OUTPUT SIGNALS

SINUSOIDAL VOLTAGE SIGNALS 1 VPP

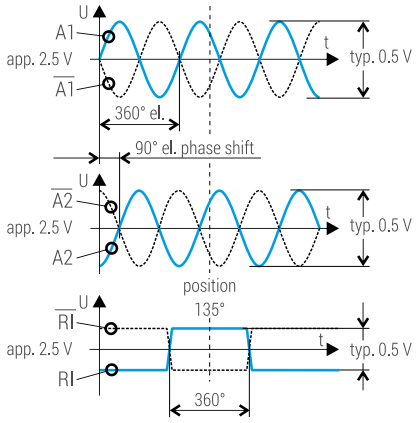
(drawing shows „positive counting direction“)
Two sinusoidal voltage signals A1 and A2 and one reference mark signals (all with inverted signals).

Power supply: +5 V ±5 %, max. 150 mA (unloaded)
Track signals (differential voltage A1 to $\overline{A1}$ resp. A2 to $\overline{A2}$):
Signal amplitude 0.6 Vpp to 1.2 Vpp; typ. 1 Vpp
(with terminating impedance Zo = 120 Ω between A1 to $\overline{A1}$ resp. A2 to $\overline{A2}$)

Reference mark (differential voltage RI to $\overline{RI}$):
Square-wave pulse with an amplitude of 0.8 to 1.2 V; typ. 1 V
(with terminating impedance Zo = 120 Ω between RI to $\overline{RI}$)

Advantage:
High traversing speed with long cable lengths possible.

Voltage signals (1 Vss)



SQUARE-WAVE SIGNALS

(drawing shows „positive counting direction“)
With a Schmitt-trigger (for times 1) or integrated interpolation electronics (for times 2, -5, -10, -20, -25, -50 or -100) the photoelement output signals are converted into two square-wave signals that have a phase shift of 90°. Output signals either can be „single ended“ or line driver „differential“ (RS 422). The resolution equates to the distance between two edges of the square-wave signals.

The controls/DRO's must be able to detect each edge of the square-wave signals. The minimun edge separation a_{min} is listed in the technical data and refers to a measurement at the output of the interpolator (inside the reading head). Propagation-time differences in the line driver, the cable and the line receiver reduce the edge separation.

Propagation-time differences:
Line driver: max. 10 ns
Cable: 0.2 ns/m
Line receiver: max. 10 ns (referred to the recommended line receiver circuit)

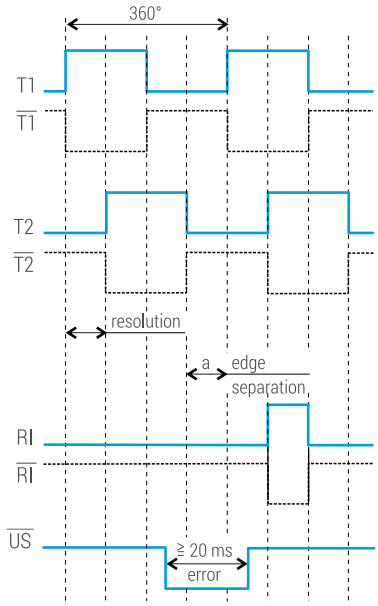
To prevent counting errors, the controls/DRO's must be able to process the resulting edge separation.

Exapmle:
a_{min} = 125 ns, 10 m cable
125 ns - 10 ns - 10 x 0.2 ns - 10 ns = 103 ns

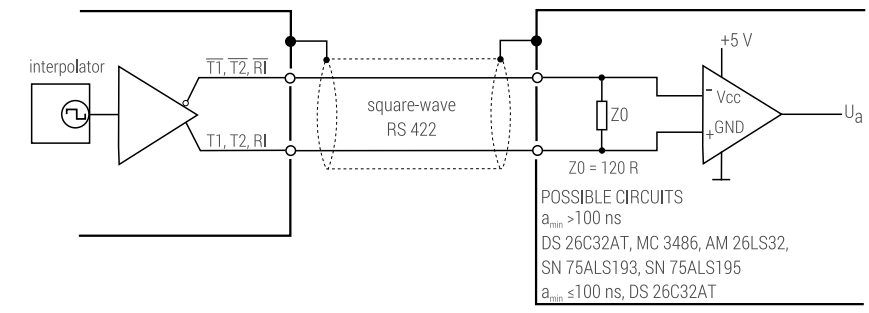
Power supply: +5 V ±5 %, max. 180 mA (unloaded)

Advantages:
- Noise immune signals
- No further subdividing electronics necessary

Square-wave signals „differential“



Recommended line receiver



„Positive counting direction“