Instruction Manual

ASL-62 Frequency, RPM Meter Instruction Manual

Version 1.1

1. Features

This multifunctional meter is designed to provide automation solution for a broad range of applications. It can be used as a frequency or RPM meter. It allows you to activate the relay at a specific frequency or rotation speed.

2. Specification

Input signal	Signal input level, low: -30V~+0.6V, high: +4V~+30V)
Sensor type	Optical coupler, proximity sensor, hall sensor, encoder
Power supply	DC 9-30V
Alarm relay output	3A(resistive load)
Relay life	100,000 times
Sample time	1 second; Maximum meaurable frequency: 50KHz
Display range	0~999999
Multiplier	Factors A and b. Reading = input pulses x A/b
Operating temperature	0-50 °C
Operating Humidity	< 85% RH
Dimension	96 x 48 x 82 mm (3.8x1.9x3.3 inch)
Panel outcut	93 x 46 mm (3.66x1.81inch)

3. Front Panel and Operation

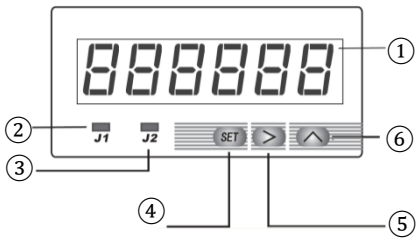


Figure 1. Front panel

① LED digital display. Shows the measured value
② J1 relay indicator. It lights up when J1 relay is on
③ J2 relay indicator. It lights up when J2 relay is on
④ SET key: set/confirm
⑤ Shift key: shift digit/select the previous parameter
⑥ Increment/reset key: select the next parameter/reset

4. Terminal Assignment

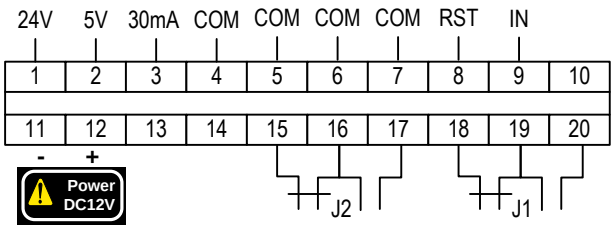


Figure 2. Wiring diagram

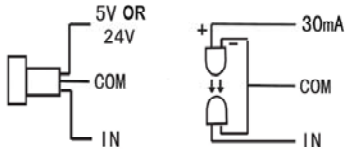


Figure 3. Proximity sensor (left) and Optical coupler (right) wiring

Note: Proximity sensor wiring above is for NPN type sensor. Add a 512 ohm resistor between IN and COM for PNP type sensor.

5. Meter type, System Configuration and Relay Mode

5.1 Set meter type (accessed by code PP0089)

The meter type parameter is listed in Table 1. To change the setting, press SET, enter code" PP0089", then press SET again. Press Λ or > to change the setting for the parameter P-SN. Press SET to confirm; Press Λ or > to select END. Press SET to exit. Please see Figure 4 for details.

Table 1. Meter type parameter setting

Symbol		Description	Setting Range	Initial	Note
P-Sn	P-Sn	Meter type setting	1, 2	1	1
End	End	Exit			

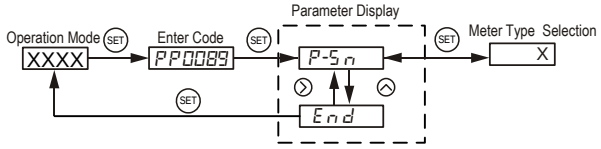


Figure 4. Meter type setup flow chart

Note 1. Set P-Sn to 000001 to use the meter as a tachometer (default); set to 000002 to use it as a frequency meter.

5.2 System Configuration Parameter (accessed by code PP0036)

The system configuration parameters are listed in Table 2. To change the parameters, press SET, enter code "PP0036", press SET again. Then, follow the flow chart in Figure 5.

Table 2. System configuration parameter setting

Symbol		Description	Setting Range	Initial	Note
r1Sn	r1Sn	Relay J1 working mode	1, 2, 3	1	2
r2Sn	r2Sn	Relay J2 working mode	1, 2, 3	1	3
FILt	FILt	Digital filter	0, 1, 2, 3	1	4
A	A	Multiplier	-199999~999999	1	5
b	b	Multiplier	1~999999	1	5
dot	dot	Decimal point	------~-.-----	------	5
End	End	Exit			

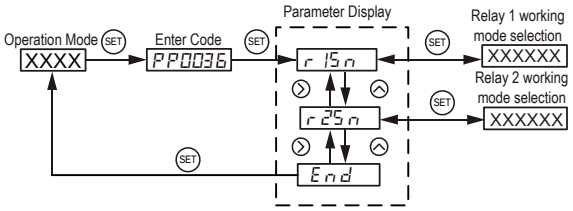
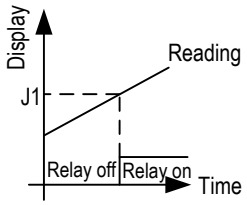


Figure 5. Relay working mode setup flow chart

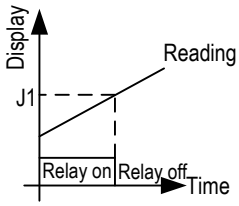
1) Press SET to enter setting mode;
2) Press >, Λ to enter parameters;
3) Press SET to confirm;
4) Press Λ or > to select the new parameter.

Note 2. Relay J1 working mode (r 1Sn): 1, 2, 3



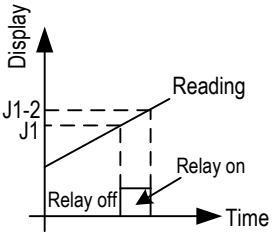
r1Sn=01

Relay pulls-in when reaches the set value J1, the meter continues counting



r1Sn=02

Relay drops-out when reaches the set value J1, the meter continues counting



r1Sn=03

If J1-2>J1, relay pulls-in when reaches the set value J1, and it drops out when reaches the set value J1-2.

If J1-2<J1, relay drops-out when reaches J1-2, and it pulls-in when reaches J1.

If J1=J1-2, then the relay keeps the previous state, closed or open.

Figure 7. Relay working mode

Note 3. Relay J2 working mode (r 2Sn)

It acts the same way as the relay J1 does.

01-Relay pulls-in when reaches the set value J2, the meter continues counting.

02-Relay drops-out when reaches the set value J2, the meter continues counting.

03- If J2-2>J2, relay pulls-in when reaches the set value J2, and it drops out when reaches the set value J2-2. If J2-2<J2, relay drops-out when reaches J2-2, and it pulls-in when reaches J2. If J2=J2-2, then the relay keeps the previous state, closed or open.

Note 4. Digital Filter (FILt).FILt=0, filter disabled; FILt=1, weak filtering effect; FILt=3, strongest filtering effect. Stronger filtering increases the stability of the readout display, but causes more delay in the response to change in reading.

Note 5. Multiplier A and b.

Display reading=number of pulses received x A/b

Please set the parameter dot for the display resolution.

5.3 Alarm setting (accessed by code PP0001)

To change the parameters, press SET, enter code "PP0001", press SET again. The parameter flow chart is similar to Figure

Table 2 Alarm parameters

Symbol		Description	Setting Range	Initial
J1	J1	Relay J1 trigger value 1	-1999999~999999	20000
J1-2	J1-2	Relay J1 trigger value 2	-1999999~999999	40000
J2	J2	Relay J2 trigger value 1	-1999999~999999	20000
J2-2	J2-2	Relay J2 trigger value 2	-1999999~999999	40000
J2-t	J2-t	Relay J2 delay time	0.1~99999.9	0.1
End	End	Exit		

6. Examples

6.1 Measuring RPM

Set meter type to tachometer, P-Sn=000001. If the meter receives 1 pulse per revolution, then the minimum measurable value is 60 rpm. If the speed is less than 60 rpm, you need to install an uniform distributed gear on the axis, and set the decimal point, multiplier A and b to the right values (see Table 3) to get the expected reading.

Table 3. The relative values for parameters A, b and dot.

Pulses per revolution	Multiplier A	Multiplier b	dot	Minimum measurable rpm	Maximum measurable rpm
1	000001	000001	- - - - - -	60	999999
1	000001	000001	- - - - -.-	60	99999.9
2	000001	000002	- - - - -.-	30	99999.9
10	000001	000010	- - - - - -	6	999999

6.2 Measuring Linear Velocity.

Set meter type to tachometer, P-Sn=000001.

If V is the linear velocity, units in m/s.

N is the speed of revolution, units in r/s.

r is the radius, units in m.

Then the angular velocity to linear velocity formula is:

$$V=\pi Nr/(30 \times \text{pulses per revolution})$$

Display reading=number of pulses received x A/b

To set the multiplier A and b, set A/b=π r/(30 x pulses per revolution), then get the values A and b. Input the values to the meter and connect the sensor to it. The reading would be the linear velocity.

If you want to improve the display resolution, you can shift the decimal point n digits to the left and multiply A/b by 10^n. Otherwise, shifting the decimal point n digits to the right and multiply A/b by $1/10^n$ to improve the display stability

For example: To measure the linear velocity of the axis, if the diameter is 150 mm, and the rotational speed is very low, we can install a pulse encoder to output 2000 pulses per revolution, the unit of the display reading should be in mm/s.

Set the meter type to tachometer, P-Sn=000001;

$$A/b=\pi r/(30 \times \text{pulses per revolution}) = 0.003925$$

The table 4 is for reference about the value A, b and decimal point settings.

Table 4. The relative values for A, b and dot.

Multiplier A	Multiplier b	dot	Display reading	Display resolution
3925	999999	- - - - - -	x	1
3925	100000	- - - - -.-	x.x	0.1
3925	1000	- - - -.--	x.xx	0.01
3925	100	- - -.- - -	x.xxx	0.001
3925	10	- -.- - - -	x.xxxx	0.0001
3925	1	-.- - - - -	x.xxxxx	0.00001

6.3 Measuring frequency.

Set the meter to frequency meter, P-Sn=000002.

The minimum measurable frequency is 1Hz, the maximum is 60000Hz. Set parameters A, b and dot to the right values to improve the resolution. See table 5 for details.

Table 5. The settings to improve the display resolution.

Multiplier A	Multiplier b	Resolution	dot	Min measurable frequency	Max measurable frequency
000001	000001	1	000000	1Hz	600000Hz
000010	000001	0.1	00000.0	1.0Hz	60000.0Hz
000100	000001	0.01	0000.00	1.00Hz	6000.00Hz
001000	000001	0.001	000.000	1.000Hz	600.000Hz
001000	000001	0.001	00.0000	1.0000Hz	600.000Hz

For example, to measure the electronic frequency with 0.01 Hz resolution: Connect the 5V output of the 120V/5V transformer to the terminals IN and COM of the meter. Alarm will turn on when the measured value is 60.10Hz or 60.20Hz.

Then, set the meter to frequency meter, P-Sn=000002; A=000100, b=000001, dot=0000.00 (display resolution 0.01Hz); J1=0060.10, J2=0060.20.

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