CNC 8055 -M-

New features

Ref.1201
Soft: V01.4x

FAGOR AUTOMATION

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The content of this manual and its validity for the product described here has been verified. Even so, involuntary errors are possible, thus no absolute match is guaranteed. Anyway, the contents of the manual is periodically checked making and including the necessary corrections in a future edition. We appreciate your suggestions for improvement.

The examples described in this manual are for learning purposes. Before using them in industrial applications, they must be properly adapted making sure that the safety regulations are fully met.

This product uses the following source code, subject to the terms of the GPL license. The applications *busybox* V0.60.2; *dosfstools* V2.9; *linux-ftpd* V0.17; *ppp* V2.4.0; *utelnet* V0.1.1. The library *grx* V2.4.4. The linux kernel V2.4.4. The linux boot *ppcboot* V1.1.3. If you would like to have a CD copy of this source code sent to you, send 10 Euros to Fagor Automation for shipping and handling.

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VERSION V01.40

1 Execution of M3, M4 and M5 using PLC marks

From this version on, M3, M4 and M5 can be executed using PLC marks. Executing these M function is similar to doing it from the main channel; i.e. besides acting upon the spindle command, it changes the execution history.

The same PLC operation that handles the execution from the main channel also serves for this execution mode, that does it through PLC marks.

1.1 PLC marks

The PLC has new marks for the first spindle, called PLCM3 (M5070), PLCM4 (M5071) and PLCM5 (M5072).

When having 2 spindles, the marks of the first spindle will be called in one of the following ways:

- PLCM3SP1 or PLCM3.
- PLCM4SP1 or PLCM4.
- PLCM5SP1 or PLCM5.

The marks of the second spindle will be called as follows:

- PLCM3SP2 (M5073), PLCM4SP2 (M5074) and PLCM5SP2 (M5075).

When having an auxiliary spindle, there will be the following PLC marks:

- PLCM45 (M5076): to stop the spindle.
- PLCM45S (M5077): to start the spindle.

1.2 Variables

The PLC can change the speed of the spindle or spindles through the variables PLCS and SPLCS or through the variables PLCCSS and SPLCCS if the spindle works in G96. The new variable PLCAS will be used for the auxiliary spindle. These variables have higher priority than their DNC equivalents. The priorities, from highest to lowest are: PLC, DNC and program.

Variable PLCAS

There is now a new PLCAS variable for the auxiliary spindle. This variable may read and written from the PLC and it may be used to change the value of the auxiliary spindle speed. The sign indicates the turning direction.

1.3 Operation

The PLC activates the marks described earlier to indicate to the CNC that it must execute the corresponding M function at the indicated spindle.

If that spindle is not the main spindle at that moment, it changes the M in the execution history, it activates the corresponding PLC mark DM3/4//5 and executes the transfer with the PLC (it writes the M number in the MBCD1 (R550) register, it activates the MSTROBE signal, it waits for the AUXEND signal to go up and it cancels the MSTROBE signal; if the M function is set as not to wait for AUXEND in the M function table, it waits for the time period set with MINAENDW and cancels the MSTROBE).

When acting upon the secondary spindle, it executes the same operation, but having activated the mark S2MAIN (M5536) first and then cancelling it at the end. This operation is done automatically; i.e. there is no need to program it at the PLC.

Even if the M3, M4 or M5 function has an associated subroutine in the M function table, that subroutine will not be executed when they are executed using the PLC marks.

When executing M3, M4 or M5 using the PLC marks, the gear change that could be required by the new S is not output to the PLC even if the gear change is automatic.



If the CNC is started up with no gear being active yet, because no M3 or M4 has been executed in the main channel, the CNC will issue an error message even if it has been configured as AUTOGEAR.

The CNC will admit the M functions from the PLC as long as it is not in an error state or with LOPEN (M5506) high, whether there is an execution active or not, either in manual or automatic. If the M function is executed during a tool inspection and the spindle turning direction is changed, the change will be identified in repositioning and it will offer the choice to change it again.

If when activating the M3, M4 or M5 marks via PLC, the main channel is transferring something to the PLC, the PLC keeps the mark active until the CNC can attend to it. Once the M function is executed, the CNC deactivates the mark.

In the following cases, the CNC ignores these PLC marks and deletes the mark so the request is not left as pending:

- When the spindle is threading in electronic threading (G33).
- When it is doing a rigid tapping or a regular tapping.
- When the CNC is in error state or when LOPEN (M5506) is high.

When activating several marks of different spindles at the same time, it will follow this order: first the first spindle, then the second spindle and last the auxiliary spindle.

When receiving contradictory marks, they will all be ignored. When receiving several marks at the same time and there is a stop (PLCM5 / PLCM45) between them, only this will be considered and the rest will be ignored and not saved.

If the spindle has M19TYPE=1, the spindle is homed with the first M3 or M4 after start-up, as long as that M function is executed in manual or automatic mode. If the M function is executed using one of the PLC marks, the spindle will not be homed.

When activating the PLC marks while homing the spindle, the PLC command stays waiting for the homing operation to be over. If the home search is associated with the first M3 or M4 after start-up, the PLC command stays waiting for the homing operation is over.

If there are synchronized spindles, it acts upon the command of the main and secondary spindles at the same time.

While executing the M function, it is possible to abort the process by deactivating the PLC mark that has initiated it.

Note:

The PLCM5 mark is used to handle the open-door safety operation defined by Fagor Automation.

2 OPMODE. Operating-mode related variable

The OPMODE variable returns the code corresponding to the selected operating mode.

In conversational modes (MC, TC, MCO, TCO) the OPMODE variable contains different values from the standard mode.

The value of 12 of this variable in the conversational mode indicates the change to MDI mode (ISO key) from the jog mode and from tool inspection mode. The OPMODE also takes this value when selecting one of the following fields of the main screen that admits the start key: Axes, T, F or S.

The value of 43 of the OPMODE variable in the conversational mode indicates the home search mode.

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