The Focus control is located on the MCC GUI Tab.
Details are located in MCC/Details/FIOC.
The ic/ fio_c/focus.c program controls the focus control.

Summary of the focus program:

User Variables:

- `enable`: UI: enable control loop [0=off, 1=on]
- `adj_enable`: UI: enables Temperature/Position adjustment to focus [0=off, 1=on]
- `user_dpos`: UI: user requested focus position.
- `adj_zero`: Software calculated adjustment value using Temperature and Position.
- `adj_value`: Software calculated adjustment value using Temperature and Position.
- `dpos`: UI: requested Focus position as voltage (user_dpos + adjustment)
- `apos`: AI: value of Focus position indicator [-7.33 to +7.00V]
- `speed`: DO: Focus Speed [0=slow | 1=fast]
- `stuck`: UI: set if focus does not respond to move command

Digital Outputs:

- `FIOC_DO_Focus_In`: opto 22 logic: 0=stop; 1=focus_in
- `FIOC_DO_Focus_Out`: opto 22 logic: 0=stop; 1=focus_out
- `FIOC_DO_Focus_Fast`: opto 22 logic: 0=slow; 1=fast
- `FIOC_DO_Focus_Brake`: opto 22 logic: 0=on; 1=off

Analog Inputs:

- `FIOC_AI_Focus_Pos`: raw ranges -10.99 to +10.55 (-7.33 to +7.00V scaled by relay board).

Summary of Logic:

When trying to move the focus mechanism, if the voltages does not change within 1.5 seconds, a stuck flag is set to alert the operator. A MCC1 warning is generated with the focus is stuck.

When user_dpos is set the temperature_position_adjust is calculated and stored in adj_zero (zero point for adjustment). In the 10Hz loop, the adj_value is calculated. The actual desired position, dpos is:

```
if( adj_enable )
  dpos = user_dpos + (adj_value - adj_zero);
else
  dpos = user_dpos;
```

The operator must not set enable ON to allow changes in the focus. When focus enable is ON, the focus program tries to position the focus to match focus.dpos. A match is when abs(focus.apos - focus.dpos) < 0.05 volts.

To move the focus In:

- `FIOC_DO_Focus_In` = 1
- `FIOC_DO_Focus_Out` = 0
- `FIOC_DO_Focus_Fast` = 1
- `FIOC_DO_Focus_Brake` = 1

To move the focus Out:

- `FIOC_DO_Focus_In` = 0
- `FIOC_DO_Focus_Out` = 1
- `FIOC_DO_Focus_Fast` = 1
- `FIOC_DO_Focus_Brake` = 1

The operator must set focus.enable ON to allow changes in the focus. When focus.enable is ON, the focus program tries to position the focus to match focus.dpos. A match is when abs(focus.apos - focus.dpos) < 0.05 volts.

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