

OUTPUT SIGNALS

SINUSOIDAL VOLTAGE SIGNALS 1V_{pp}

(drawing shows "positive counting direction")

Power supply: +5V ±10%, max. 130 mA (unloaded)

Track signals (differential voltage A1+ to A1- resp. A2+ to A2-):

Signal amplitude 0.6 V_{pp} to 1.2 V_{pp}; typ. 1 V_{pp}

(with terminating impedance $Z_0 = 120 \Omega$ between A1+ to A1- resp. A2+ to A2-)

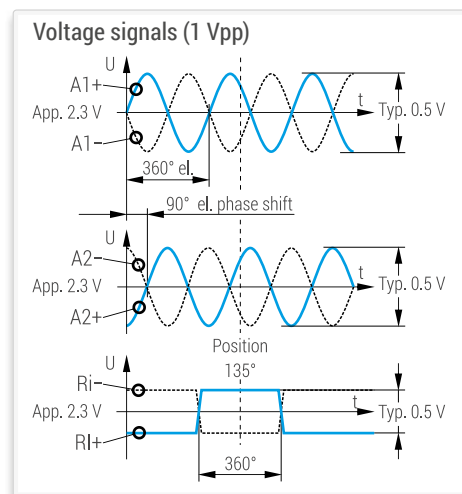
Reference mark (differential voltage RI+ to RI-):

Square-wave pulse with an amplitude of 0.8 up to 1.2 V; typical 1 V

(with terminating impedance $Z_0 = 120 \Omega$ between RI+ to RI-)

Advantage:

- High traversing speed with long cable lengths possible.



SQUARE-WAVE SIGNALS

(drawing shows "positive counting direction")

With an interpolation electronics (for times -1, -2, -5, -10, -20, -25, -50, -100 or -200) the photoelement output signals are converted into two square-wave signals that have a phase shift of 90°. The output signals are „differential“ via line driver (RS 422). One measuring step reflects the measuring 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 minimum edge separation a_{\min} is listed in the technical data and refers to a measurement at the output of the interpolator (inside the scanning 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 per meter

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.

Example:

$a_{\min} = 200 \text{ ns}$, 10 m cable

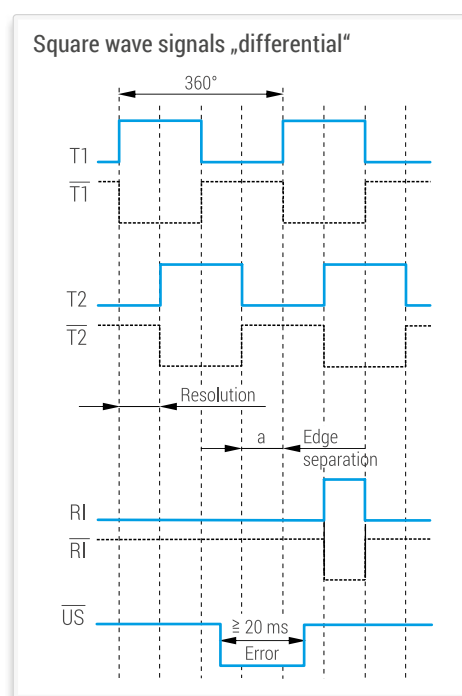
$200 \text{ ns} - 10 \text{ ns} - 10 \times 0.2 \text{ ns} - 10 \text{ ns} = 178 \text{ ns}$

Power supply: +5 V ±10%, max. 165 mA (unloaded)

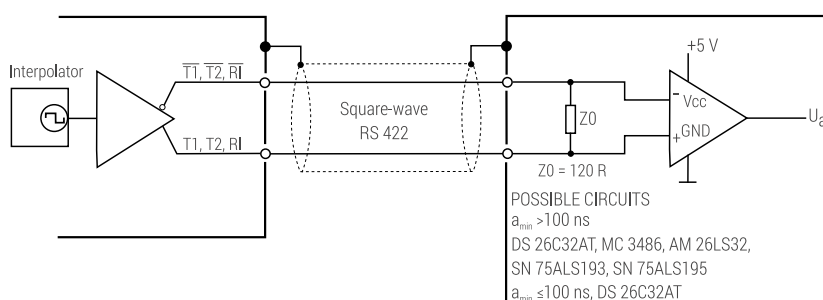
Advantage:

- Noise immune signals

- No further subdividing electronics necessary



Recommended line receiver circuit



Counting direction

