

Índice

P1P51FE30 - 001 : Wiring connections 3

1. Hardware 4

1.1 Operator Panel 4

2. I/O Resources 5

2.1 Digital Inputs 5

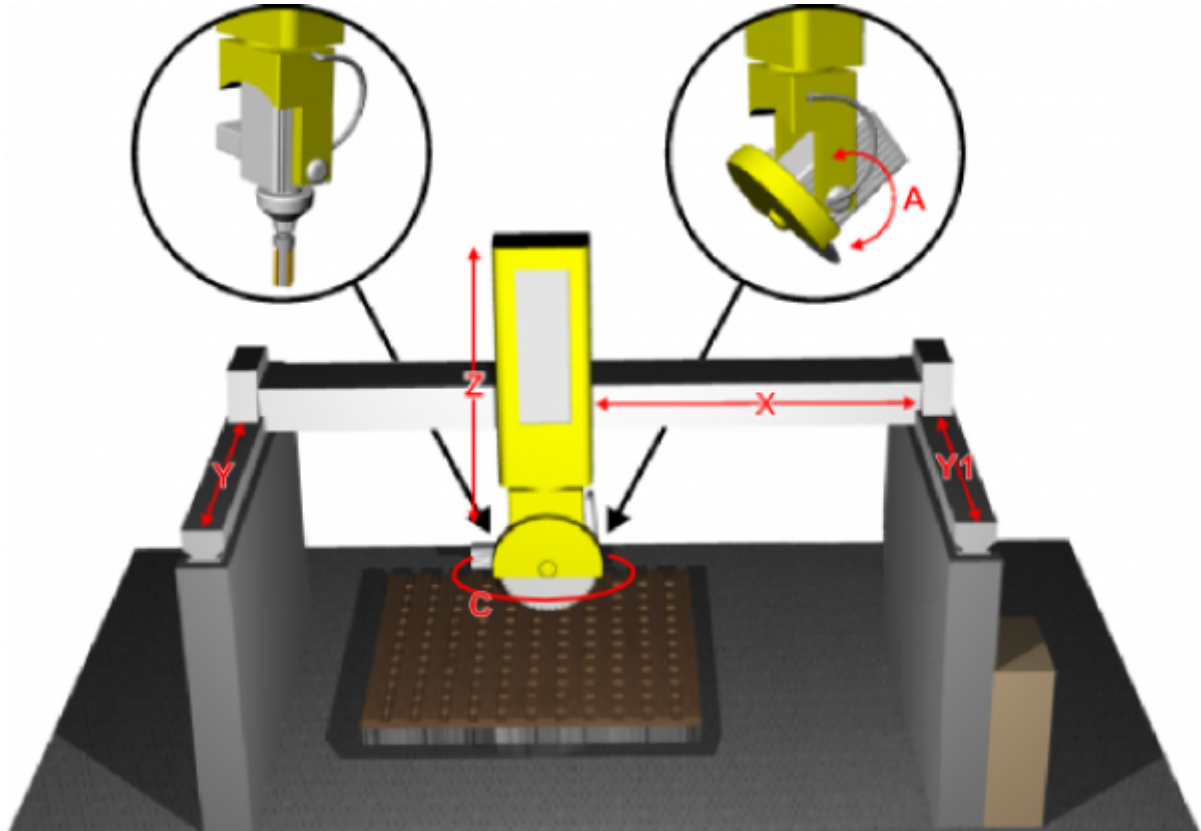
2.2 Digital Outputs 7

2.3 Two-way Encoder Count Inputs 8

2.4 Analog Inputs 11

2.5 Analog Outputs 11

P1P51FE30 - 001 : Wiring connections



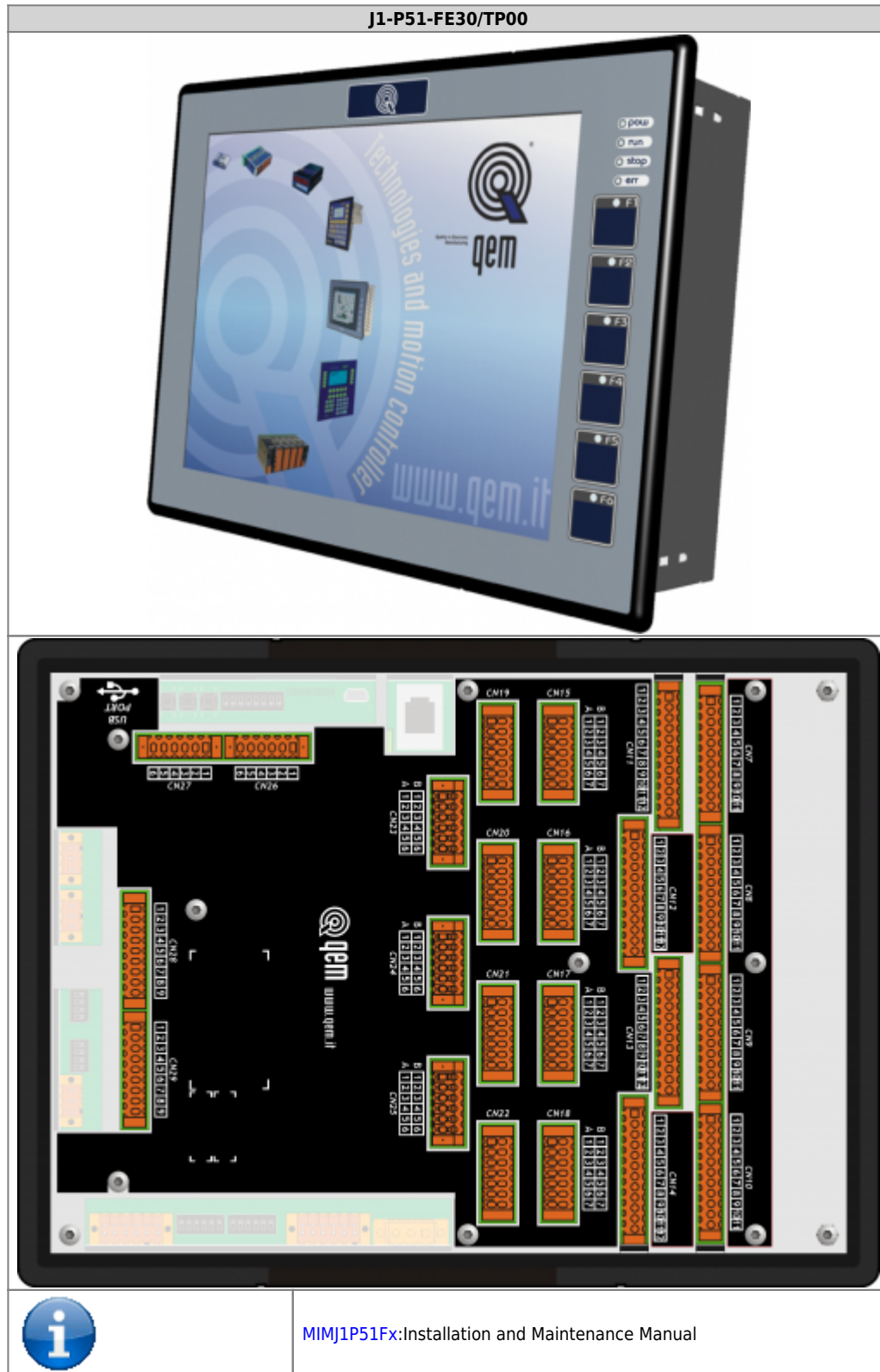
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1. Hardware

1.1 Operator Panel

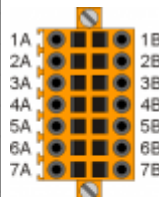


2. I/O Resources

2.1 Digital Inputs

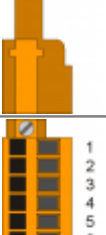
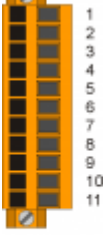
- NO = Normally Opened
- NC = Normally Closed
- PR = Programmable
- I = Impulsive
- C = Continuous

NAME	DESCRIPTION	LOGIC		TERMINAL	HARDWARE
I01	Jog button forward Z [P]	NO	I		CN11.1
n	Connect to terminal CN11.3				CN11.2
0V	Common for digital inputs				CN11.3
I1	FC Y maximum	NC	C		CN11.4
I2	FC Y minimum	NC	C		CN11.5
I3	Motor driver disk fault	NC	C		CN11.6
I4	Disc motor running	NO	C		CN11.7
I5	Disc motor in stop	NO	C		CN11.8
I6	Auxiliary OK	NO	C		CN11.9
I7	Air disc motor and thermal OK	NO	C		CN11.10
I8	Thermal engine oil pump OK	NO	C		CN11.11
0V	Common for digital inputs				CN11.12
I02	Jog button back Z [P]	NO	I		CN12.1
n	Connect to terminal CN12.3				CN12.2
0V	Common for digital inputs				CN12.3
I9	Barrier closed	NO	C		CN12.4
I10	Pressure water present	NO	C		CN12.5
I11	Desk horizontal position sensor	NO	C		CN12.6
I12	Motor Driver X fault	NO	C		CN12.7
I13	Motor Driver Y fault	NO	C		CN12.8
I14	Motor Driver Y1 fault	NO	C		CN12.9
I15	Motor Driver Z fault	NO	C		CN12.10
I16	Motor Driver C fault	NO	C		CN12.11
0V	Common for digital inputs				CN12.12
I03	Button climb tilting bench [P]	NO	I		CN13.1
n	Connect to terminal CN13.3				CN13.2
0V	Common for digital inputs				CN13.3
I17	FC X maximum	NC	C		CN13.4
I18	FC X minimum	NC	C		CN13.5
I19	FC Z Up	NC	C		CN13.6
I20	FC Z Down	NC	C		CN13.7
I21	FC C maximum	NC	C		CN13.8
I22	FC C minimum	NC	C		CN13.9
I23	Low oil level	NO	C		CN13.10
I24	Micro Homing Y1 axis	NO	C		CN13.11
0V	Common for digital inputs				CN13.12
I04	Button-down tilting bench [P]	NO	I		CN14.1
n	Connect to terminal CN14.3				CN14.2
0V	Common for digital inputs				CN14.3
I25	RESET button automatic cycle [P]	NO	I		CN14.4
I26	STOP automatic cycle (HOLD) [P]	NC	I		CN14.5
I27	Jog button forward X [P]	NC	I		CN14.6
I28	Jog button back X [P]	NC	I		CN14.7
I29	Jog button forward Y [P]	NC	I		CN14.8
I30	Button jog back Y [P]	NC	I		CN14.9
I31	Selector blade speed	NC	C		CN14.10
I32	Selector spindle speed	NC	C		CN14.11
0V	Common for digital inputs				CN14.12

NAME	DESCRIPTION	TERMINAL		HARDWARE
-	Not used		CN22.1A	J1-P51
PHA1	Start button [P]		CN22.2A	
PHB1	Reserve		CN22.3A	
Z1	Reserve		CN22.4A	
n	Connect to terminal 5B		CN22.5A	
n	Connect to terminal 6B		CN22.6A	
0V	Common for count inputs		CN22.7A	
n	Connect to terminal 7B		CN22.1B	
-	Not used		CN22.2B	
-			CN22.3B	
-			CN22.4B	
-			CN22.5B	
n	Connect to terminal 5A		CN22.6B	
n	Connect to terminal 6A		CN22.7B	
n	Connect to terminal 7A			

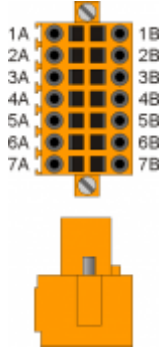
2.2 Digital Outputs

- I = Impulsive
- C = Continuous

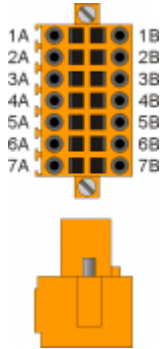
NAME	DESCRIPTION	LOGIC	TERMINAL	HARDWARE
V+	Input Supply digital output (+24V)	-		CN7.1
O1	Enabling spindle	C		CN7.2
O2	Activation by-pass safety barriers	C		CN7.3
V-	<i>not used</i>			CN7.4
O3	Turning oil pump for tilting bench	C		CN7.5
O4	Enabling EV water cooling	C		CN7.6
V-	Common for digital output (0V)			CN7.7
O5	Laser activation	C		CN7.8
O6	Machine OK	C		CN7.9
O7	Lamp presence alarm	I/C		CN7.10
O8	Enabling EV climb bench	C		CN7.11
V+	Input Supply digital output (+24V)	-		CN8.1
O9	Enabling EV descent bench	C		CN8.2
O10	Enable drive axis X	C		CN8.3
V-	<i>not used</i>			CN8.4
O11	Enable drive axis Y	C		CN8.5
O12	Enable drive axis Y1	C		CN8.6
V-	Common for digital output (0V)			CN8.7
O13	Enable drive axis Z	C		CN8.8
O14	Enable drive axis C	C		CN8.9
O15	Signaling axis in motion	C		CN8.10
O16	Reset driver	I/C		CN8.11
V+	Input Supply digital output (+24V)	-		CN9.1
O17	Selection rotating disk (OFF) or cutter (ON)	I/C		CN9.2
O18	Activation lubrication	C		CN9.3
V-	<i>not used</i>			CN9.4
O19	Lamp automatic cycle stopped [P]	C		CN9.5
O20	Lamp disk in motion with cycle stop [P]	I		CN9.6
V-	Common for digital output (0V)			CN9.7
O21	Lamp automatic cycle in progress [P]	C		CN9.8
O22	Bypass safety barriers Active lamp [P]	C		CN9.9
O23	Lamp (or beep) alarm in progress [P]	I		CN9.10
O24	Auxiliary lamp lit and ready CN [P]	C		CN9.11
V+	Input Supply digital output (+24V)	-		CN10.1
O25	<i>reserve</i>			CN10.2
O26	<i>reserve</i>			CN10.3
V-	<i>not used</i>			CN10.4
O27	<i>reserve</i>			CN10.5
O28	<i>reserve</i>			CN10.6
V-	Common for digital output (0V)			CN10.7
O29	<i>reserve</i>			CN10.8
O30	<i>reserve</i>			CN10.9
O31	<i>reserve</i>			CN10.10
O32	<i>reserve</i>			CN10.11

J1-P51

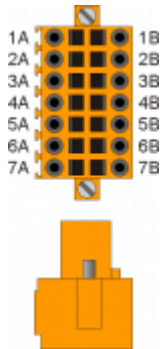
2.3 Two-way Encoder Count Inputs

Axis X (Line Driver)			
NAME	DESCRIPTION	TERMINAL	HARDWARE
-	<i>Not used</i>		CN15.1A
-			CN15.2A
-			CN15.3A
-			CN15.4A
-			CN15.5A
-			CN15.6A
0V	Common for count inputs		CN15.7A
-	<i>Not used</i>		CN15.1B
PHA1+	+ PHA		CN15.2B
PHB1+	+ PHB		CN15.3B
Z1+	+ Z		CN15.4B
PHA1-	- PHA		CN15.5B
PHB1-	- PHB		CN15.6B
Z1-	- Z		CN15.7B

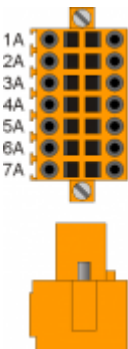
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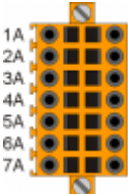
Axis Y (Line Driver)			
NAME	DESCRIPTION	TERMINAL	HARDWARE
-	<i>Not used</i>		CN16.1A
-			CN16.2A
-			CN16.3A
-			CN16.4A
-			CN16.5A
-			CN16.6A
0V	Common for count inputs		CN16.7A
-	<i>Not used</i>		CN16.1B
PHA2+	+ PHA		CN16.2B
PHB2+	+ PHB		CN16.3B
Z2+	+ Z		CN16.4B
PHA2-	- PHA		CN16.5B
PHB2-	- PHB		CN16.6B
Z2-	- Z		CN16.7B

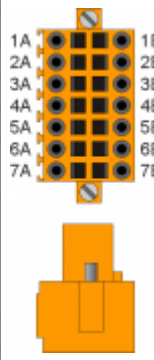
J1-P51

Axis Z (Line Driver)			
NAME	DESCRIPTION	TERMINAL	HARDWARE
-	<i>Not used</i>		CN17.1A
-			CN17.2A
-			CN17.3A
-			CN17.4A
-			CN17.5A
-			CN17.6A
0V	Common for count inputs		CN17.7A
-	<i>Not used</i>		CN17.1B
PHA3+	+ PHA		CN17.2B
PHB3+	+ PHB		CN17.3B
Z3+	+ Z		CN17.4B
PHA3-	- PHA		CN17.5B
PHB3-	- PHB		CN17.6B
Z3-	- Z		CN17.7B

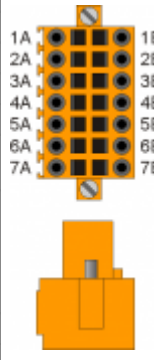
J1-P51

Axis Y1 (Line Driver)				
NAME	DESCRIPTION	TERMINAL		HARDWARE
-	Not used		CN18.1A	J1-P51
-			CN18.2A	
-			CN18.3A	
-			CN18.4A	
-			CN18.5A	
-			CN18.6A	
0V	Common for count inputs		CN18.7A	
-	Not used		CN18.1B	
PHA4+	+ PHA		CN18.2B	
PHB4+	+ PHB		CN18.3B	
Z4+	+ Z		CN18.4B	
PHA4-	- PHA		CN18.5B	
PHB4-	- PHB		CN18.6B	
Z4-	- Z		CN18.7B	

Axis C (Line Driver)				
NAME	DESCRIPTION	TERMINAL		HARDWARE
-	Not used		CN19.1A	J1-P51
-			CN19.2A	
-			CN19.3A	
-			CN19.4A	
-			CN19.5A	
-			CN19.6A	
0V	Common for count inputs		CN19.7A	
-	Not used		CN19.1B	
PHA5+	+ PHA		CN19.2B	
PHB5+	+ PHB		CN19.3B	
Z5+	+ Z		CN19.4B	
PHA5-	- PHA		CN19.5B	
PHB5-	- PHB		CN19.6B	
Z5-	- Z		CN19.7B	

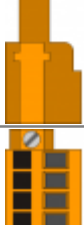
Axis A (Push-Pull)			
NAME	DESCRIPTION	TERMINAL	HARDWARE
-	Not used		CN20.1A
PHA6	Phase A		CN20.2A
PHB6	Phase B		CN20.3A
Z6	Z		CN20.4A
n	Connect to terminal 5B		CN20.5A
n	Connect to terminal 6B		CN20.6A
0V	Common for count inputs		CN20.7A
n	Connect to terminal 7B		CN20.1B
-	Not used		CN20.2B
-			CN20.3B
-			CN20.4B
-			CN20.5B
n	Connect to terminal 5A		CN20.6B
n	Connect to terminal 6A		CN20.7B
n	Connect to terminal 7A		CN20.7B

J1-P51

Axis Flyer (Push-Pull)			
NAME	DESCRIPTION	TERMINAL	HARDWARE
-	Not used		CN21.1A
PHA7	Phase A		CN21.2A
PHB7	Phase B		CN21.3A
Z7	Z		CN21.4A
n	Connect to terminal 5B		CN21.5A
n	Connect to terminal 6B		CN21.6A
0V	Common for count inputs		CN21.7A
n	Connect to terminal 7B		CN21.1B
-	Not used		CN21.2B
-			CN21.3B
-			CN21.4B
-			CN21.5B
n	Connect to terminal 5A		CN21.6B
n	Connect to terminal 6A		CN21.7B
n	Connect to terminal 7A		CN21.7B

J1-P51

2.4 Analog Inputs

NAME	DESCRIPTION	TERMINAL	HARDWARE
GAI	Common for analog inputs		CN28.1
AI1	Setting cutting speed interpolation (potentiometer)	2	CN28.2
SEL1V	<i>Not used</i>	3	CN28.3
SEL1C	<i>Not used</i>	4	CN28.4
GAI	Common for analog inputs	5	CN28.5
AI2	Amperage reading of the spindle motor (0-10V)	6	CN28.6
SEL2V n	Connect to GAI (terminal CN28.5)	7	CN28.7
SEL2C	<i>Not used</i>	8	CN28.8
VRef	Reference Voltage	9	CN28.9
GAI	Common for analog inputs		CN29.1
AI3	Setting speed in the cutting direction (potentiometer)	2	CN29.2
SEL3V	<i>Not used</i>	3	CN29.3
SEL3C	<i>Not used</i>	4	CN29.4
GAI	Common for analog inputs	5	CN29.5
AI4	Setting speed in the opposite direction to the cutting (potentiometer)	6	CN29.6
SEL4V	<i>Not used</i>	7	CN29.7
SEL4C	<i>Not used</i>	8	CN29.8
VRef	Reference Voltage	9	CN29.9

J1-P51

2.5 Analog Outputs

NAME	DESCRIPTION	TERMINAL	HARDWARE
GAO	Common for analog outputs		CN26.1
AO1	Axis X speed control $\pm 10Vdc$	2	CN26.2
AO2	Axis Y speed control $\pm 10Vdc$	3	CN26.3
GAO	Common for analog outputs	4	CN26.4
AO3	Axis Z speed control $\pm 10Vdc$	5	CN26.5
AO4	Axis Y1 speed control $\pm 10Vdc$	6	CN26.6
GAO	Common for analog outputs		CN27.1
AO5	Axis C speed control $\pm 10Vdc$	2	CN27.2
AO6	<i>Not used</i>	3	CN27.3
GAO	Common for analog outputs	4	CN27.4
AO7	Reference (0-10V) for spindle speed	5	CN27.5
AO8	<i>Not used</i>	6	CN27.6

J1-P51

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