

1-1 Features1.

The K3NR Frequency/Rate Meter displays desired values after converting input pulses.

The K3NR has the following functions.

Operating mode	Function
1	Displays rotational or circumferential speed of a single input.
2 to 5	Displays the calculation results of two rotational inputs.
6	Displays passing time calculated from the frequency and process length of a single input.
7	Counts and displays the number of pulses.

Measurement

The internal system clock counts the ON/OFF time (T) of sensor input or other input and automatically calculates the frequency. The number of revolutions is calculated from the result of the frequency multiplied by 60.

$$\text{Sensor input pulse ON/OFF time (T)} = \frac{1}{f}$$

$$\text{Frequency (f)} = \frac{1}{T}$$

- Rotational speed (rpm) = $f \times 60$
- Circumferential speed = Circumference x revolutions
- Passing time = Length of processing/Circumferential speed
- Pulse counting

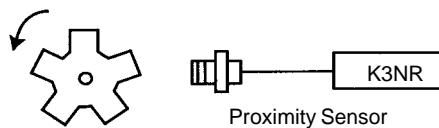
If there is any pulse input, the input will be automatically converted numerically and displayed.

Prescaling

The number of input pulses is converted into a desired value.

Enables the K3NR to display the revolutions or rotational speed. It is necessary to multiply the number of pulses per revolution or circumference by a certain factor. This factor is called the prescaling value.

Example:



$\text{rpm} = f \times 60 \times a$
 f : Input pulse frequency (number of pulses per second)
 a : Prescale value
 If there are five pulses per rotation, the accurate rotational speed can be calculated if $a = 1/5$ ($= 0.2 = 2 \times 10^{-1}$).

Comparative Output Selection

Comparison output patterns can be selected from the standard, level, or zone output depending on the application.

Refer to *Comparative Output Patterns*, page 94.

Linear Output	Refer to <i>Linear Output Range</i> , page 98.
BCD Output	<p>A digital data output format where every four binary bits is numerically equivalent to one decimal digit.</p> <p>Refer to <i>Section 7 BCD Output</i>.</p>
Communications Output	Refer to the <i>Communications Manual</i> .
HOLD	<p>HOLD is an external input which is used to stop the A/D process and freeze the display. The comparative, linear, and BCD outputs are also retained.</p> <p>Refer to <i>5-3 External Input Signals</i> for details.</p>
RESET	<p>RESET is an external input to reset the present max./min. values and counting values. The process value when the RESET is ON is set as the maximum and minimum values. The counting value is reset to zero. The max./min. values and counting values can be reset using the front panel keys.</p> <p>Refer to pages 125 and 126.</p>
Teaching	<p>The K3NR is provided with a teaching function that can set an actual measured value as a setting value without key input.</p> <p>This function is useful for setting parameters while checking the operating status of the K3NR.</p> <p>The teaching function can be used to set the set and prescaling values. It can be also used to set the linear output range of the K3NR with a Linear Output Board.</p> <p>Refer to <i>6-1 Teaching Function</i> for details.</p>
Output Test	<p>This function is convenient for checking a system to which the K3NR is connected, especially when some inputs cannot be operated. The K3NR simulates an input to check the output conditions.</p> <p>Refer to <i>6-2 Output test</i> for details.</p>
Hysteresis	<p>The established setting value includes a hysteresis setting to prevent “chattering” of the output when the measured value fluctuates in the vicinity of the setting values.</p> <p>Hysteresis is enabled when the measured value is starts to become smaller than the HH and H setting values and larger than the LL and L setting values.</p> <p>Refer to <i>Hysteresis</i>, page 92.</p>
Startup Compensation Time	<p>The startup compensation time parameter keeps the measurement operation from sending an unnecessary output corresponding to instantaneous, fluctuating input from the moment the K3NR is turned ON until the end of the preset period.</p> <p>Refer to <i>Startup Compensation Time</i>, page 88.</p>

Remote/Local Selection

The K3NR can be operated remotely through a host computer or locally with key inputs.

Remote Mode: For programming remotely by downloading setup parameters from a host computer via RS-232C, RS-485, or RS-422.

Local Mode: Programming is performed with the front panel key input.

Refer to *Remote/Local Programming*, page 101.

Process Time for Averaging Measured Value

Setting process time for averaging measured value prevents the display from fluctuating due to unstable input.

Refer to *Process Time for Averaging Measured Value*, page 85.

Auto-Zero Time

The input pulse frequency does not drop to zero perfectly due to the estimated frequency calculation of the K3NR. Therefore, the K3NR has a function to calibrate the frequency to zero forcibly should no input pulse be received for a certain period. The period during which no pulse is received before the K3TR sets the frequency to zero is called "auto-zero time."

Refer to page 74.