

5. Overview of Connection to CNC

The signal connection from MOP-03 to the CNC is done with the connectors which are located on the back side of the MOP-03:

- CG31 (Digital Input 32 Points)
- CG32 (Digital Output 32 Points)
- CG33 (Digital Input 32 Points)
- CG34 (Digital Output 32 Points)

5.1. MOP-03 - 400 mm connected to Operator Panel I/O of M700 VS CNC

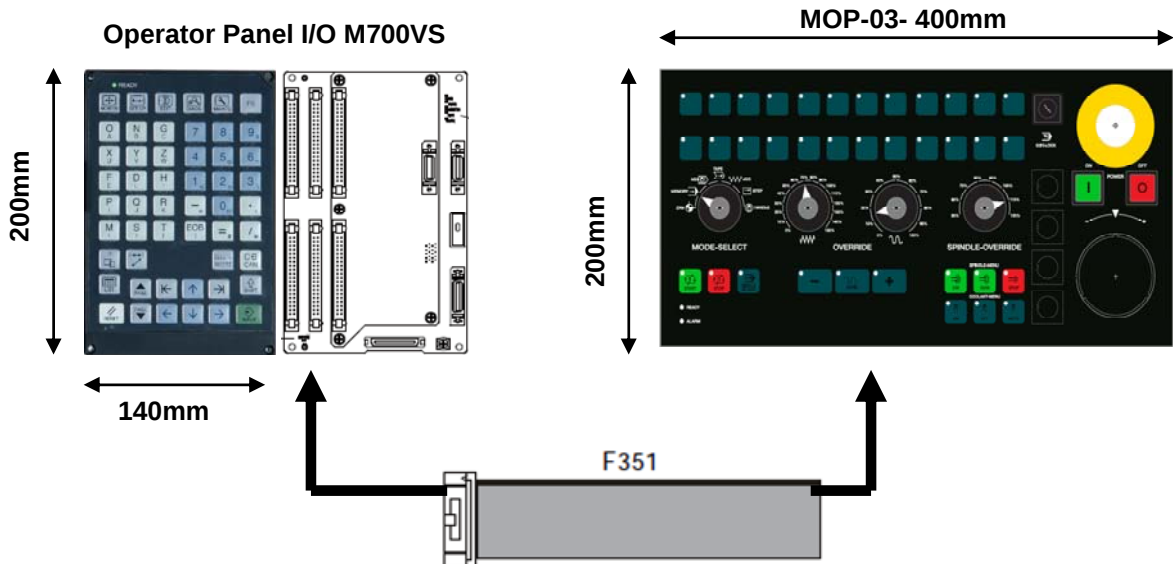


Figure 5.1. MOP-03- 400 mm connected to Operator Panel I/O of M700 VS CNC

5.2. MOP-03 - 430 mm connected to Operator Panel I/O of M700 VS CNC

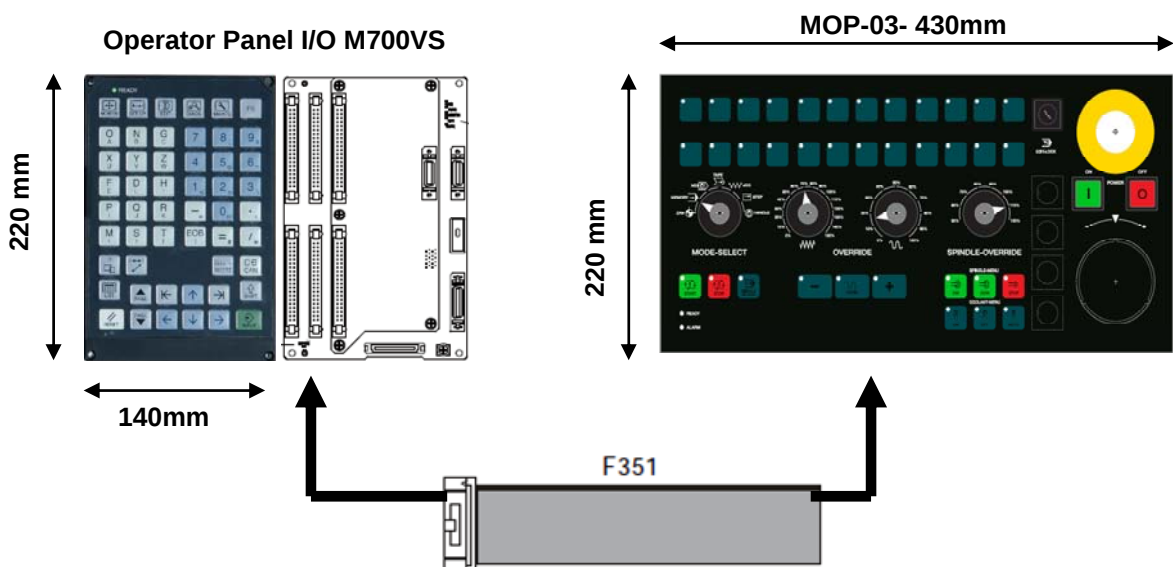


Figure 5.2. MOP-03- 430 mm connected to Operator Panel I/O of M700 VS CNC

8. Function Description and Corresponding Addresses

8.1. Mode Selection

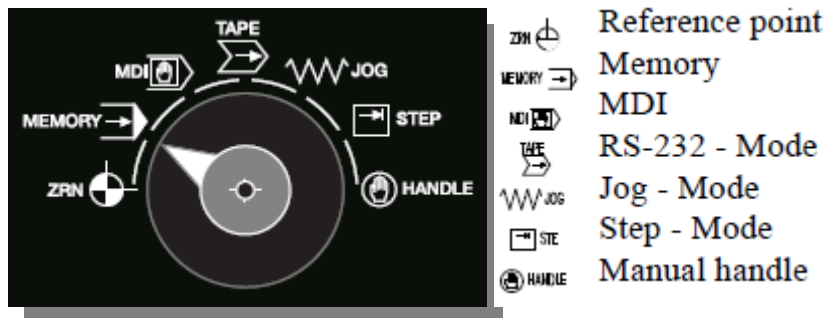


Figure 8.1. Mode Select

PLC Interface Signals of Mode Select

MODE SELECT			
M700 VS, M700 VW, M70 and M700	X222	X221	X220
E68	X122	X121	X120
Reference Mode			1
Memory		1	1
MDI		1	
TAPE	1	1	
JOG	1	1	1
STEP	1		1
HANDLE	1		

Table 8.1. PLC Interface Signals of Mode Select

Example: Related Signals (Inputs: CNC → PLC, Outputs: PLC → CNC)

MODE SELECT				
	M700 VS, M700 VW, M70 & M700		E68	
	Input	Output	Input	Output
Reference Mode	XC04	YC04	X1E4	Y20C
Memory	XC08	YC08	X1E8	Y210
MDI	XC0B	YC0B	X1EB	Y213
TAPE	XC09	YC09	X1E9	Y211
JOG	XC00	YC00	X1E0	Y208
STEP	XC02	YC02	X1E2	Y20A
HANDLE	XC01	YC01	X1E1	Y209

Table 8.2. Related Signals Mode Selection

8.2. Override

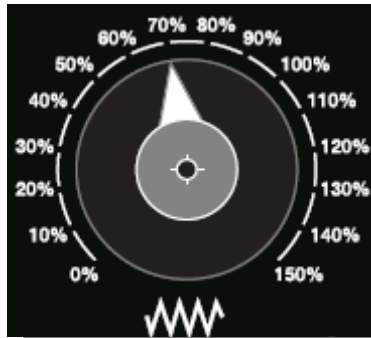


Figure 8.2. Override Speed 0 – 150% of Programmed or selected value.

PLC Interface Signals of Override

OVERRIDE					
M700 VS, M700 VW, M70 & M700	X227	X226	X225	X224	X223
E68	X127	X126	X125	X124	X123
0%					1
10%				1	1
20%				1	
30%			1	1	
40%			1	1	1
50%			1		1
60%			1		
70%		1	1		
80%		1	1		1
90%		1	1	1	1
100%		1	1	1	
110%		1		1	
120%		1		1	1
130%		1			1
140%		1			
150%	1	1			

Table 8.3. PLC Interface Signals of Override

Example: Related Signals (Inputs: CNC → PLC, Outputs: PLC → CNC)

OVERRIDE				
	M700 VS, M700 VW, M70 & M700		E68	
	Input	Output	Input	Output
Cutting Feedrate Override Method Selection		YC67		Y2A7
Manual Feedrate Method Selection		YC77		Y2B7
...				
1 st Cutting Feedrate Override		R2500		R132
Manual Feedrate		R2504		R136, R137
...				

Table 8.4. Related Signals Override

8.3. Rapid Override

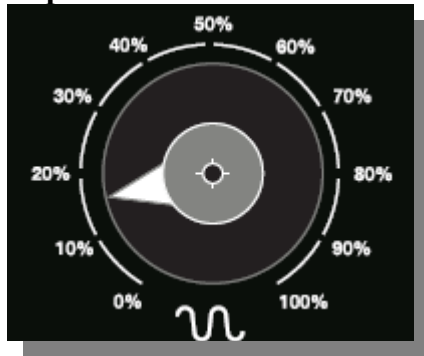


Figure 8.3. Rapid Speed 0 – 100% of Programmed or selected value.

PLC Interface Signals of Rapid

RAPID				
M700 VS, M700 VW, M70 & M700	X22B	X22A	X229	X228
E68	X12B	X12A	X129	X128
0%				1
10%			1	1
20%			1	
30%		1	1	
40%		1	1	1
50%		1		1
60%		1		
70%	1	1		
80%	1	1		1
90%	1	1	1	1
100%	1	1	1	

Table 8.5. PLC Interface Signals of Rapid Override

Example: Related Signals (Inputs: CNC → PLC, Outputs: PLC → CNC)

RAPID				
	M700 VS, M700 VW, M70 & M700		E68	
	Input	Output	Input	Output
Rapid Traverse Override Method Selection		YC6F		Y2AF
...				
Rapid Traverse Override		R2502		R134
...				

Table 8.6. Related Signals Rapid Override

8.4. Spindle Override

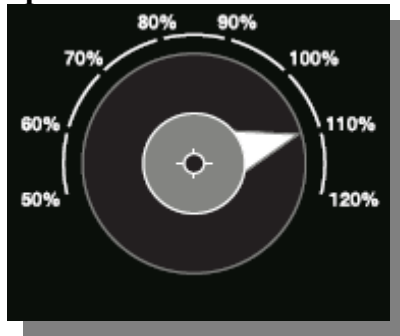


Figure 8.4. Spindle Speed 0 – 120% of Programmed or selected value.

PLC Interface Signals of Spindle Override

SPINDLE OVERRIDE				
M700 VS, M700 VW, M70 & M700	X22F	X22E	X22D	X22C
E68	X12F	X12E	X12D	X12C
50%				1
60%			1	1
70%			1	
80%		1	1	
90%		1	1	1
100%		1		
110%		1		
120%	1	1		

Table 8.7. PLC Interface Signals of Spindle Override

Example: Related Signals (Inputs: CNC→PLC, Outputs: PLC→CNC)

SPINDLE OVERRIDE				
	M700 VS, M700 VW, M70 & M700		E68	
	Input	Output	Input	Output
Spindle Override Method Selection		Y188F		Y28F
...				
S Command Override		R7008		R8, R9
...				

Table 8.8. Related Signals Spindle Override

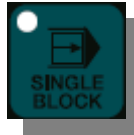
8.5. Program Control



Cycle Start



Feed Hold



Single Block

Figure 8.5. Program Control

PLC Interface Signals of Program Control

PROGRAM CONTROL				
	M700 VS, M700 VW, M70 & M700		E68	
	Input	Output	Input	Output
Cycle Start	X230	Y220	X130	Y120
Feedhold	X231	Y231	X131	Y121
Single Block	X232	Y222	X132	Y122

Table 8.9. PLC Interface Signals of Program Control

Example: Related Signals (Inputs: CNC → PLC, Outputs: PLC → CNC)

PROGRAM CONTROL				
	M700 VS, M700 VW, M70 & M700		E68	
	Input	Output	Input	Output
In Automatic Operation “Run”	XC12		X1F2	
In Automatic Operation “Start”	XC13		X1F3	
In Automatic Operation “Pause”	XC14		X1F4	
...				
Automatic Operation “Start” Command (Cycle Start)		YC10		Y218
Automatic Operation “Pause” Command (Feedhold)		YC11		Y219
Single Block		YC12		Y21A
...				

Table 8.10. Related Signals of Program Control

8.6.

Jog

The selected axis will move in

- o JOG
- o STEP



Negative Direction



Positive Direction



Rapid Overlay in JOG- Mode

Figure 8.6. JOG Mode

PLC Interface Signals of JOG

JOG				
	M700 VS, M700 VW, M70 & M700		E68	
	Input	Output	Input	Output
Negative Direction	X233	Y223	X133	Y123
Positive Direction	X235	Y235	X135	Y125
Rapid	X234	Y224	X134	Y124

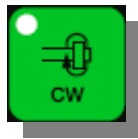
Table 8.11. PLC Interface Signals of JOG

Example: Related Signals (Inputs: CNC → PLC, Outputs: PLC → CNC)

JOG				
	M700 VS, M700 VW, M70 & M700		E68	
	Input	Output	Input	Output
Feed Axis Selection Minus n-TH Axis		Y900, Y901, Y902, Y903, Y904, Y905, Y906, Y907		Y1E0, Y1E1, Y1E2, Y1E3
Feed Axis Selection Plus n-TH Axis		Y8E0, Y8E1, Y8E2, Y8E3, Y8E4, Y8E5, Y8E6, Y8E7		Y1D8, Y1D9, Y1DA, Y1DB
Rapid Traverse		YC26		Y22E
...				

Table 8.12. Related Signals of JOG

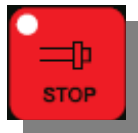
8.7. Spindle Control



Spindle start CW



Spindle start CCW



Spindle Stop

Figure 8.7. Spindle Control

PLC Interface Signals of Spindle Control

SPINDLE CONTROL				
	M700 VS, M700 VW, M70 & M700		E68	
	Input	Output	Input	Output
Spindle CW	X236	Y226	X136	Y126
Spindle CCW	X237	Y237	X137	Y127
Spindle Stop	X238	Y228	X138	Y128

Table 8.13. PLC Interface Signals of Spindle Control

Example: Related Signals (Inputs: CNC → PLC, Outputs: PLC → CNC)

SPINDLE CONTROL				
	M700 VS, M700 VW, M70 & M700		E68	
	Input	Output	Input	Output
Spindle Forward Run Start		Y1898		Y2D0
Spindle Reverse Run Start		Y1899		Y2D1
Spindle Stop		Y1894		Y294
...				

Table 8.14. Related Signals of Spindle Control

8.8. Coolant Control



Coolant ON



Coolant OFF



Control by NC – Program (M8 / M9)

Figure 8.8. Coolant Control

PLC Interface Signals of Coolant Control

COOLANT CONTROL				
	M700 VS, M700 VW, M70 & M700		E68	
	Input	Output	Input	Output
Coolant ON	X239	Y229	X139	Y129
Coolant OFF	X23A	Y23A	X13A	Y12A
Coolant Auto	X23B	Y22B	X13B	Y12B

Table 8.15. PLC Interface Signals of Coolant Control

8.9. 24 Free buttons

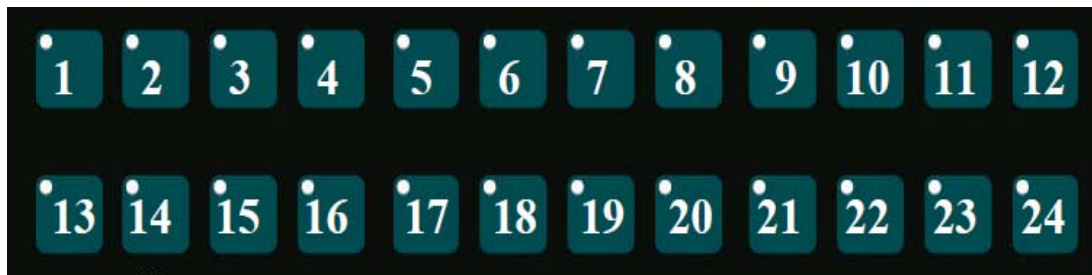


Figure 8.9. 24 Free Buttons

PLC Interface Signals of 24 Free Buttons

24 FREE BUTTONS				
	M700 VS, M700 VW, M70 & M700		E68	
	Input	Output	Input	Output
Free Button #1	X200	Y200	X100	Y100
Free Button #2	X201	Y201	X101	Y101
Free Button #3	X202	Y202	X102	Y102
Free Button #4	X203	Y203	X103	Y103
Free Button #5	X204	Y204	X104	Y104
Free Button #6	X205	Y205	X105	Y105
Free Button #7	X206	Y206	X106	Y106
Free Button #8	X207	Y207	X107	Y107
Free Button #9	X209	Y209	X109	Y109
Free Button #10	X20A	Y20A	X10A	Y10A
Free Button #11	X20B	Y20B	X10B	Y10B
Free Button #12	X20C	Y20C	X10C	Y10C
Free Button #13	X210	Y210	X110	Y110
Free Button #14	X211	Y211	X111	Y111
Free Button #15	X212	Y212	X112	Y112
Free Button #16	X213	Y213	X113	Y113
Free Button #17	X214	Y214	X114	Y114
Free Button #18	X215	Y215	X115	Y115
Free Button #19	X216	Y216	X116	Y116
Free Button #20	X217	Y217	X117	Y117
Free Button #21	X218	Y218	X118	Y118
Free Button #22	X219	Y219	X119	Y119
Free Button #23	X21A	Y21A	X11A	Y11A
Free Button #24	X21B	Y21B	X11B	Y11B

Table 8.16. PLC Interface Signals of 24 Free Buttons

8.10. Free button for Axes

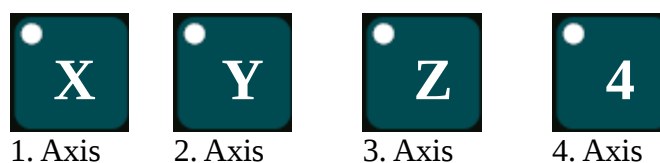


Figure 8.10. 24 Free buttons for Axes

8.11. Free button for Increment for Step- and Handle Mode

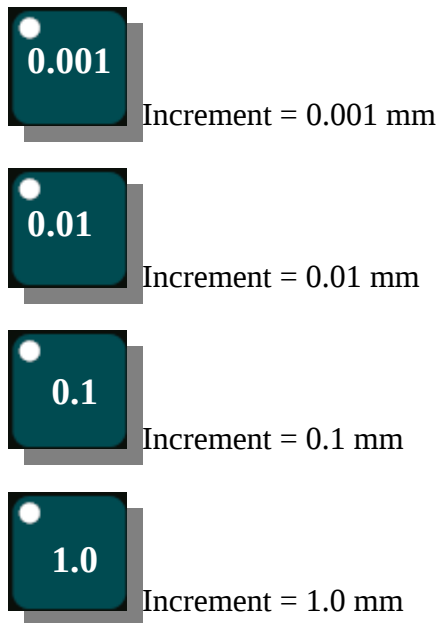


Figure 8.11. 24 Free Buttons for Increment for Step- and Handle Mode

Example: Related Signals (Inputs: CNC → PLC, Outputs: PLC → CNC)

FREE BUTTON FOR INCREMENT				
	M700 VS, M700 VW, M70 & M700		E68	
	Input	Output	Input	Output
Feedrate Least Increment Code 1, 2		YC78, YC79		Y2B8, Y2B9
Handle / Increment Feed Magnification Method Selection		YC87		
...				

Table 8.17. PLC Related Signals of Increment for Step- and Handle

8.12. Edit Lock



Edit Lock ON (Keyswitch left)

Edit Lock OFF (Keyswitch right)

Figure 8.12. Edit Lock

PLC Interface Signals of Edit Lock

EDIT LOCK				
	M700 VS, M700 VW, M70 & M700		E68	
	Input	Output	Input	Output
Key Switch	X20D, X20E		X10D, X10E	
....				

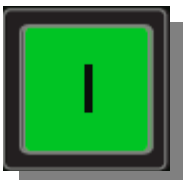
Table 8.18. PLC Interface Signals of Edit Lock

Example: Related Signals (Inputs: CNC → PLC, Outputs: PLC → CNC)

EDIT LOCK				
	M700 VS, M700 VW, M70 & M700		E68	
	Input	Output	Input	Output
Data Protect Key 1		Y708		Y238
Data Protect Key 2		Y709		Y239
Data Protect Key 3		Y70A		Y23A
Data Protect Key 4		Y70B		
...				

Table 8.19. Related Signals of Edit Lock

8.13. CNC – ON / OFF



Switch for CNC Power ON



Switch for CNC Power OFF

Figure 8.13. CNC – ON / OFF

8.14. EMERGENCY

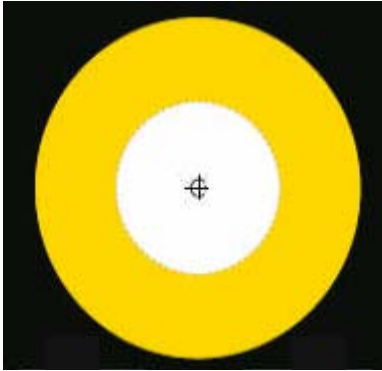


Figure 8.14. The EMERGENCY button.

Example: Related Signals (Inputs: CNC → PLC, Outputs: PLC → CNC)

EMERGENCY				
	M700 VS, M700 VW, M70 & M700		E68	
	Input	Output	Input	Output
PLC Emergency Stop		YC2C		Y29F
...				
Emergency Stop Cause		R69		R69
...				

Table 8.20. Related Signals of Emergency

8.15. Electronic Handwheel (Option)

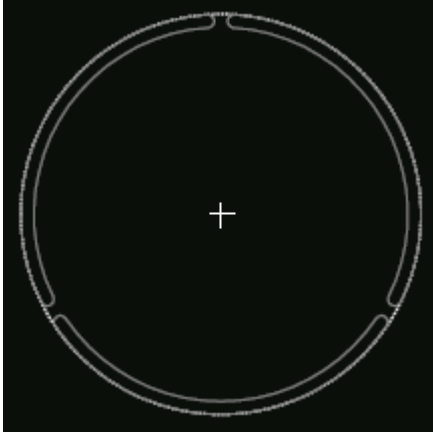


Figure 8.15. The electronic handwheel .

It is not part of the standard scope of supply. It can be assembled later on at any time.

Example: Related Signals (Inputs: CNC → PLC, Outputs: PLC → CNC)

HANDWHEEL				
	M700 VS, M700 VW, M70 & M700		E68	
	Input	Output	Input	Output
1 st Handle Valid		YC47		Y24F
HS11 Handle Axis Code 1		YC40		Y248
HS11 Handle Axis Code 2		YC41		Y249
...				

Table 8.21. Related Signals of Handwheel

8.16. Condition Display

 **READY** NC – READY indicates proper NC condition

 **ALARM** NC – ALARM indicates CNC – error

Figure 8.16. Condition Display .

PLC Interface Signals of Condition Display

CONDITION DISPLAY				
	M700 VS, M700 VW, M70 & M700		E68	
	Input	Output	Input	Output
Ready		Y22C		Y11C
Alarm		Y22D		Y11D
....				

Table 8.22. PLC Interface Signals of Condition Display

Example: Related Signals (Inputs: CNC→PLC, Outputs: PLC→CNC)

CONDITION DISPLAY				
	M700 VS, M700 VW, M70 & M700		E68	
	Input	Output	Input	Output
NC Alarm 1	XC98		X210	
NC Alarm 2	XC99		X211	
NC Alarm 3	XC9A		X212	
NC Alarm 4	XC9B		X213	
...				

Table 8.23. Related Signals of Condition Display