

ASI CRISP Control

For general information about CRISP, please visit the [manual](#).

Setup

The plugin comes with **Micro-Manager 2.0** by default, it also comes with **Micro-Manager 1.4** but is not actively developed.

First, make sure that you add CRISP to your hardware configuration. You can access the **Hardware Configuration Wizard** through the **Devices** drop down menu. If you need further guidance, check out the [Hardware Configuration Guide](#).

You can get the latest version of the plugin by installing the [latest nightly build](#) of **Micro-Manager 2.0**.

Accessing the plugin

You can find the plugin in the **Plugins > Device Control > ASI CRISP Control**

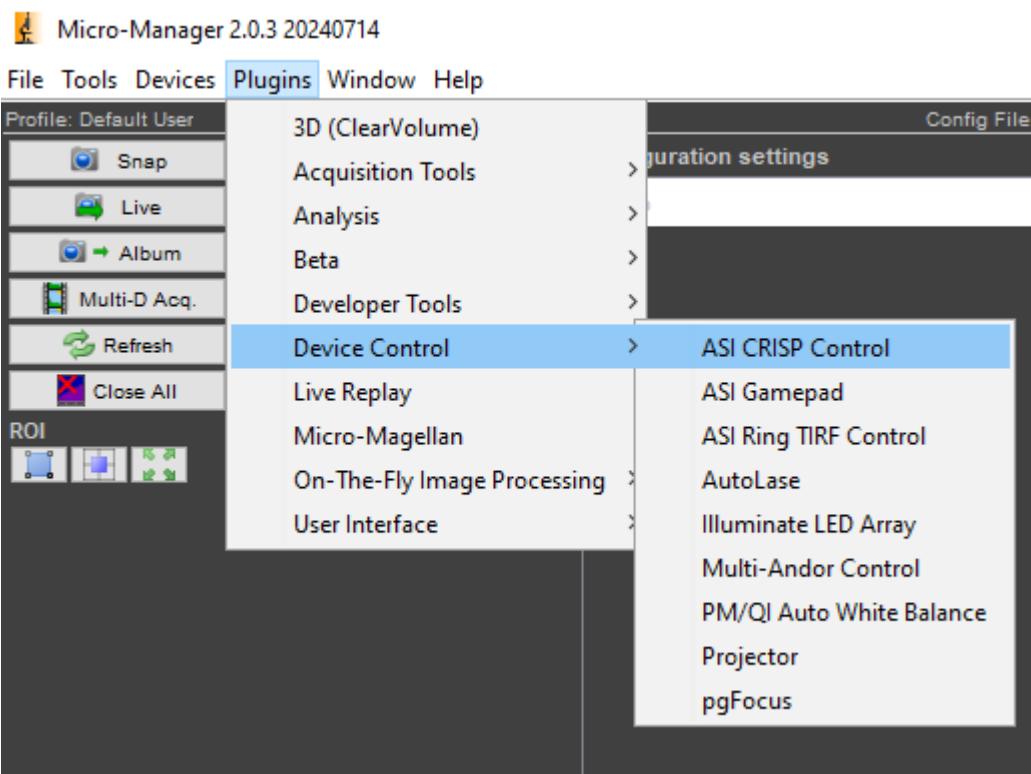


Fig. 1

Accessing the plugin window

Micro-Manager Main Window > Plugins > Device Control > ASI CRISP Control

Plugin Controls Explained

The text above the spin boxes contains the axis CRISP controls, in the image below it's Z.

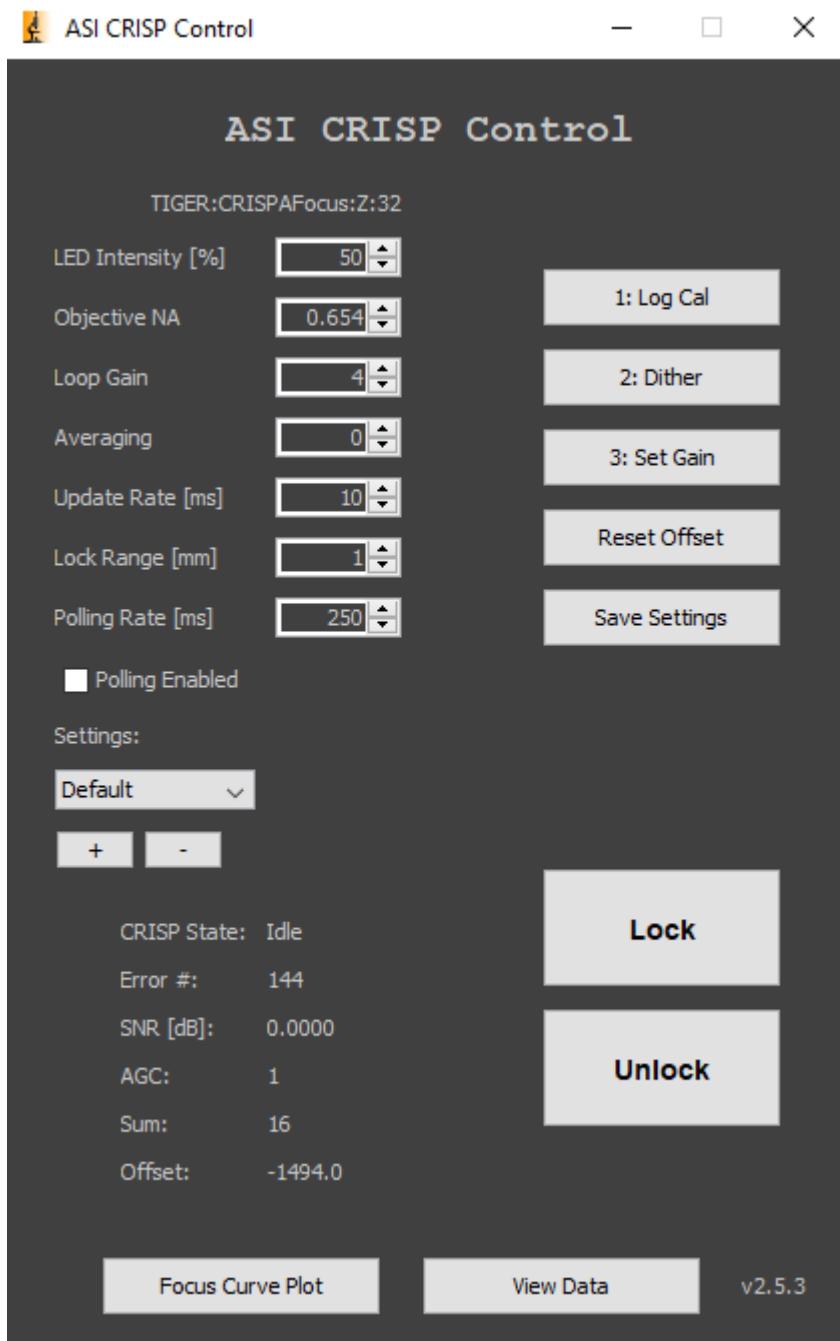


Fig. 2

The plugin interface

This is the Micro-Manager 2.0 version.

Buttons

- **1: Log Cal:** puts the CRISP in Log Amp Calibration state and measures SNR
- **2: Dither:** causes CRISP to dither in order to measure the Error #
- **3: Set Gain:** puts the CRISP in Set Gain state
- **Reset Offset:** resets the focus offset to zero for the current position
- **Save Settings:** saves the settings to the controller (all spinners except polling rate)

- **Lock**: sets the focus position
- **Unlock**: unlocks the focus position

Spin Boxes

- **LED Intensity [%]**: controls CRISP's infrared (IR) LED from 0-100%
- **Objective NA**: the objective's numerical aperture
- **Loop Gain**: controls the gain multiplier or loop gain; decrease the value if CRISP seems to oscillate or jitter
- **Averaging**: the number of samples to be averaged
- **Update Rate [ms]**: the update rate in milliseconds
- **Lock Range [mm]**: limit the lock range in millimeters
- **Polling Rate [ms]**: the rate that the status is updated in milliseconds

Check Box

- **Polling Enabled**: directs the Plugin to poll or query the controller at frequent intervals for CRISP state, error number, and SNR; uncheck when done with the 4-step calibration

Settings

- **Combo Box**: the current software settings profile
- **Button +**: add a new software settings profile to the the list
- **Button -**: remove the last software settings profile from the list

Status

- **CRISP State**: such as Idle, Calibrating, Ready, In Focus, etc.
- **Error #**: during DITHER higher error values are better; after SET GAIN the Error # will be close to zero
- **SNR [dB]**: should be at least 2 dB or else CRISP performance may be unstable and lock will be lost easily; increasing LED intensity and performing the 4-step calibration again to increase the SNR
- **AGC**: minimum of ~20 is acceptable for average samples; may be much higher for very reflective samples
- **Sum**: indicates the amount of light hitting the photodiode; if outside 50-80, redo the 4-step calibration
- **Offset**: the difference between the locked-in focal position and the current position

Buttons

- **Focus Curve Plot**: run the focus curve routine and plot the results.
- **View Data**: load and view focus curve data plots.

Quick Setup Guide

- Enter the objective's NA (which affects the dither).
- Start the 3-step calibration¹⁾ by clicking the **1: Log Cal** button.
- Check the SNR display. If < 2 dB, click through the rest of the 3-step calibration, increase the LED Intensity, and begin the calibration again. If SNR is still low after the LED is at maximum intensity, proceed to the next step anyway.
- Click the **2: Dither Button**.
- Check the Error #. It must be at least +/- 100; if it isn't, move the Lateral Adjustment Screw. The farther from zero the error number, the stronger the lock.
- Press the **3: Set Gain** button.
- Press the **Lock** button to preserve the focal position. (Press the **Unlock** button to release CRISP's focus lock.)
- If CRISP loses lock, repeat the calibration steps and try to get a higher error number after dithering.



Fig. 3

Lateral Adjustment Knob

Used to increase error number during dither

Additional Tips

If you would like CRISP to maintain focus at a certain position, but the error isn't 0, use the **Reset Offset** button to make your desired focal position have "0" error.

Further Reading Refer to [CRISP: Continuous Autofocus System](#) for a description of CRISP operation and troubleshooting guides.

[crisp](#), [software](#), [manual](#), [micromanager](#)

¹⁾

Note that the 3-step calibration should always go through all 3 steps before re-starting; Log Amp Calibration has a countdown in the CRISP State display but otherwise you can quickly click through them to get back to the beginning.

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