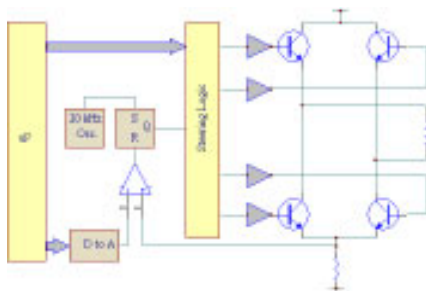


The Clever Drive is now FULL-Digital



D/A drive basic schematic

Digital/analog (D/A) Drives technology

Since the beginning of '80s years, the Ever programmable motion controllers, controlled by a microprocessor in a mixed D/A device technology, can manage, through an user program developed in a Windows operating system, the typical PLC's resources, like serial links, I/O lines, timers, counters etc...while at the same time driving the step motor in the best way for its own electro-mechanical characteristics.

The current regulating stages of EVER drives, since a while indeed, adopt proprietary solutions to follow the analog winding current reference values, generated by the drive controlling microprocessor, in order to obtain winding current in sinusoidal wave shapes with very low odd harmonics ratings.

Thanks to this current shaping, optimized according to the actual step's angle and rate, the EVER drives, unlike the competitors common drives, are able, without any rotor oscillation damping device, to make the motor rotation extremely smooth, either at low and at high rotation speed, getting the maximum output torque with the minimum motor overheating.

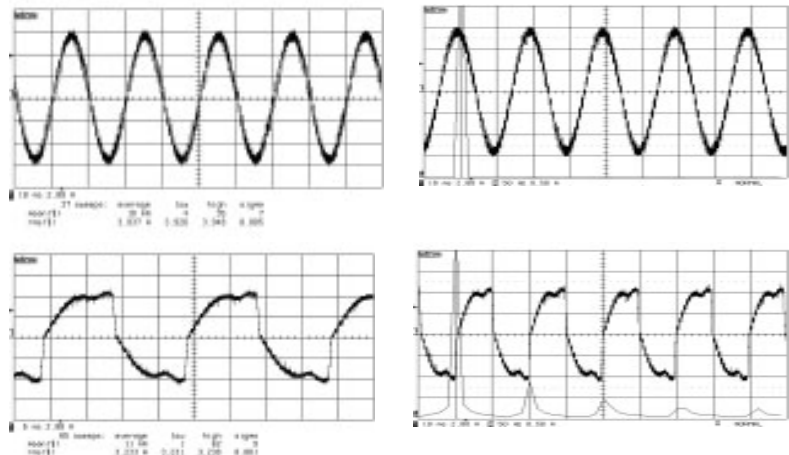
Drives' performances comparison

Herein the comparison data related to the winding currents of a step motor powered with:

- parallel connected phases : ($R=0,46$; $L=2,7$ mH)
- 4 Arms current set-point
- 40Vdc Bus voltage
- 1600 steps per revolution

as resulting from the current regulation method implemented in Ever drives,

and compared with the winding current shape from one of the competitors' micro-processors common drives.



It's easy to notice the meaningful difference between two very important parameter ratings affecting the motor output torque, the motor rotation's smoothness and the motor's noise:

- The actual rms current width, obtained with the same 4 Amps reference set-point.
- The rms value of the basic 50Hz current and of the odd higher order harmonics

The above at the total advantage of the Ever drives performances.

Clever Drives' main characteristics

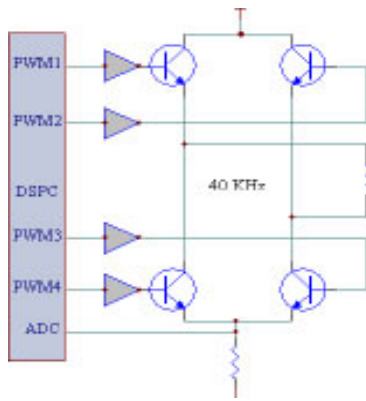
From such an optimized level of technology implementation one can understand what in practice, for years, in the Ever quality assurance commitment, the development of drives according to the CLEVER DRIVE philosophy did mean.

It's a continuous engagement to the research of products characterized by the maximum application reliability, easiness and flexibility, designed and manufactured according to a rigorous respect of the standards concerning the Hardware and the Software releases, and meeting the norms' specifications for a safe use and for a real, not only written on paper, CE certification.

Thanks to this philosophy EVER is able to supply a large range of stepping motor drives, robust also because manufactured in surface mounting technology and provided with:

- various types of optoisolated serial and fieldbus links
- I/O lines with an extended control voltage range (5, 24 Vdc, line driver, PNP, NPN etc...) and optoisolated for a safe usage of the devices in EMI environments.
- hardware protections of all the components more sensitive to failures, as, for instance the power stages and the drive's outputs, for a reliable and safe operation.

Fully Digital Technology Drives (FULL - DIGITAL).



Full Digital Drive basic schematic

The EVER Enhanced SD DRIVE line has been recently expanded with a new range of drives and motion controllers defined as FULL-DIGITAL because, while having at least all the quality and performance characteristics of the previous D/A technology devices, they need no analog circuitry for the step motor winding currents control. This characteristic is achieved by replacing, in the drive's firmware, the general purpose microprocessor with a new generation DIGITAL SIGNAL PROCESSOR CONTROLLER (DSPC): practically a single chip microprocessor core provided with all the typical on-chip hardware peripherals dedicated to easy motor control.

Thanks to the DSPC motor control capability, the FULL-DIGITAL drives upgrade the D/A drives technology in various quality and functionality characteristics by the following plusses:

- better long term repeatability and stability of the drive performances due to no analog circuit drift.
- lower hardware costs and dimensions thanks to the reduced components count.
- wide device flexibility in generating and regulating the current shape at every speed, thanks to the high frequency (40Khz) chopped winding currents regulation.
- maximum motor output torque achieved with the lower overheating in standstill or rotation condition as well.
- extreme diagnostic functionality thanks to the DSPC capability to check in real time, to display on a local seven segments led display, to inform through the proper output and to record for assistance in case of faults, all the application sensitive drive's working parameters.

Using these diagnostic capabilities, the EVER FULL-DIGITAL drives, for example, can monitor in real time for a quick and safe debugging and optimisation of the user application and for service convenience:

- the continuous and the alternated ratings of the power supplied to the drive in order to grant the proper supplying conditions for long term effective and safe motor's and voltage rectifier's operation
- the " real time" temperature rise of the drive's heat dissipator in the actual application to avoid unwanted machines stops due to thermal protection intervention
- the actual winding current and voltage values at any drive protection's intervention
- "when and which" of the protection interventions occurred: open-phase, phase-phase-ground short, DC bus overvoltage, drive dissipator overtemperature, etc.....

Everything in addition, as seen, to the large and flexible drives' functionality characterizing, for instance, two of the devices available today as the typical "step and direction" drive (SDL180Vxx) and the programmable motion control module (SDM180Vxx).

They, in several basic versions ready for options, give performances in dimensions and costs unthinkable, if referred to a time before, also for drives with clearly lower performances even if compared with the performances now implemented into the new firmware and even more if referred to the coming soon drives functionality improvements....

