Manual for installation and use of GCA145 with Fiddle yard program.

Version 8-5

Hardware additions.

In addition to the instructions from the GCA145 page, some extra connections have to be made.

1) The jumper EEP1 must ALWAYS be set to ON. This connects resistor R18 to +5V.

2) A resistor of 10 Kohm needs to be soldered at the bottom of the PC-Board MGV145. It needs to be fixed between point 3 and 1 of ICSP1. This is also remarked at the GCA145 page.

3) A fiddle yard needs two limit switches. One at each side. This could be microswitches, halldiodes or reed switches. These switches are used for two reasons.

   To be able to have an automatic adjustment after the first set-up, for adjustment when the FY is out of position for any reason, and as safety limit switch.

   Switches are situated at both ends, beyond the the positions where the first and last rails are in line.

4) These switches are to be connected to ICSP1 connector.

   Connections are:

   Limit switch close to first rail (zeroswitch) : Point 2&5.

   Limit switch close to last rail (Max-limit) : point 3&5.

   Remark: Point 5 of ICSP1 is closest to J5.

   When switch is pushed, both contacts should connect together (COM + NO)

Software settings.

After startup, there are just a few settings preset in the Firmware.

To avoid that adjustment will be a lot of work, the processor can do the important issues automaticly.

For further info about the menus, please refer to chapter MENU.

Each position of a rail has to be determined. And because there is no onfo yet how many steps are needed, the processor needs to find out.

This is done in the following way.

It can only be done if two switches are up and working.

Automatic settings of positions

Activate menu-settings and select menu 1. Select the maximum positions you need, minus 1.

So if you have 12 rails on the FY, select 11. Rails are counted from 0-11.

Select menu 8 and change setting to 1.

Cancel menu settings .

Choose position 62 on GCA146 and press the selector.

The motor start moving towards the highest rail.

If it goes the wrong way, switch off power immidiately, and swap wires 1 & 2 of the motor in connector J2,

Now begin at Automatic settings of positions again, it should now be running in the right direction.

The motor will stop when the maxlimit switch is activated.

The next movement is towards the zero switch, in the mean time counting the total steps it needs from max-limit position to zerolimit position.

It stops again when zero limit switch is activated.

After this the firmware will divide steps by the max positions and store that amount of steps for each position.

Then the FY will move to the first rail.

That position, including all other position is of course a rough approach.

Semi Manual position setting.

It is not easy, specially if there is a large amount of steps needed for each position, to let the system itself calculate these positions.

From Version 8.5, position 61 can be selected. It enables you by pressing the selctor on each position , which will far more acurate than running position 62.

The sequeunce is as follows:

First the FY will run to zero switch position. Then, display wil be showing 0.

The FY now runs towards first rail connection.

On the right moment , when rails are nicely inline, press selector.

This position will be stored, display will show 1 and fy continues.

Again, when rails are in line, press selector.

This will go on until all given positions have had their turn.

If fy runs to fast to achieve correct positions, simply increase max-speed setting first.

FY will run back to zero switch and then to position 0.

From here you can do the fine adjustments.

Fine adjustment of positions

Fine adjustment can be made for each position by activating the menu settings, then select menu 0 , which will display after 1 second the actual position where the FY is on.

Now , with the selector you can fine tune the position, to make the rails perfect in-line.

Cancel the program mode, run the FY to the next position and redo the same procedure for fine adjustment adjust of positions.

Menu.

The program switch, connected to two pins on GCA146 board, has two positions:

1) The normal running mode (switch OFF)
2) The programming mode (switch ON)

In normal running mode only the actual position of the FY can be selected.

Turn the selector to get a position, and press the selector. FY will start moving according to that.

When a higher position is selected, the motor will stop a little bit further the desired , and then will run backwards after one second. The amount of steps, the runback will do is to be set in menu 5.

This is done to correct the free space in gearing, if applicable. Value can also be set to 0.

The programming mode (switch ON) will start with menu zero.

It will show the menu number for 1 second, and after that the display will show the value of that menu. Changing this value can be done with the selector. No need for confirmation.

Pressing the selector will put you into the next menu, again showing the menunumber first and then the value of it.

List of menus.

The available menues are:

0) Adjust the actual position of the fiddle yard. When turning the selector , the motor will turn backwards or forward step by step, making a very fine adjustment possible.

   All changes are stored in internal eeprom.

   Please remind not to leave this menu 0 active for a longer time, because the motor is constantly powered on, and will be getting rather warm after some time.

   When selecting a next menu, or deactivating the menues, the power to motor will be off.

1) Total amount of railpositions.

   Positions are counting from 0, so choose 1 less than you have e.g. 9 if you have 10 positions.

2) The minimum speed.

   Two speed limit are used for the motor., making it possible to make a slow or fast ramp up and ramp down when start en stop moving.

3) The maximum speed. Same as point 2. A higher number means a longer interval of timing,

so that makes a slower movement. Depending on motor type and power consumption, mostly the lowest speed setting you can have is 2 or 3, If the motor makes strange reactions, try a larger number for this speed. Maximum speed can not be higher then minimum speed

4) Delay of speed change.

   The actual speed from low to high or v.v. is incremented (in microseconds) with this number.

   A higher number means faster change.

   When minimum and maximum speed are set to te same value, there will be no change at all.

5) Correction steps.

   When FY is running to a higher position, it will make this amount of steps further, and after that run the same steps back . That option can reduce the influence of any 'slack' in the gear system. If you do not need it, just the better, just set it to zero.

6) Rail power off at movement.

   The rails can be powered off while moving the FY.

   It is a good safety precaution.

   If you do not like it, set this menu to 1.

7) Pos match delay.

   After the FY has reached its position, this will give an extra delay before the indication "FY ready" is given to pt 10 o J5. Also, only after that time, the selector is active again.

   It is used if signals are fixed on or besides the FY. They will have an extra delay before they will be on. The number is in 10th of second, so 50 will be 5 seconds.

8) To be able to select position 61 or 62 (for readjusting / calculation) of all postions, set this value to 1. After using position 61 or 62 once, it will be set automaticly to zero, avoiding that pos 61 or 62 is selected by mistake again.

Operating mode

If program switch is off, only the current position can be selected with selector on GCA146.

Apart from pos 0 to xx (the max amount of rails) there are two more positions to select.

1) Position 63.

   If you select this position, the FY will move to the zero-switch position and after the switch is activated, the FY will run to zero limit switch, and after that to position 0.
   This is a nice way to 'synchronize' the fiddle yard.

2) Positon 62.

   This position can only be activated if menu 8 is set to 1.

   See for further instructions: Automatic settings of positions.

3) Position 61

   This position can only be activated if menu 8 is set to 1

   See fo further instructions : Semi Manual position setting.