

# Modulation techniques

Pulse amplitude modulation, Digital pulse modulation

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# Analog Pulse Modulation techniques

- Sample  $\rightarrow$  Pulse
- Pulse properties: amplitude, width, phase/position
- Modulation technique for each property: PAM, PWM, PPM

# Pulse Amplitude Modulation

- Sequence of finite-width  $\tau$  pulses
- Signal level  $\rightarrow$  pulse height
- Analog signal sampled at pulse edge:  $m_\delta = m(nT_s)\delta(t - nT_s)$
- Holding circuit:  $h(t) = \text{rect}\left(\frac{t - \frac{1}{2}\tau}{\tau}\right)$