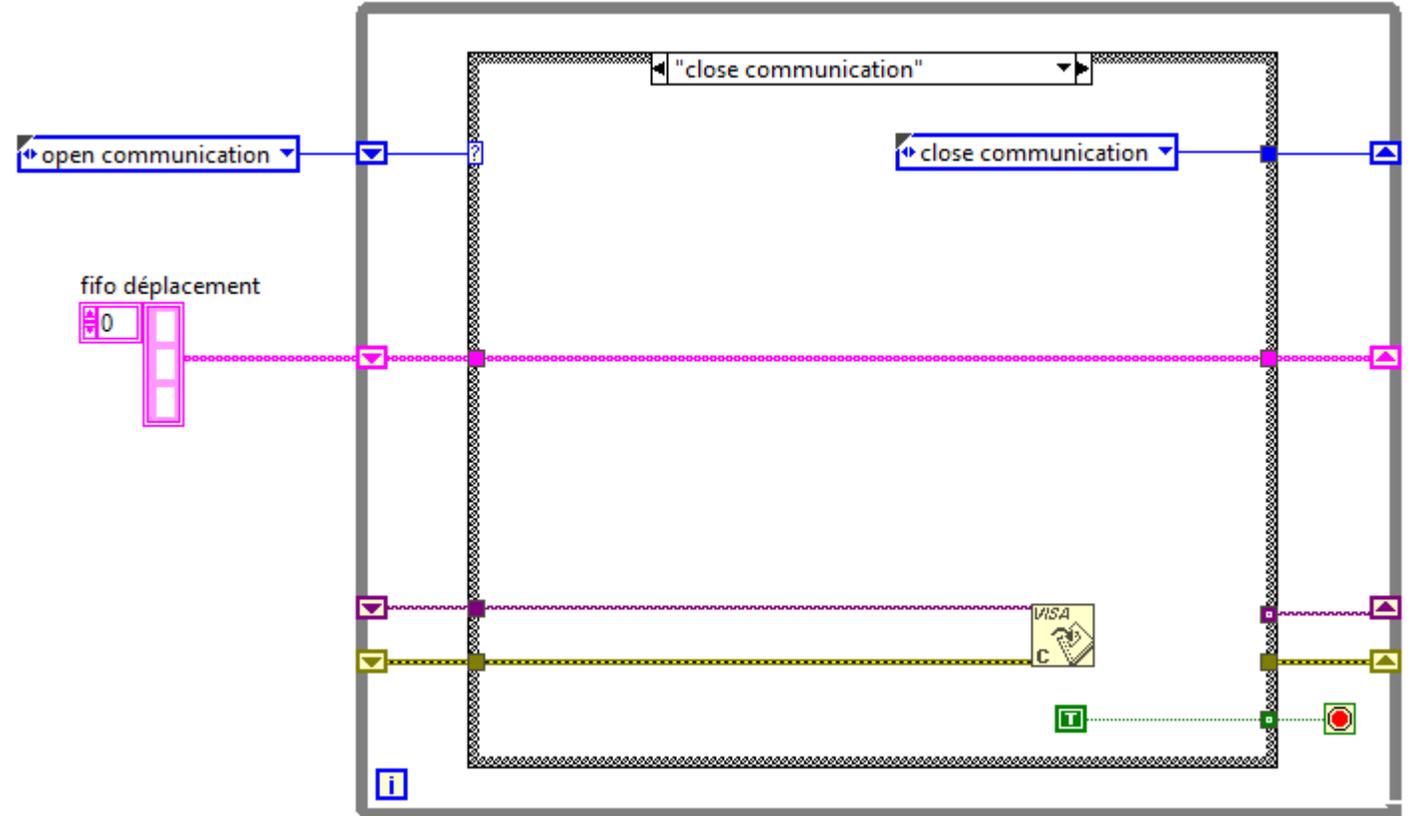
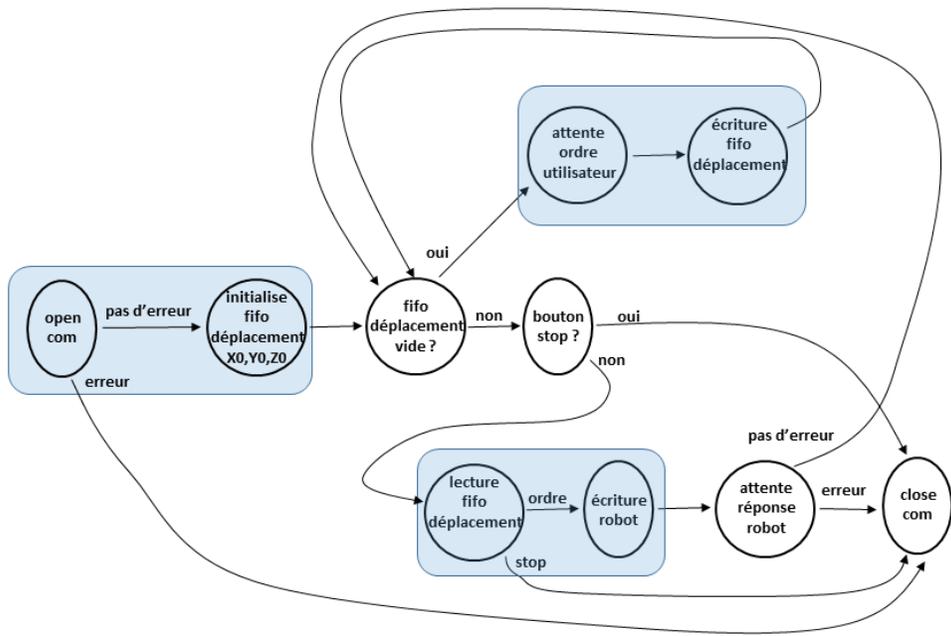












Merci pour votre attention,