Expanded functionality in the DMX firmware on JVL MAC00-FS4 modules.

This document describes, on a fairly detailed level, the changes to be made to the existing firmware version 2.2 (called v2.02 in MacTalk) to honour the following three points requested by the end user. This document must be read together with the document JVL DMX Protocol Implementation v1.1 from December 2010.

1. The firmware should ignore changes to the acceleration and maximum velocity parameters while the motor is moving. The acceleration and maximum velocity would be listened to only while the motor is at rest, and would take into effect the next time a move is commanded.

3. The remote JOG pendant program stops when the motor falls into an error. The customer has to remove 24 volt power then bring it back on to restart the remote JOG operation. This is not desirable. Can you make sure that the JOG program runs all the time? Or maybe this problem would go away if point 5 below is implemented.

5. Can you add a RESET FAULT function to the homing procedure of the motor? The customer wants to be able to clear a fault with the DMX by issuing a HOMING command. This would be much more convenient than having to cycle 24 volt power to the motor controls.

Solutions:

1) In the existing firmware, changes to values written over DMX are sent to the basic motor immediately, and independently of whether the motor is moving or is at rest. There is a need to start moving one or more motors with a set of acceleration and velocity, and then let the motor complete this movement even if other values for acceleration and/or velocity are sent on the DMX line to other motors. We have now agreed to send the latest received values for acceleration and velocity to the motor only when a new (changed) value for position is received. Note that the module firmware does not test if the motor is at rest before sending the new set of values (Pos, Acc, Vel), so it will be up to the DMX programmer to perform the correct timing. This can be seen as an advantage in that a move can be changed before the motor has reached its final position, by sending a new position value to the motor.

3) The existing JOG function send a set of values to the basic motor every time one of the digital inputs changes state between low and high. We have now agreed to first send a command and/or values that will clear any errors so JOG will always succeed. JOG may still fail if there is a hardware reason for a fault, so the motor cannot possibly perform the movement, for instance that the power supply is insufficient, there is a mechanical stop or the motor has an overload condition, temperature is too high or other error. The central idea is that each JOG action will only send one command to clear the errors. If the error re-occurs during the JOG movement, it will be needed to remove the source of the error, possibly by waiting for the motor to cool down or other needed actions. The JOG can then be attempted again without first power cycling the motor.

5) To reset any errors before starting a homing will be similar to the JOG function described above. The FS4 modules will simply send one reset errors command before starting a homing. As with JOG, if errors occur during homing because the source(s) of the error(s) is still present, the sources must be manually eliminated and the homing can be retried without power cycling the motor.

In addition to the firmware changes, the MacTalk program will need to be updated to make this set of features selectable. This will be a sub-mode of DMX, so we will always have sub-modes 0 for firmware 2.04 and selectable sub-modes 0 and 1 for v2.05.