CNC-330 Series

►►► F8612 User's manual VER. 1.0

1. Introduction

Thanks on your purchase of TAILY AUTOMATION CNC-330 series Micro controller

The CNC-330 is a high-performance micro controller, manufactured using high-quality component and the latest single chip microprocessor.

This manual will help in the installation, parameter setting, operate and daily maintenance of the CNC-330 controller. To guarantee safe installation and operation of the equipment, this manual should be read and understood before the actual installation begins.

※Some of software edition that controller used with different functions and wiring diagrams, please consult each software edition users manual for the details.

1.1. Model

◆ CNC-330 series offers two different models, depending on whether a close-loop driver is provided for various applications.

◆ AC Power input offers AC100V~120V and AC220V~240V, 50/60HZ.

Model		Dipping axis
CNC-330S		Drive 2 phase 2.0A step motor in directly
CNC-330E		Drive 2 phase 2.0A step motor in directly or external connect guiding traverse motor driver

1.2. Software edition

◆ F8612 Edition is design for soldering machine, it controls a step motor for dipping axis and 4 cylinders for wiping refuse.

1.3. Caution

◆ The controller should be operated in an environment that is protected from moisture, corrosive gases, oil mist, and airborne dust, metallic particles.

◆ The controller should be operated free from magnetic noise, if not, use a noise filter to minimize of electromagnetic interference.

◆ Normally operate under 5℃~40℃ environment, do not block the intake/exhaust ports of the controller. Otherwise, a fault may occur.

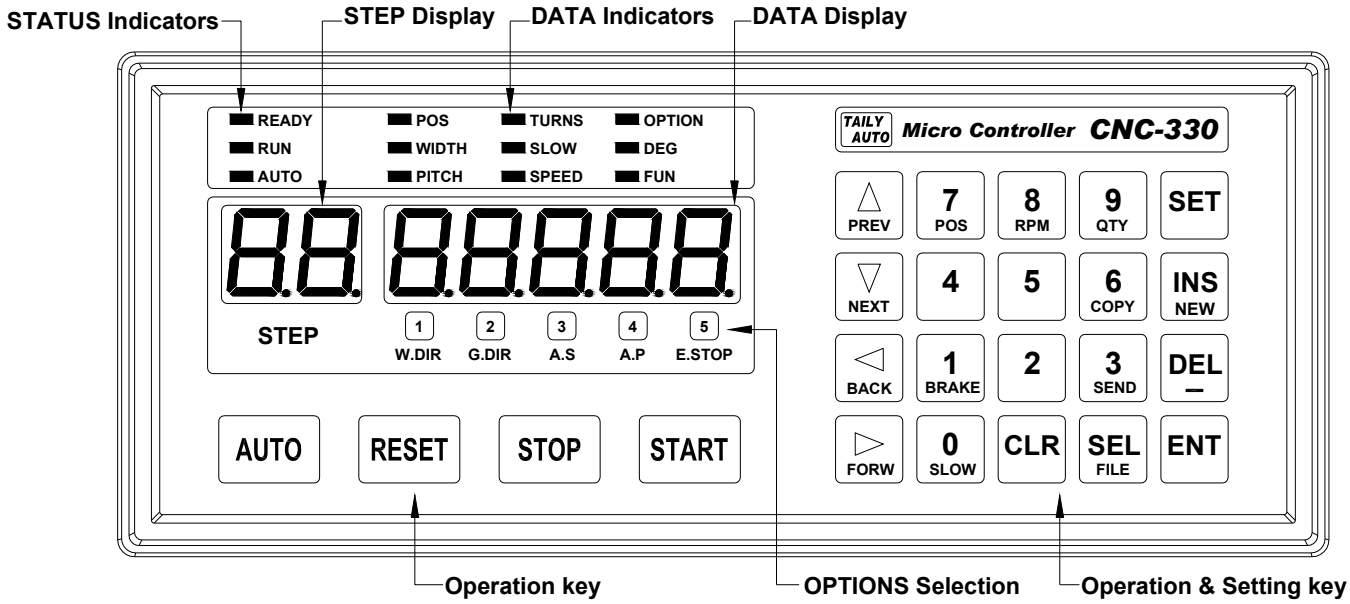
◆ Do not connect or disconnect connectors while power is applied to the controller.

◆ Make sure all the connectors are connected to the correct position before turn on the power.

◆ Make sure that the power source supplies the correct voltage and is capable of supplying the required current to the controllers.

◆ Make sure that the machine and controller are properly grounded.

2. Control panel description



◆ Status indicators：Indicate the controller status.

Indicator	On	Off	Flashing
READY	Ready	Running、Editing	Pause
RUN	Running		
AUTO	Automatic mode	Manual mode	Data linking

◆ Data indicators：Indicate the data item on data display

Indicator (on)	Editing	Operating
POS	Desired position of dipping axis	Position
WIDTH		
PITCH		
TURNS		
SLOW		
SPEED	Dipping axis moving speed	
OPTION	Running Options： Wiping refuse 、Auto starting、Surface detect、Move fixture	
DEG		
FUN	Duration of the dipping axis to stay at desired position.	
(All Indicators off)		Production quantity

◆ STEP display：Displays STEP number, function code, item number.

◆ DATA display：Displays file name, dipping data, position,, quantity.

◆ Options selection：Indicate numerical key for options select.

3. Configuration setting & adjustment

3.1. Configuration setting

When supplied the power to CNC-330 for the first time after finish installation, the configuration set is necessary to insure CNC-330 is meet various winding machines specification request.
In READY state, press〔SET〕〔SEL〕〔0〕to invokes this function, STEP Display shows item number[0.1.], DATA display shows setting value [XXXX], If no change is necessary, press〔ENT〕going to next item, or press〔DEL〕, then the parameter can be modified by pressing numerical key followed by〔ENT〕, There are 4 items can be set in this function, press〔SET〕again to finish this function.

◆ In this function press〔▲、▼〕to select item number, press〔CLR〕to clear setting value.

〔SET〕〔SEL〕〔0〕Configuration setting			
Item	Function	Setting range	Description
0.1.	Station number	1~9999	This station number used to identify the station when using RS-485 communication function, (Initial value as 1).
0.2.	Password	0000~9999	If password has been set, when press〔SET〕or〔SEL〕keys, the controller will request to key-in four digits of password, if passed, you can edit the setting data according normal procedure, if not, you can not edit any setting data, (Initial value as 0000).
0.3.	Travel limit	0~99999.	Dipping axis maximum travel length, When dipping axis moves exceed this position, will stop immediately and the display shows error massage, then reset and get into ready state, (Initial value as 0).
0.4.	Moving increment	0.01~99.99	Dipping axis moving increment. This value is calculated according to the specification of winding machines, (Initial value as 2.00).

◆ How to calculate the dipping axis guiding increment
Moving increment＝(Screw pitch×Gear ratio÷Resolution of the step motor)
Example： Screw pitch＝5mm、Gear ratio=1.6、Resolution of step motor＝400
Moving increment＝5×1.6÷400＝0.02mm
Setting value= Moving increment×100=0.02×100=2.00

Reference table							
Screw pitch	Gear ratio (motor side/screw side)						
	0.8/1	1/1	**1.6/1**	2/1	3.2/1	4/1	8/1
2.00mm	0.40	0.50	0.80	1.00	1.60	2.00	4.00
4.00mm	0.80	1.00	1.60	2.00	3.20	4.00	8.00
5.00mm	1.00	1.25	**2.00**	2.50	4.00	5.00	10.00
8.00mm	1.60	2.00	3.20	4.00	6.40	8.00	16.00
10.00mm	2.00	2.50	4.00	5.00	8.00	10.00	20.00
16.00mm	3.20	4.00	6.40	8.00	12.80	16.00	32.00
In this table the resolution of step motor＝400							

◆ In READY state, press〔SET〕〔SEL〕〔9〕〔ENT〕will restore configuration setting value as initial value.

4. Files management

The CNC-330 has huge memory capacity, can store at most 330 program files.
Each program file has a file name [Pxxxxx], constitute by letter P and five numbers,
The filenames are scope from P00000 to P99999, total 100,000 combinations.
Before operating and editing, must specify a file to become the active file, then all operations and edit will regard this active file as the target, all un-selected files will retain their original contents and unmodified.

In READY state, use the following functions to manage the program files.
The〔filename〕on following functions can be entering by numerical keys or use〔▲、▼〕key to browse the files.

◆ Re-call the file：
Press〔SEL FILE〕〔filename〕〔ENT〕to re-call the file and specify it become the active file. (Only the active file can be edit and execute).

◆ Delete the file：
Press〔SEL FILE〕〔filename〕, then press〔DEL-〕make the filename flicker, at the moment press〔SET〕to abort delete process or press〔ENT〕to delete the file.(The active file can't be deleted).

◆ Add a new file：
Press〔SEL FILE〕〔INS NEW〕〔filename〕〔ENT〕to add a new file, and specify it become the active file.

◆ Copy the file：
Press〔SEL FILE〕〔SEL FILE〕to shone the decimal point of the active filenames, then press〔COPY〕and entering a new〔filename〕, at the moment press〔SET〕to abort copy process or press〔ENT〕to make a copy with the new filename and specify the new file become the active file.

◆ Clear the file contents：
Press〔SEL FILE〕〔SEL FILE〕to shone the decimal point of the active filenames, then press〔CLR〕to flicker the filename, at the moment press〔SET〕to cancel the abort clear process or press〔ENT〕to clear all contents of the active file.

◆ Error messages

Error code	Description
Err.F0	Can't find the file, please reconfirm the filename.
Err.F1	The active file can't be deleted.
Err.F2	The filename has existed, please use with another filename.

◆ Check memory space
In READY state, press〔SET〕〔2〕, display shows the total number of files stored in the memory, then press〔ENT〕to shows the surplus memory space percentage, press〔ENT〕again to finish this function.

◆ Format memory space
In READY state, press〔SET〕〔SEL FILE〕〔CLR〕〔ENT〕to format the memory space and also restore all parameters as the factory initial value.

※Must be careful in use format memory space function, avoid to delete all files.

5. Edit program file

5.1. Edit dipping parameters

Each program file can accept 72 steps at most and each step with 4 items of parameter to be set. In READY state, press〔SET〕〔ENT〕, The STEP Display shows step number[1.], data indicator [POS] light, data display shows position setting value [XXXXX], the parameter can be modified by pressing numerical key followed by〔ENT〕, then the data indicators [SPEED] light, data display shows width setting value [XXXXX] , follow this way to set totally 4 items parameter for each step, Press〔SET〕again to finish this function.

If the data display of step number [1.] shows [End], Indicate that the file is empty, have to insert a new step and then you can edit parameter for step [1.].

◆ Insert a new step：During editing, press〔INS〕to add a step into current position and shift the original steps backward one after another.

◆ Delete current step：During editing, press〔DEL〕to delete current step, the display flicker and shows [－dEL－]，at the moment press〔SET〕to cancel the procedure or press〔ENT〕to delete current step，And shift the followed steps forward one after another.

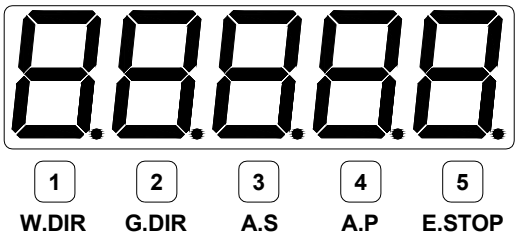
◆ During editing the following key functions are available：

〔SET〕〔ENT〕Edit winding parameters	
Key	Function
〔▲ PREV〕	Return to the previous step
〔▼ NEXT〕	Go forward to the next step
〔◄ BACK〕	Dipping axis moving backward
〔► FORW〕	Dipping axis moving forward
〔SEL〕	Toggle between 4 items of parameter
〔CLR〕	Clear the parameter to zero
〔0~9〕	Entering dipping parameters
〔INS〕	Insert a new step
〔DEL〕〔ENT〕	Delete current step
〔ENT〕	Writing data into memory
〔SET〕	Finish editing
〔RESET〕	To abort editing and excuse reset process

◆ Jogging speed： In READY state, press〔SET〕〔4〕〔XX〕〔ENT〕to set the manual operation speed for dipping axis. [Setting range 0~99].

◆ Moving speed： In READY state, press〔SET〕〔6〕〔XX〕〔ENT〕to set the moving speed for dipping axis,(moving speed when dipping axis returning to the home position). [Setting range 0~99].

◆ Dipping parameters：

Item	Setting range	Description
POS	0~99999.	St Set the desired position of dipping axis.[Setting range 0.00~ 999.99 mm]. ；Can also setting by press〔◄〕〔►〕keys.
SPEED	0~99	Dipping axis moving speed when moving to the desired position. [Setting range from 0~9].
OPTION	0.0.0.0.0. 1.1.1.1.1.	Select running options for current step： Press each options corresponding numerical key(shows below the digit) to toggle between 0 and 1.  **W.DIR**： **0= NO, 1= YES.** Select whether to have wiping refuse process for current step. **G.DIR**： **No function.** **A.S**： **0= NO, 1= YES.** Select whether to have auto starting function for current step. **A.P**： **0= NO, 1= YES.** Select whether to have solder bath surface detecting function for current step, when the dipping axis is moving to the desired position. (Using with surface detect probe).With auto positioning function. **E.STOP**： **0= NO, 1= YES.** Select to move fixture from rear toward operator before left work piece from bath for current step.
FUN	00.00 99.99	Set the duration of the dipping axis to stay at desired position. [Setting range 0.0~99.99sec].

6. Dipping operation

Each time when supplying the power to the CNC-330, Have to press 〔RESET〕to do the reset process once and then you can start to running.

◆ Function keys for operation.

Key	Ready and pause state	Running state
〔START〕	Start	Pause
〔STOP〕		Pause
〔RESET〕	Stop current process and do reset process	
〔AUTO〕	Toggle between auto and manual operation mode	
〔SET〕	Get into edit mode	
〔SEL〕	To invokes file management function	
〔▲〕	Return to the previous step	
〔▼〕	Go forward to the next step	

6.1. Running mode

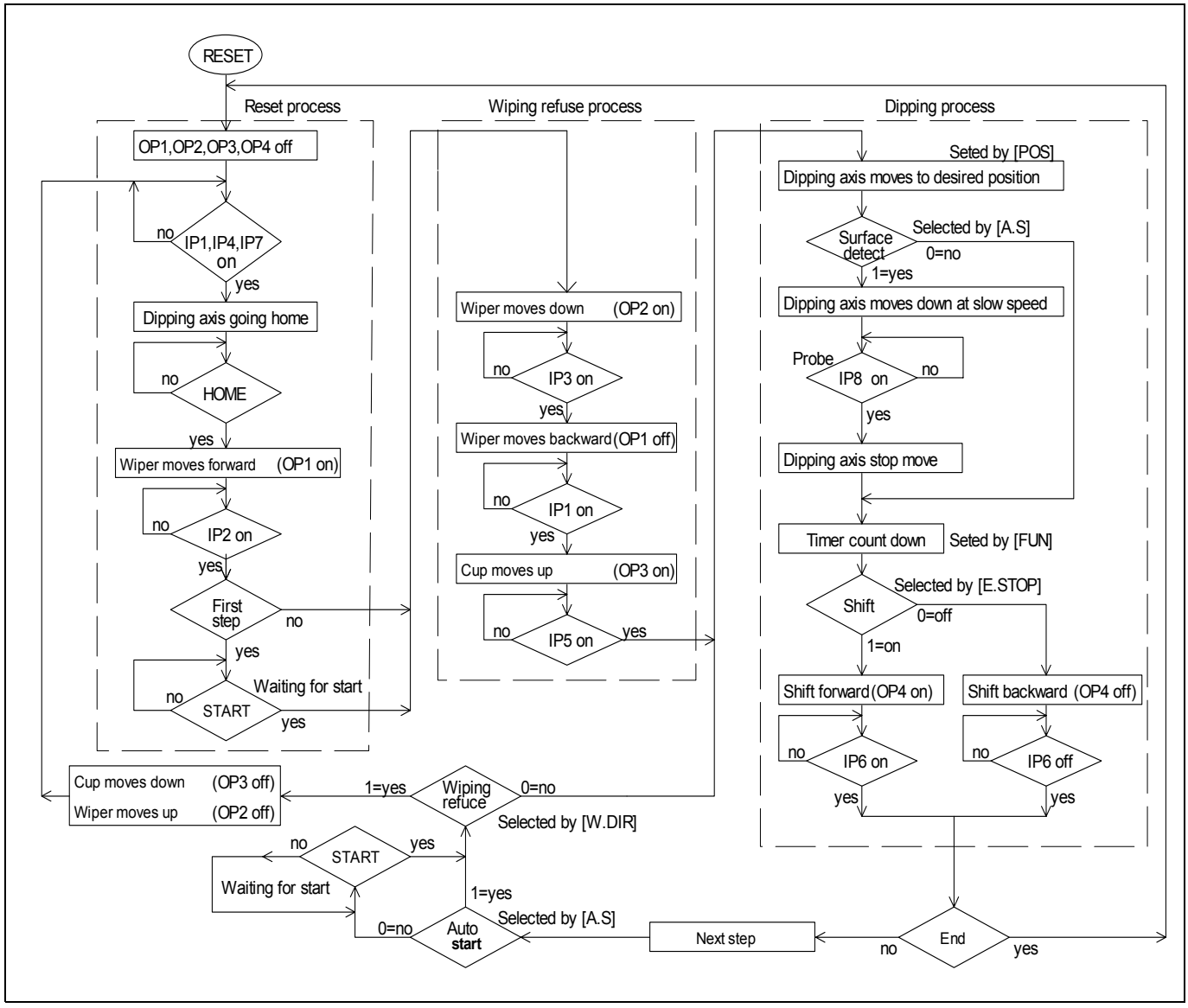
◆ Manual mode：

If the status indicator [AUTO] not light, when finish a step the controller will stop and wait for 〔START〕signal to continue next step winding. Select by〔AUTO〕key.

◆ Automatic mode：

If the status indicator [AUTO] is light, when finish a step, the controller will automatically get into next step and start winding without press〔START〕. Select by〔AUTO〕key.

6.2. Running sequence



6.3. Production quantity management

During wining, each time the winding process goes from the step [1.] to the [End], the production counter will automatically increase by one.

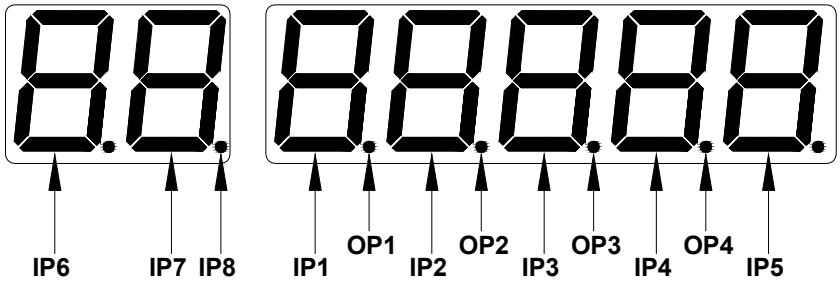
◆ Preset production quantity：
In READY and PAUSE state, press〔SET〕〔9 QTY〕〔XXXXX〕〔ENT〕to preset production quantity, during running if the production quantity exceed the preset value, the data display will flicker and shows production quantity and the buzzer alert. [Setting range 0~99999].

◆ Decrease production quantity：
In READY and PAUSE state, press〔9 QTY〕to make display shows production quantity, then press〔DEL－〕and holding down for two seconds, the production quantity decrease by one.

◆ Reset production counter：
In READY and PAUSE state, press〔9 QTY〕to make display shows production quantity, then press〔CLR〕and holding down for two seconds, it will reset the production quantity to zero.

6.4. Additional functions

◆ I/O Test
In READY state, press〔SET〕〔5〕to make display shows each I/O status as below, and the following key functions are available：



KEY	Function	Conditions
〔1〕	OP1：ON/OFF Wiper moves for/back	OP3、OP4 off；IP5、IP6 off、Dipping axis at home position
〔2〕	OP2：ON/OFF Wiper moves up/down	OP3 off；IP5 off、Dipping axis at home position
〔3〕	OP3：ON/OFF Cup moves up/down	OP1、OP2、OP4 off；IP1、IP4 on
〔4〕	OP4：ON/OFF Shifter moves for/back	
〔►〕	Dipping axis moves down	OP1、OP2 off；IP1、IP4 on
〔◄〕	Dipping axis moves up	OP1、OP2 off；IP1、IP4 on
〔ENT〕	Finish I/O test	

7. MAINTAIN AND TROUBLESHOOTING

7.1. Periodically maintain

◆Periodically clean up the controller inner accumulate dust and dopants.

◆Periodically check the wire connection of the controller if have loose or bad contact.

◆The following parts must be maintained or changed periodically as list below.

◆For parts replacement, please contact your sales representative.

NO	Parts name	Life guideline
1	Dipping axis home sensor HMS-01A	2 years
2	COOLING FAN (DC 12V 6cm)	◆ 10,000 hours

7.2. Error message

When a fault occurs during operation, the DATA DISPLAY shows error massage, and stop current process then do reset process and back to the READY mode.

Error code	Description	Correctives action
Err-0	Memory failure.	Re entering the winding parameter. Send back the 330-CPU board for repair.
Err-1	The dipping axis moves exceed the Travel Limit.	Check the [POS] setting value. Check the [Travel limit] setting value.
Err-3	The dipping axis moves exceed the home position.	Check or replace the home sensor (HMS-01A).
Err.L0	RS-485 LAN Communication failure.	Check the target station number is correct. Check the 330-CN2 wire connection.
Err.F0	Can't find the filename.	Please reconfirm the filename.
Err.F1	The active file can't be deleted.	
Err.F2	The filename has existed.	Please use with other filename.

7.3. To abort reset process

At boot and reset process, if because of unknown reason however engender the dipping axis can't find out the home position and can't make the controller get into ready mode, can press 〔STOP〕 key to abort reset process and make controller get into ready mode.

7.4. Reset password

If forgot the password you have been set, you can press〔 DEL〕〔3〕〔3〕〔0〕〔1〕in sequence to reset the password as the initial value during the controller are requesting to entering password.

8. Wiring diagram

There are two ways to drives dipping axis STEP motor：

a. CN11=Drive STEP motor in directly，**b.** CN10= Drive motor through external motor driver.