Agilis™ Family – Step Size .vs Actual Motion

One of the most frequently asked questions about the Agilis™ family of products is:

"What is the relation between the step size and the actual motion of the Agilis device?"

In order to be able to answer to this question, we need to first understand that the step size of an Agilis device and its step amplitude are two different things. The step size of Agilis products is not repeatable. It varies from mount to mount and it differs between forward and backward motion. It somehow reminds us of human steps, which varies between tall and short people, tired and fresh people, athletic and non-athletic people, the load that is being carried during the motion, etc.

Although the step size is adjustable, we cannot forecast the relation between step amplitude and step size for an individual mount. So our customers will need to measure the step size for a defined step amplitude on their own.

Here is a simple procedure to measure the step size for an application, where it is required to rotate the polarizer with an Agilis device to adjust the power of a laser:

1. Adjust the rotator for 100% transmission.
2. Send command ZP to zero the position (this is now the reference point)
3. Send command SU to set the desired step amplitude (the amount of the voltage applied to the motor. Maximum value is 50)
4. Send successive PR commands and record the power after each step until 0% transmission is reached (it is recommended to start with a large number of PR steps, then make them smaller as they get closer to the 0% transmission). Note: always move in the same direction, not back and forth.
5. At 0% transmission the polarizer has been moved by 45°.
6. Send TP command. 45° divided by the result of the TP command is the average step size in that direction for this mount, in this configuration and for a pre-defined step amplitude.
7. Repeat the same procedure for the other direction of the motion, since the step size varies between forward and backward motion.
8. For a reliable process, this procedure needs to be repeated from time to time, since the step size will change over time.
9. For best practice it is recommended to always read the power from a sensor. In that case we don't really care what the step size is and only adjust until the desired value is reached.

For Agilis devices with limit switches finding the approximate relation between the step size and the actual motion in mm or degrees is a lot easier and doesn't require any external devices (for more details on a process please see the description of MV command in Agilis manual)

DS-08096