tech note

I-3020 MLLAC

The I-3020 MLLAC Multi well plate auto locking insert utilizes a Solenoid lock with a spring to drive a cam in and out of locking position. The insert is driven by a microprocessor in the controller and a solenoid driver board in the insert. The solenoid only consumes and dissipates power when in the unlock state. Over time the heat generated by this power dissipation may damage the solenoid.

To counter this we implement five variables, X,Y,Z,F, and T by the SECURE command: https://asiimaging.com/docs/commands/secure

X argument accepts either "0" or "1". "0" is the locking command , and "1" is the unlocking command. The Solenoid use no power when in "0" or lock position , so this is the default and the controller's initial state.

Y arguments is a percentage of power briefly applied to the solenoid to pull the lever back and unlock the well plate. Set by factory, we recommend that this setting not be adjusted unless suggested by ASI support.

Z arguments is a percentage of power applied to the solenoid to keep it unlock. After unlocking, the solenoid needs very little power to keep the lever pulled back and keep the well plate unlocked. Set by factory, we recommend that this setting not be adjusted unless suggested by ASI support.

F argument sets the auto lock time, units are in minutes. When in unlock position , the solenoid is consuming power, over time solenoid will heat up and may damage it. There is an auto locking timer, Y sets the maximum time the solenoid stays unlocked, after which the controller auto locks. The default is 5 min. This feature can be disabled by setting Y as "0", though this is not recommended.

T argument, units are in milliseconds. This arguments sets the amount of time higher power (Y arguments) needs to be applied to unlock the well plate. After that lower power (Z arguments) is applied to keep the well plate unlocked. Set by factory, we recommend that this setting not be adjusted unless suggested by ASI support.

These variables code for the Unlocking state commanded X, Unlocking power Y, Holding power Y, Power in Unlock Time limit F, and the Power in Opening time. We connect the insert via a Hirose 4-Pin connector seen here: https://asiimaging.com/docs/solenoid_lock_insert with pins for +24 VDC (red), GND (Black), Power activation (White) and one not used.

If you want to run I-3020 MLLAC without our controller, you could setup a profile in a motor driver to produce a voltage to the White power activation wire to trigger the solenoid driver board transistor pair and open the insert. The voltages of the profile would have to be determined experimentally from the power supplies output and the solenoids DC characteristics, as available at the Ledex Solenoid web page, C5-271-B-1. Take special care to monitor the temperature of the unit when active.

From:

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Last update: **2023/04/20 17:47**