

Technical Note

CTTN # 149

This Technical Note is pertinent for Unidrive SP and Unidrive Classic

Quick Setup/Checkout Guide


There are many considerations when setting up a drive of which safety during commissioning is of primary concern. One should always have a method of E-Stopping the drive and verify that it works before attempting a drive setup. This guide is intended for the technician who is already familiar with the Unidrive Classic or Unidrive SP and is no substitute for the information provided in the User Guides for these products. It is merely a short form guide outlining very basic initial setup steps toward the goal of verification of a drive and motor combination.

Unidrive Classic

Unidrive SP

Enable	(typically 30-31)	Terminal 22-31
Security	#0.00= 149	#0.49= L2
Storing/Saving	#0.00= 1000 then RESET (Stop Button)	
Setting Defaults	#0.00= 1244 then RESET (Stop Button)	
Mode Change	#0.00= 1254 then set #0.48= desired mode then RESET	
Normal Display	#0.10 shows Motor rpm	
Auto Tune	#0.40=1 Rotating	#0.40=1 Static non-rotating)
		#0.40=2 Rotating
	(motor will go to 2/3 max speed)	
	Enable needs toggled to move beyond	

(Shaft must be unloaded for rotating Autotune !!!)

Performing an Autotune – [Show Me](#) 

Main Setup Parameters are in Menu 0

#0.02	Max Hz or RPM
#0.03 & 0.04	Accel and Decel rates
#0.05	Basic Control Method ie PA d (or 4)= Keypad operation

#0.42 = # of motor poles
 #0.43 = power factor (not Service Factor ! Never 1 or greater !!
 If you don't know it leave at 0.85

#0.44 = rated voltage
 #0.45 = rated RPM
 #0.46 = rated AMPS
 #0.47 = rated Frequency

Motor
Nameplate
Data

Other Resources







[Unidrive Classic User Guide](#)
[Unidrive Classic Advanced User Guide](#)

[Unidrive SP User Guide](#)
[Unidrive SP Advanced User Guide](#)

Unidrive Classic to Unidrive SP PreConversion Considerations- see [CTAN277](#)

Unidrive Classic Replacement Details- see [CTAN278](#)

Other SHOW ME Unidrive SP Video Resources

<u>CTVI103</u>		Changing a Parameter Selection
<u>CTVI104</u>		Modifying Numeric Values
<u>CTVI105</u>		Saving Parameter Changes
<u>CTVI106</u>		Saving drive data on SMARTCARD
<u>CTVI107</u>		Read drive data from SMARTCARD
<u>CTVI108</u>		Accessing parameters outside menu 0

AC Motor Synchronous Speeds

# Poles	50Hz Motor	60Hz Motor
2	3000	3600
4	1500	1800
6	1000	900
8	750	450

Example: If a motors nameplate indicates that its “rated” speed is 3510 rpm, this would infer that the motor is a 60Hz 2 pole design.

Open Loop Checkout

If the drive is setup for Open Loop (see 0.48) then the drive can be run and checked for its' most basic operation. Open Loop mode does not depend on any motor mounted speed feedback element (encoder or similar). In addition, running in Open Loop with the Voltage mode #0.07= Fd allows the drive to be run up without needing a motor to be attached. This is sometimes useful during determining whether an Overcurrent trip (**OI .AC**) is due to a motor/motor lead issue vs output stage of the drive itself.

Set

1. #0.05 = **PAd** (or 4)so that you can Start/Stop and change speed from front of drive
2. #0.07= **Fd** for pure V/Hz mode (attached motor is not necessary)
3. #0.08= 3% for motor 30HP and less
= 1% for motors 40HP- 75HP
= 0.3% for motors 100HP- 200HP
4. Recheck motor parameters #0.42 - 0.47 and Max Hz (# 0.02= 60Hz ??) ,
5. Accel Rates #0.03 & 0.04 = 5 – 15 (5 seconds to 100Hz)
Use larger values for large motors/inertias
Also turn S-ramp #2.06 = On
The amount of S curvature could also be increased with #2.07
6. You should be able to run drive from keypad for basic checkout

Note: When changing drives modes of operation, one should be aware that the drive will revert to factory default values for that particular mode. One should back up the drive parameters either by extracting and saving the configuration using CTSOft or by placing a copy on the SmartCard.

CTVI106



Saving drive data on SMARTCARD

Vector Mode

If drive is setup for CL.Vector (see 0.48) then the drive can be run and checked for its' most basic operation.

Set

#0.05 = **PAd** (or 4) so that you can Start/Stop and change speed from front of drive

Recheck motor parameters #0.42 - 0.47 and Max RPM (# 0.02) ,

Accel Rates #0.03 & 0.04 = 5-15 seconds to 1000rpm

S-ramp #2.06 = On S-Curvature #2.07 could be increased a bit (10)

Stop Mode **rP** = Ramp located at #6.01 in both Classic & SP

Verify encoder voltage

Unidrive Classic
#3.23 0= 5v 1= 15v

Unidrive SP
#3.36 5,8,15v
If >5v set #3.39= 0

Check for proper encoder wiring and operation

Manual rotation of motor shaft clockwise will result in up counting
-if not swap A and /A

Check for correct encoder PPR #3.21

Unidrive Classic
If correct
Encoder #3.27=
1/4 Rev = 4096
1/2 Rev = 8192
1 Rev = 16384

Unidrive SP
#3.34
#3.29=
= 16384
= 32767
= 65,535

You could run Auto Tune

Auto Tune #0.40=1 Rotating

#0.40=1 Static (non-rotating)

#0.40=2 Rotating
(motor will go to 2/3 max speed)

Enable needs toggled to move beyond
(Shaft must be unloaded for rotating Autotune !!!)

If motor rotates CCW reverse U & V motor leads and repeat

You should be able to run drive from keypad for basic checkout.

Test by depressing **GREEN** Run and Up Arrow to 1/4 speed then test **Stop**

If ok go to 1/2 Speed – Stop then 3/4 - Stop then to Full Max Speed if all OK

Servo Mode

If drive is setup for **Servo** (see 0.48) then the drive can be run and checked for its' most basic operation.

Set

#0.05 = Pad (or 4) so that you can Start/Stop and change speed from front of drive

Recheck motor parameters #0.42, 45 and 0.46 and Max RPM (# 0.02) ,
Accel Rates #0.03 & 0.04 = 5-15 seconds to 1000rpm

Hold Mode= #6.08= 0 or **OFF**

Stop Mode **rP** = Ramp located at #6.01 in both Classic & SP

Verify encoder voltage

Unidrive Classic
#3.23 0= 5v 1= 15v

Unidrive SP
#3.36 5,8,15v
If >5v set #3.39= 0

Check for proper encoder wiring and operation

Manual rotation of motor shaft clockwise will result in up counting
–if not swap A and /A

Check for correct encoder PPR

	<u>#3.21</u> <u>Unidrive Classic</u>	<u>#3.34</u> <u>Unidrive SP</u>
If correct		
Encoder	#3.27=	#3.29=
¼ Rev	= 4096	= 16384
½ Rev	= 8192	= 32767
1 Rev	= 16384	= 65,535

You could run Auto Tune

Auto Tune #0.40=1 Rotating #0.40=1 motor rotates upto 2 revs
#0.40=2 motor rotates upto 2 revs
Stator resistance measured in test 2

Parameter #3.25 gets updated with motor phasing angle

Enable needs toggled to move beyond

(Shaft must be unloaded for rotating Autotune !!!)

If motor rotates CCW reverse U & V motor leads and repeat

You should be able to run drive from keypad for basic checkout.

Test by depressing **GREEN** Run and Up Arrow to ¼ speed then test **Stop**

If ok go to ½ Speed – Stop then ¾ - Stop then to Full Max Speed if all OK

Motor/Machine Directionality

There are times when the motor direction needs to be CCW (counter clockwise) for a forward machine direction. If the previous quick setup proved ok but motor direction is incorrect for the machine one could perform the following.

Open Loop

Simply reverse 2 motor leads - U and V

Vector Mode

Reverse 2 motor leads - U and V

And

Swap A and /A encoder wires – (cheap and dirty method)

Correct method would be to swap A with B and /A with /B

Servo Mode

Reverse 2 motor leads - U and V

And

Swap A and /A encoder wires – (cheap and dirty method)

Correct method would be to swap A with B and /A with /B

And

Swap U with V and /U with /V on encoder



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