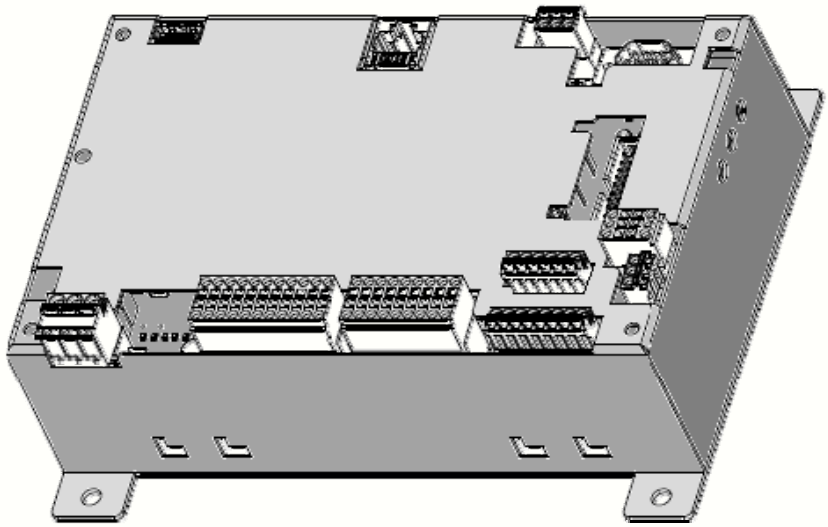
HMI + PLC with Motion Control functions

Power Z 7” Small

- TFT WVGA (800x480 pixel) size with touch screen
- dimensions 197x125x66 (WxHxD in mm)

Power Z Box



- dimensions 185x145x66 (WxHxD in mm)

Technical data

Description		Notes / Options
CPU	**32 bit RISC**	264 MHz - Dual core
Flash memory + F volume	**8 MB**	
Ram (with battery backup)	**2 MB**	
Fast access internal RAM memory	**512 KB**	
Clock calendar	**No**	
Axes interpolation	**No**	Lack editors CNC and BLC
Buzzer	**Yes**	
Touch screen	**Yes**	
Keyboard management	**No**	Only USB keyboard
Digital inputs PNP 24 Vdc	**10**	Locally expandable to 26 with INT-SPI
Protected outputs PNP 0,35 A - 24Vdc	**8**	Locally expandable to 24 with INT-SPI
Optoinsulated outputs 60 mA 24Vdc PNP	**2**	
Analog inputs 0..5 volt - 14 bit	**3**	On request 2 can be 0-20 mA
Analog input +/-10 volt	**1**	Optional
Analog input 0-20 mA 12 bit	**1**	Optional
Analog outputs +/-10V, from PWM	**1**	
ABZ 5V Line Driver encoder interface	**1**	5V Push Pull opening the jumpers
AB 5V Line Driver encoder interface	**1**	5V Push Pull opening the jumpers
STEP / DIRECTION or PWM outputs	**for 3 axes**	5V Line Driver
RS232 port	**2**	
RS485 port	**1**	
CAN port	**1**	Only CANopen CiA 401 for I/O
Ethernet 10-100 T port	**1**	TCP/IP, FTP, ModbusTCP and WEB server
USB 2.0 port	**1**	Only rear
SPI port (local I/O expansion)	**1**	For INT-SPI interface with 16 I +16 O
Power supply	**24 Vdc**	Low consumption, battery function also possible

Please note: the graphics controller of Power Z not have enough dynamic memory and thus cannot handle the USB mouse and is generally less performing than other Power controllers.
In cases where it is required to use the mouse or you have to have high-performance graphics is therefore recommended to use the Power J.

Removable terminal blocks

The controller is shipped without the removable terminal blocks, with the exception of that is used for its power supply (M1). On request a Kit can be provided that includes all the remaining terminal blocks that are:

Terminal board	Brand	Description
M2	Phoenix	FMC 1,5/8-ST-3,5 cod.1952322
M3	Phoenix	FMC 1,5/6-ST-3,5 cod.1952306
M4	Phoenix	FMC 1,5/3-ST-3,50 cod.1952270
M5	Weidmuller	B2L3.50/6/180 FEM. 3x2P. P.3,50 cod.1727560000
M6	Weidmuller	B2L3.50/18/180 FEM. 9x2P. P.3,50 cod.1727620000
M7	Phoenix	FMC 1,5/3-ST-3,50 cod.1952270
M8	Weidmuller	B2L3.50/22/180 FEM.11x2P. P.3,50 cod.1747850000

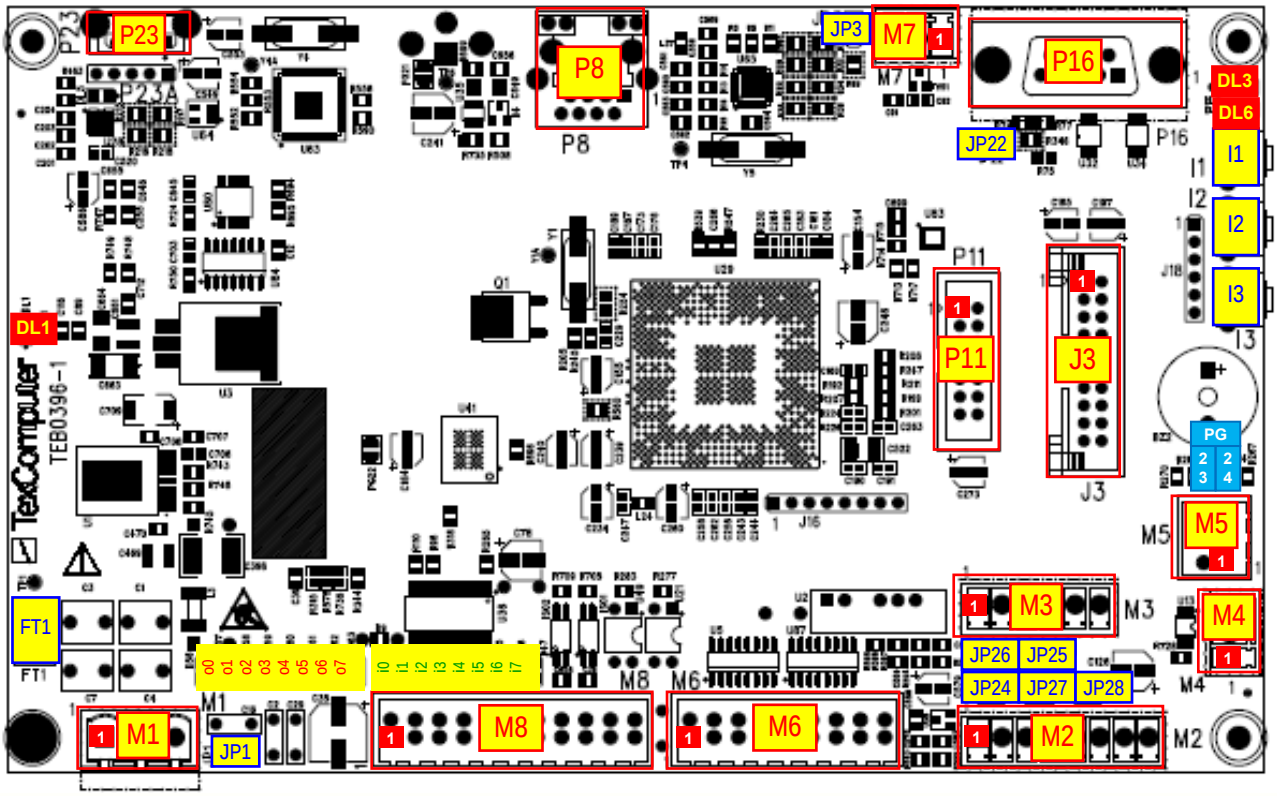
Alternatively, you can buy on the market only those that are required in each specific application using the codes given above or of equivalent products.

Warnings

Before powering up the controller you should always check the following:

1. **That the power is supplied only via terminal M1**
2. **That the supply voltage never exceeds 27 VDC**
3. **That the connections between the + and - of the power supplies are not reversed, both incoming or exiting the controller**
4. **That the encoders are not fed with voltages other than those provided by the controller**

Failure to observe any of these recommendations could cause irreparable damage to the controller.



Name	Type	Function
M1	3 pin terminal board	Controller power supply
M2	8 pin terminal board	no. 3 signals A, B and Z, 5V Line Driver, encoder # 1
M3	6 pin terminal board	no. 2 signals A, B 5V Line Driver encoder # 2
M4	3 pin terminal board	Analog inputs +/- 10V and 0-20 mA - 14 bit, buffered
M5	6 pin terminal board	no. 3 Analog inputs 0-5Volt 14-bit, not buffered (on request 2 can be 0-20mA)
M6	18 pin terminal board	PWM / STEP outputs and DIR # 1, 2 and 3 (5V Line Driver) no. 2 digital output 5V Line Driver (can be used as Enable) no. 1 analog output +/- 10 V (from PWM # 5)
M7	3 pin terminal board	CAN A (addressable nodes 0-63)
M8	22 pin terminal board	no. 10 digital inputs (to use also as Fc Zero) no. 8 digital protected outputs PNP 0,35 A – 24 Vdc no. 2 digital outputs PNP 60 mA – 24 Vdc
P8	Connector RJ45	Ethernet 10/100 T
P16	Pan connector 9 pin M	RS232 (COM1 & COM2) and RS485 (COM3)
P23	Connector USB	USB 2.0 rear connector
J3	Connector 20 pin	Connection to INT-SPI interface (I/O expansion)
JP1	Jumper	VA supply short circuit with VAX supply
JP3	Jumper	CAN port termination resistance
JP22	Jumper	RS485 port termination resistance
JP24	Jumper	Line Driver / Push Pull of CLKA encoder # 1
JP25	Jumper	Line Driver / Push Pull of CLKB encoder # 2
JP26	Jumper	Line Driver / Push Pull of CLKA encoder # 2
JP27	Jumper	Line Driver / Push Pull of CLKB encoder # 1
JP28	Jumper	Line Driver / Push Pull of NOTCH 0 encoder # 1

Name	Type	Function
FT1	Faston	Ground connection with at least 2,5 mm^2 cable
I1	Microswitch (input i88)	Launch of Boot and Card recovery functions
I2	Microswitch (input i89)	At start up it simulates pression on STOP key
I3	Microswitch (input i90)	
DL1	Red led	Internal power supply ok
DL3	Red led (output o43)	Signalling boot functions selectable by micro switch I1
DL6	Red led (output o44)	
PG23	Welding point	0-20 mA configuration of analog input # 256
PG24	Welding point	0-20 mA configuration of analog input # 257

For connectors without numbering, pin 1 is highlighted in red.

M1 TERMINAL BOARD (power supply)

Terminal	Function
1	VA +24 Vdc controller's power supply, with jumper JP1 closed (default configuration) it's connected to pin 21 of M8 (VAX)
2	GNDA 0Vdc power supply
3	GNDA 0Vdc power supply

M2 TERMINAL BOARD (encoder # 1)

Terminal	Function	Jumper	Notes
1	CLK A channel A straight encoder # 1	JP24	Jumper close = 5V Line Driver Jumper open = 5V Push Pull
2	CLK/ A channel A negated encoder # 1	-	
3	CLK B channel B straight encoder # 1	JP27	
4	CLK/B channel B negated encoder # 1	-	
5	NOTCH /0 channel 0 negated encoder # 1	JP28	Jumper close = 5V Line Driver Jumper open = 5V Push Pull readable in interrupt as i56
6	NOTCH 0 channel 0 straight encoder # 1	-	
7	GND power supply ground encoder # 1	-	
8	VDC +5Vdc power supply for encoder # 1	-	

M3 TERMINAL BOARD (encoder # 2)

Terminal	Function	Jumper	Notes
1	CLK A channel A straight encoder # 2	JP26	Jumper close = 5V Line Driver Jumper open = 5V Push Pull
2	CLK/ A channel A negated encoder # 2	-	
3	CLK B channel B straight encoder # 2	JP25	
4	CLK/B channel B negated encoder # 2	-	
5	GND power supply ground encoder # 2	-	
6	VDC +5Vdc power supply for encoder # 2	-	

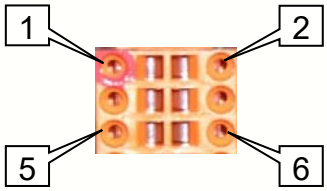
Opening their jumpers, the straight inputs of encoder are configured as 5V Push Pull; in this case the negated inputs must not be connected.

The encoder inputs can be filtered by software acting on INFO 1623 and INFO 1648.

M4 TERMINAL BOARD (+/- 10V and 0-20 mA optional inputs)

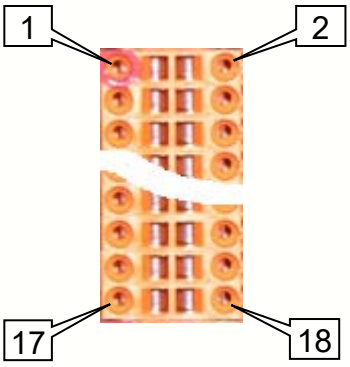
Terminal	Function
1	+/- 10 V Analog input # 16, range 1640…14744, resolution 14 bit
2	GND
3	0-20 mA Analog input # 17, range 0… 16384, 14 bit

M5 TERMINAL BOARD (no. 3 5V or 0-20mA analog input)

Terminal	Function	Layout
1	GND analog	
2	0-5 V Analog input # 256, resolution 14 bit *	
3	0-5 V Analog input # 257, resolution 14 bit *	
4	0-5 V Analog input # 258, resolution 14 bit	
5	GND analog	
6	+ 5V for potentiometers supply	

* They can be 0-20mA, with resistance in input of 249 Ω, welding PG23 and PG24

M6 TERMINAL BOARD (+/-10V output and PWM or STEP/DIRECTION outputs)

Terminal	Function	Layout
1	PWM - STEP # 1 (straight signal)	
2	/ PWM - STEP # 1 (inverted signal)	
3	o24 (straight signal, can be used as Direction)	
4	/ o24 (inverted signal, can be used as Direction)	
5	PWM - STEP # 2 (straight signal)	
6	/ PWM - STEP # 2 (inverted signal)	
7	o25 (straight signal, can be used as Direction)	
8	/ o25 (inverted signal, can be used as Direction)	
9	PWM - STEP # 3 (straight signal)	
10	/ PWM - STEP # 3 (inverted signal)	
11	o26 (straight signal, can be used as Direction)	
12	/ o26 (inverted signal, can be used as Direction)	
13	o20 (straight signal, can be used as Drive Enable)	
14	/ o20 (inverted signal, can be used as Drive Enable)	
15	o21 (straight signal, can be used as Drive Enable)	
16	/ o21 (inverted signal, can be used as Drive Enable)	
17	GND (0Vdc)	
18	VREF X, +/- 10V analog output from PWM # 5	

The digital outputs are 5V Line Driver (IC type 26C31), with internal power supply.

When outputs o20 and/or o21 are used as Enable for the axis, their operating logic is reversed internally; then, when the axis is activated, the straight signal goes to 0V and the inverted signal goes to 5V.

+/- 10V analog outputs is obtained by converting the digital signal PWM #5 into analog with an integrator; the “drive type” parameter must be set to 1 and the PWM resolution can be set to 13 or 14 bit.

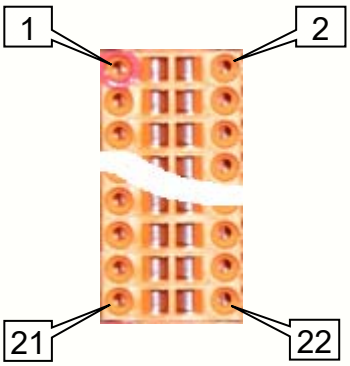
The PWM signal can become a STEP signal if you set the *drive type* special parameter at value 8; if *other motor parameter* is set at 0 the axis feedback is an encoder, if it is at 1 the pulses generated by the STEP output are used as feedback. The *motor output offset* special parameter should also be set at a value different from 0 to avoid that the stabilization time is too long when the target position is reached. Max. frequency of the STEP signal is 263 KHz if INFO 1154=1 and may fall to 37 KHz if INFO 1154 = 7 (further information in “Power Family.chm” manual)

M7 TERMINAL BOARD (CAN port)

Terminal	Function
1	CAN H
2	GND (0Vdc)
3	CAN L

The Power Z can manage the CAN port using both the profile of general communication CiA 301, that the specific profile for the I / O devices CiA 401.

M8 TERMINAL BOARD (digital I/O)

Terminal	Function	Layout
1	User output o0 - 24V PNP, **350 mA** protected	
2	User input i0 - 24V PNP	
3	User output o1 - 24V PNP, **350 mA** protected	
4	User input i1 - 24V PNP	
5	User output o2 - 24V PNP, **350 mA** protected	
6	User input i2 - 24V PNP	
7	User output o3 - 24V PNP, **350 mA** protected	
8	User input i3 - 24V PNP	
9	User output o4 - 24V PNP, **350 mA** protected	
10	User input i4 - 24V PNP	
11	User output o5 - 24V PNP, **350 mA** protected	
12	User input i5 - 24V PNP	
13	User output o6 - 24V PNP, **350 mA** protected	
14	User input i6 - 24V PNP	
15	User output o7 - 24V PNP, **350 mA** protected	
16	User input i7 - 24V PNP	
17	User output o16 - 24V PNP, **60 mA unprotected**, internally connected to VA (ENBX)	
18	User input i41 - 24V PNP	
19	User output o17 - 24V PNP, **60 mA unprotected**, internally connected to VA	
20	User input i40 - 24V PNP (Fc Zero axis # 1)	
21	VAX (+ 24Vdc I/O) *	
22	GND (0Vdc I/O) *	

* VAX terminal allows you, if JP1 is open, to supply the 0.35A protected outputs independently from the controller's power supply. This is useful especially when the controller's outputs are used on machines which have to respect CE safety regulations.

Unsupported graphics commands

Compared to other members of the Power Family, the Power Z adopts a graphics controller different, already integrated in the display. This controller does not allow to support the following graphics commands:

- **HCURS:** which displays a graphic cursor depicted by an icon
- **SPRITE:** defining superimposed graphic layers
- **WINDOW !p:** a graphical window with SPRITE (ie with a priority level p> 64)
- **MKPERM:** making permanent the graphics drawn in a rectangular area of the screen
- **SCREEN 99:** opening a dialog box after the graphic simulation of CNC program

Please be aware that into file ICU you cannot insert icons in jpeg format.

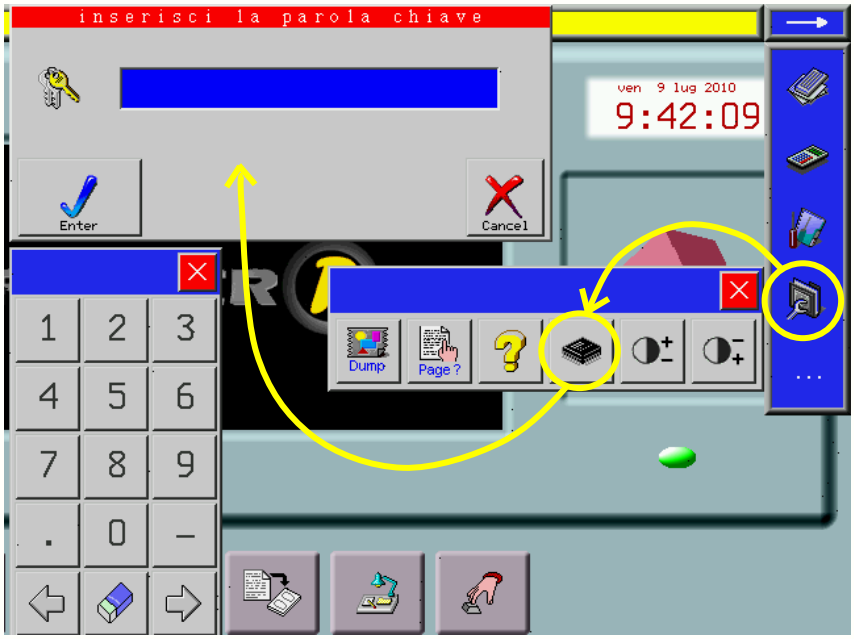
For more information, see manual html PowerFamily.chm.

Box version

Since graphics controller is integrated into the display, as there is no display when you make the dump (that is a copy of the screen image) from Power Studio or Web Server, you get a screen image completely light blue.

Ethernet connection

There is one parameter to enable Ethernet connection, one to set its IP address and one to declare its subnet mask; the first and the third one are accessible in the machine parameters, while the Ethernet address is in the "change card parameters" list accessible from the Boot menu (see also "Basic touch screen functions" in this data sheet). If the controller does not have a full hardware keyboard, the Boot menu should be accessed through the touch screen tool bar (remember that this access is protected by a password):



You can find further information on html manual PowerFamily.chm, in the paragraph "User's interface". By default connection is already enabled and the controller is accessible at IP 192.168.0.200, subnet mask 255.255.255.0; for a direct connection with a PC (peer to peer mode) use a crossed Ethernet cable with RJ45 8 pins connectors.

Names of axes

This hardware configuration parameter associates the names of axes to the hardware resources on the motherboard. These resources can be identified per type and differ for a consecutive numbering (e.g. encoder # 1, encoder # 2, PWM # 5 etc.). In the default configuration, the names XYZ are assigned to the axes and the position assumed by each letter indicates the number of the hardware resource which will be associated to the relative axis if installed.

Installed axes

In order to be installed and be operative the axis have to be declared in specific hardware configuration parameter. It's possible to modify default hardware resources assignation operating on respective special parameters of each axis.
For example: installing axes X and Y and modifying the "encoder number" parameter of the "X axis special parameters" from the "default" value to value "4" transfers the X axis feedback from encoder # 1 to encoder # 4, while the Y axis feedback will remain the default correlation to # 2.
The freed resources (encoder # 1 in the example) can be used by other axes or managed through specific commands available in the programming language.

Parameters to associate hardware resources to the axes

"PWM/DAC/freq output number": destination of the PID output of the axis (valid values from 1 to 16).
"encoder number": velocity/position feedback of the axis (valid values from 1 to 2)
"enabling output": output to enable the drive of the axis (any available user output is valid).
"zero sensor": input to change the position of the axis (only interrupt inputs are valid)
"minimum sensor": input to limit the minimum stroke of the axis (any available input is valid).
"maximum sensor": input to limit the maximum stroke of the axis (any available input is valid). The output which controls the direction of the axis cannot be changed from the default setting.

Management of the limit switches dedicated to the axes

Each installed axis has associated by default inputs which have a predetermined function:

- **Zero limit switch**, allows you to change axis position when at its deactivation or when an encoder impulse occurs through signal "Notch 0". Input must be manageable in interrupt.
- **Minimum limit switch** at its activation interrupts axis motion, puts it in alarm and prevents any motion towards lower quotes. The input must remain active till it reaches the lowest physical limit of the axis motion.
- **Maximum limit switch** at its activation interrupts axis motion, puts it in alarm and prevents any motion towards higher quotes. The input must remain active till it reaches the highest physical limit of the axis motion.

Generally, Zero Limit Switch can also simultaneously work as one of the two limit switches (minimum or maximum), therefore by default the Zero and Minimum Limit Switchs use the same input.

Inputs in interrupt

All inputs present on the main board can be managed at interrupt.

+/- 10V analog inputs

To use correctly analog input connected to pin 1 of terminal M4, you have to execute linearization of the value read through ADC (16) operator, considering that:

- At each value in input equal to -10V corresponds a value of 1640 um
- At each value in input equal to 0V corresponds a value of 8192 um
- At each value in input equal to +10V corresponds a value of 14744 um

Since the converter resolution is 12 bit, the smallest noticeable variation will be 1,5996 um

Other analog inputs

All analog inputs readable from ADC operator (xxx) have to be lined up to Full Scale value (F.S.) of the input considering that:

- To a value in input equal to 0 % of F.S. corresponds a value of 0 um
- To a value in input equal to 100 % of F.S. corresponds a value of 16384 um

Since the converter resolution is 12 bit, the smallest noticeable variation will be 4 um

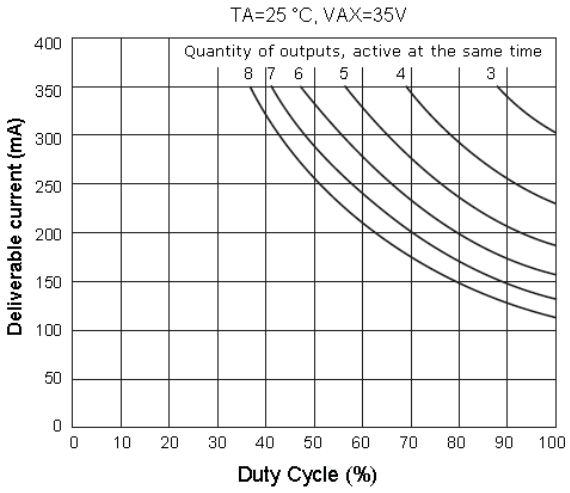
Processing of the analog inputs via Sigma-Delta units

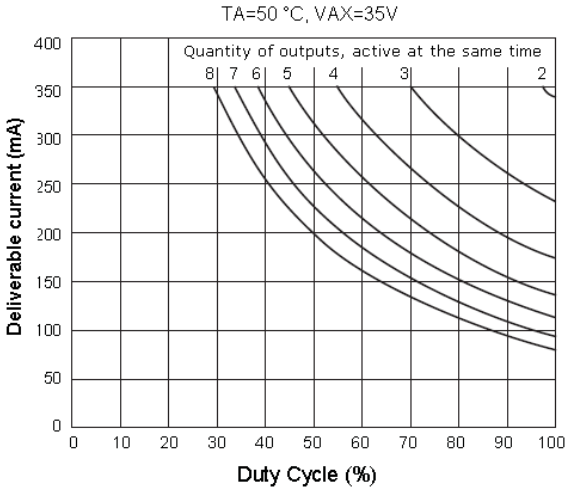
The card has 4 Sigma-Delta (SD) units for analog signals processing; all analog inputs readable via the ADC operator (xxx) may be directed to one of these units through the command SDADC. The value, filtered and digitized, can be read with a 14 bits resolution on the INFOs 2091-2094 (one for each unit). The syntax is the following: *SDADC n, xxx* where *n* is the SD channel number (1 to 4) and *xxx* is the analog channel to be processed, one for every SD unity. For example, using the # 4 SD unit to process the signal on pin # 2 of the M5 terminal, the command to use will be SDADC 4, 256; the filtered and digitized value will be readable on INFO 2093. Note that the value returned is formatted at 15 bits, while the same channel read with the command ADC is formatted at 14 bits.

Alarm signal on protected outputs

If one of protected 0,35A outputs goes in overload, the automatic thermal protection function of the integrated circuit UDN 2987 shutdown all outputs generating, at the same time, an alarm signal detectable with the transition from 1 to 0 of input i22.

The deliverable current of each output also depends on the number of active outputs at the same time and by the possible thermal dissipation of the integrated circuit which is also affected by the ambient temperature TA, as can be seen from the following graphs:



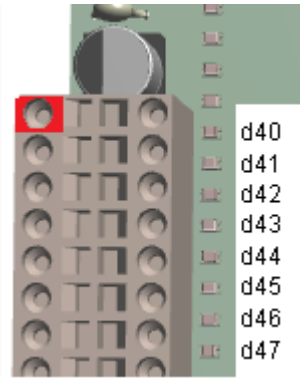


If the integrated circuit reaches the thermal overload threshold, all outputs are turned off; they automatically reset only after the internal temperature of UDN 2987 will have dropped by about 10%. During overcurrent shutdown the i22 output will remain at 0.

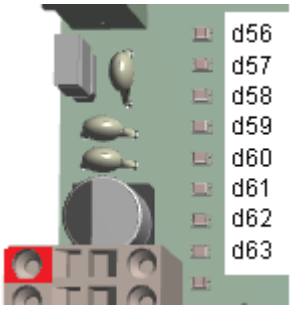
Special inputs disable

In Power Z the Hardware configuration parameter "disable special in " must be set to 1111 (all special inputs, including Emergency, should be disabled).

DIGITAL INPUTS (consecutive numbering)

Input	Connector	pin	led	notes
i0	M8	2	d40	
i1	M8	4	d41	
i2	M8	6	d42	
i3	M8	8	d43	
i4	M8	10	d44	
i5	M8	12	d45	
i6	M8	14	d46	
i7	M8	16	d47	
i22	-	-		Internal alarm on protected outputs
i40	M8	20		Fc Zero axis # 1 (X)
i41	M8	18		
i56	M2	5&6		Enc. # 1 zero notch, 5V Line Driver, usable in interrupt
i88	-	-		I1 push button
i89	-	-		I2 push button
i90	-	-		I3 push button

DIGITAL OUTPUTS (consecutive numbering)

output	connector	pin	led	powered from	notes
o0	M8	1	d56	VAX	 24V PNP 0,35A * protected output
o1	M8	3	d57		
o2	M8	5	d58		
o3	M8	7	d59		
o4	M8	9	d60		
o5	M8	11	d61		
o6	M8	13	d62		
o7	M8	15	d63		
o16	M8	17		VA	ENB X, 24V PNP - 60 mA
o17	M8	19			ENB Y, 24V PNP - 60 mA
o20	M6	13 & 14	-	internal 5V	5V Line Driver output When used as Enable for the axis, their operating logic is reversed and then, when the axis is activated, the straight signal goes to 0V and the inverted signal goes to 5V
o21	M6	15 & 16	-		
o24	M6	3 & 4	-		5V Line Driver output
o25	M6	7 & 8	-		
o26	M6	11 & 12	-		
o41	-	-	-	-	Buzzer
o43	-	-	DL3	-	internal output
o44	-	-	DL6	-	internal output

* To check the maximum current deliverable, see section "Alarm signal on protected outputs.".

ANALOG INPUTS (consecutive numbering)

input	connector	pin	full scale	notes	
16	M4	1	+/- 10V	14 bit, buffered	
17		3	0-20 mA	14 bit, buffered	
256	M5	2	0-5V or 0-20 mA	PG23	14 bit, not buffered
257		3	0-5V or 0-20 mA	PG24	
258		4	0-5V	14 bit, not buffered	

ANALOG OUTPUTS (consecutive numbering)

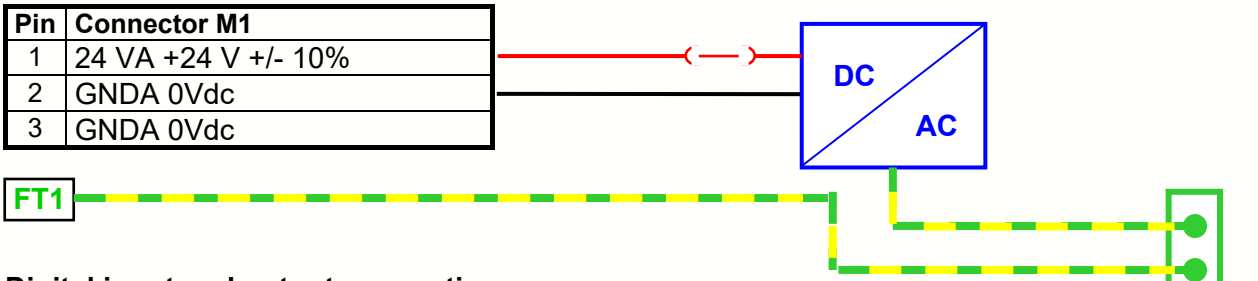
output	connector	pin	full scale	notes
5	M6	18	+/- 10V	from PWM # 5, with 12-14 bits resolution

CONNECTION EXAMPLES

This section is an extract of the information provided in the “Electrical Connections” section of the manual supplied with the controller, to which you must always refer for the wiring of the system according to the constructor’s technical recommendations.

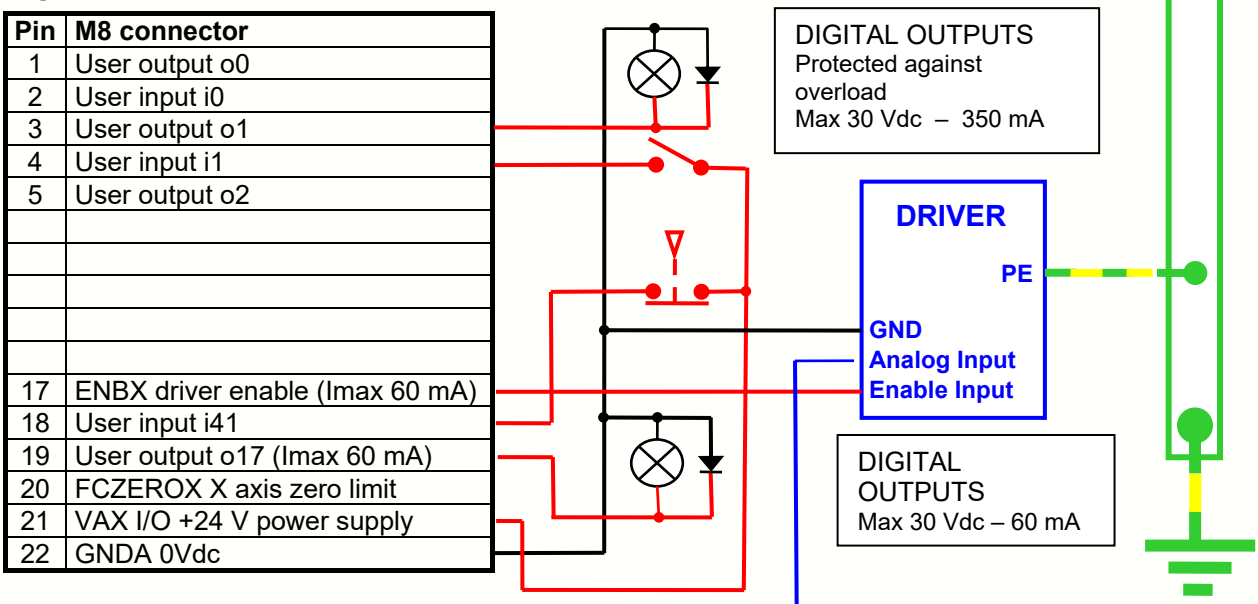
Power supply and ground connection

Pin	Connector M1
1	24 VA +24 V +/- 10%
2	GNDA 0Vdc
3	GNDA 0Vdc



Digital input and output connection

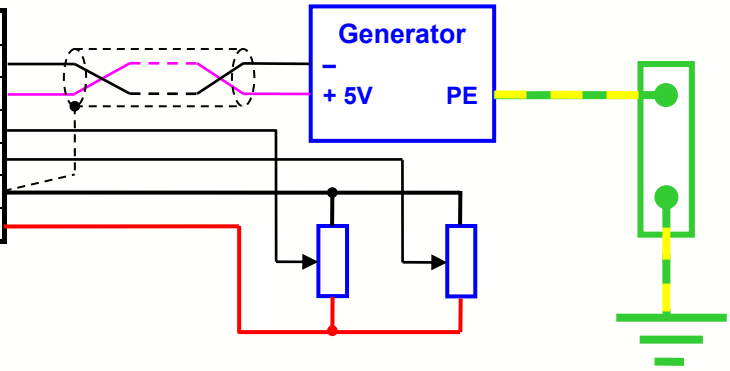
Pin	M8 connector
1	User output o0
2	User input i0
3	User output o1
4	User input i1
5	User output o2
17	ENBX driver enable (Imax 60 mA)
18	User input i41
19	User output o17 (Imax 60 mA)
20	FCZEROX X axis zero limit
21	VAX I/O +24 V power supply
22	GNDA 0Vdc



Pin	M6 connector
1	PWM - STEP # 1
2	/ PWM - STEP # 1
17	GNDA 0Vdc
18	+/- 10V from PWM # 5

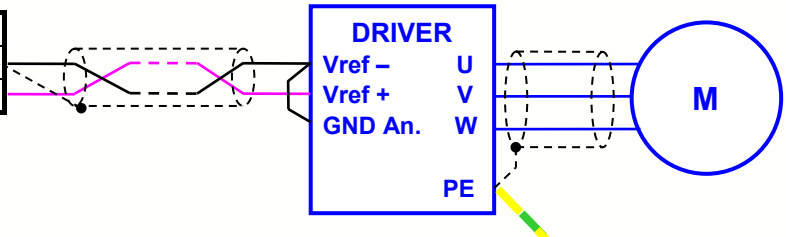
Analog input connection

Pin	M5 connector
1	Analog GND
2	Analog input # 256
3	Analog input # 257
4	Analog input # 258
5	Analog GND
6	+ 5V for potentiometer power supply



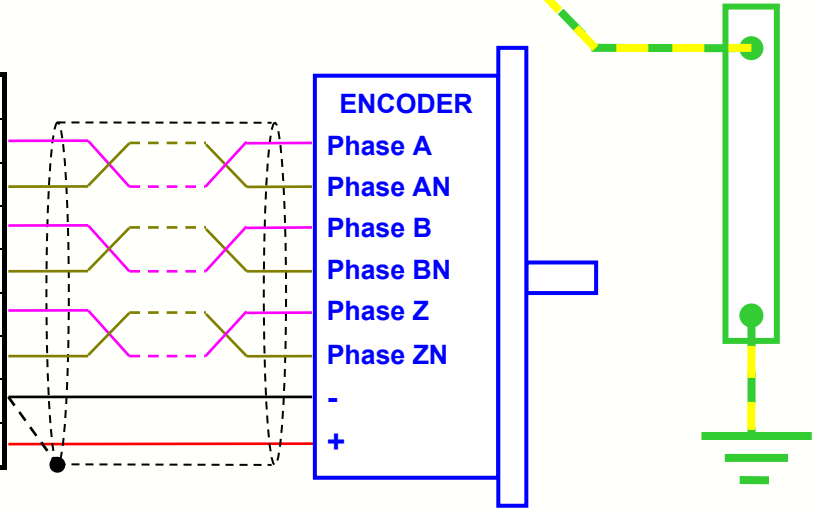
Drive reference connection

Pin	M6 connector
17	GNDA 0Vdc
18	VREF X X reference signal, +/- 10V



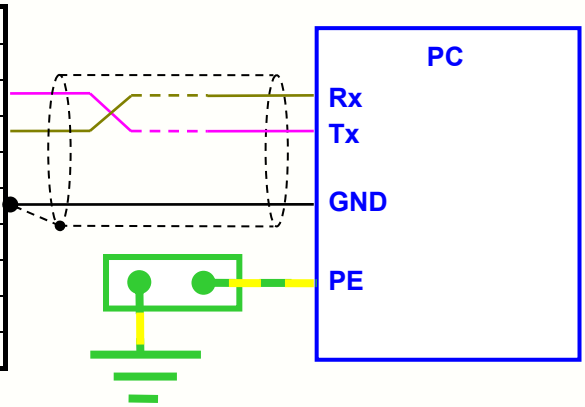
5V Line Driver Encoder connection

Pin	M2 connector
1	CLK A channel A straight enc. # 1
2	CLK/A channel A negated enc. # 1
3	CLK B channel B straight enc. # 1
4	CLK/B channel B negated enc. # 1
5	NOTCH 0 ch. 0 straight enc. # 1
6	NOTCH /0 ch. 0 negated enc. # 1
7	GND logic ground
8	VDC +5Vdc power supply



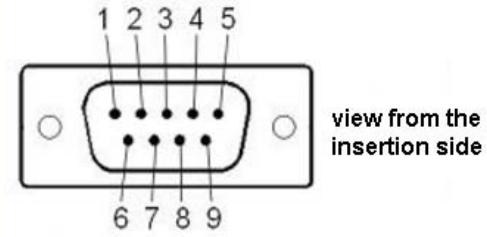
Connection of RS232 serial interface Com. 1

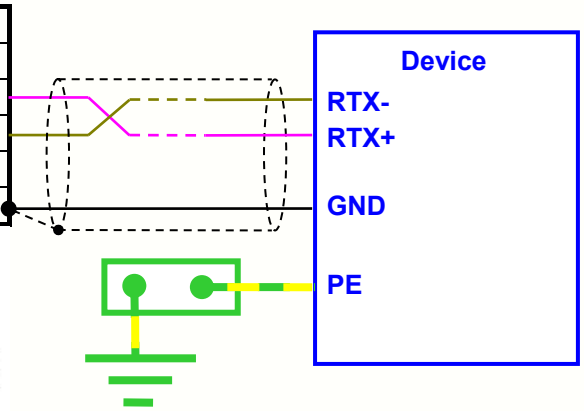
Pin	P16 connector
1	GDN logic ground
2	Com. 1 RX
3	Com. 1 TX
4	RTX- Com. 3 (RS485)
5	GDN logic ground
6	
7	Com. 2 TX
8	Com. 2 RX
9	RTX+ Com. 3 (RS485)



Connection of RS485 serial interface Com 3

Pin	P16 connector
9	RTX + Com. 3
4	RTX - Com. 3
5	GDN logic ground





JP22 inserts the start or end termination resistance of the RS485 line (not connected by default).

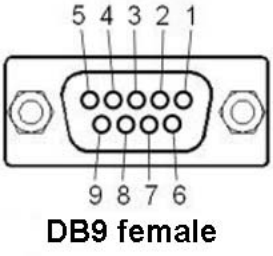
CANopen interface connection

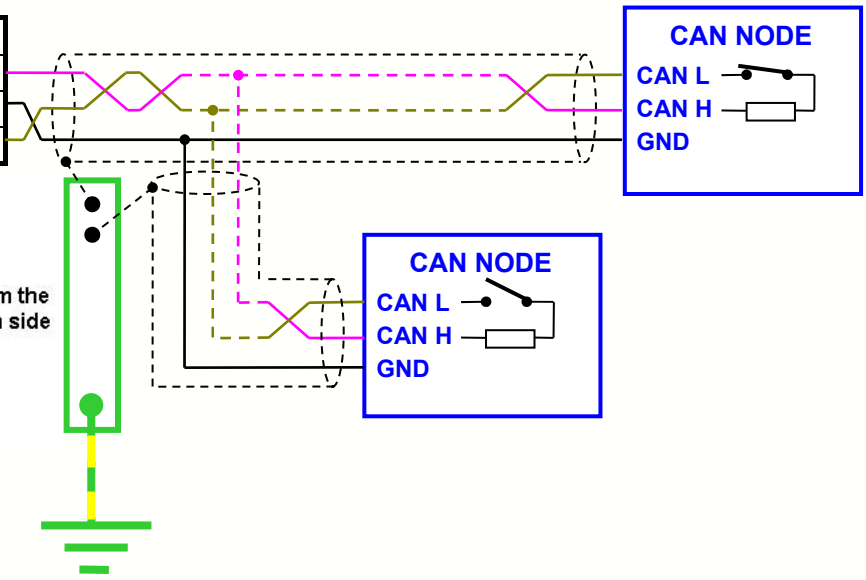
The Power Z is able to control one CAN port using both the CiA 301 general communication protocol and the specific profiles CiA 401 (I/O devices).

The CAN network must be done with twisted screened cables and the furthest ends of CAN H and CAN L signals must be charged through a 120 ohm termination resistance.

In Power Z the termination resistance is already connected by default and can be disconnected by removing jumper JP3, but you have to install the termination resistance at the other end of the network.

Pin	M7 connector
1	CAN H
2	GNDA (0Vdc)
3	CAN

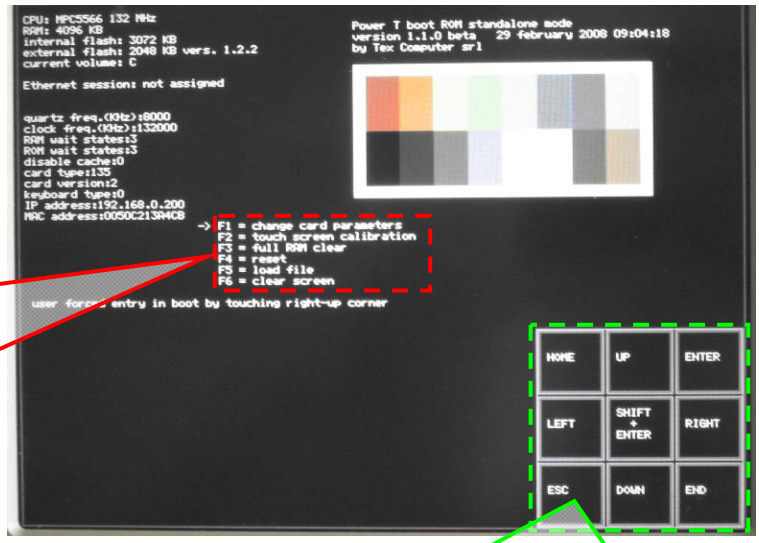




Basic functions of the touch screen

On the controllers equipped with touch screen, a number of basic functions can be accessed immediately without having to enable and calibrate the screen.

1. If at start up the system detects a pressure at the top right-hand corner of the screen, it accesses the **Boot menu**:



FUNZIONI DI BOOT
F1 = change card parameter
F2 = touch screen calibration
F3 = full ram clear
F4 = reset
F5 = load file
F6 = clear screen
F7 = save current firmware
F8 = export card parameter

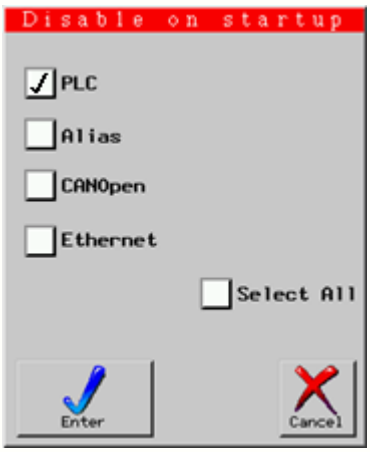
Touch keys to browse the boot functions

WARNING: the Boot menu only manages the USB memories and not any other peripherals, such as the keypad and the mouse, which may be connected to the same USB port by means of a hub.

Once you are in Boot menu, we suggest you to calibrate the touch screen so that the touch function is still active when the system is switched on again, even after running functions F3 and F4 which partially or totally clear the RAM memory.

We recommend not to alter the card's basic configurations without contacting first the Tex Computer's technical staff.

2. If at start up the system detects a pressure at the top left-hand corner of the screen you enter the menu which allows the operator to disable some functions during the current start-up phase. The following check list will be displayed:



Touching the screen on each of the white boxes allows the user to check or un-check the functions to be disabled during the current start-up phase. Pressing ENTER you confirm the selections made, which affect the current start-up phase only and not the following ones.

For further information on the functions of the touch screen, refer to the manual with the same name.

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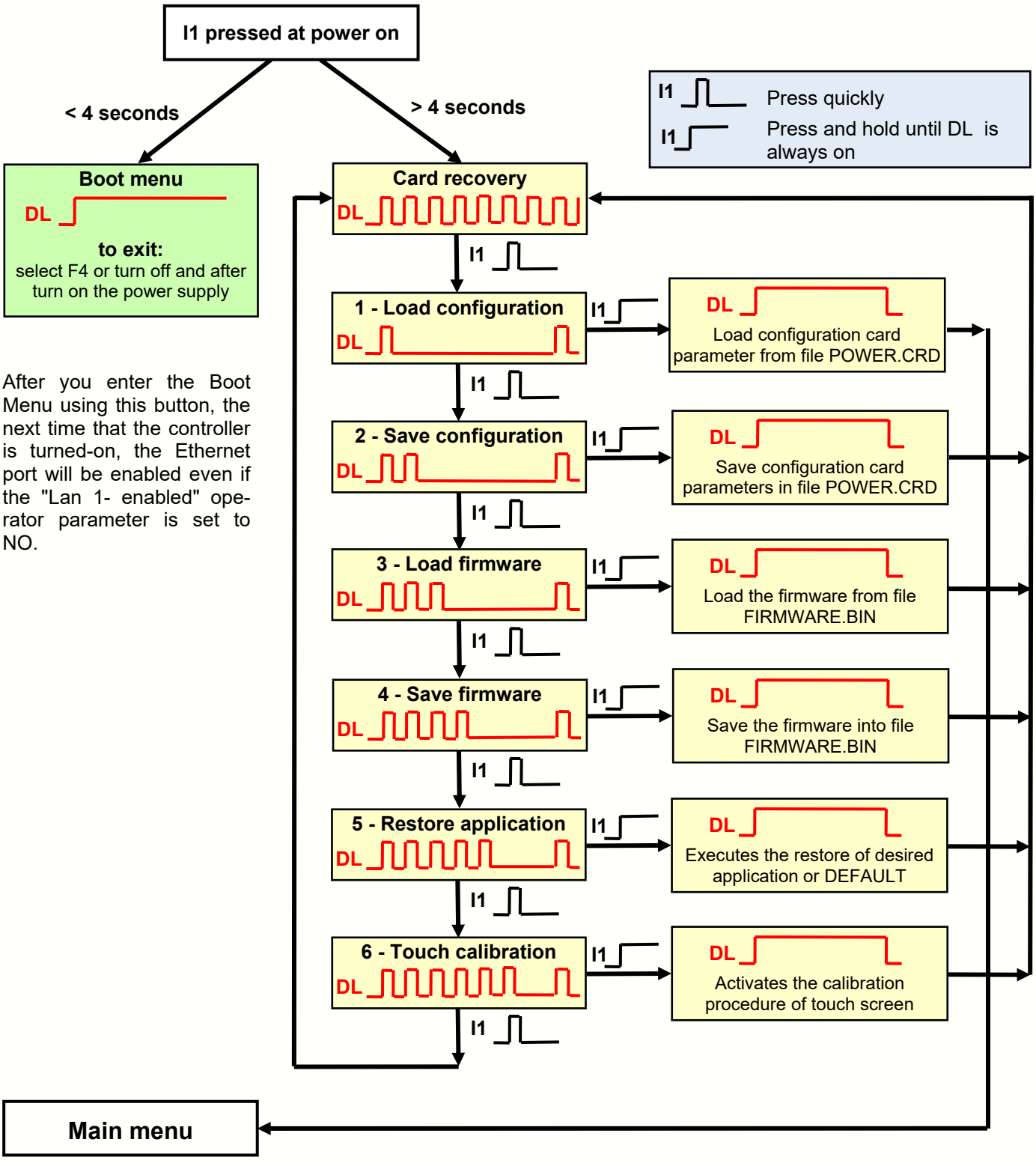
Recalling Boot and Card recovery Functions from I1



After you enter the Boot Menu using this button, the next time that the controller is turned-on, the Ethernet port will be enabled even if the "Lan 1- enabled" operator parameter is set to NO.

The controller is equipped with a microswitch, called I1, located on one side of the motherboard; next to it there is also a red LED DL3. Pressing the microswitch I1 at power on you can access both the **Boot menu** and the **Card recovery** functions which allow you to upload from a removable storage medium, a text file, called POWER.CRD, where there are listed the values of the main card configuration parameters, including the IP address of the controller; these features are particularly useful for Box version controllers.

The functions available are:

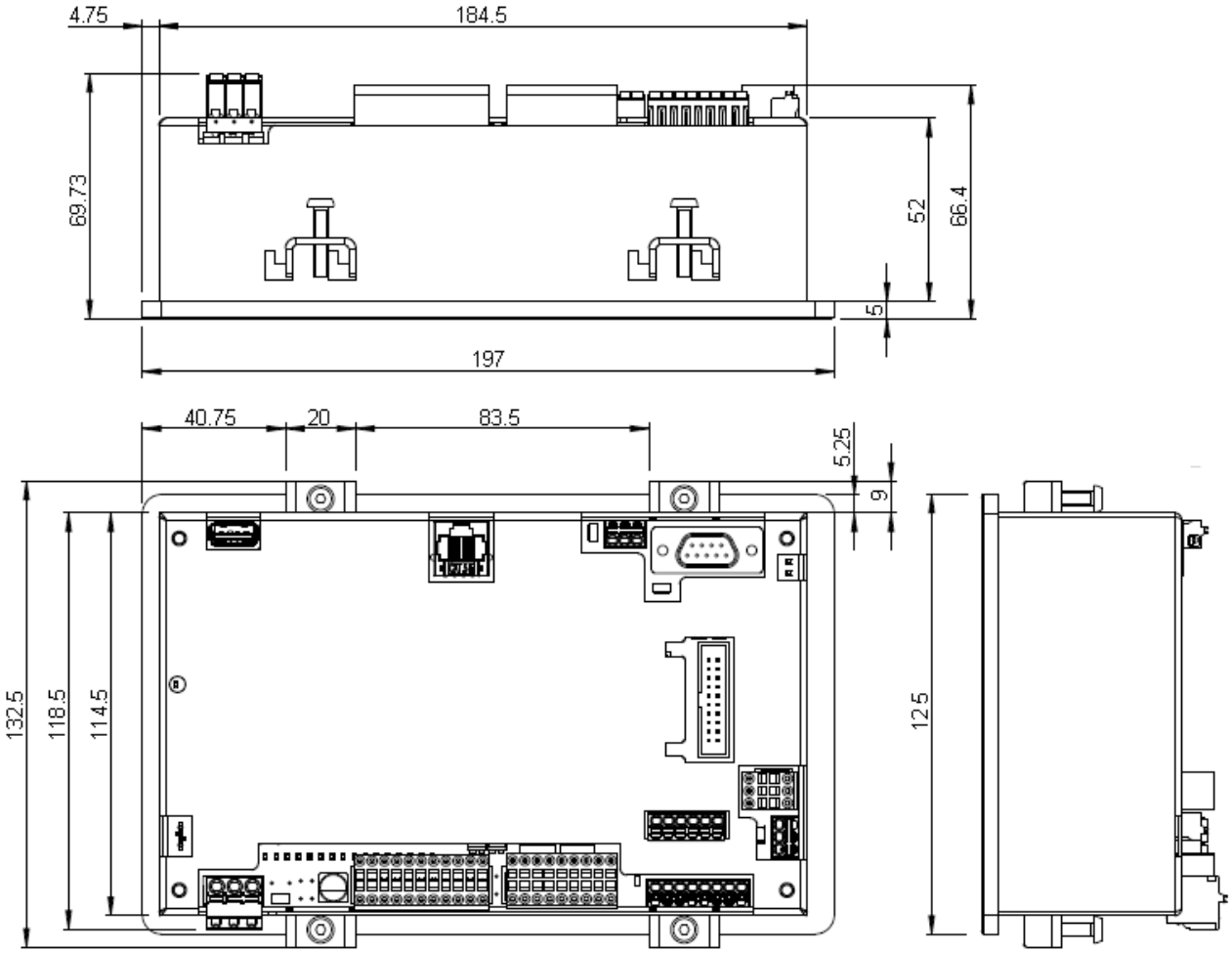
- *1 - Load configuration;* loads the motherboard with the configuration parameters of the file POWER.CRD
- *2 - Save configuration; c*reate a POWER.CRD file with the motherboard data
- *3 - Load firmware;* loads, in two different moments, indifferently both the Main and the Boot of the controller if in the storage medium they are both called FIRMWARE.BIN
- *4 - Save firmware; s*ave the motherboard firmware by creating a file named FIRMWARE.BIN
- *5 - Restore application;* activates the procedure that allows to instantly load the backup of an application program, present on the main root of a removable storage drive, whose name is defined in the operator parameter restore al reset. If this parameter is empty it will be automatically searched for an application program called DEFAULT

6 - Touch calibration; gives you instant access to the calibration of the touch screen

You can exit the Card recovery menu at any time by turning off and on the power supply of controller.

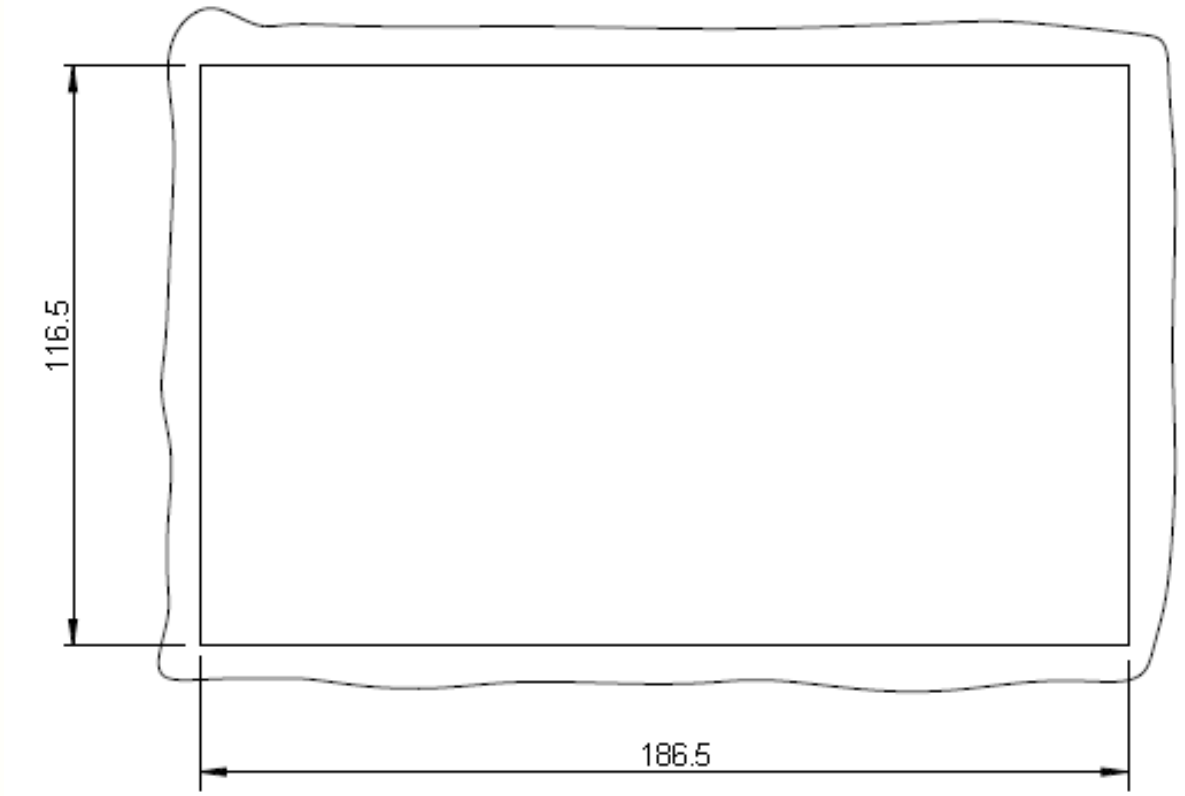
Power Z 7” Small dimensions (fixing with clips)

(Dimensions in mm)



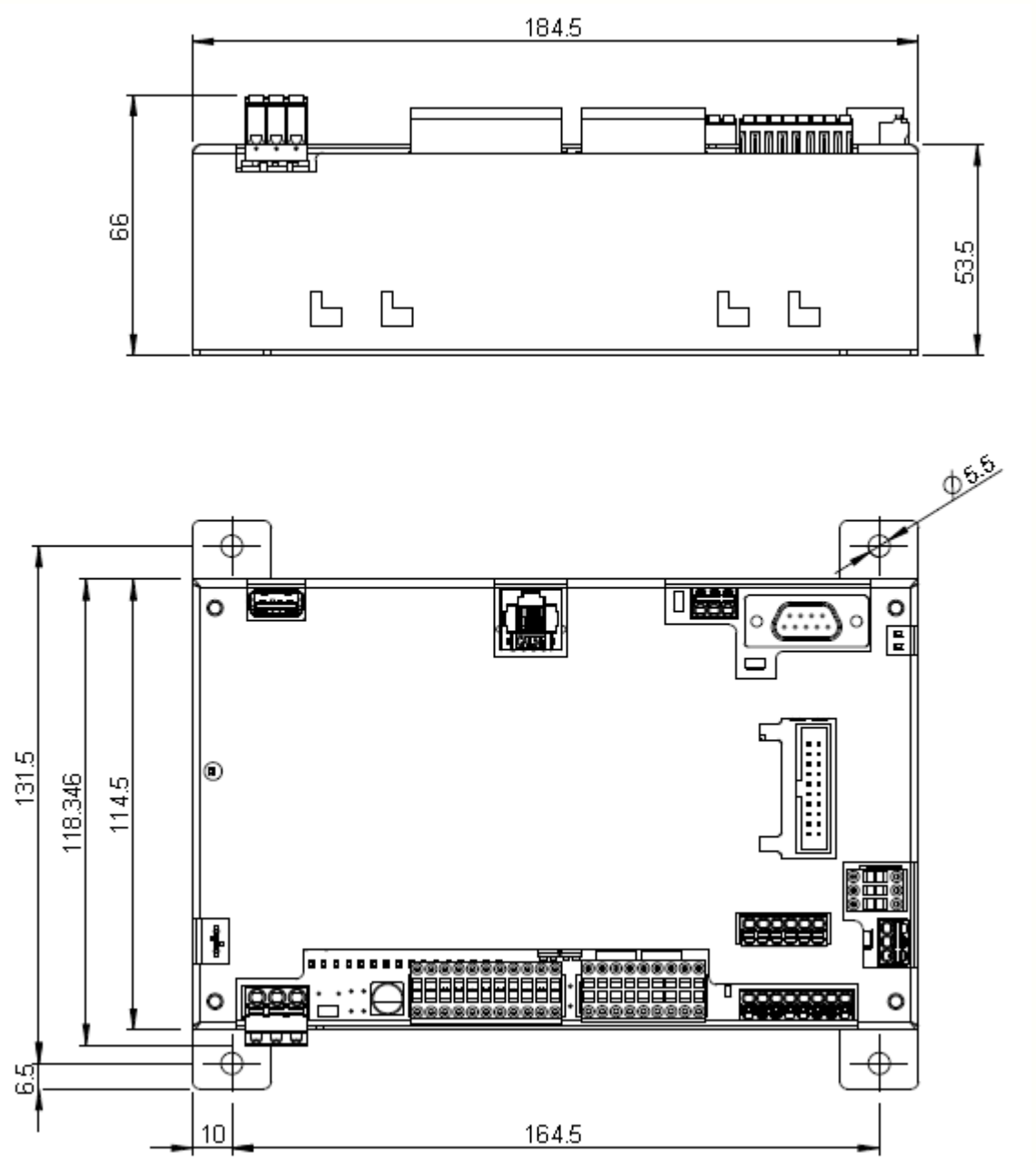
Power Z 7” Small drilling template

(Dimensions in mm)



Power Z Box dimensions

(Dimensions in mm)



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