L50-Z18 Adapter for Incremental Encoder for rotation speed measurement

General

This plug-on adapter for LMG500 converts pulses of common industrial incremental encoders into analogue voltage. This voltage can also be analysed graphically with high temporal resolution by using sensor input of LMG500. Compared to this, encoder input of process signal interface provides one sample each measuring cycle.

Description

Incremental encoders (speed sensors) with TTL technology (supply +5V and GND) or HTL technology (supply +5V and –5V) can be connected. There are four colour coded measuring ranges of the adapter to align with different pulse rates Z of the incremental encoder and maximum revolutions per minute Nmax.
Attention! Read measuring value Idc, only this presents exact speed values according to absolute value and sign (depending on sense of rotation)!Positive output voltage is seen in case A signal leads electrically by 90° to B signal. This equals usually to clockwise rotation when looking onto the encoder shaft.

Ripple

As a matter of principle of frequency to voltage conversion there is a ripple at low revolution on output voltage. Built-in filters are optimised for short settling time without overshooting. In case that remaining ripple is too high, this can be reduced with the settings of LMG, for example
1. Selectable adjustable low pass in measuring channel (filter)
2. Extension of measuring cycle time (cycle)
3. Averaging over a couple of measurement cycles (average)

Selection of the filter is always a compromise of fast reaction on variation of input signal and reduction of ripple on output signal. The user can find optimal setting weighing these antithetic approaches.

Version for LMG450

The version L45-Z18 is also available for use at current sensor input of LMG450 with identical electrical and measuring specifications.

Revision: 7/ November 2006 hg
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Properties of the measuring ranges

Measuring range	LED Colour	**Red**	**Yellow**	**Green**	**Blue**
Position of the slide switch (rear of device)	Unit	Left most	Left	Right	Right most
Z*Nmax (Pulse rate max. revolution)	1 / min	144000	576000	2304000	9216000
Specified tolerance	% of m.value + % of m.range	+- (0.1 + 0.1)	+- (0.1 + 0.1)	+- (0.1 + 0.1)	+- (0.1 + 0.1)
Max. pulse input frequency using A and B	Hz	2400	9600	38400	153600
Formula for "Scale"	1 / min	1152000 / Z	1152000 / Z	1152000 / Z	1152000 / Z

"Z" is the number of pulses per rotation of the used incremental encoder (speed sensor)

Scaling

In range menu of LMG500 you can set the calculated scale value of the last line from above mentioned chart, depending on the pulse rate Z per rotation of the used incremental encoder. Then the revolution will be presented correctly in value 1/min on the display. The unit will however be A (or V)! Displayed 1.465kA means 1465 1/min. For further user-friendly presentation utilise capabilities of LMG500 built-in formula editor and user defined menu.

Pin assignment

9 pin D-Sub connector (male) to incremental encoder

Pin No.	1	2	3	4	5	6	7	8	9	Screen
Function	Supply +5V	Supply -5V	GND (on screen)	Input A	Input B	No connection (internal test pins)				Screen (on GND)

Pulse input A and B

Permissible input voltage: U_{low}min = -30V@-1.4mA, U_{low}max=+0.8V@0.001mA
U_{high}min=+2V@0.002mA, U_{high}max=+30V@1.2mA

Input resistance: 1MΩ@0V<Uin<+5V
22kΩ@-30V<Uin<+30V

Encoder Supply

Voltage: ±5V ±10%
Load: max. ±100mA

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