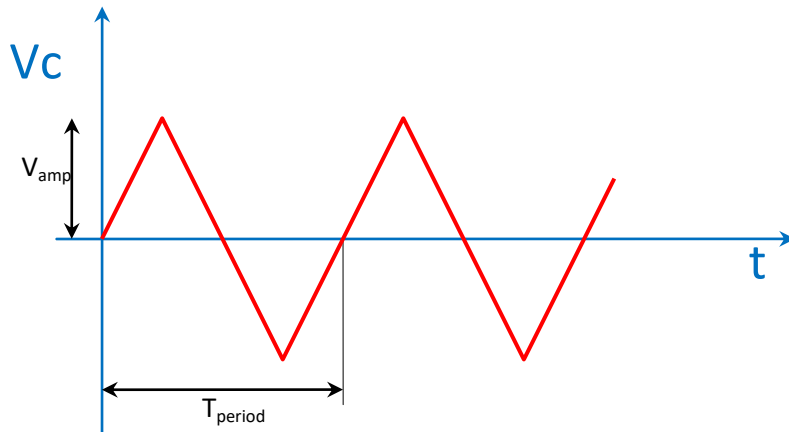


## eNPR VOLTAGE PROTOCOL LIST

### 1) Triangular wave (infinite repetition)

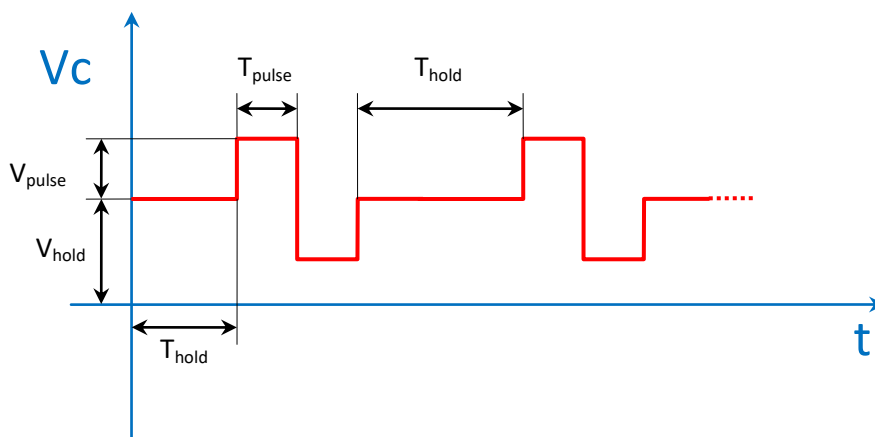


Triangular wave parametric. Possible values:

$V_{amp} = 25, 50, 75, 100 \text{ mV}$

$T_{period} = \text{variable from } 1\text{ms to } 1000\text{ms}$

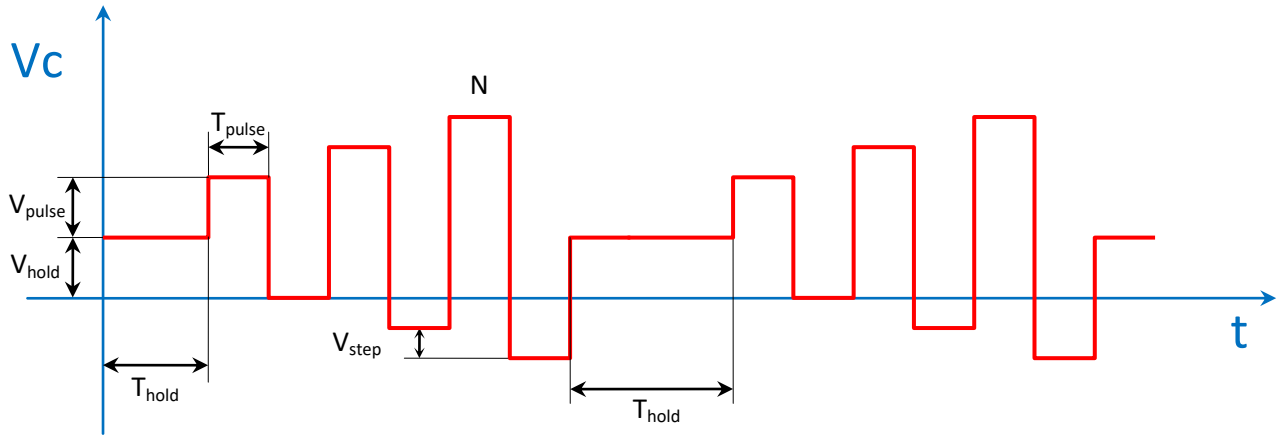
### 2) Seal Test (infinite repetition)



Parameters:  $V_{hold}$ ,  $V_{pulse}$ ,  $T_{pulse}$ ,  $T_{hold}$

### 3) Conductance estimation

*Test for the conductance estimation.*



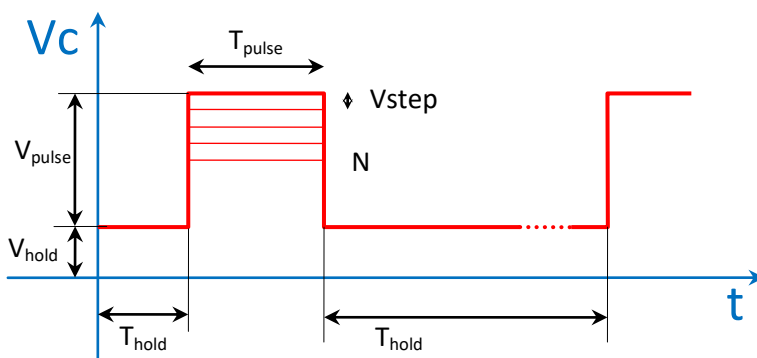
Parameters:  $V_{hold}$ ,  $V_{pulse}$ ,  $V_{step}$ ,  $T_{pulse}$ ,  $T_{hold}$ ,  $N$ ,  $NR$

$N$ : number of symmetric pulses

$NR$ : number of repetition of the protocol. If 0, infinite repetitions.

### 4) Rectangular pulse with variable amplitude

*Pulse with amplitude variable between two consecutive pulses of  $V_{step}$  quantity*



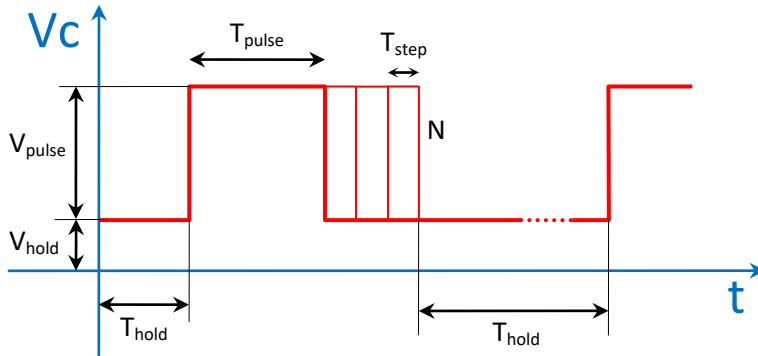
Parameters:  $V_{hold}$ ,  $V_{pulse}$ ,  $V_{step}$ ,  $T_{pulse}$ ,  $T_{hold}$ ,  $N$ ,  $NR$

$N$ : number of pulses with changing amplitude from the previous pulse

$NR$ : number of repetition of the protocol. If 0, infinite repetitions.

## 5) Rectangular pulse with variable duration

Variation of the time duration of the pulse of the quantity  $T_{step}$



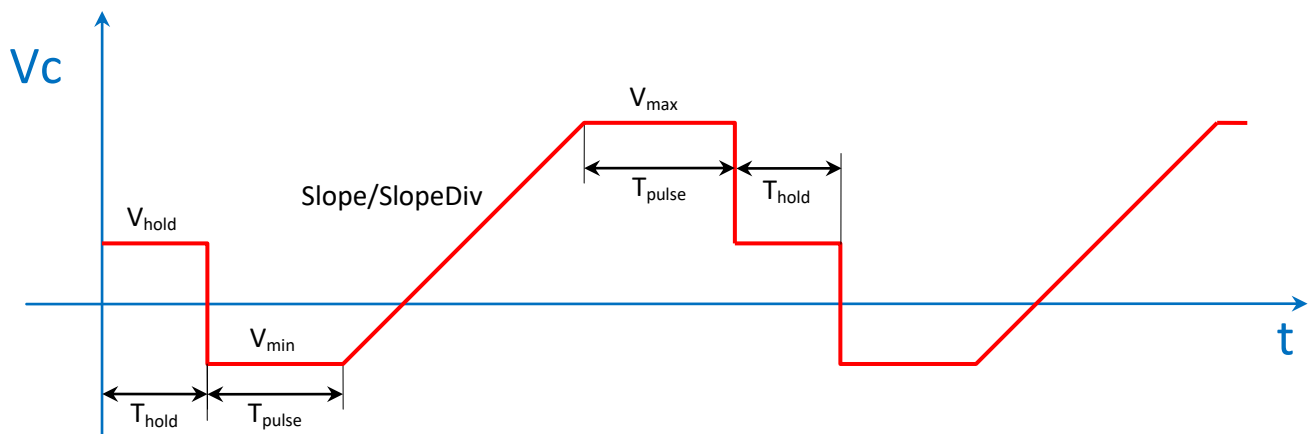
Parameters:  $V_{hold}$ ,  $V_{pulse}$ ,  $T_{pulse}$ ,  $T_{step}$ ,  $T_{hold}$ ,  $N$ ,  $NR$

$N$ : number of pulses with changing duration from the previous pulse

$NR$ : number of repetition of the protocol. If 0, infinite repetitions.

## 6) Ramp

The min voltage step is  $62,5 \mu V$ .



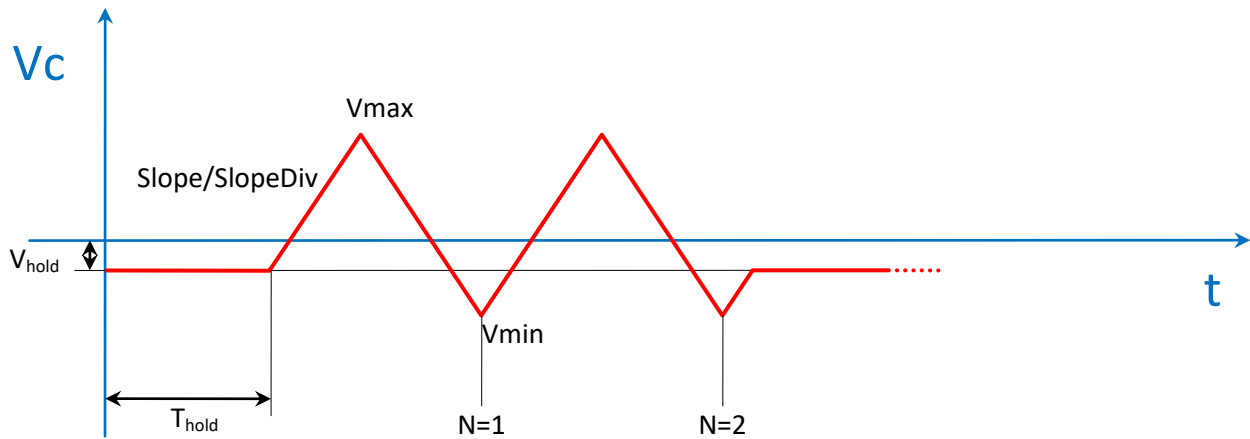
Parameters:  $V_{hold}$ ,  $V_{min}$ ,  $V_{max}$ ,  $T_{pulse}$ ,  $T_{hold}$ ,  $NR$ ,  $Slope$ ,  $SlopeDiv$

$NR$ : number of repetition of the protocol. If 0, infinite repetitions.

$SlopeDiv$ : divisor of the  $Slope$  parameter. Enables the creation of very slow ramps

## 7) Cyclic voltammetry

The min voltage step is 62,5  $\mu$ V.



Parameters: Vhold, Vpulse, Vmin, Vmax, Slope, N

N: number of cycle Vmax-Vmin-Vmax

SlopeDiv: divisor of the Slope parameter. Enables the creation of very slow ramps

### Ranges for Voltage protocol parameters:

Vhold:  $\pm 2000$  mV (Normal Low Noise modality) /  $\pm 700$  mV (Ultra Low Noise modality), min step 1mV

Vpulse:  $\pm 2000$  mV (Normal Low Noise modality) /  $\pm 700$  mV (Ultra Low Noise modality), min step 1mV

Vstep:  $\pm 2000$  mV (Normal Low Noise modality) /  $\pm 700$  mV (Ultra Low Noise modality), min step 1mV

Vmax:  $\pm 2000$  mV (Normal Low Noise modality) /  $\pm 700$  mV (Ultra Low Noise modality), min step 1mV

Vmin:  $\pm 2000$  mV (Normal Low Noise modality) /  $\pm 700$  mV (Ultra Low Noise modality), min step 1mV

Tpulse: from 0 to  $2^{28} * 1$  ms, equal to about 74h

Thold: from 0 to  $2^{28} * 1$  ms, equal to about 74h

Tstep: from 0 to  $2^{27} * 1$  ms, equal to about 37h, with sign

N: number of repetition of pulses, from 1 to 1000

NR: number of repetition of the full set of pulses, from 1 to 1000. If 0, infinite repetition of the full set of pulses.

Slope: inclination of the ramp, in mV/ms, variable from 1mV/ms to 1000mV/ms

SlopeDiv= 1 , 1000