新発売

–整合式微步進驅動器及馬達

AK-STEP Summary

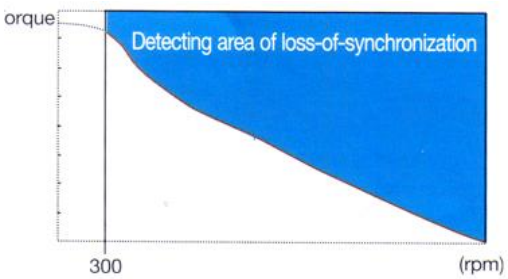
K-STEP is an all-in-one unit. In other word, a motor and a driver are integrated seamlessly together. Because it is an l-in-one unit product,AK-STEP makes it possible to apply many functions compared with a conventional stepping motor, ch as the sensor less detection of the loss of synchronization, smooth control over the whole velocity range by software ımping control, and no vibration at the low speed range.

ɔr high-speed and high-precision drive of a stepping motor,AK-STEP is an unique driver that adopts a new control scheme ving to an on-board high-performance digital signal processor. With an unique position estimation algorithm it stantaneously detects an out-of-synchronization in the rotor position of the stepping motor, which is not an easy task in a ınventional stepping motor and drive (effective only over 300 rpm). Utilizing a software damping and filtering method, a gh speed actuation is realized by the exciting angle control of a step-angle.
ıe resolution ofAK-STEP can be improved from basic 1.8° up to 0.0072°(1/250). In addition it generates various signals cluding loss-of-synchronization alarm.

Detection of loss-of-synchronization
Software Damping
Run/Stop Signal Output

1 Step-Out Detection(Patent pending)

K-STEP can detect the loss-of-synchronization of a stepping motor without the addition of an external sensor. By monitorii e voltage, the current, and the back-emf signal, the on-borad DSP estimates the current position of a rotor and enables to tect the loss-of-synchronization (so far seemingly impossible task in a conventional stepping motor drive), in turn realizing ıeration in high-speed region without worrying about loss-of-synchronization*.
effective only over 300 rpm

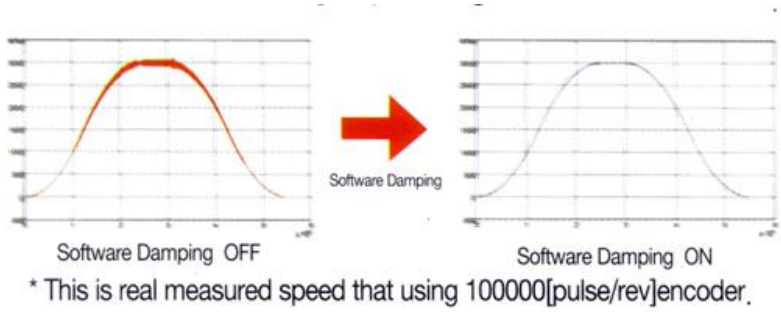


2 Microstep and Filtering

igh Precision microstep function and Filtering (Patent pending)
ıe high-performance DSP resolves the basic resolution of 1.8° up to maximum 0.0072° (1/250 steps).
ɔntrary to a conventional driver,AK-STEP adjusts PWM control signal in every 25 usec, which makes possible to more precise current control and realizes a high-precision microstep operation.

3 Software Damping

Vibration suppression and High-speed operation (Patent pending)
eally the applied currents to a stepping motor are a precise sinusoidal waves. But in practice the magnetic flux nonlinearity the motor, the lowering of current due to the increase of back emf at high- speed and the lowering of the phase voltage are e sources of motor vibration.
ɔr these practiceAK-STEP detects these nonlinearity with DSP and adjusts the phase of the current according to the pole ısition of the motor, drastically suppressing vibration. As reducing the vibration of the motor, it is possible to operate in gh-speed regime.



* This is real measured speed that using 100000[pulse/rev]encoder.

4 Diverse Output Signal Monitoring

ɛsides alarming loss-of-synchronization, there are various warning signals depending on the alarm issued. Also,AK-STEP ovides an easy interface to communicate with an upper controller by issuing RUN/STOP signal.
'he type of alarm issued can be identified by LED indicator)

5 Improve of High-Speed Driving

ɛpending on the speed of a stepping motor,AK-STEP automatically increases the supply voltage and prevents the torque wering due to the low effective operating voltage on a motor from the back emf voltage, in turn enabling a high-speed ıeration. Also, the software damping algorithm minimizes the vibration and prevents the loss-of-synchronization at gh-speed.