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Servo processor module

For use with the HP-UHU and other UHU based servo drives

KEY FEATURES

- Pin compatible with the original UHU chip.
- PID loop with velocity and acceleration feed-forward.
- Integrator can be inhibited while motor is in motion.
- Adjustable servo loop rate.
- Sliding scale following error trip limit.
- Data recorder.
- Antidither function with settable region and gain.
- Digital filter on encoder inputs.
- Digital filter on fault-input.

KEY BENEFITS

- Higher step-rates
- Higher encoder resolution

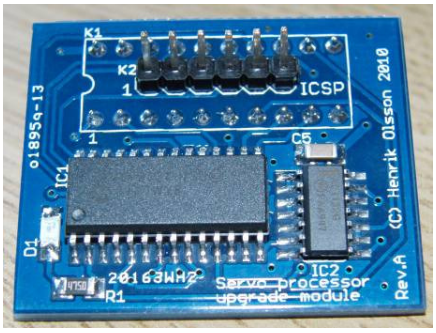


Photo of the module.

Product Highlights

The servo processor module will increase the performance of your UHU based servo drive by allowing higher encoder resolutions and higher step rates than previously possible. It will keep up with step rates above 1Mhz and encoder frequencies of up to 2.5Mhz.

Pin compatible with the UHU chip

The module was designed to be a drop in replacement for the UHU chip. It features the same pin out and has the same inputs and outputs as the UHU chip. See page 2 for details.

Enhanced PID loop

Some of the settings for the PID loop are:

- Proportional, integral & derivative gain
- Adjustable integral time constant
- Velocity and acceleration feed forward gain
- Adjustable output offset

Sliding scale following error

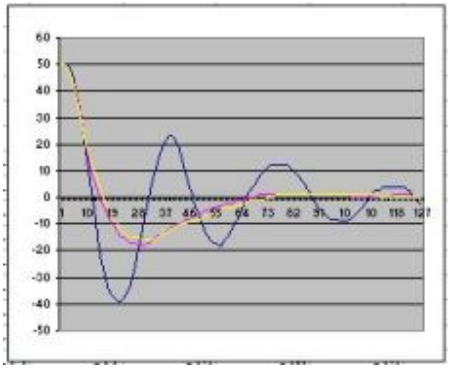
With the sliding scale following error feature it is possible to allow a larger following error for a higher commanded velocity yet keep a very “tight” limit at slower speeds. The point at which the servo trips due to a following error “slides” a long a linear curve based on the commanded velocity.

Data recorder

The data recorder feature allows one of several internal values like following error or motor velocity to be recorded into a 128 entries deep buffer at a selectable rate up to 2800Hz. When the buffer is full the values are sent to the PC as plain text and can then be plotted in EXCEL etc.

Technical specifications

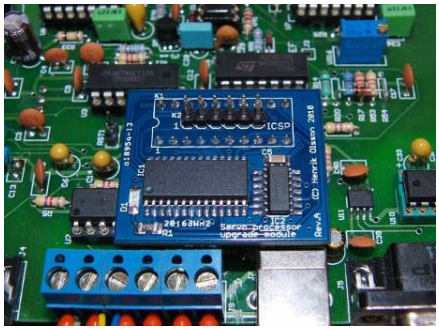
General specifications		
Step frequency	>1MHz	Verified on HP-UHU
Encoder frequency	2.5MHz	After quad. decoding
Baud rate	57600 8N1	TTL level serial
Servo loop rate	1220-2800Hz	Adjustable in 10 steps
Operating voltage	4.8V – 5.2V	5V nominal
Current consumption	TBD	
PWM Output freq.	19.455kHz	Locked antiphase
Output swing	8-92%	Default 13-87%
Physical size	41 X 31mm	



EXCEL plot of step response.

Module pin out			
Pin 1	Reset\ (Acitve low)	Pin 11	N/U
Pin 2	RXD (To module)	Pin 12	Encoder A
Pin 3	TXD (From module)	Pin 13	Encoder B
Pin 4	N/U	Pin 14	Fault input
Pin 5	N/U	Pin 15	PWM output
Pin 6	Step (active low) *	Pin 16	Enable output
Pin 7	Direction	Pin 17	Fault Output
Pin 8	N/U	Pin 18	Firmware status *
Pin 9	N/U	Pin 19	N/U
Pin 10	GND / Vss	Pin 20	+5v / Vcc

*See note below.



Module mounted on HP-UHU

Differences between the UHU and the module

- The servo processor module “steps” on the falling edge of the step signal while the UHU steps on the rising edge. Inverting the polarity of the step-pulse in the control software is recommended.
- The firmware status output operates differently on the servo processor module than on the UHU chip. More details regarding this are available in the manual.
- The baud rate for communicating with a host PC is different than on the original UHU chip.
- For compatibility the output swing is by default limited to the same as on the UHU chip. This can however be increased further if supported by the hardware onto which the module is mounted.

ADDITIONAL INFORMATION

More information can be found at:
www.henriksplace.se/servo