

Product:

MSC2.5PN7.5

Title:

Safety Installation and User Guide



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D

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B	09/07/2021	All 3.2 4 Appendix A	Template updated Connectors information added Chapter expanded with Front panel instructions Drawing updated
C	04/10/2021	3.2 3.3.1 4 4.2.1 4.3.6	Power input and HV Out mating cables info added Brackets kit info added Picture updated with correct part number Updated with correct part number Auto toggle menu, info added
D	26/04/2023	Title 3.2.1 3.2.2	Document Title updated Added pinout picture Intro corrected from female to male connector

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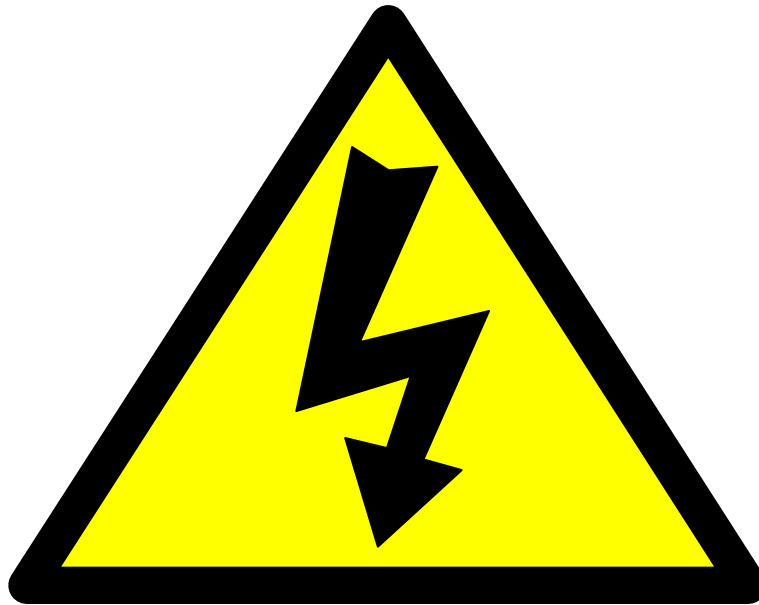
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SAFETY



DANGER HIGH VOLTAGE RISK OF ELECTROCUTION

Observe extreme caution when working with this equipment

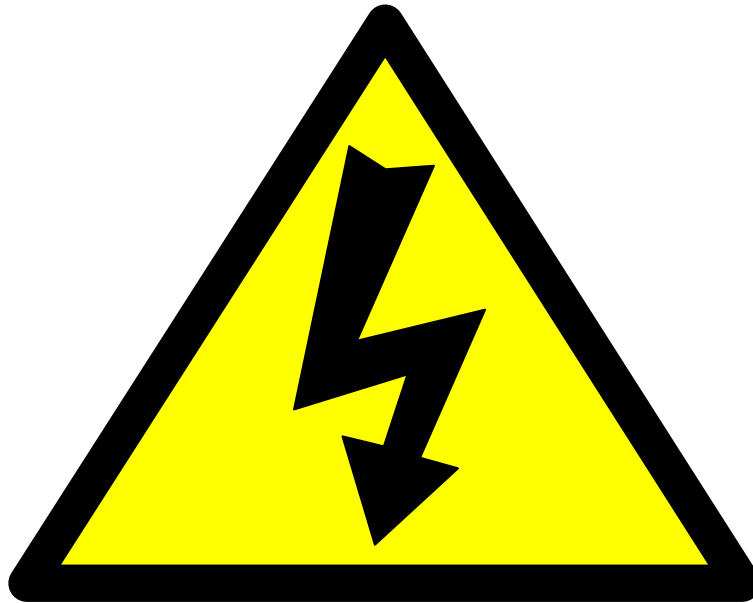
- High voltage power supplies must always be connected to protective earth**
- Do not touch connections unless equipment is turned off and the capacitance of both the load and power supply are grounded**
- Allow adequate time for discharge of internal capacitance of the power supply**
- Do not ground yourself or work under wet or damp conditions**

Servicing Safety

- Maintenance may require removing the Instrument cover with the power on**
- Servicing should only be done by qualified personnel aware of the hazards**
- Return to supplier for servicing**

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SÉCURITÉ



DANGER HAUTE TENSION RISQUE D'ÉLECTROCUTION

Observez une extrême prudence lorsque vous travaillez avec cet équipement

- Les alimentations haute tension doivent toujours être connectées au conducteur de protection.**
- Ne pas toucher les connexions à moins que l'équipement soit éteint et que la capacité de la charge et de l'alimentation électrique ne soit mise à la terre.**
- Prévoir un temps suffisant pour la décharge de la capacité interne de l'alimentation.**
- Ne pas vous mettre à la terre ou travailler dans des conditions humides.**

Sécurité d'entretien

- L'entretien ne doit être effectué que par un personnel qualifié et conscient des dangers.**
- Il n'y a pas de pièce remplaçables par l'utilisateur dans l'unité, retourner au fournisseur pour l'entretien.**

1. Unit Description

The MSC2.5PN7.5 high voltage power supply is for ESC (Electrostatic chuck) applications. ESCs use a platen with integral electrodes which are biased with high voltage to establish an electrostatic holding force between the platen and wafer, thereby “chucking” the wafer. This unit is designed to provide the HV to drive the electrodes. The unit has two output channels generating high voltage between the range from +2.5kV to -2.5kV and is powered from an dc input of 24V. The unit has an RS485/RS232 interface which allows monitoring and control of the unit and has a front panel display with buttons which also allow some control and setup of the unit.

1.1 Unit Ratings

Input: 24Vdc \pm 5%, 2A max
HV Output CH1: \pm 2.5kVdc, 3mA max
HV Output CH2: \pm 2.5kVdc, 3mA max

1.2 Environmental conditions

Operating Temperature: 0°C to +45°C
Humidity: 0% to 85% RH (non-condensing)
Altitude: 2000 Meters

2. Safety

The conditions of this manual must be complied with to maintain safety; operating the unit in a manner not defined in this manual may compromise the protection from electric shock.

2.1 Meaning of Symbols



This symbol on the unit means “read the manual before powering the equipment”.



This symbol on the unit means “Caution; risk of electric shock”.

2.2 Unit Grounding

The unit is contained in an earthed case. The case of the unit shall be properly bonded to the main protective earth termination in the end product.

3. Installing the Unit

3.1 Electrical Installation

The unit is designed for indoor use and is to be supplied from a double insulated, UL recognised, 24V dc supply.

- 1) The unit shall be properly bonded to the main protective earthing termination in the end product.
- 2) The unit should only be used in a Pollution Degree 2 Installation Category II environment.
- 3) Consideration should be given to conduct the following tests with the power supply installed in the end product:
 - Dielectric withstand test, between live parts of the power supply and the end product chassis.
 - Permissible Limits Test with the power supply installed in the end product.
- 4) The input and output connectors are not intended for field connections and should only be connected to internal wiring in the end use equipment.
- 5) The unit is intended for use as a component and no surface of the unit should be accessible in the end product.
- 6) The unit is contained in an enclosed case and can be mounted in any orientation. A cooling air flow is recommended.

3.2 Connections

3.2.1 Power input

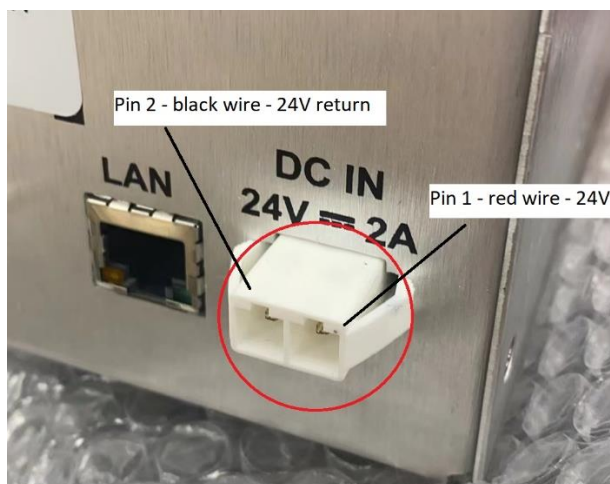
The power input is via a dual Molex VersaBlade panel mount plug. The unit is provided with an M5 earth stud close to the input connector for the earth connection.

Manufacturer : Molex		Series: 35150	Part number : 351500210
pin#	Signal	I/O	Description
1	+24VDC	I	DC in
2	+24VDC RTN	I	DC in

Mating connector: Molex 0351510210, crimp terminals: Molex 0357460110

A mating power input cable is available to order:

Power input cable part number: HVC05/2NSO/1229	Length: 3 m
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3.2.2 Serial communication link

The serial communication link (RS485 or RS232) is via a 9 way male 'D' connector. See table below for pin out details.

Manufacturer: Generic Model - 9 pin male (plug) 'D' connector, screw lock: UNC 4-40.				
pin#	Signal	I/O	Description	Remarks
1	-		Not connected	Not used
2	Z/TXD	I/O	TXD/RS485 Inverting	RS232 TXD when configured
3	Y/RXD	I/O	RXD/ RS485 Non inverting	RS232 RXD when configured
4	-	-	Not connected	Not used
5	GND	-	Ground	
6	-	-	Not connected	Not used
7	-	-	Not connected	Not used
8	-	-	Not connected	Not used
9	-	-	Not connected	Not used

Both the RS485 serial bus bit rate and the RS232 default to 9,600 baud.

3.2.3 HV Outputs

CH1 and CH2: HV output terminal.

Manufacturer: Radiall

Series: BNC-HT / MHV

Part number: R316553000

Mating connector: Radiall R316007000

A HV Output mating cable is available to order:

HV Output cable part number: HVC5/1ISO/1228	Length: 3 m
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3.3 Mechanical Installation

The unit shall be fixed in place in the end user system using screws on the hold down points provided.

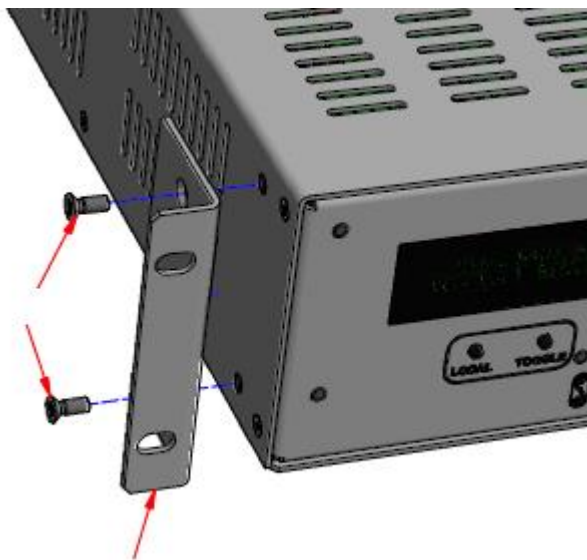
Unit weight: 1.4kg

Mechanical Dimensions - see drawing in Appendix A

3.3.1 Installation brackets

A kit including 2 brackets and installation screws (M4x10) allows the unit to be mounted on a half width rack, and is available to order:

Installation brackets kit part number: MSCK100	Contains: 2 brackets and 4 screws
--	-----------------------------------



4. Operating the Unit

The unit can be operated locally from the front panel.

It can also be controlled through the RS232/RS485 serial interface, or Ethernet. See Communication Protocol Specification (document n. 81609-21) for details.

The control interface selected is displayed on the front panel LCD display.

The front panel display is used to display the voltage and current output from both channels, primarily as a check that the unit is functioning correctly, without having to use the serial interface. The display allows configuration and setting of the various parameters via push button switches.

The LCD will power down after five minutes and is re-activated by pressing any button.



The following paragraphs discuss the contents of the display pages and the system menu.

The unit uses an audible indication that emits a tone when the front panel buttons are pressed.

4.2 Front Panel - Monitor and Status Pages

4.2.1 Power-Up Page

	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	2
	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0
1			M	S	C	2	.	5	P	N	7	.	5							
2	V	e	r	:	V	x	.	x	x		R	S	I	I	I	:		A	D	

Where: x.xx Firmware version number.
 III Serial interface (232 or 485).
 AD Serial comms address.

4.2.2 Output Status Pages

The output display page shows different information when the outputs are disabled/enabled. When the outputs are disabled, the following is displayed.

	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	2
	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0
1	O	P	1	:			O	u	t	p	u	t			O	F	F			L
2	O	P	2	:			O	u	t	p	u	t			O	F	F			N
																				T

Where: LR 'L' = Local, 'R' = Remote.
 NT 'N' = Normal Output, 'T' = Toggled/Inverted Output.

When the outputs are enabled, the following is displayed.

	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	2
	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0
1	O	P	1	:	±	V	.	V	V	k	V		I	.	I	I	m	A		L
2	O	P	2	:	±	V	.	V	V	k	V		I	.	I	I	m	A		N
																				T

Where: V.VV Output Voltage.
 I.II Output Current.
 LR 'L' = Local, 'R' = Remote.
 NT 'N' = Normal Output, 'T' = Toggled/Inverted Output.

Note: If LR displays the letter 'A' then the output is busy Auto-Toggling.

4.2.5 Time/Date Page

Displays the current system Date and Time.

	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	2			
	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0		
1	T	i	m	e	:					H	H	:	M	M	:	S	S			L	R	
2	D	a	t	e	:					D	D	/	m	m	/	Y	Y				N	T

Where: HH Hour.
MM Minute.
SS Second.
DD Day.
mm Month.
YY Year. (Century is not displayed)
LR 'L' = Local, 'R' = Remote.
NT 'N' = Normal Output, 'T' = Toggled/Inverted Output.

4.2.6 Unit Information Page

Displays unit Model number and Firmware version.

	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	2			
	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0		
1			M	S	C	2	.	5	P	N	7	.	5	/	1	1	6	6		L	R	
2			F	i	r	m	w	a	R	e		V	e	r	:	x	.	x	x		N	T

Where: x.xx Firmware version number.
LR 'L' = Local, 'R' = Remote.
NT 'N' = Normal Output, 'T' = Toggled/Inverted Output.

4.2.7 Unit Serial Number Page

Displays the unit serial number.

	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	2			
	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0		
1	U	n	i	t		S	e	r	i	a	l		N	u	m	b	e	r		L	R	
2						N	N	N	N	N	N	N	N	N	N						N	T

Where: NNNNNNNNN Nine-digit serial number.
LR 'L' = Local, 'R' = Remote.
NT 'N' = Normal Output, 'T' = Toggled/Inverted Output.

4.2.8 Serial Comms Configuration Page

Displays the Current Serial comms configuration.

	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	2			
	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0		
1					S	e	r	i	a	l		C	o	m	m	S				L	R	
2			R	S	I	I	I		A	d	d	r	e	s	s	:	A	A			N	T

Where: IIII Serial interface (232 or 485).
 AA Serial comms address.
 LR 'L' = Local, 'R' = Remote.
 NT 'N' = Normal Output, 'T' = Toggled/Inverted Output.

4.2.9 TCP/IP Port # Page

Displays the TCP/IP port number.

	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	2			
	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0		
1								E	t	h	e	r	n	e	t						L	R
2					P	o	r	t	:	n	n	n	n	n							N	T

Where: nnnnn TCP/IP Port number.
 LR 'L' = Local, 'R' = Remote.
 NT 'N' = Normal Output, 'T' = Toggled/Inverted Output.

4.2.10 Ethernet IP Address and Subnet Mask Page

Displays the TCP/IP Network configuration.

	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	2			
	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0		
1	A	d	d	r	:	x	x	x	.	x	x	x	.	x	x	x	.	x	x	x	L	R
2	M	a	s	k	:	y	y	y	.	y	y	y	.	y	y	y	.	y	y	y	N	T

Where: xxx IP Address octet.
 yyy Subnet mask octet.

4.2.11 Configuration Menu Page

From this page it is possible to manually edit the PSU configuration.

	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	2	
	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0
1					C	o	n	f	i	g	u	r	a	t	i	o	n			
2	P	u	s	h	=	E	d	i	t	,	M	O	D	E	=	E	x	i	t	

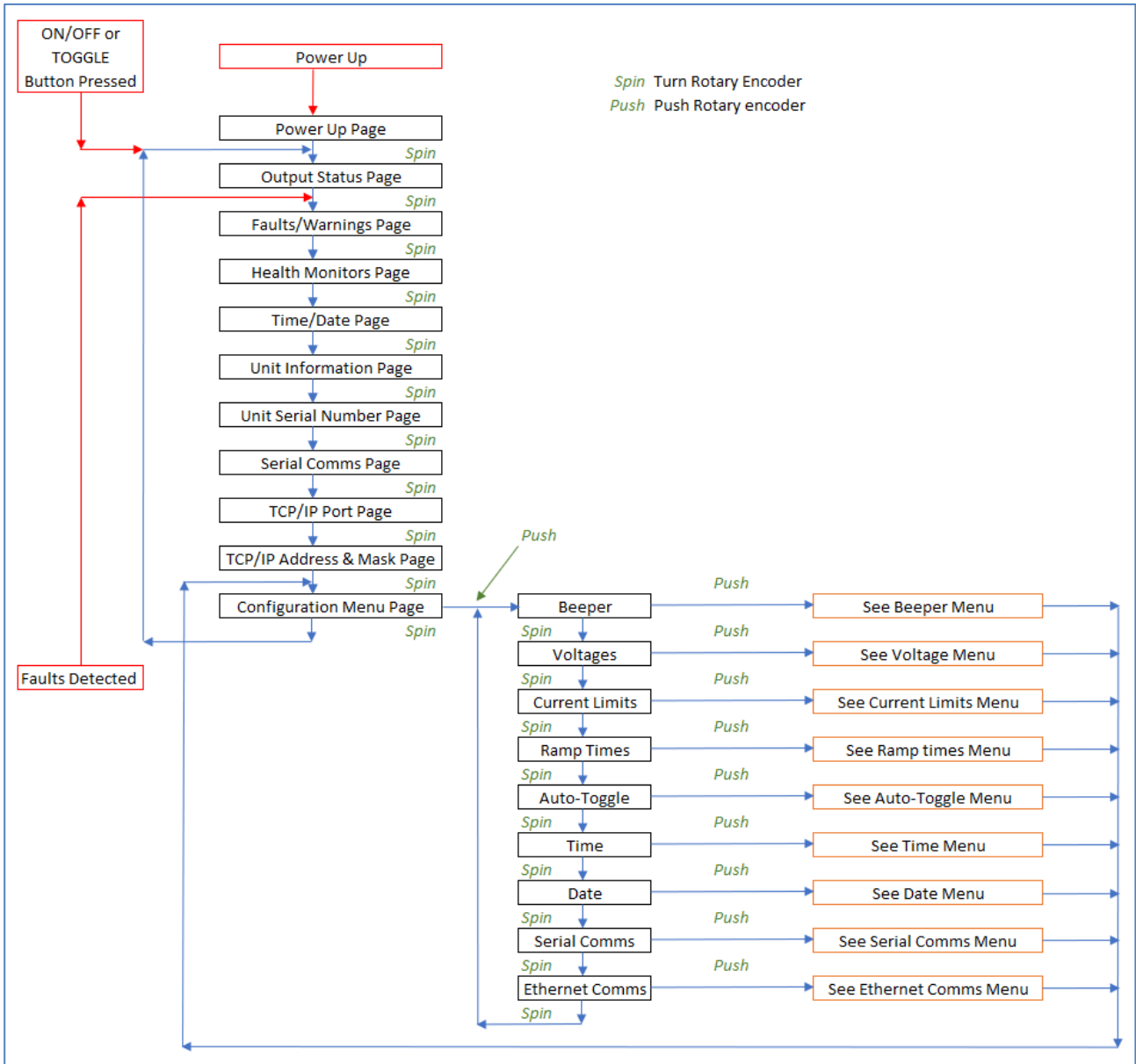
To Edit the current configuration, Push or Press the rotary encoder wheel.
 You have now entered the configuration menu. The Press the 'Mode' button to exit this page.

Notes:

- i) When the outputs are enabled or in Remote mode this will not be displayed.
- ii) While this page is displayed the Host cannot communicate with the PSU.
- iii) Entering the configuration menu stop the PSU communicating with the host.

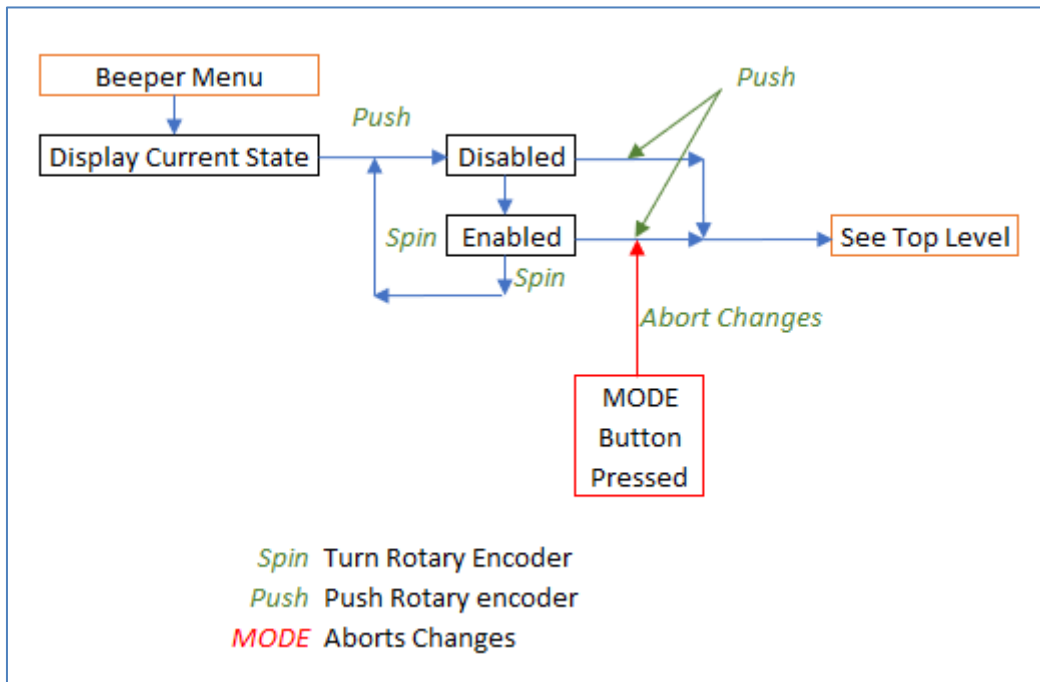
4.3 Front Panel – Configuration Menu Page

4.3.1 Top Level Menu

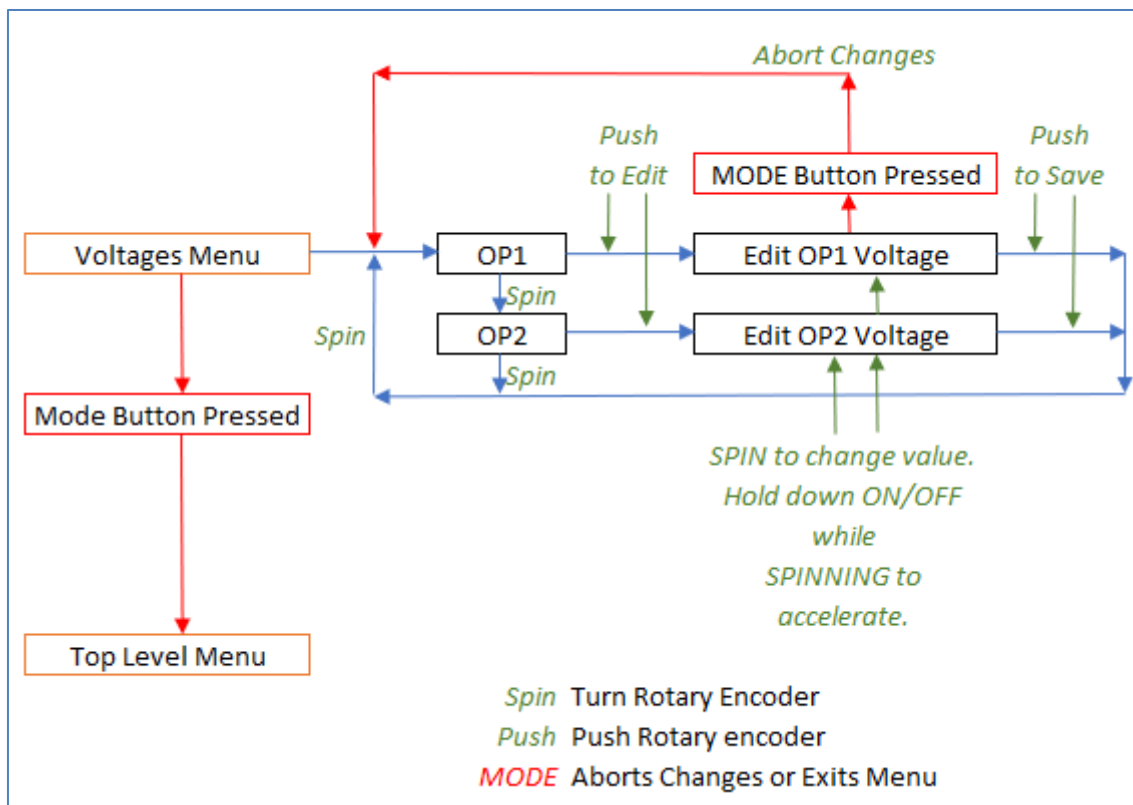


4.3.2 Beeper Menu

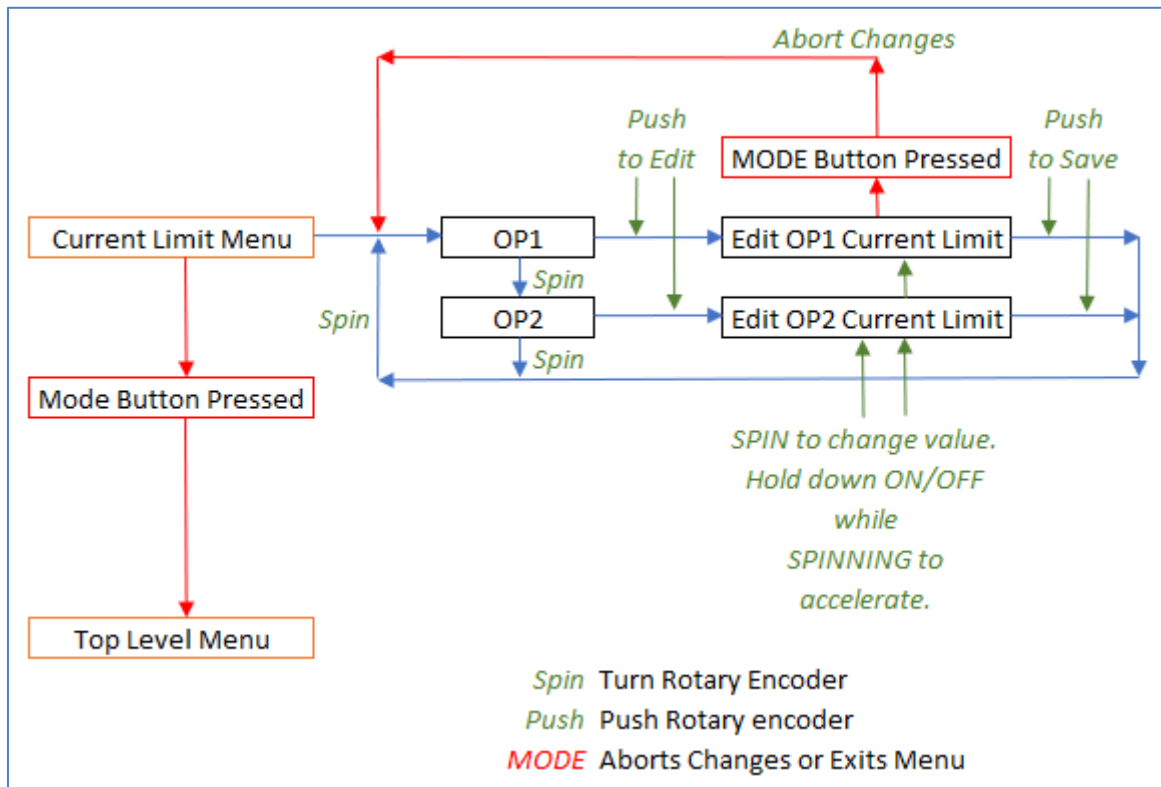
This allows to enable/disable the tone when the front panel buttons are pressed



4.3.3 Voltage Menu



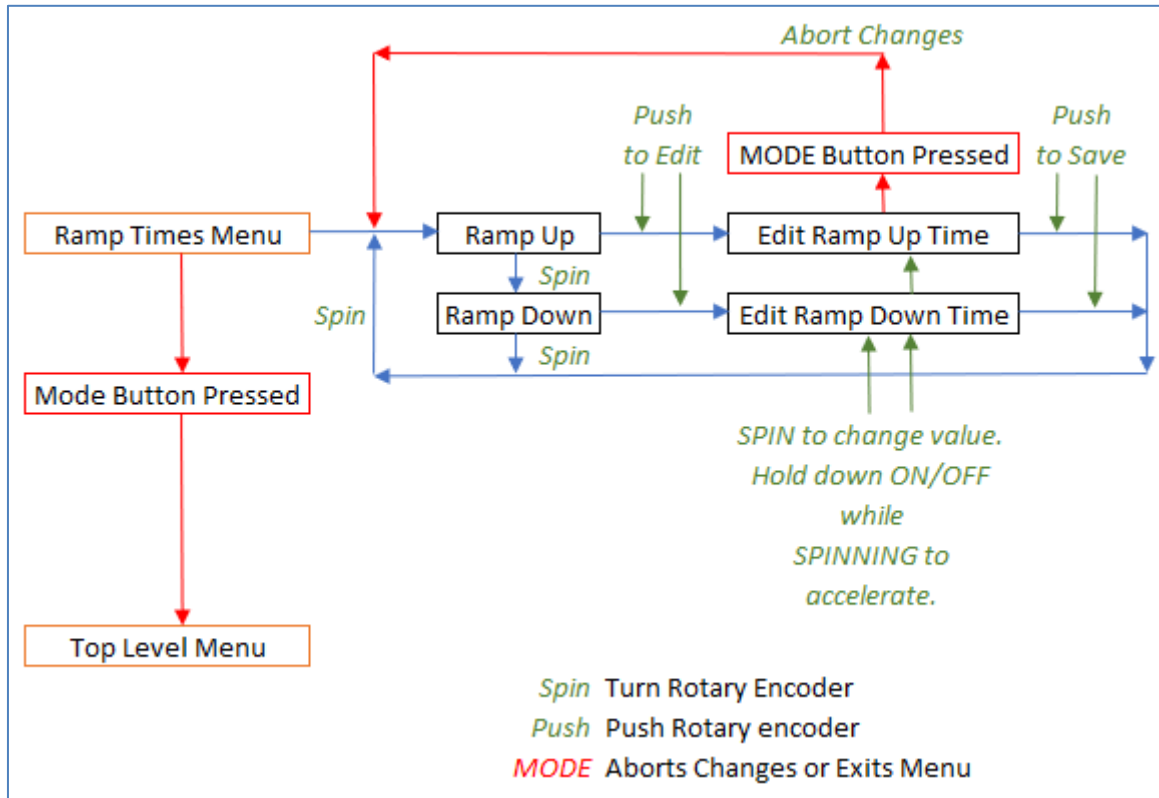
4.3.4 Current Limits Menu



4.3.5 Ramp Time Menu

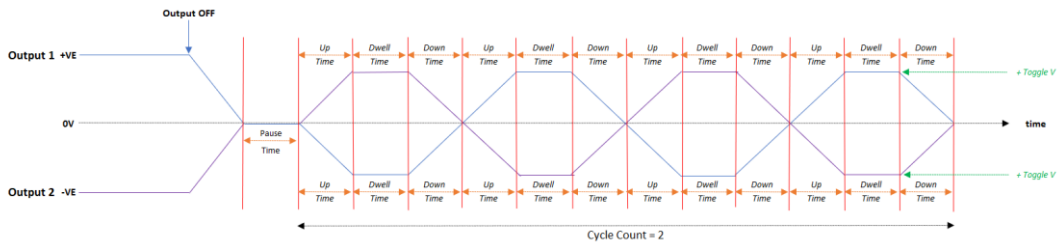
The valid range of ramp times is 300ms to 9900ms.

Ramp Up Time: 0V to 2500V. Ramp Down Time: 0V to -2500V.

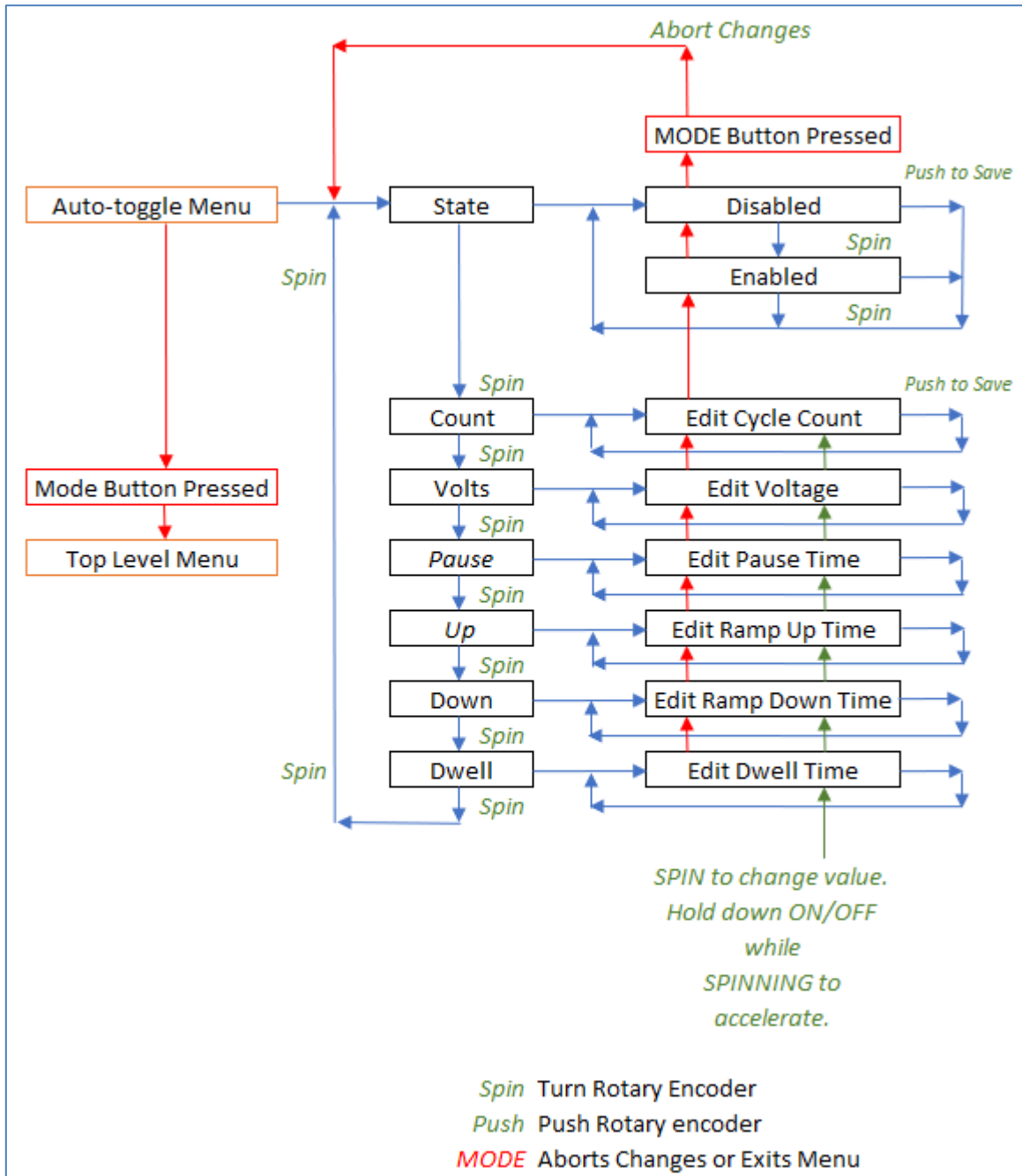


4.3.6 Auto-Toggle Menu

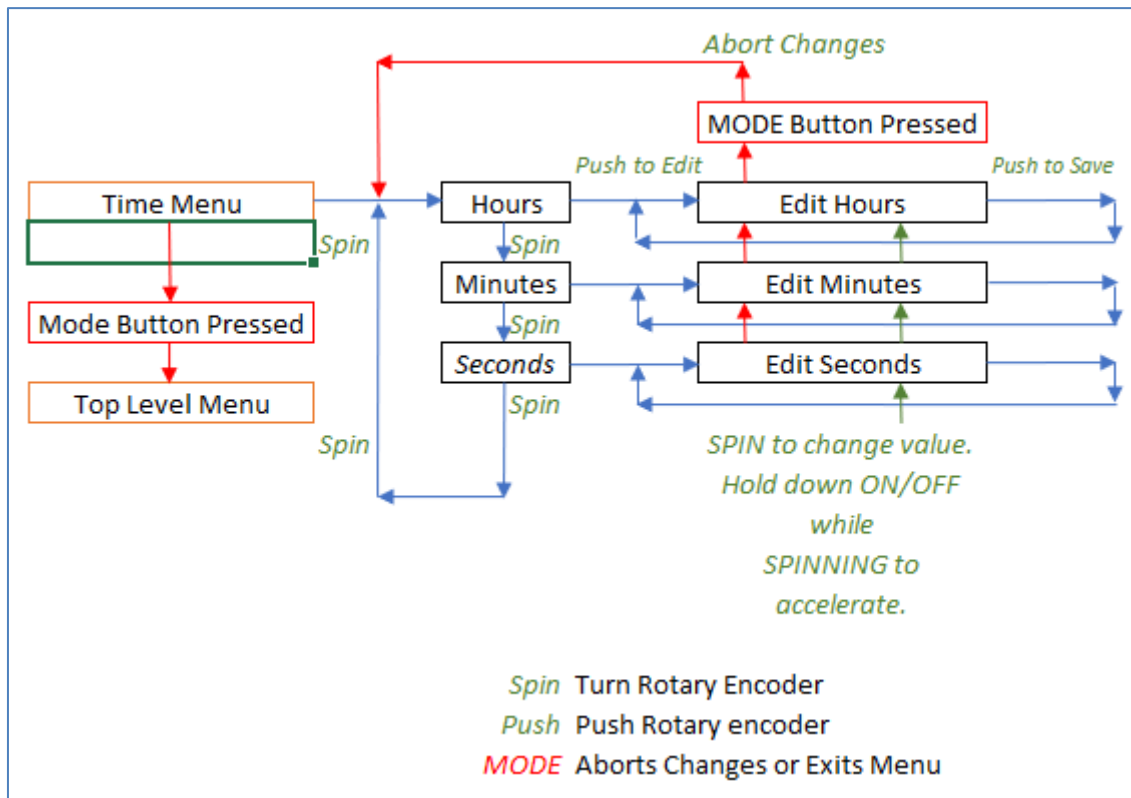
When enabled, the Auto Toggle feature executes as the outputs reach 0V after being turned off.



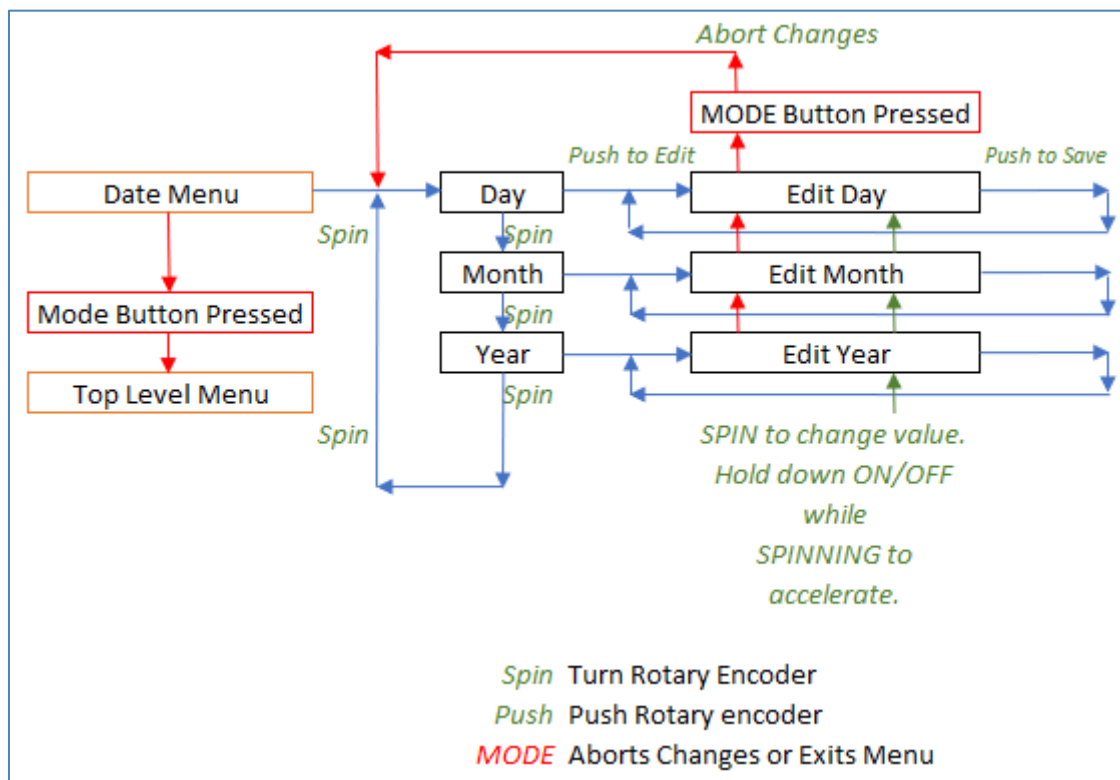
Up to 10 cycles can be programmed (Count). Pause, Up, Down and Dwell times (see auto toggle example above) are in ms and the programmable range is 300ms to 9900ms.



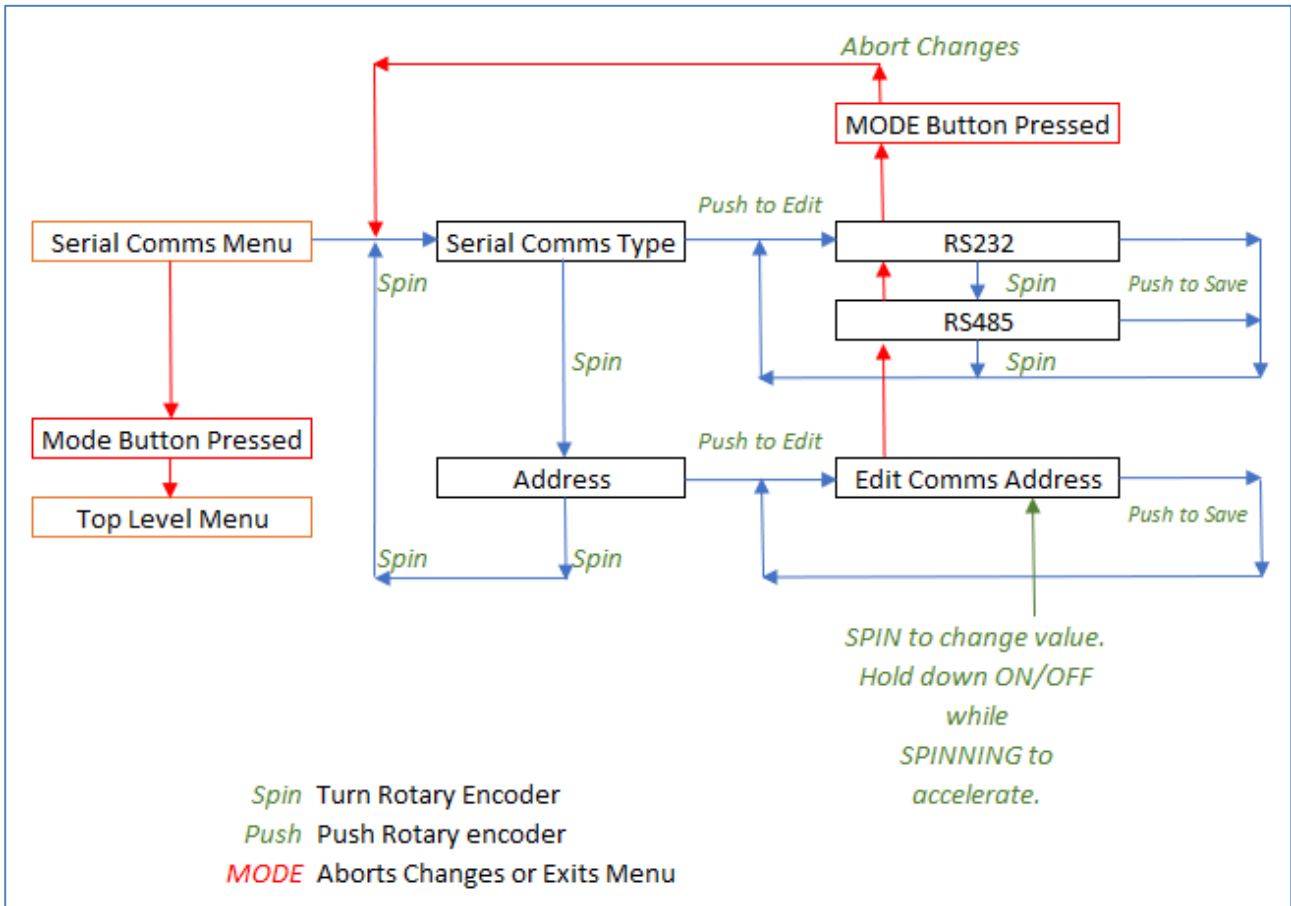
4.3.7 Time Menu



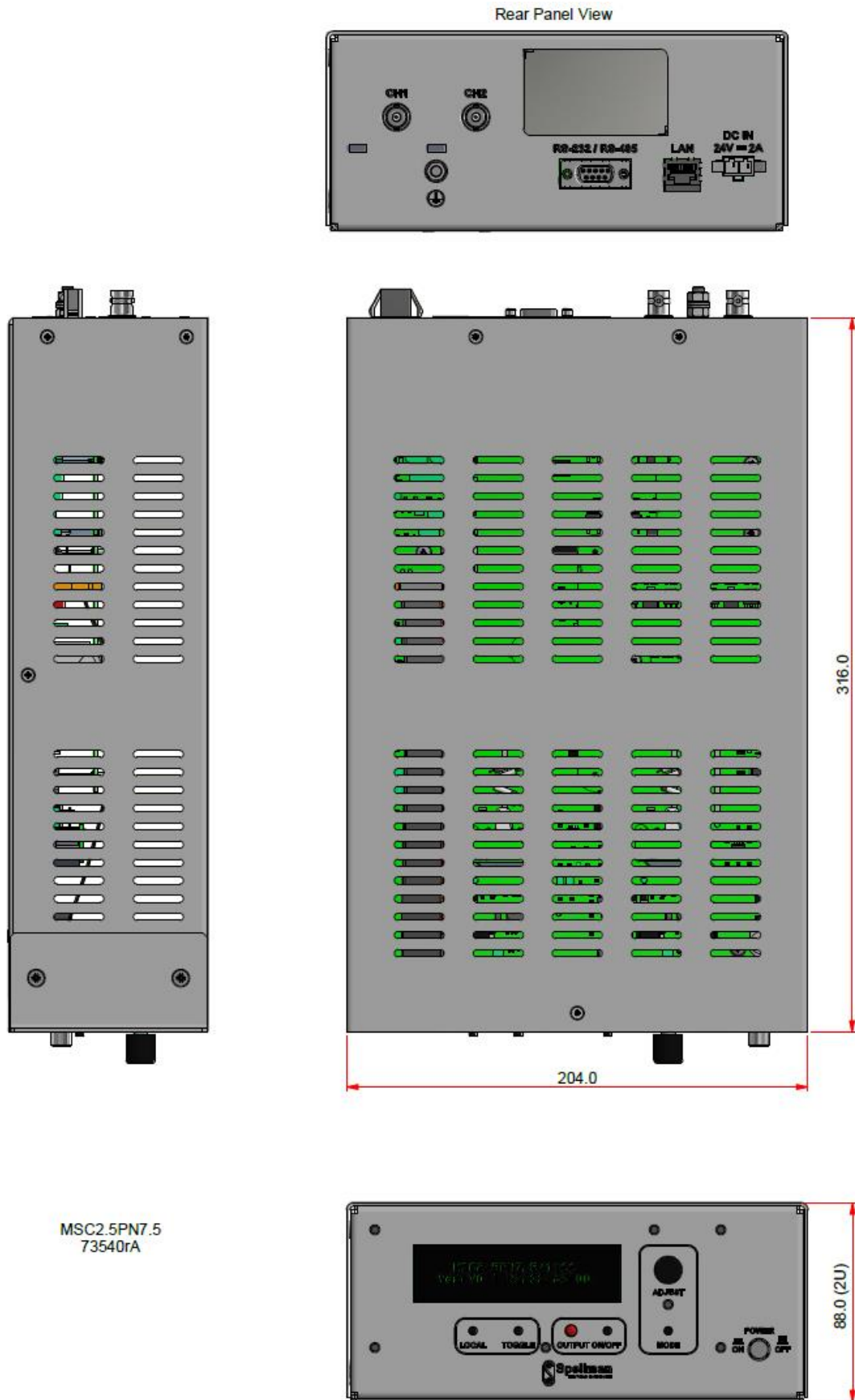
4.3.8 Date Menu



4.3.9 Serial Comms Menu

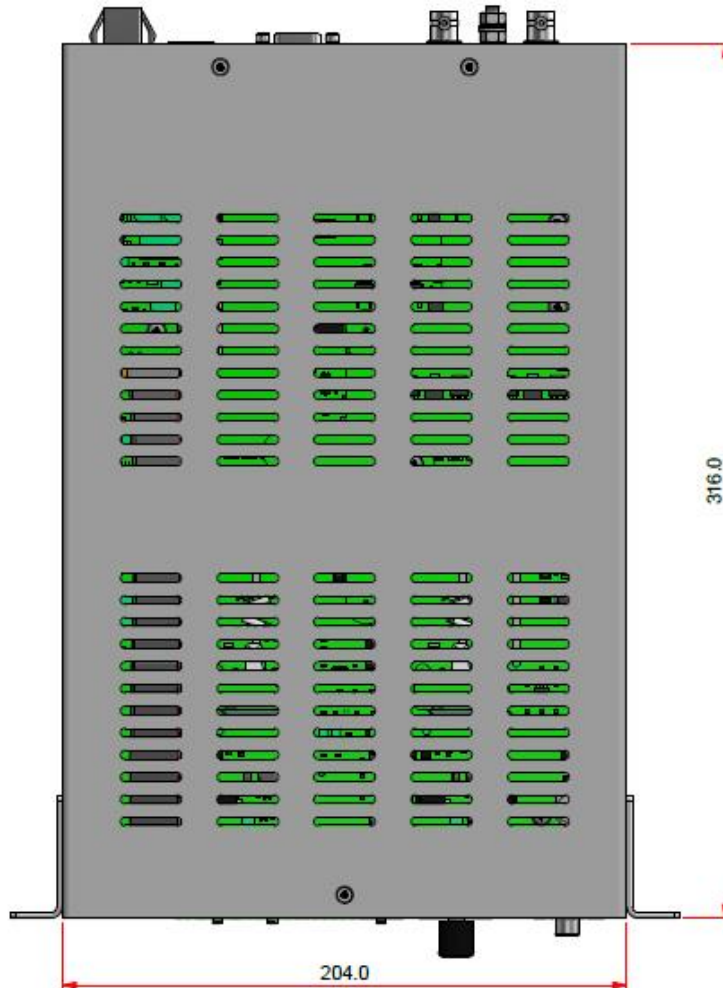
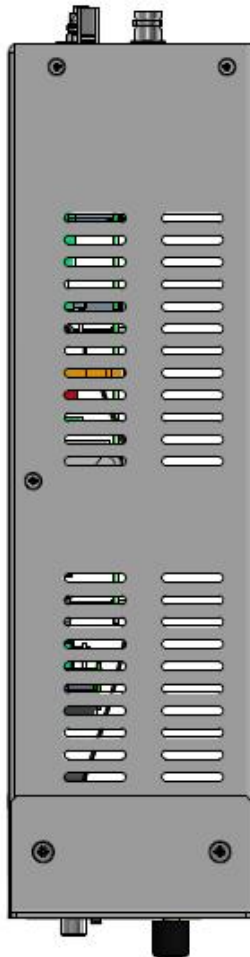


Appendix A - Mechanical layout



Optional brackets are available so the unit can be mounted on a half width rack, please contact See section 3.3.1 for further information.

Rear Panel View



MSC2.5PN7.5
73540rA

