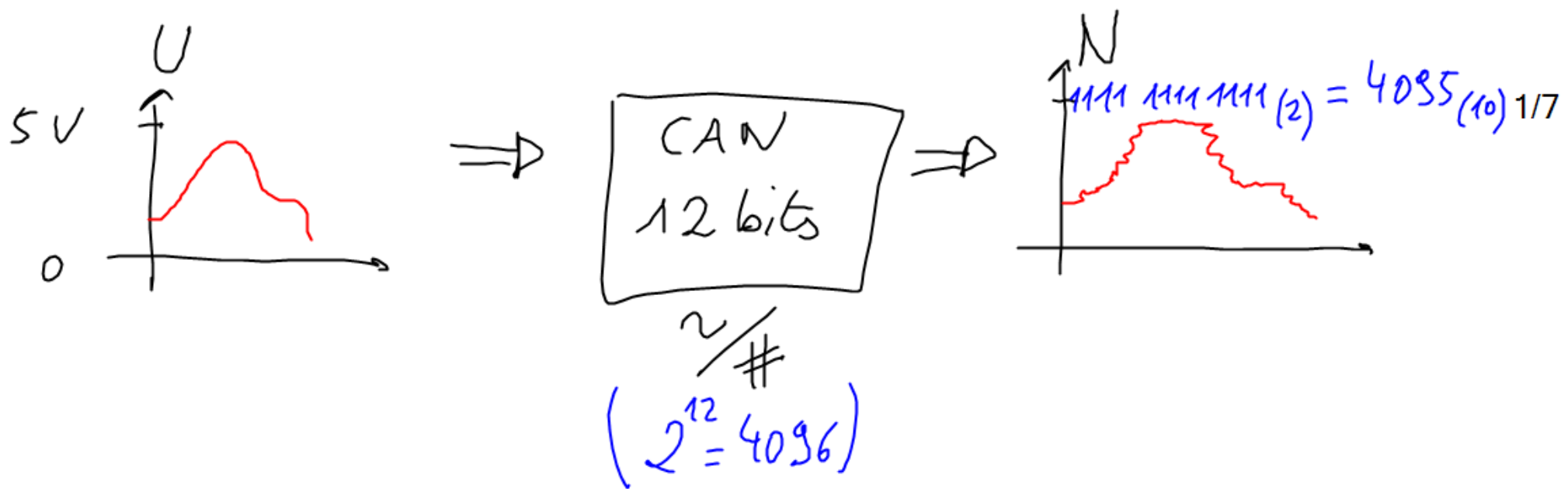




ex: calculer quantum:
(CAN 12 bits $U_{\text{plac échelle}} 5V$)

$$Q = \frac{U_{\text{plac échelle}}}{2^n - 1}$$

$$Q = \frac{5}{4095} \approx 1,22 \cdot 10^{-3} \text{ V/bit}$$

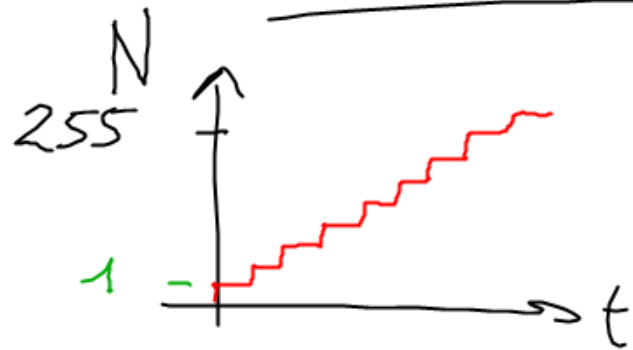
$$\approx 1,22 \text{ mV/bit}$$

si $N = 1234$ calculer $U_{\text{mesurée}}$: $U_{\text{mesurée}} = q \cdot N$

$$U_{\text{mesurée}} = 1,22 \cdot 10^{-3} \cdot 1234 \approx 1,51 \text{ V}$$

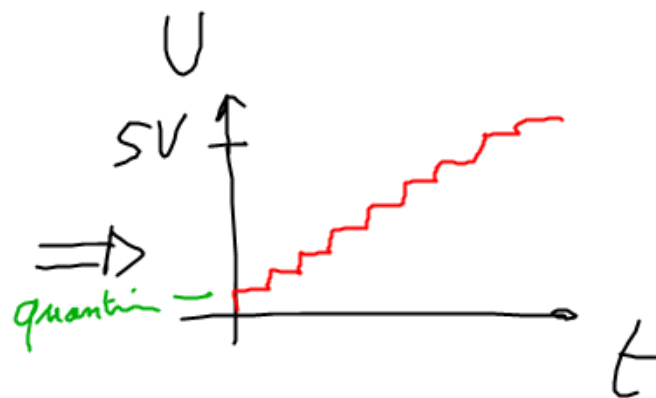
CNA

Convertisseur numérique analogique



8 bits

$$(2^8 = 256)$$



Calcul quantum (V/bit):

$$q = \frac{U_{\text{pleine échelle}}}{2^m - 1}$$

ex: pour CNA 8 bits: $q = \frac{5}{255} \approx 1,96 \cdot 10^{-2} \text{ V/bit} \approx 19,6 \text{ mV/bit}$

Calcul U sortie:

$$U_{\text{sortie}} = q \cdot N$$

Calcul quantum (V/bit):

$$q = \frac{U_{\text{pleine échelle}}}{2^m - 1}$$

3/7

ex: pour CNA 8 bits: $q = \frac{5}{255} \approx 1,96 \cdot 10^{-2} \text{ V/bit} \approx 19,6 \text{ mV/bit}$

Calcul U_{sortie} :

$$U_{\text{sortie}} = q \cdot N$$

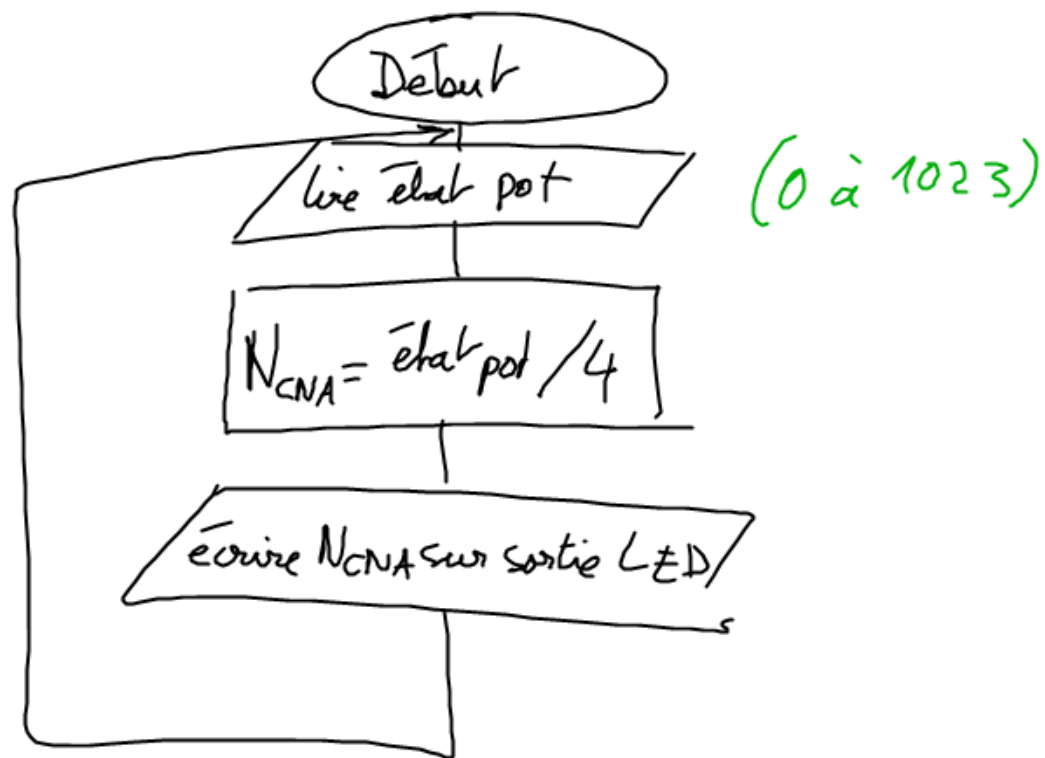
ex: calculer N pour avoir $U_{\text{sortie}} \approx 2 \text{ V}$ sur la carte Arduino UNO

$$N = \frac{U_{\text{sortie}}}{q}$$

$$N = \frac{2}{1,96 \cdot 10^{-2}} \approx 102$$

Commander le CNA d'une LED par un potentiomètre sur le CAN.

4/7

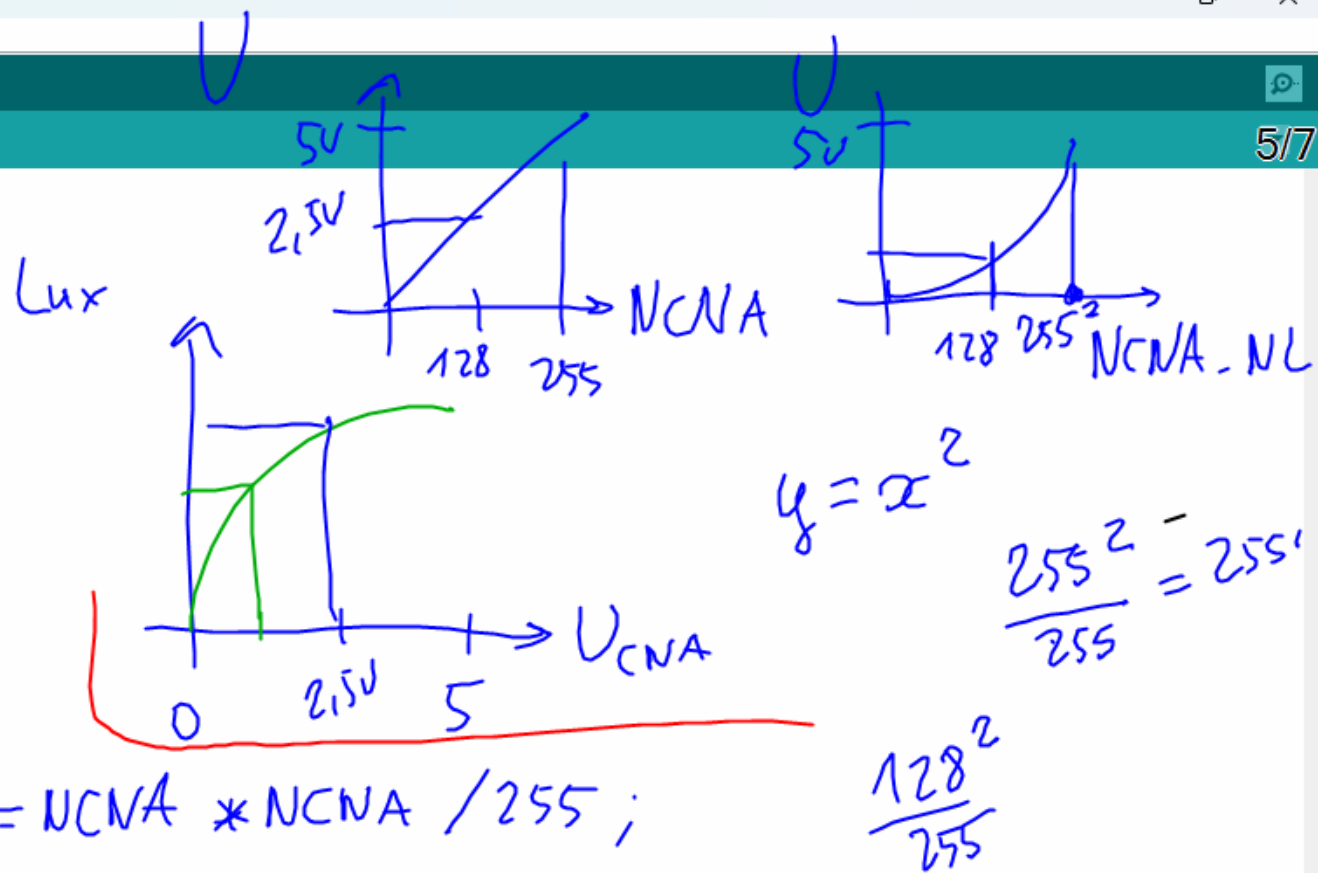




```
int pinCNA = 3;
int pinPot = A0;
int etatPot = 0;
int NCNA = 0;
int NCNA_NL = 0;
void setup() {
  pinMode(pinCNA, OUTPUT);
}
```

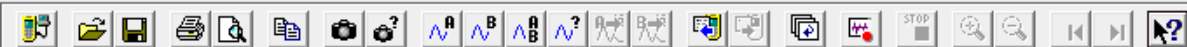
```
void loop() {
  etatPot = analogRead(pinPot);
  NCNA = etatPot / 4;
  analogWrite(pinCNA, NCNA_NL);
}
```

$$NCNA_NL = NCNA * NCNA / 255;$$

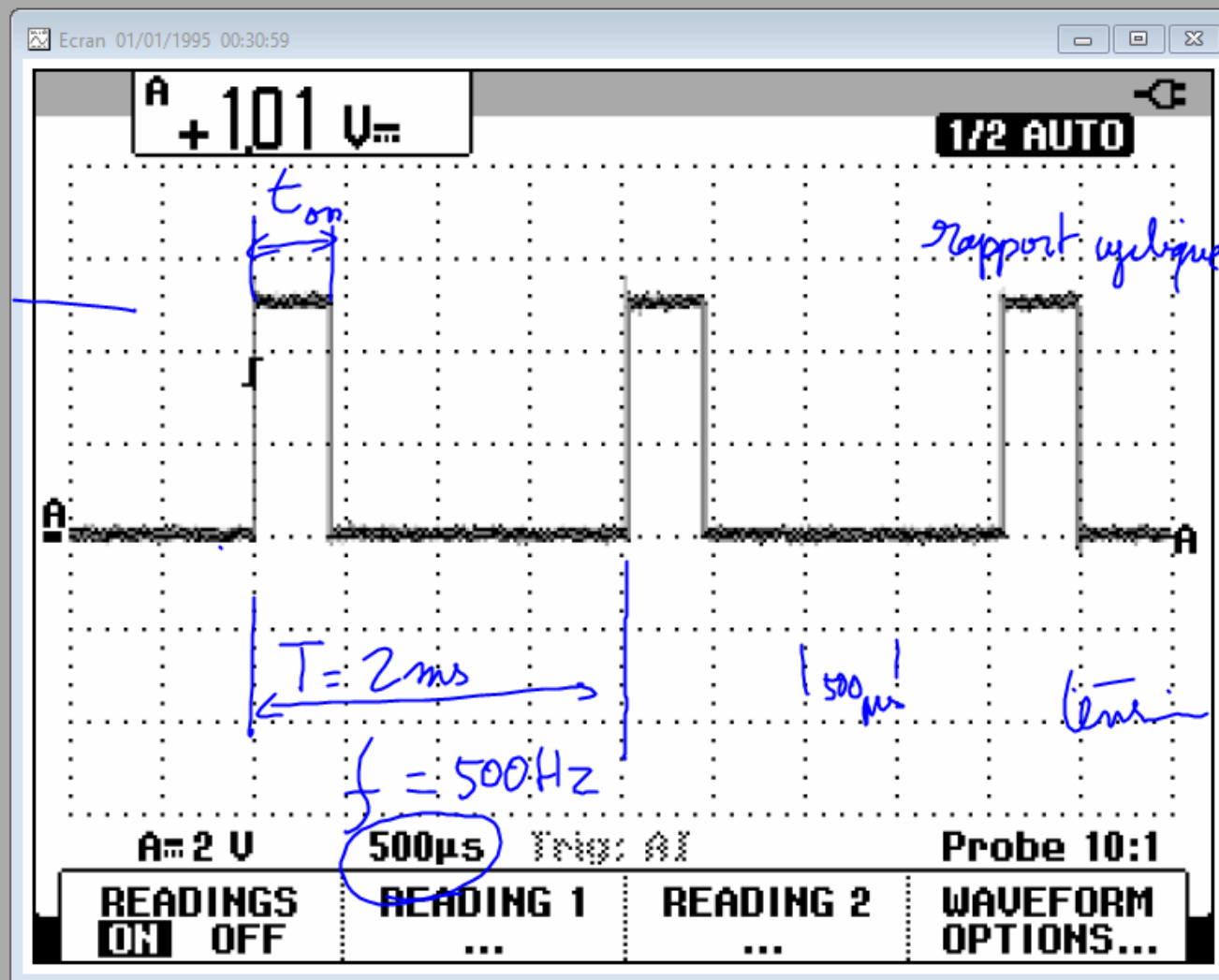


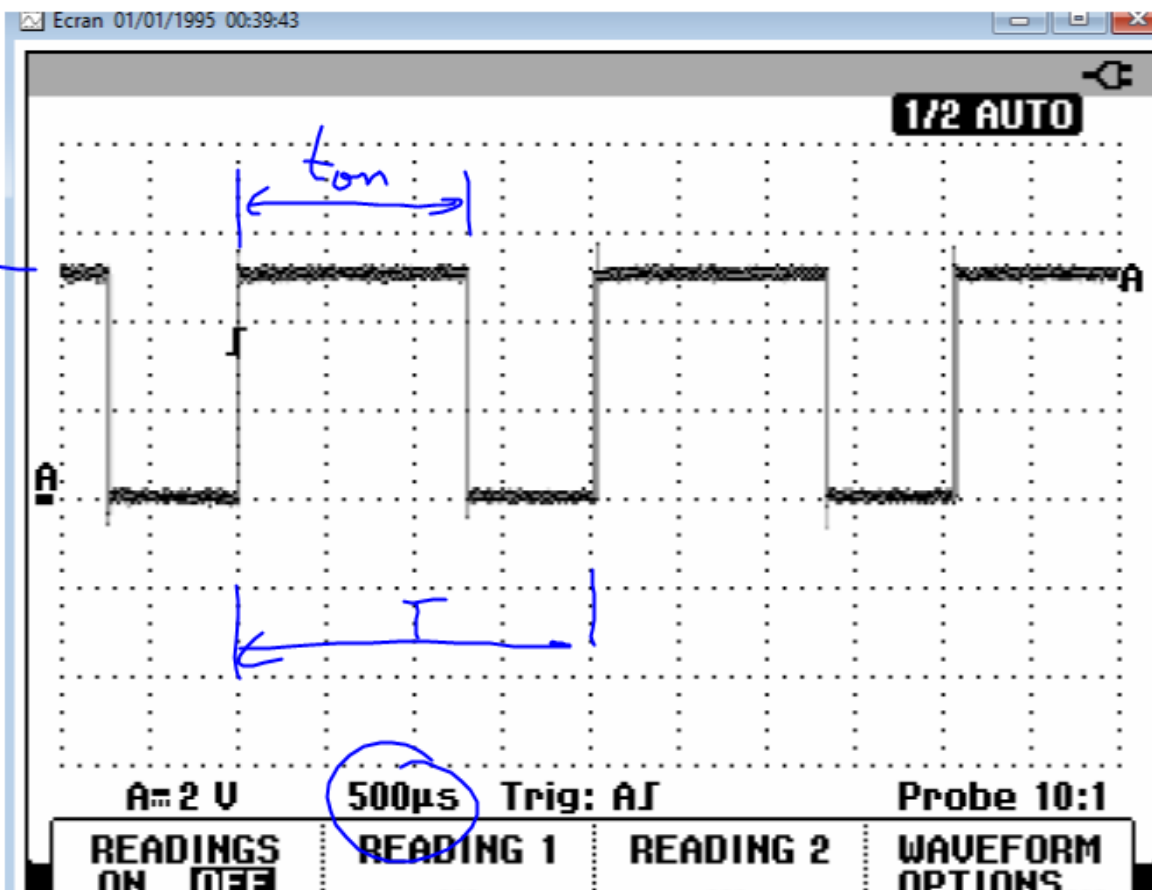
Téléversement terminé

Le croquis utilise 962 octets (2%) de l'espace de stockage de programmes. Le maximum est de
Les variables globales utilisent 9 octets (0%) de mémoire dynamique, ce qui laisse 2039 oct



5V





$$U_{\text{moy}} = U_{\text{max}} \cdot \frac{t_{\text{on}}}{T}$$

$$= 5 \cdot \frac{1,3}{2}$$

$$\approx 3,25 \text{ V}$$