



UNIVERSITÀ
DEGLI STUDI
DI BRESCIA

Dipartimento di Ingegneria Meccanica e Industriale
Corso di Laurea Magistrale Automazione Industriale

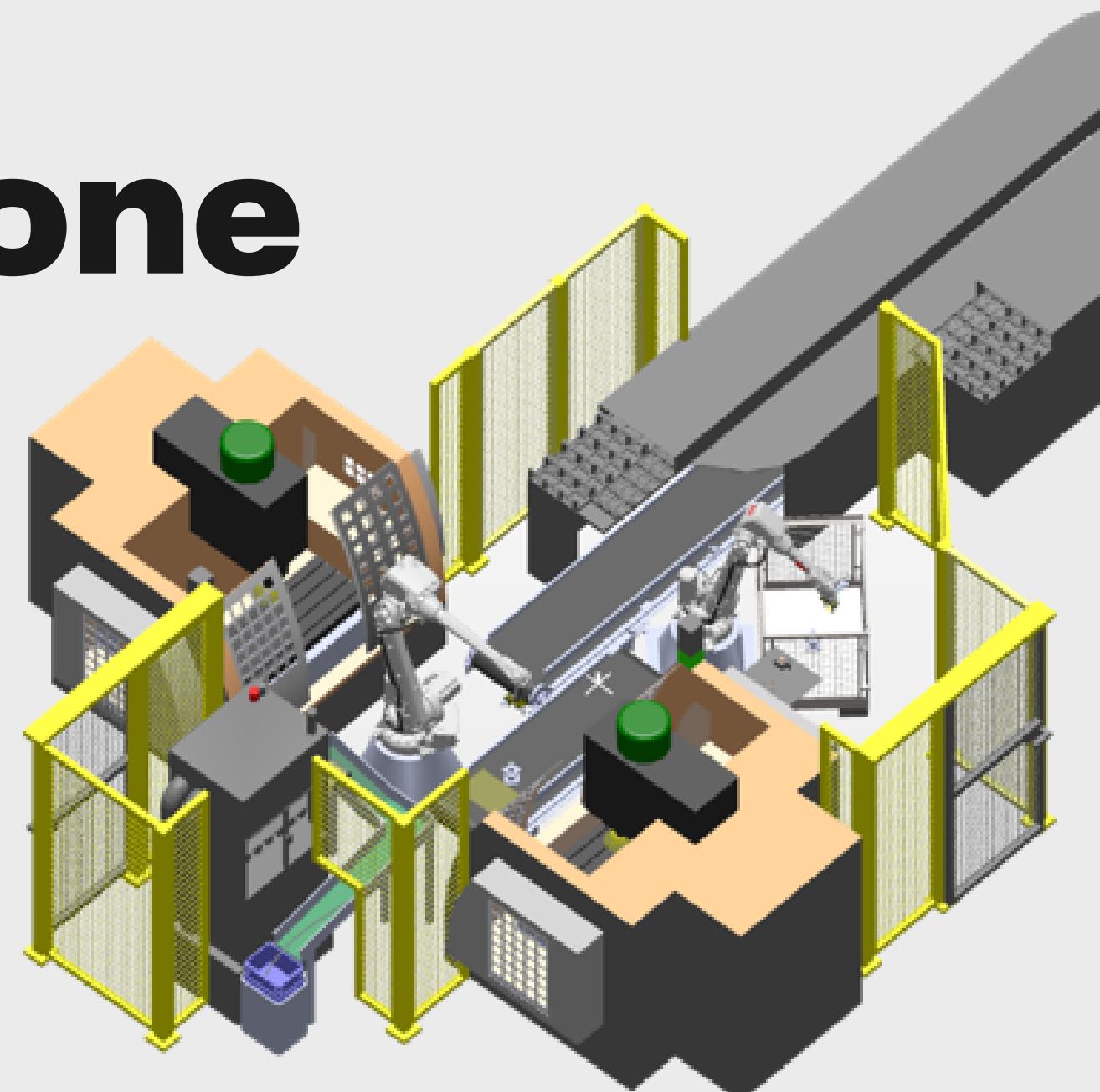
ABB

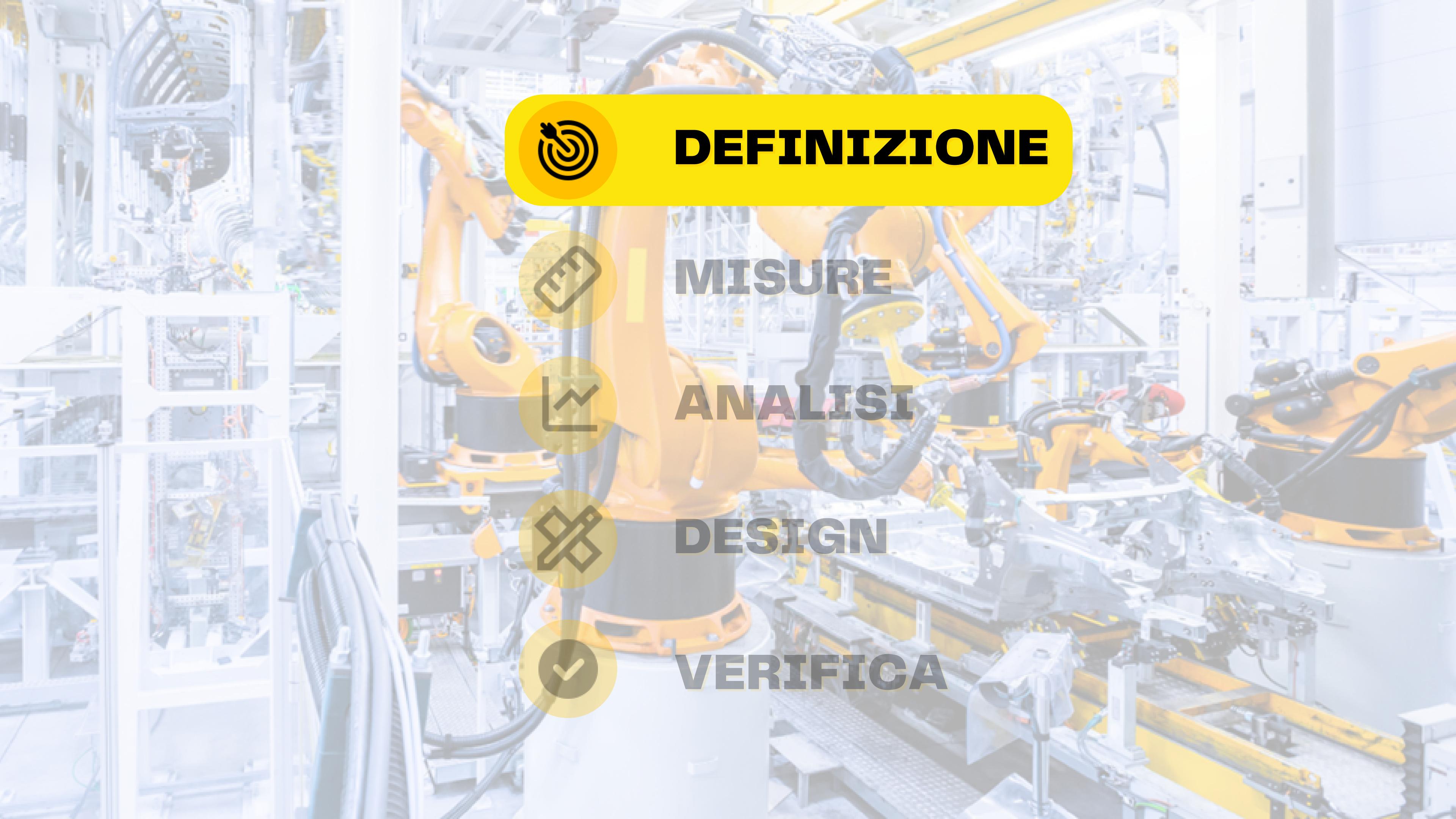
Isole Robotizzate e Sistemi di Automazione

Gruppo 2

Studenti:

- Alghisi Giovanni Angelo
- Campregher Francesco
- Mirandola Edaordo



A grayscale photograph of an industrial factory floor featuring several yellow robotic arms and complex machinery.

DEFINIZIONE



MISURE



ANALISI



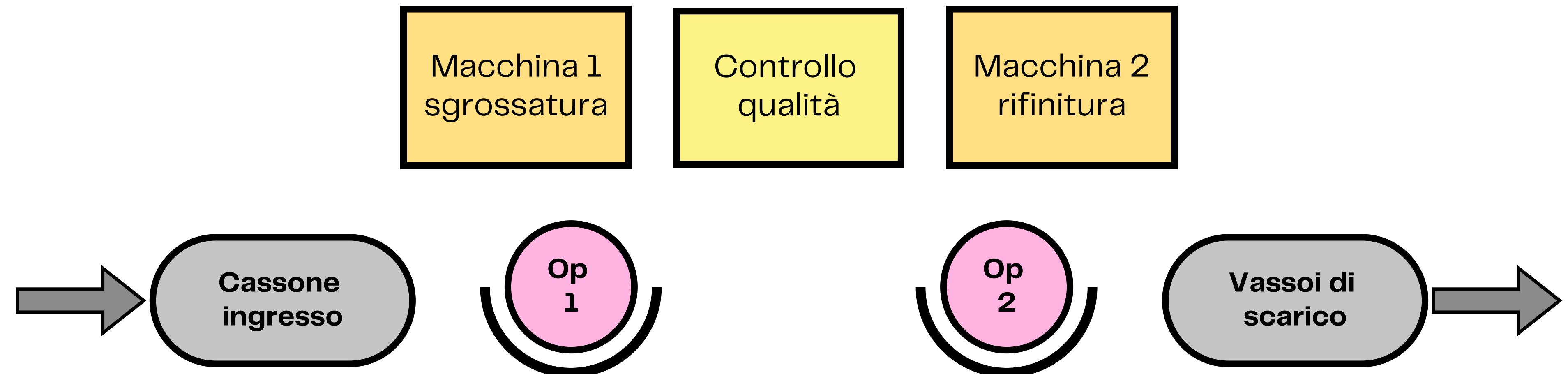
DESIGN



VERIFICA

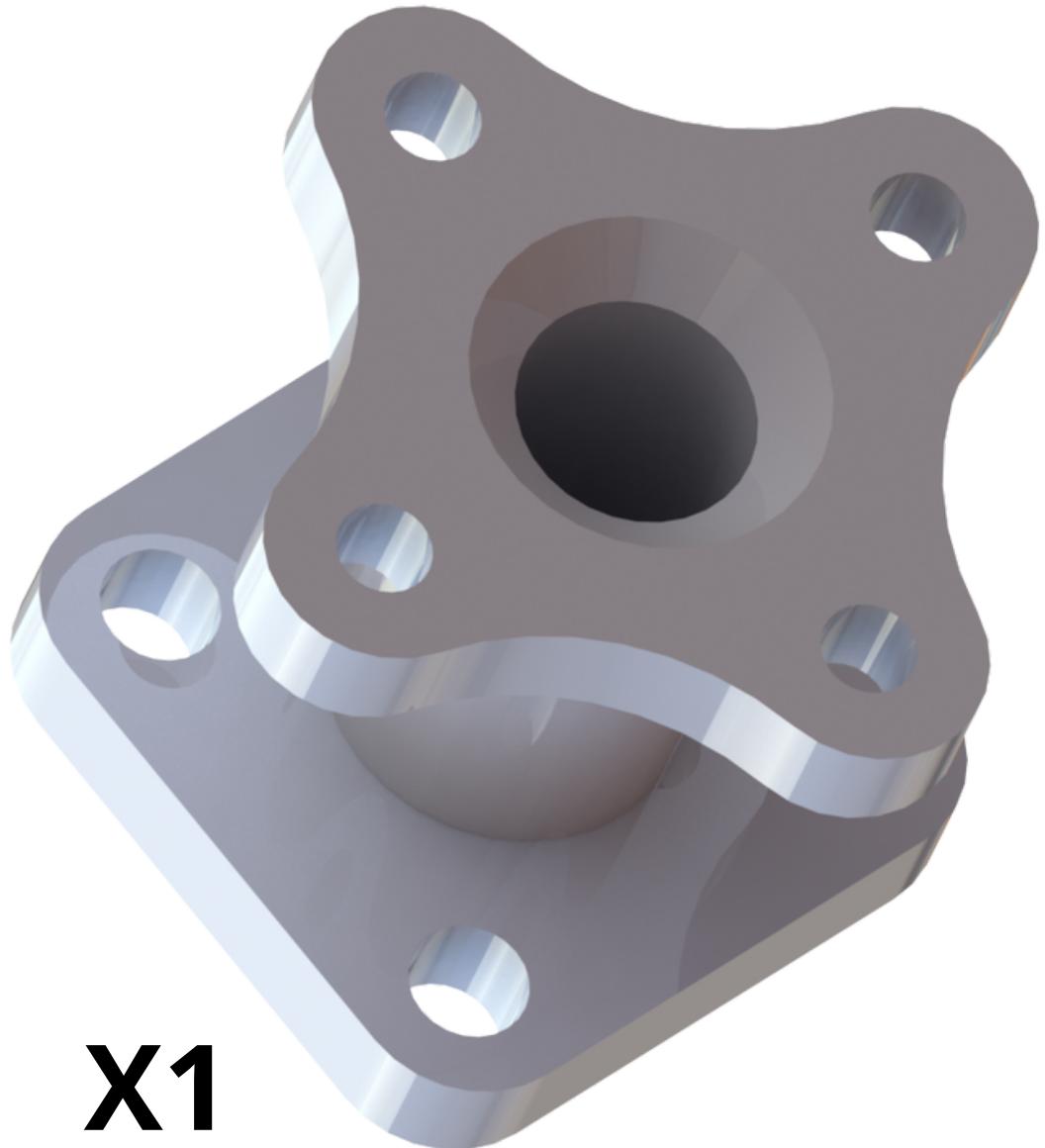


DEFINIZIONE



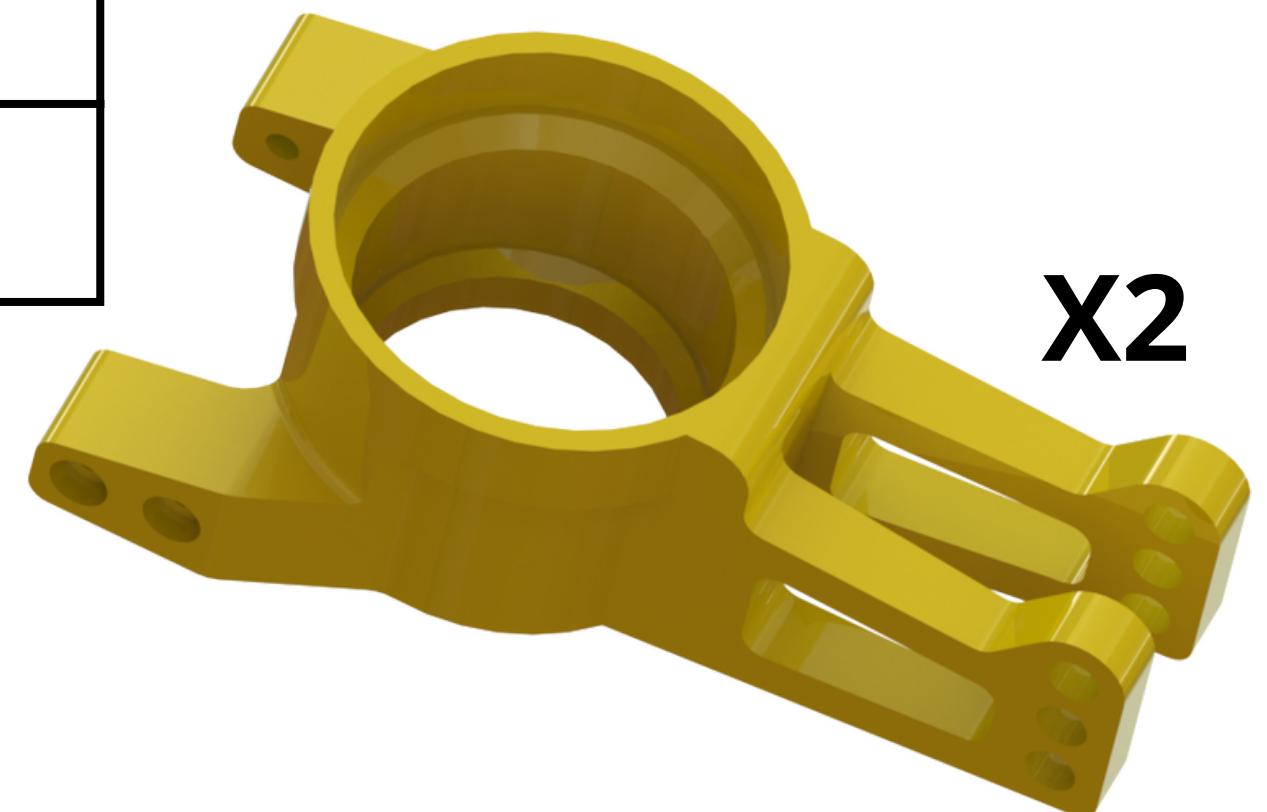
tack-time = 96 s/pz

PEZZI DA LAVORARE

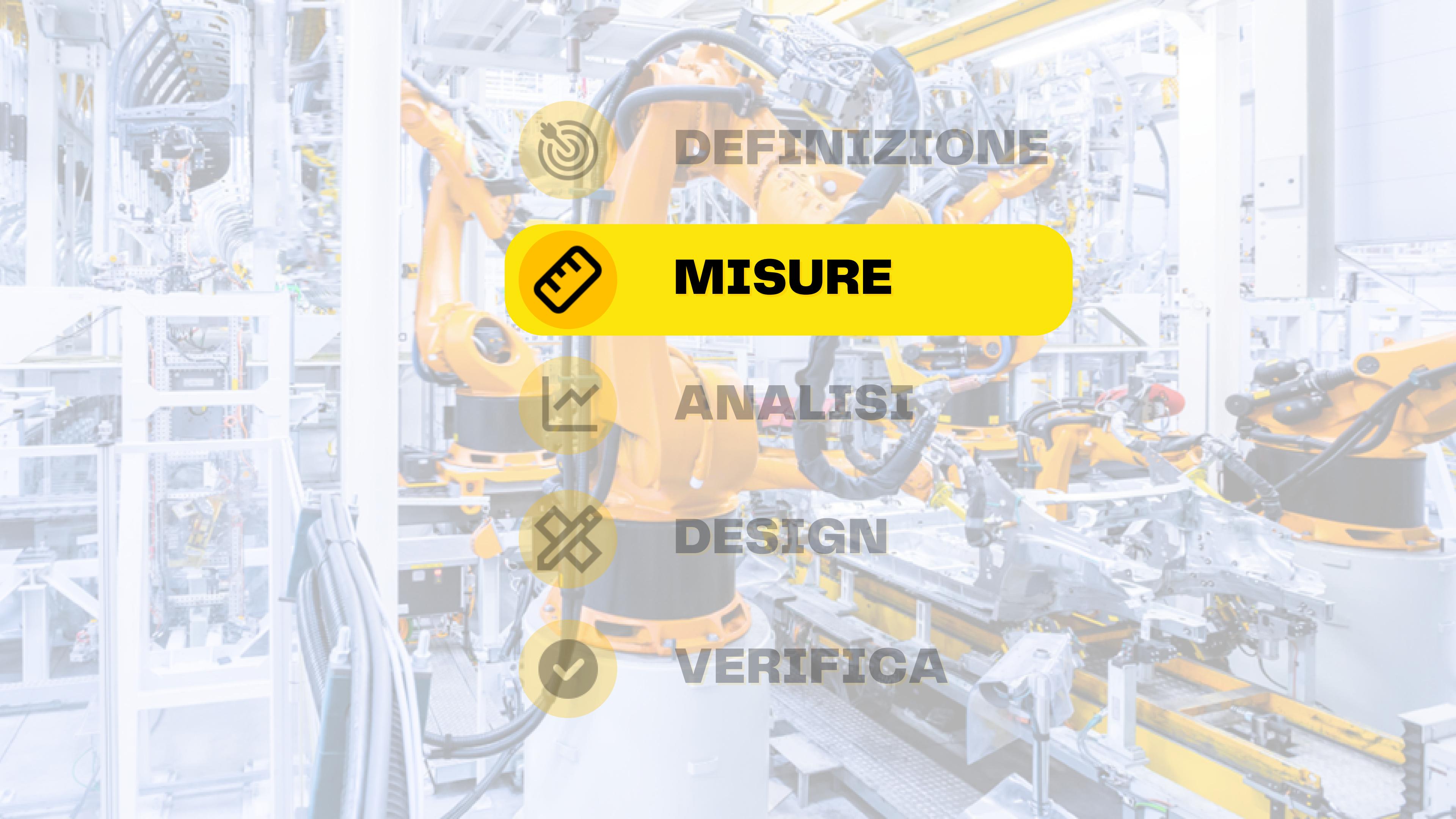


X1

pezzo	peso [kg]	Ingombro [mm x mm x mm]
X1	4.0	130 x 130 x 150
X2	0.8	80 x 150 x 50



X2



DEFINIZIONE



MISURE



ANALISI



DESIGN



VERIFICA



INDICI DELLA STAZIONE DI PARTENZA

OEE = Q · R · D =

$$97,9 \cdot 97,7 \cdot 83,7 = 80,12\%$$

TT* = 73.83 s/pz

CP = 48.00 pz/h



DEFINIZIONE

MISURE

ANALISI

DESIGN

VERIFICA



INDICI DELLA CELLA CON I ROBOT

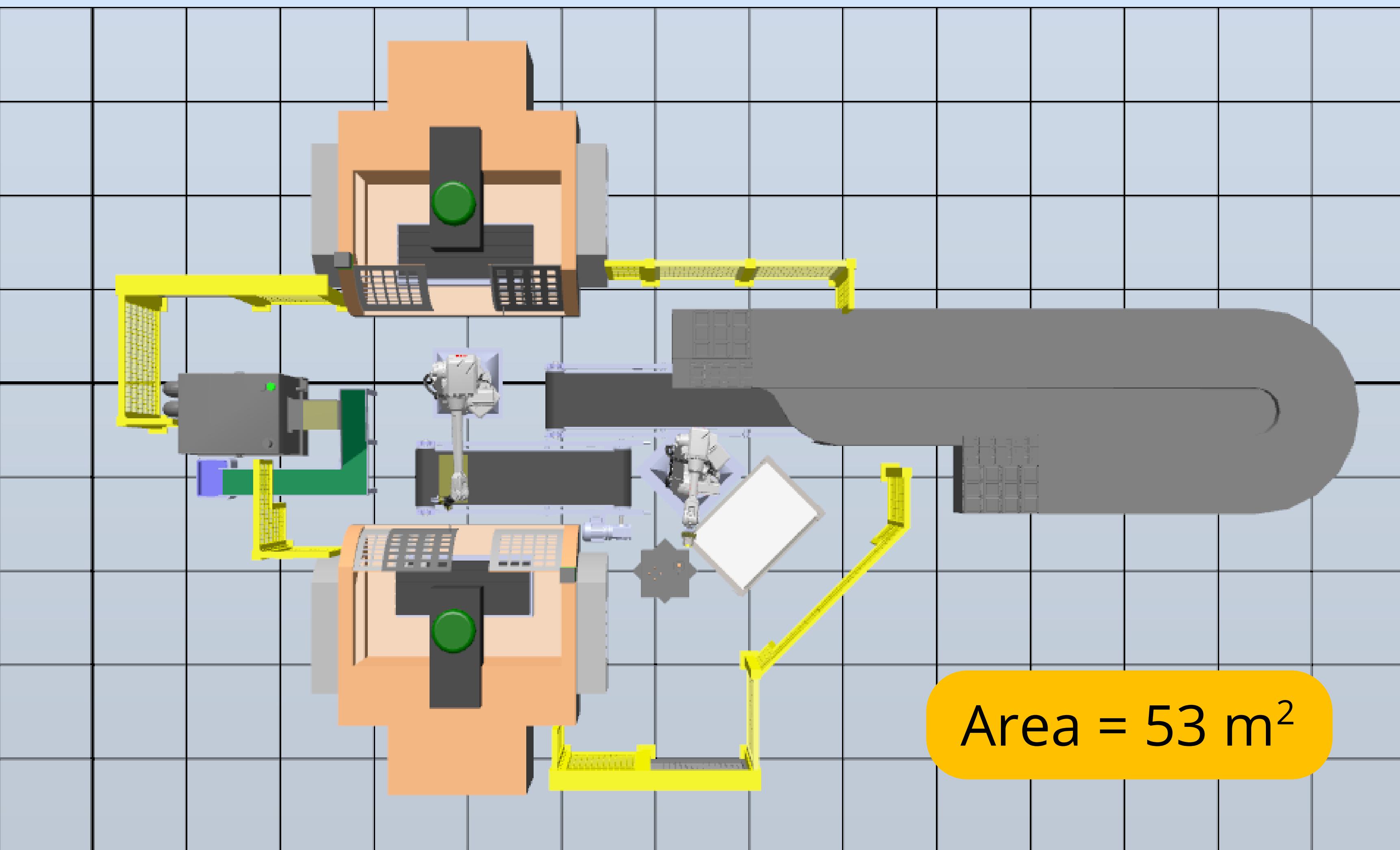
$$\begin{aligned} \text{OEE} &= Q \cdot D \cdot R = \\ &= 98.43 \cdot 97.71 \cdot 91.11 = \\ &= 87.62\% \end{aligned}$$

$$TT * 10\% = 76.47 \text{ s/pz}$$

$$CP = 52 \text{ pz/h}$$

$$TC = 60 \text{ s}$$

L A Y O U T



Area = 53 m²

IRB 4600 - 20/2.50

Payload :



Peso pezzo X1·2 = 8 kg

Peso gripper* = 3.6 kg

Reach :





IRB 2600 - 12/1.85

Payload :

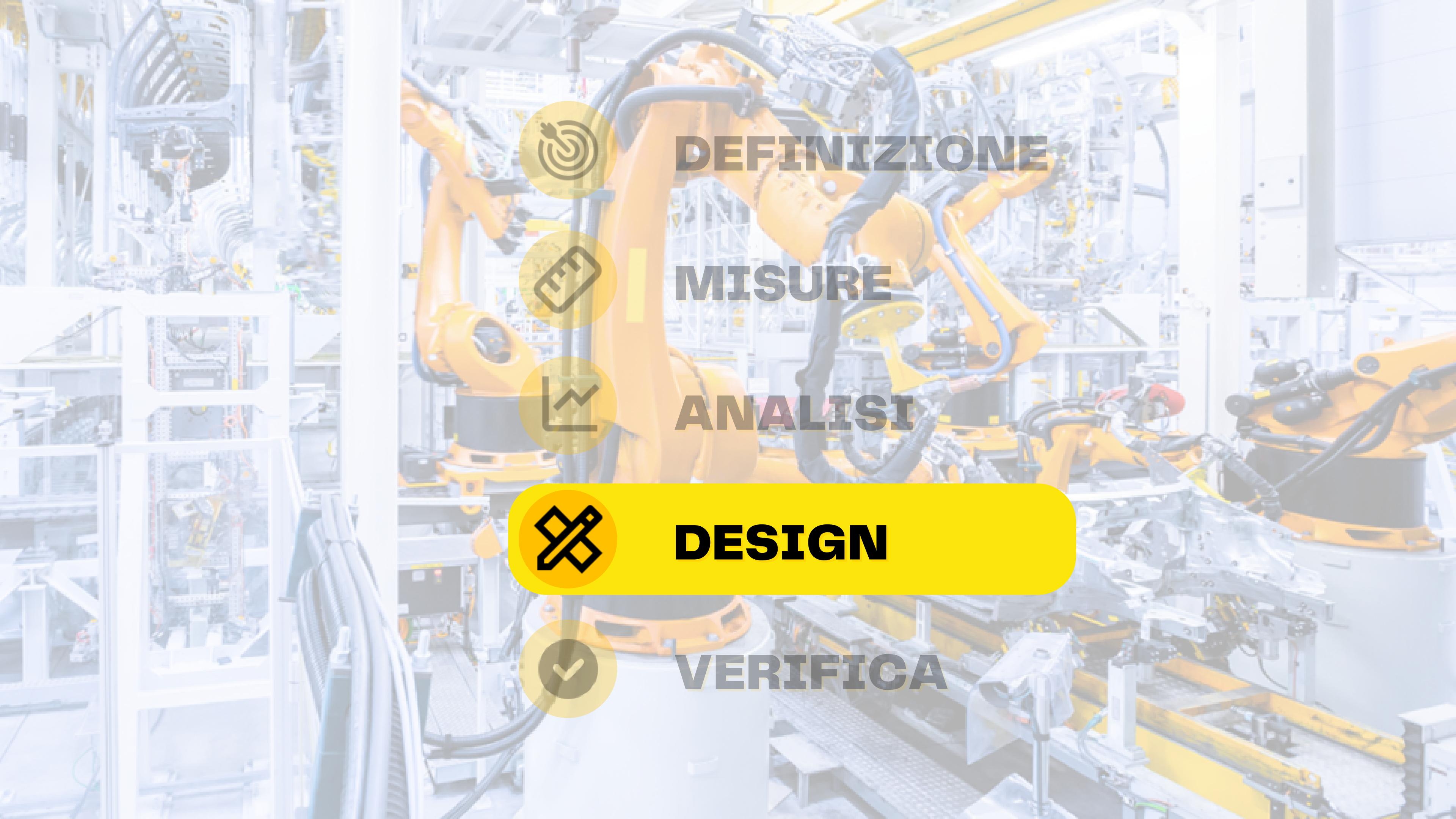


→ **Peso pezzo = 4 kg**

→ **Peso gripper* = 3.6 kg**

Reach :





DEFINIZIONE

MISURE

ANALISTI

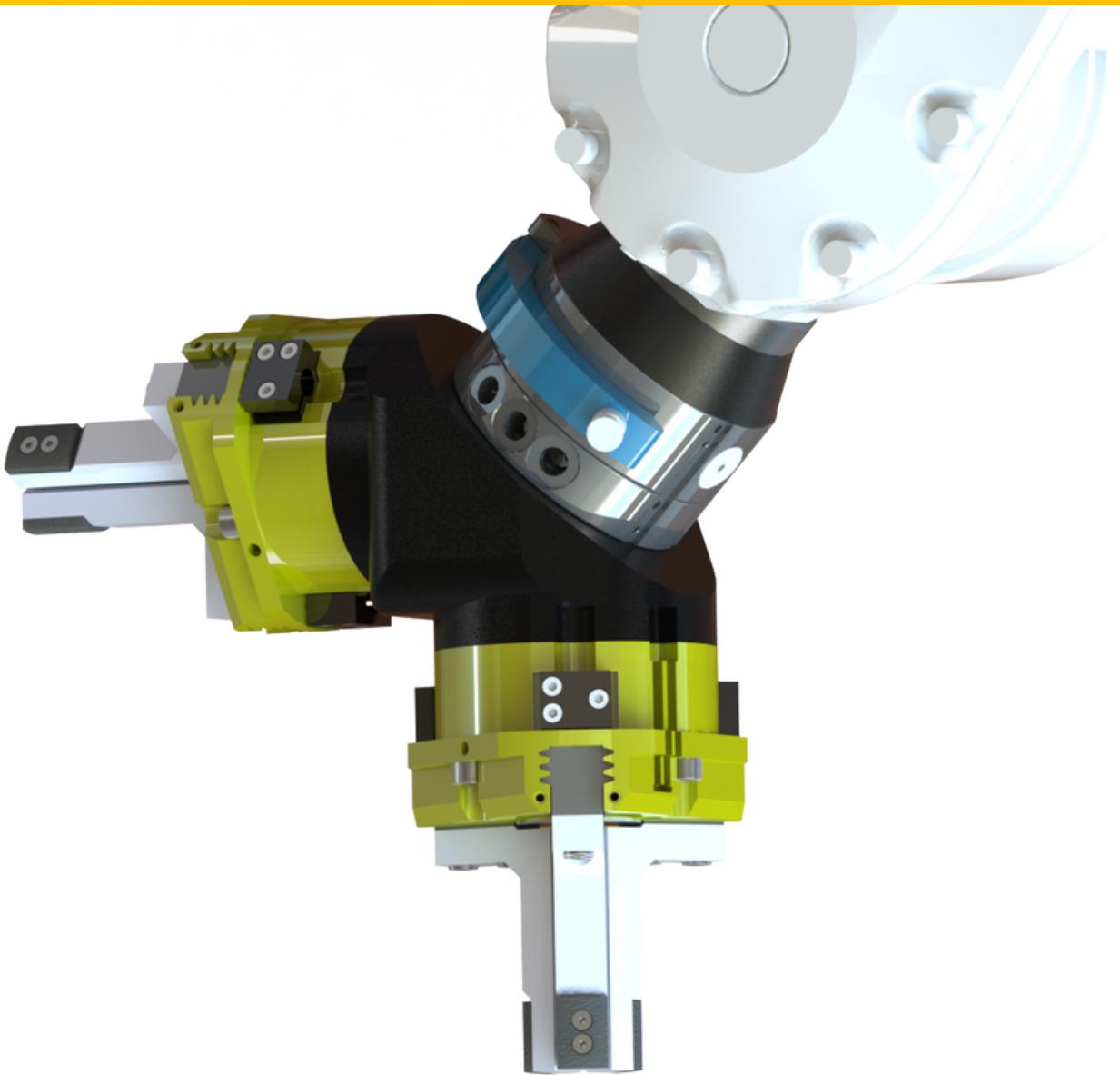


DESIGN



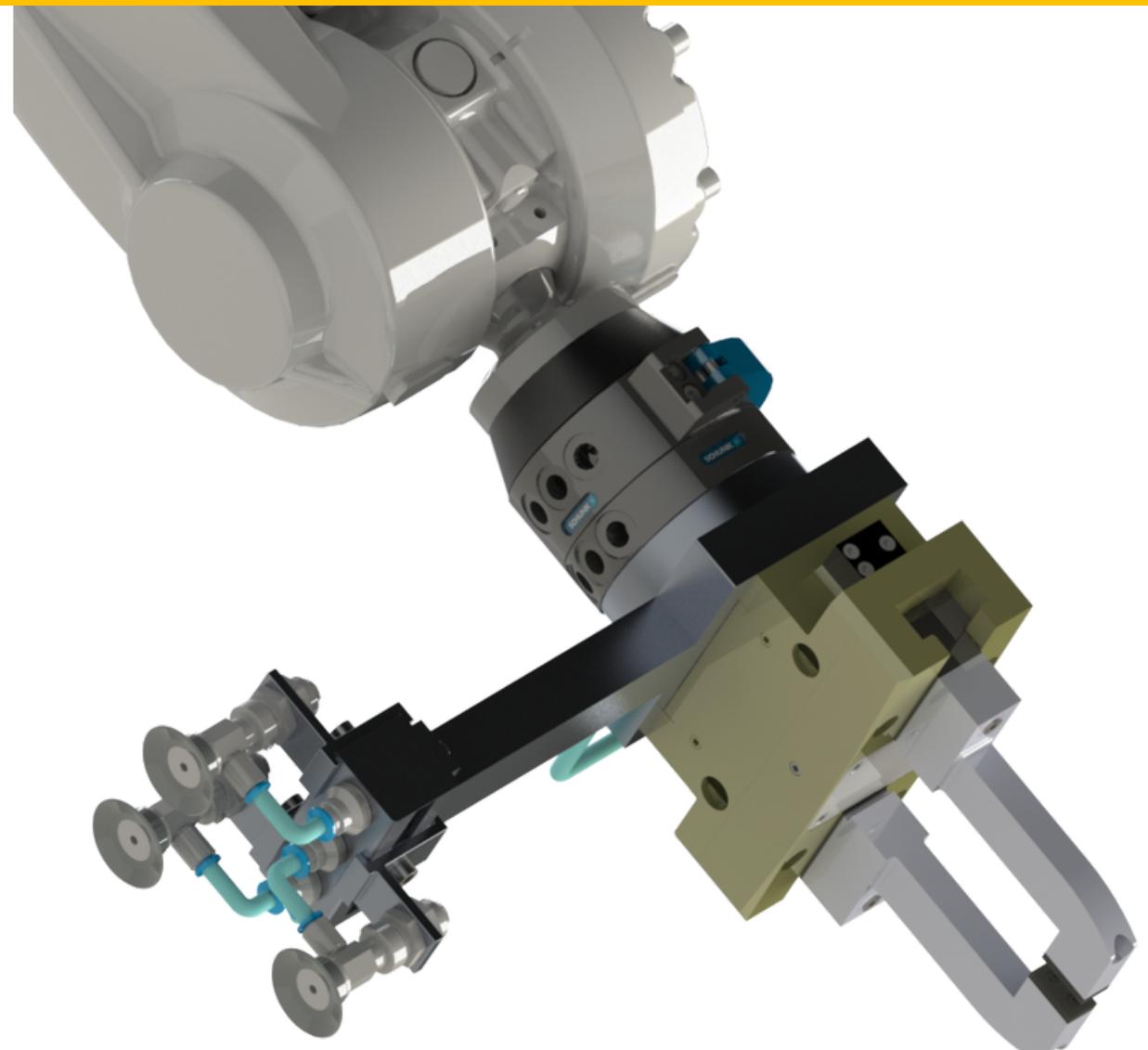
VERIFICA

IRB 4600



GRIPPER

IRB 2600

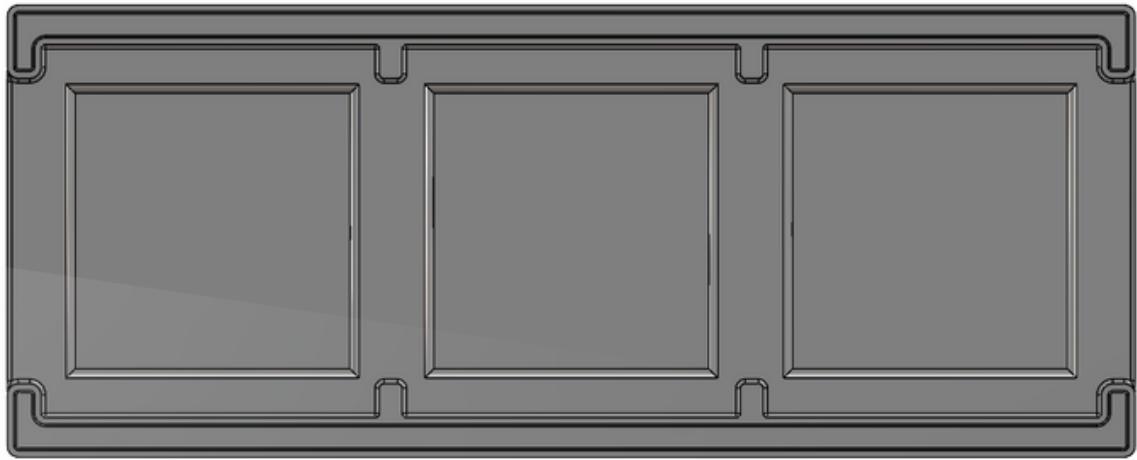


Peso = 3.54 kg

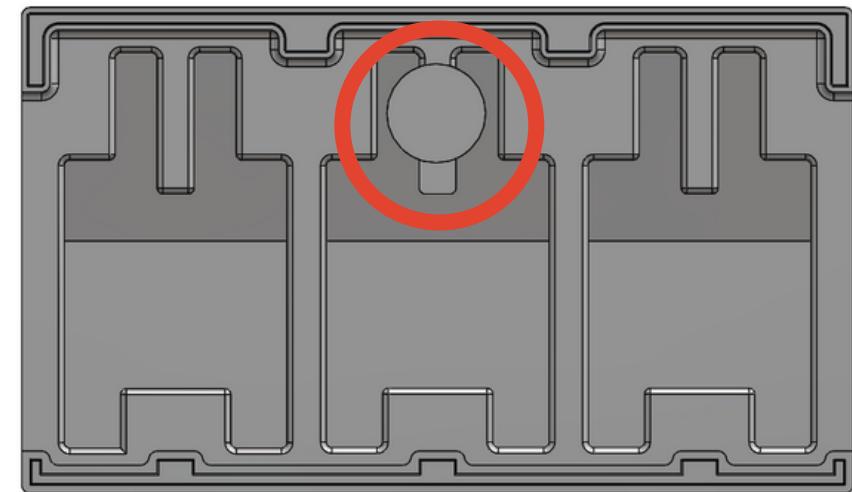
Peso = 2.85 kg

VASSOIO

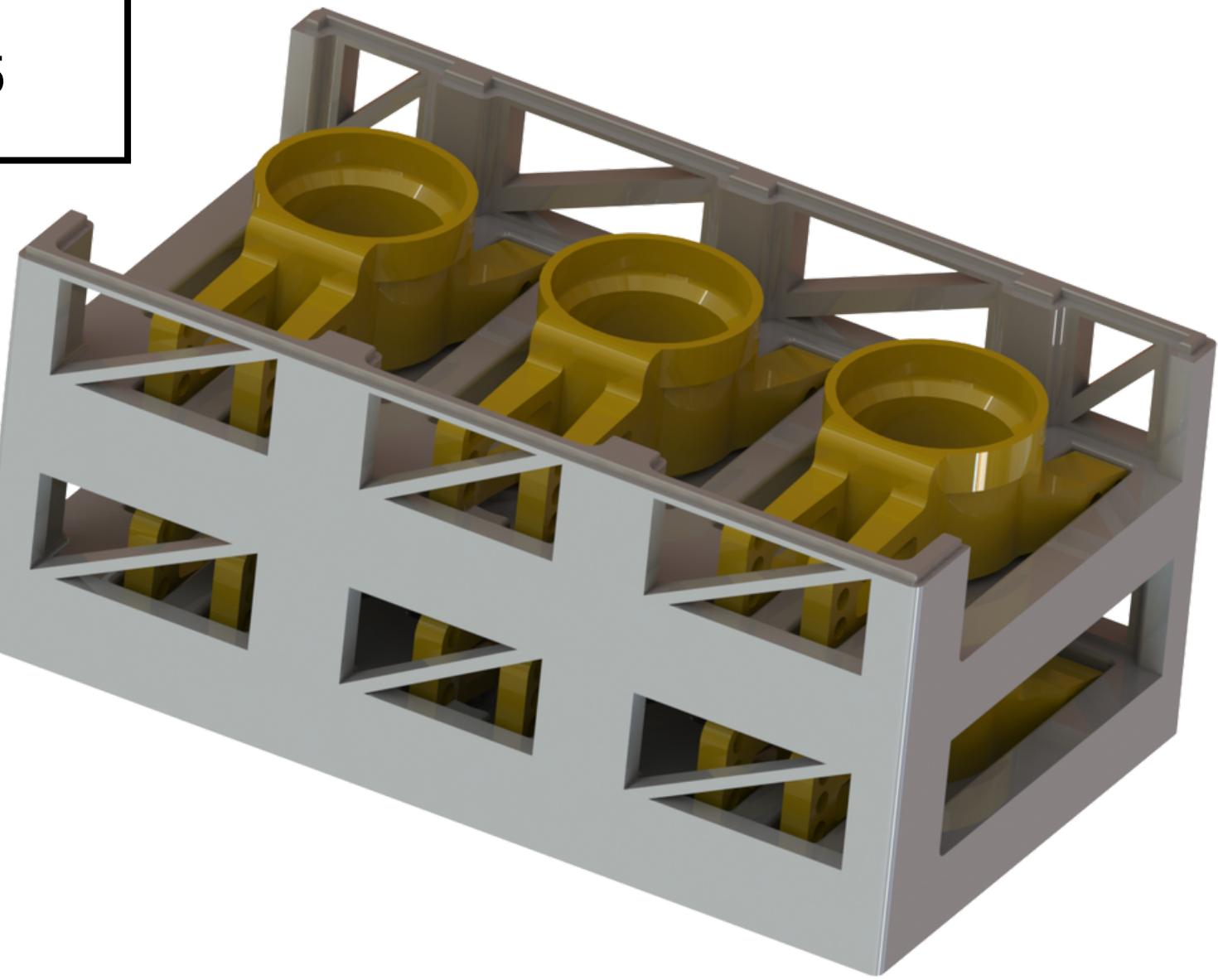
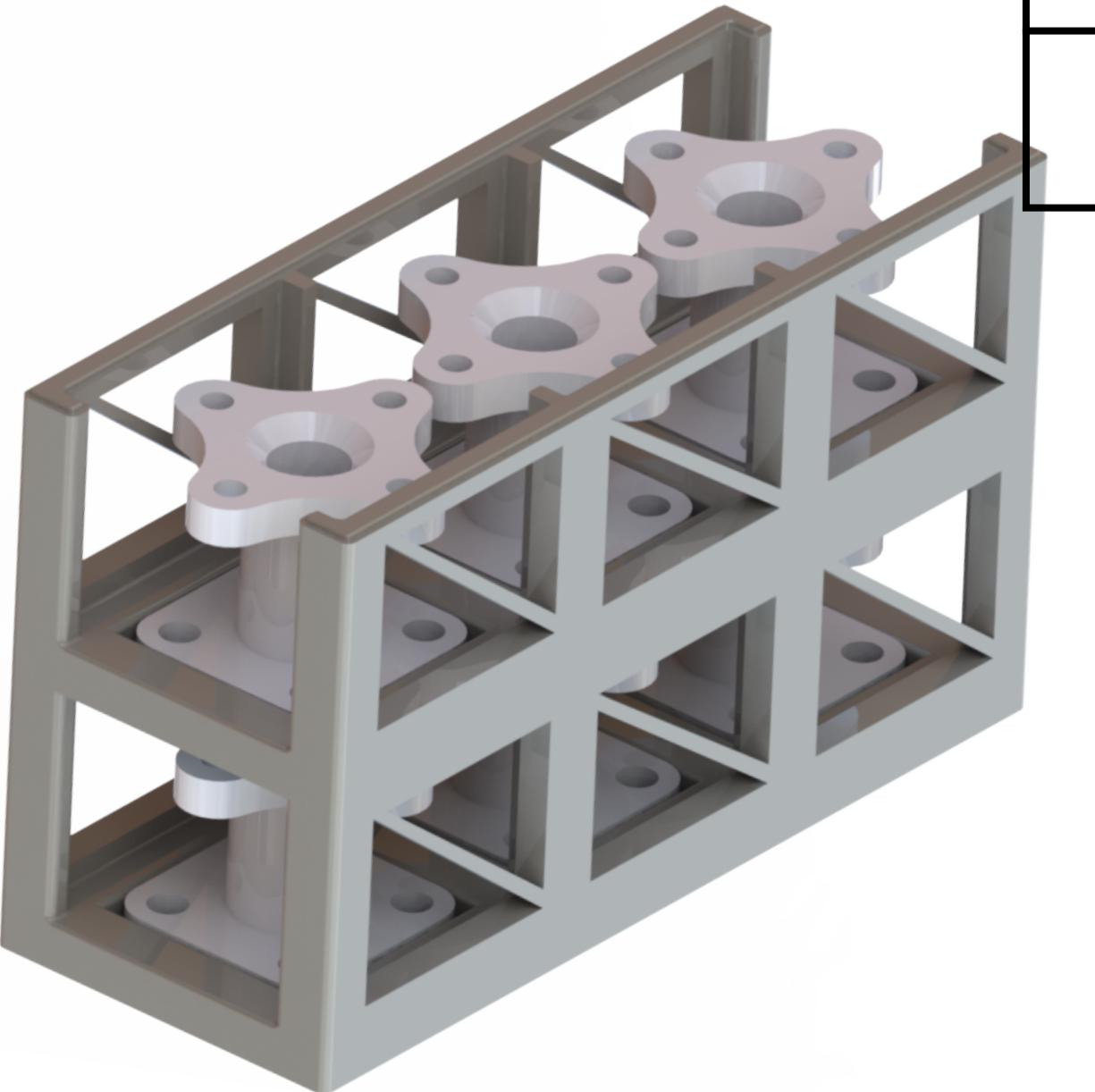
X1



X2

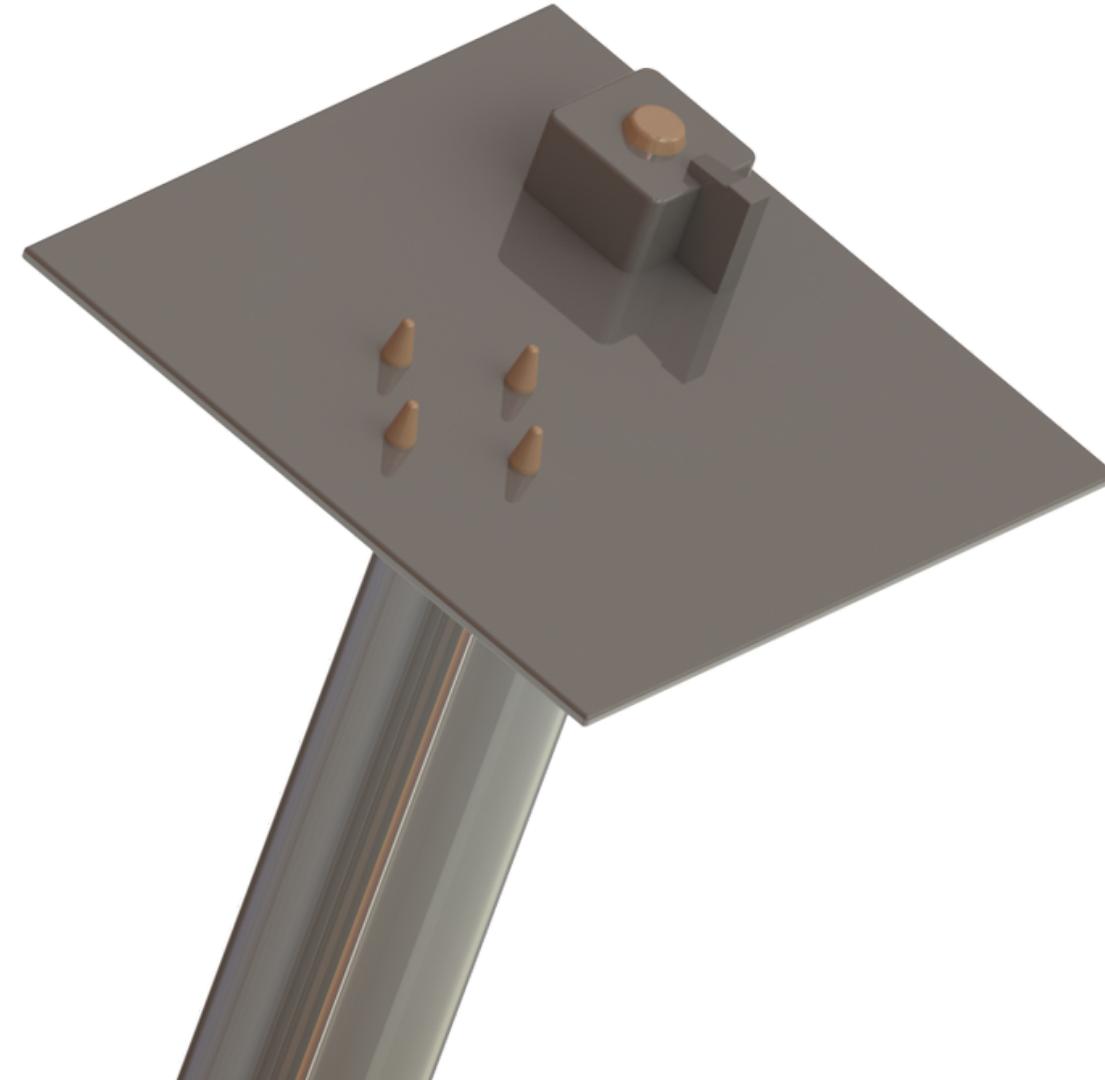


vassoio	peso [kg]
X1	2.32
X2	0.95

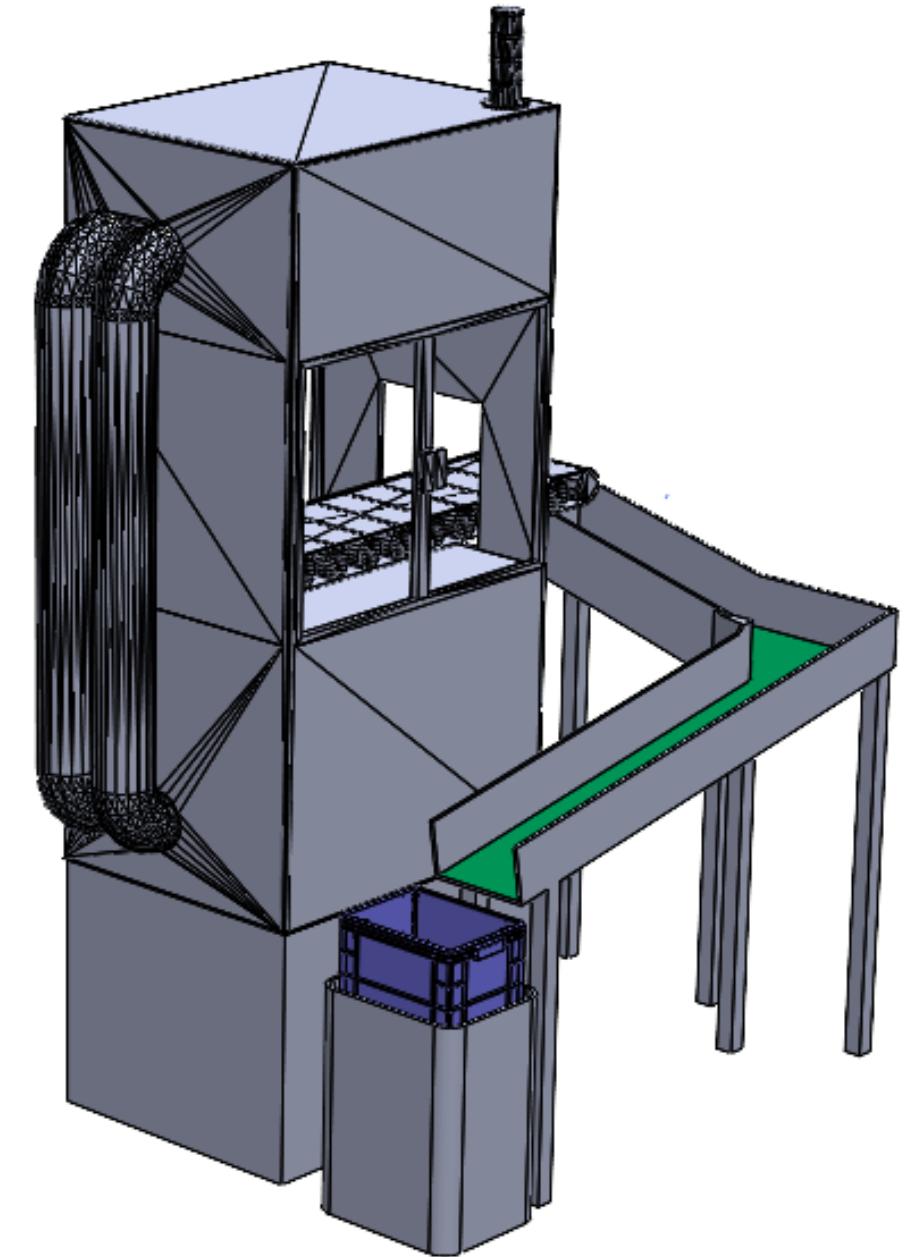


LOW COST AUTOMATION

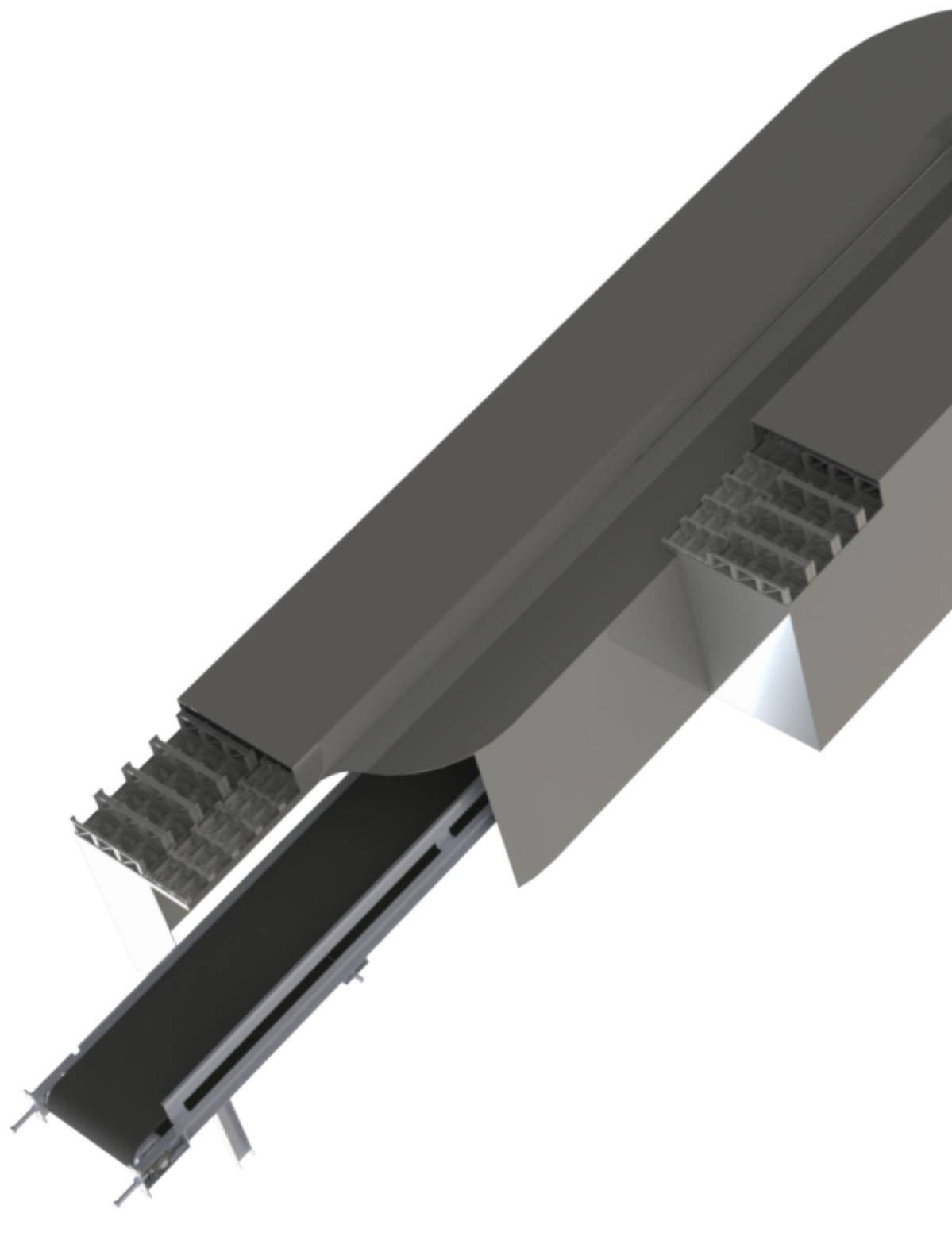
TAVOLO
RADDRIZZAMNETO



SCIVOLO
ASSERVIMENTO
VASSOI



SCIVOLO SCARICO
CONTROLLO QUALITA'





DEFINIZIONE

MISURE

ANALISI

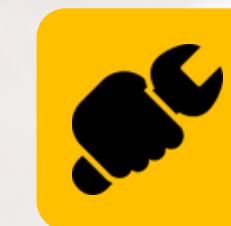
DESIGN

VERIFICA





	Ipotesi	Reale
Saturazione robot 2	100%	80.9%
Utilizzazione CNC 1	66.7%	73.6%
Utilizzazione CNC 2	66.7%	73.6%
Utilizzazione Banco Qualità	63.3%	69.9%



OEE = **87.62%**



TC = **54.37 s**



CP = **58 pz/h**



Possibile incremento
domanda **39%**

PREGI



**Ridotto tempo ciclo
+39% produzione**



Bin-picking



Bassa saturazione



**Gestione scarti
automatico**



Assenza cambio gripper



**Stesso punto di carico e
scarico**

DIFETTI



**Vincoli geometrici dei
vassoi**

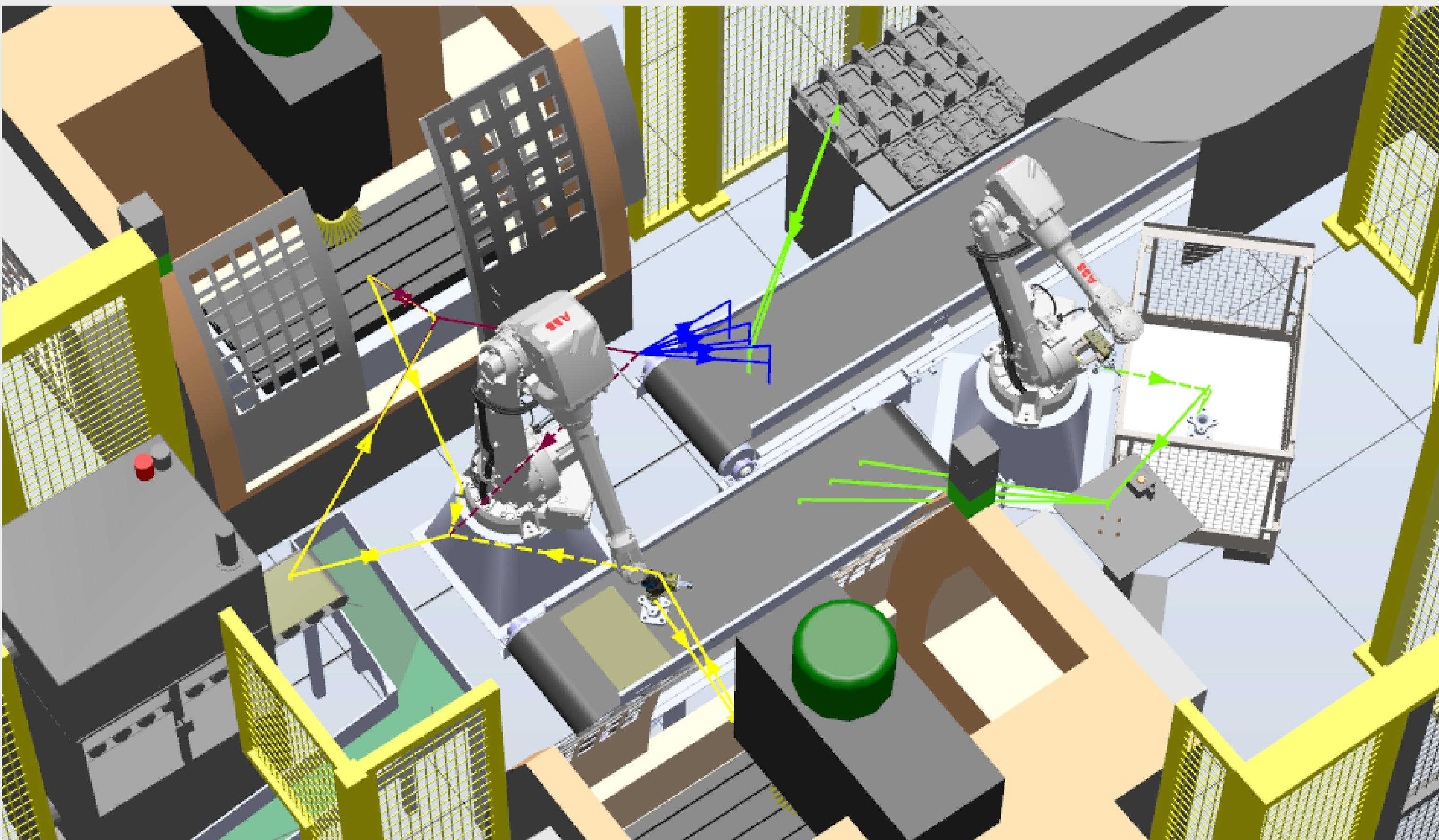


**TC inferiore a quello
richiesto per "Just in
time"**



**Sistema asservimento
vassoi**

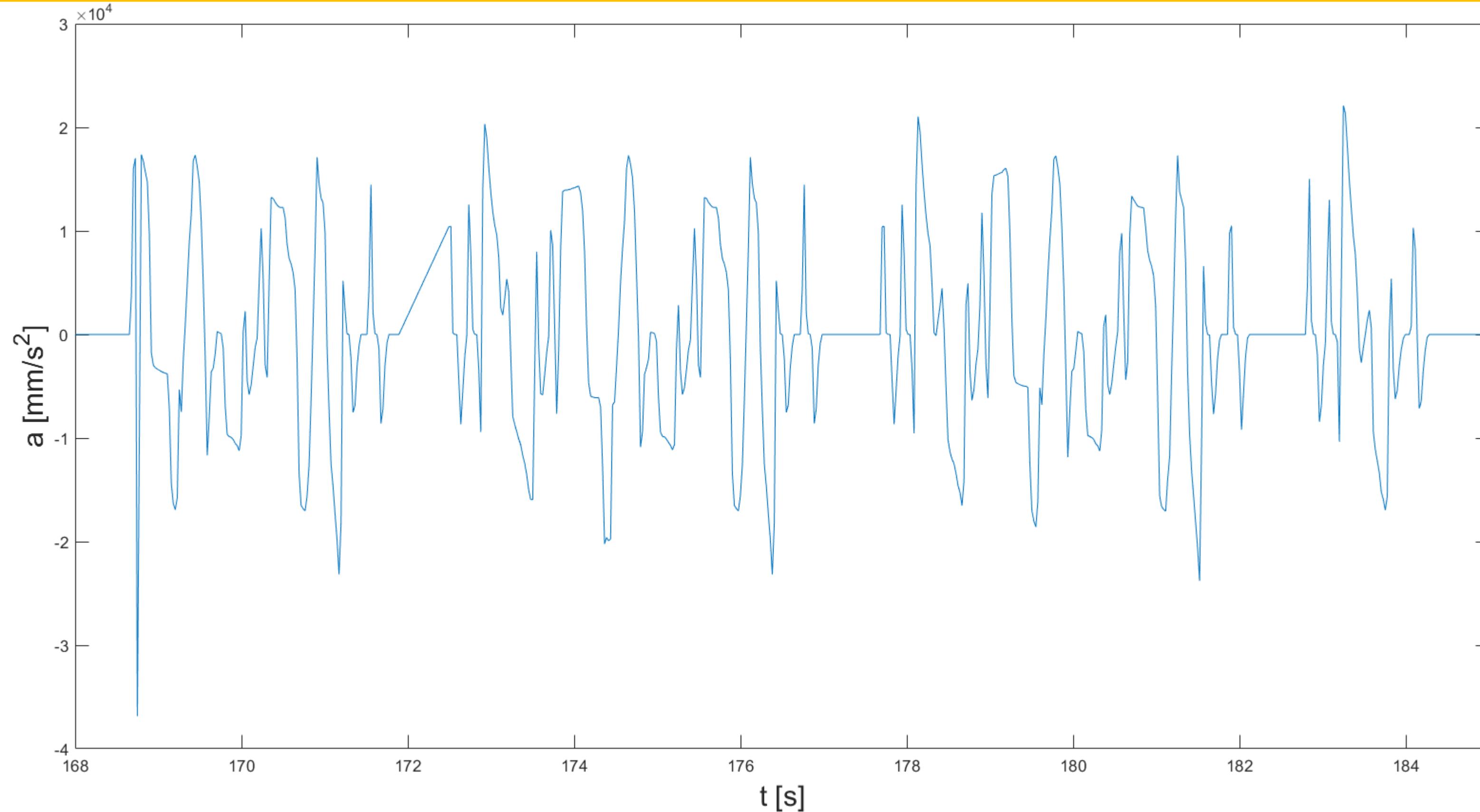
Traiettorie seguite dai robot per il pezzo X1



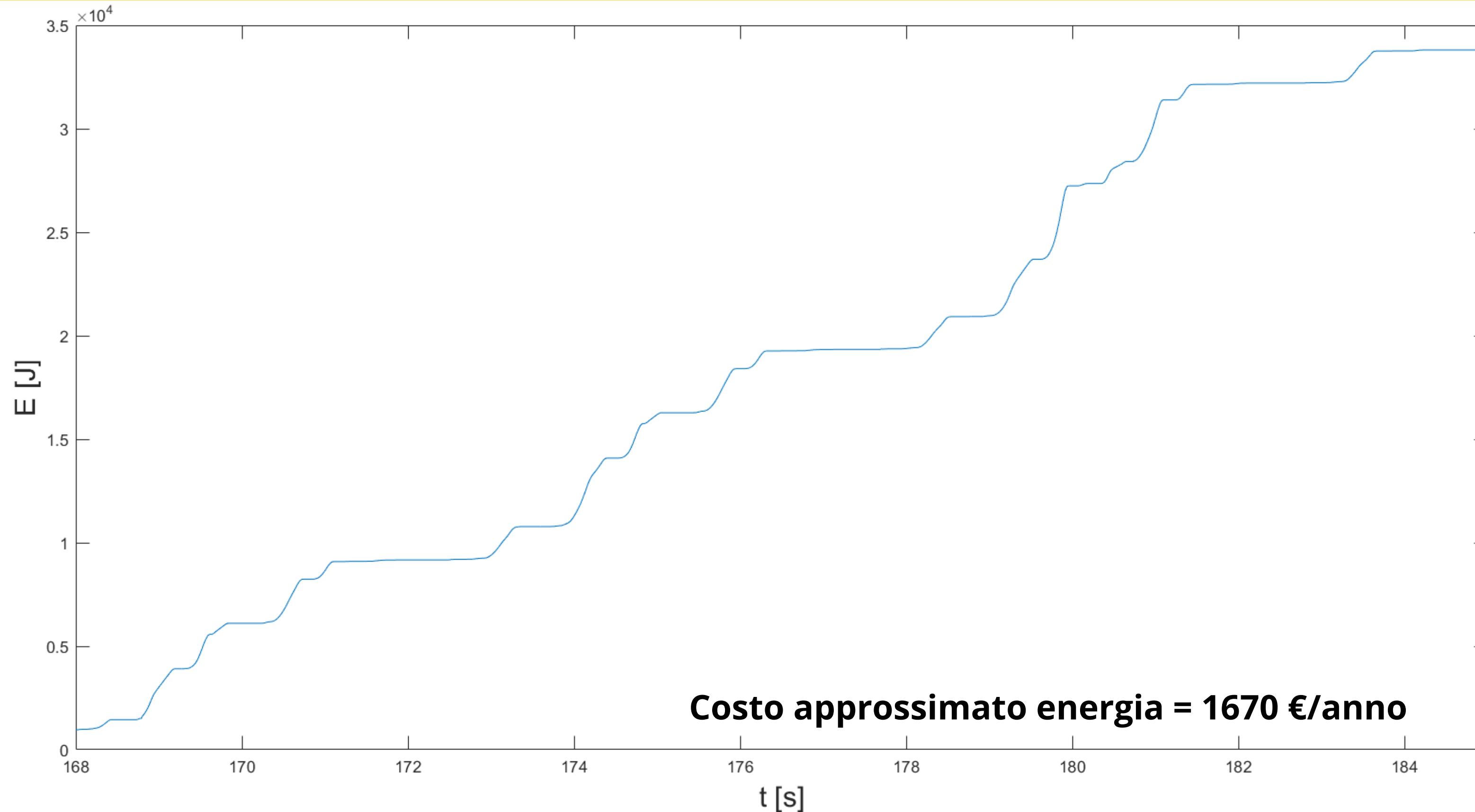
Video ciclo X1 vel. x 16



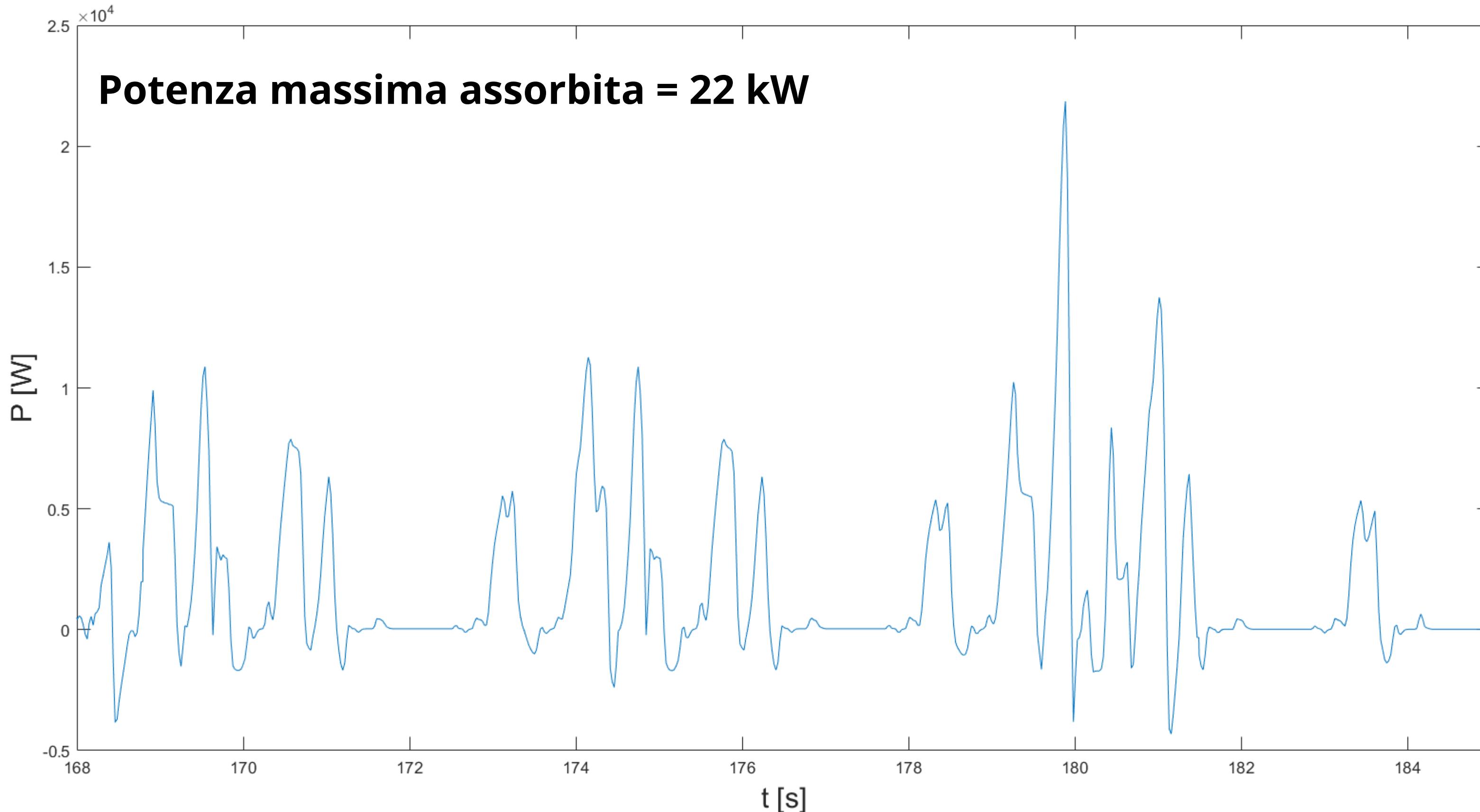
Accelerazione



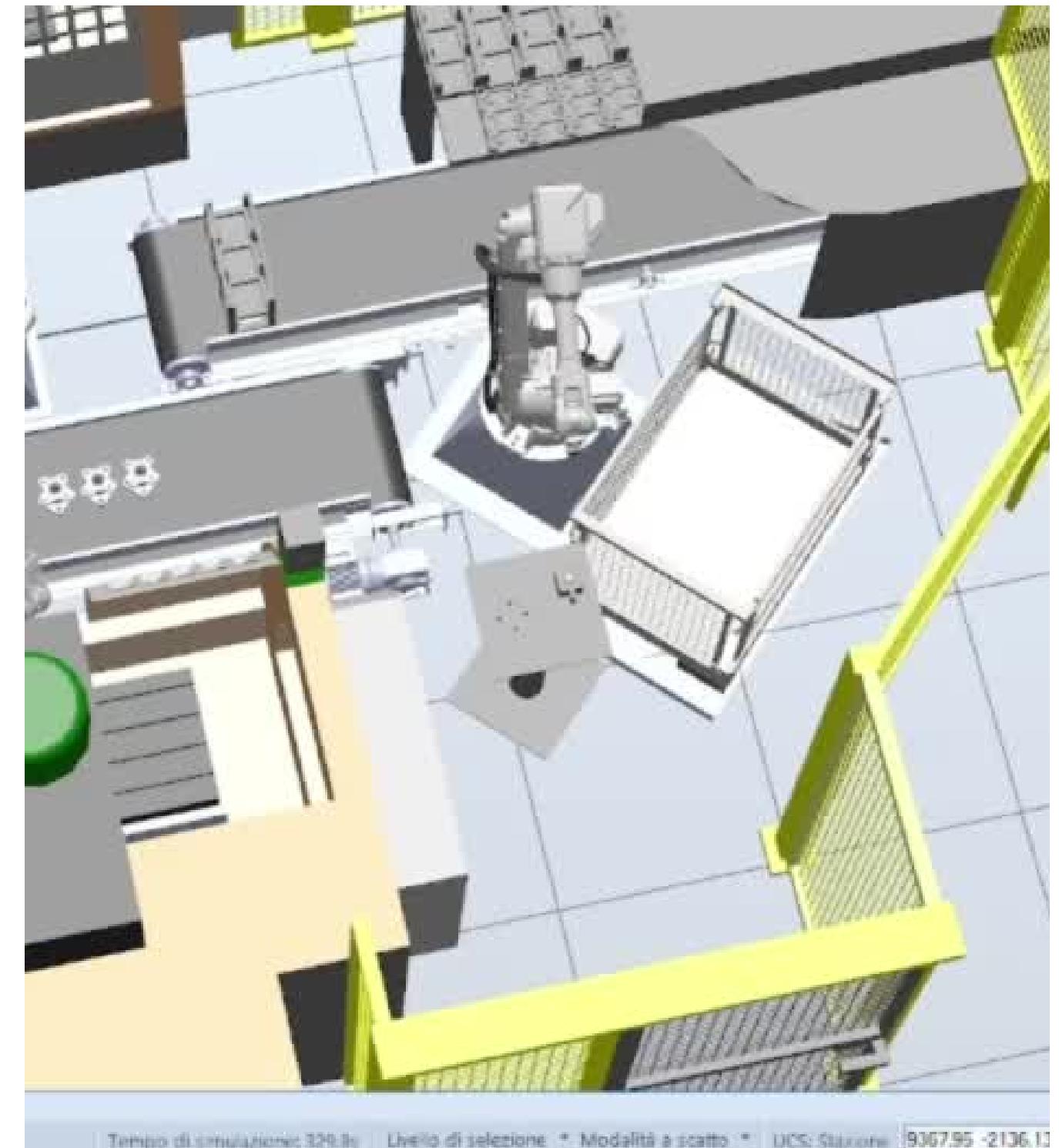
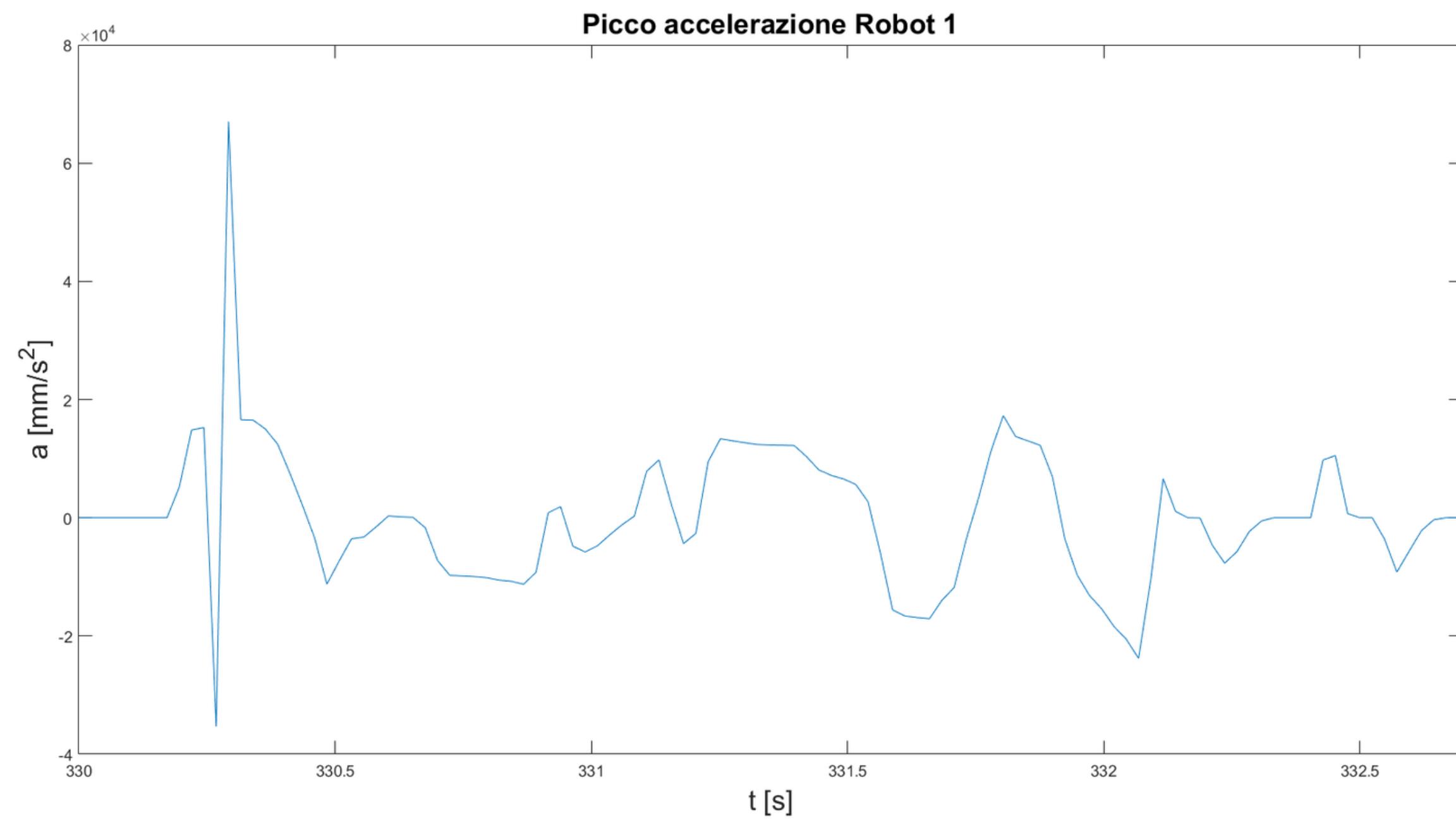
Energia



Segnale della potenza



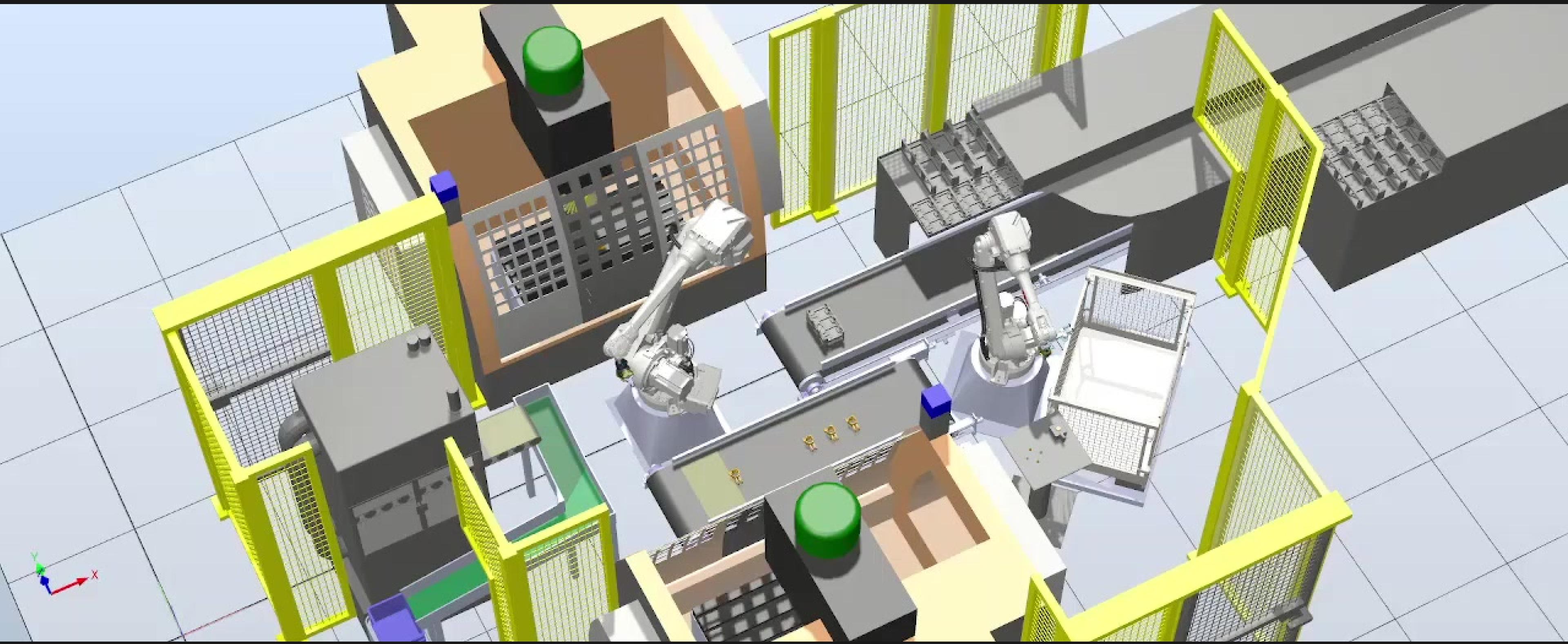
Analisi dei segnali

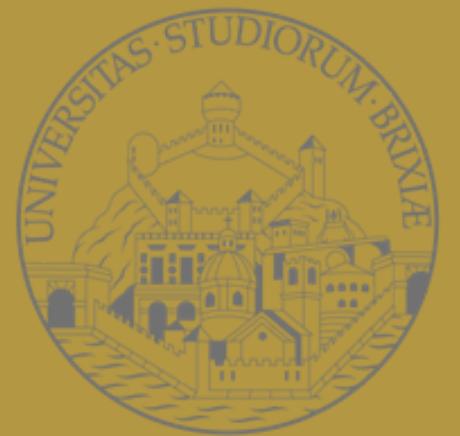


Video gestione scarti



Video ciclo regime X2





UNIVERSITÀ
DEGLI STUDI
DI BRESCIA

ABB

Dipartimento di Ingegneria Meccanica e Industriale
Corso Laurea Magistrale Automazione Industriale

Isole Robotizzate e Sistemi di Automazione

Gruppo 2

Grazie per l'attenzione