# CNC-210A Series

## H6612 User's manual

# 1. INTRODUCTION

CNC-210A is a series of MICRO CONTROLLER, developed by **TAILY AUTOMATION**. It not only retains all the features of previous designs, it also has a low noise level and is less sensitive to external power fluctuation. Furthermore, it also includes a RS-485 network interface, making operation easier to manage.

CNC-210A also features an integrated design: putting stepper motor driver, DC motor speed controller, brake and power supplier control circuits into one control box, simultaneously achieving size reduction, high performance and low cost.

CNC-210A Series offers CNC-210AS “Standard Model” and CNC-210AE "External Connection Model”, depending on whether a close-loop driver is provided for various applications.

| MODEL | | Dipping axis |
|---|---|---|
| CNC-210AS | | Drive 2-phase 2A STEP motor in directly. |
| CNC-210AE | | Drive 2-phases 2A STEP motor in directly,<br>Or external connect STEP motor driver. |

## 1.1. Software edition

◆H6612 Edition is design for soldering machine; it controls a step motor for dipping axis and 4 cylinders for wiping refuse.

# 2. MAIN FEATURES

◆Single chip Microprocessor design, has further higher performance and higher functions; it also has less sensitive to external power fluctuation or to external electromagnetic interference.

◆Memory use FLASH ROM, capacity capable storing up to 1000 steps winding data, 9 winding parameters, and 5 options can be independently assigned for each step. Off-power memory retention without battery.

◆Dipping axis stepper motor with a constant-current driver offering fast wire guiding speeds.

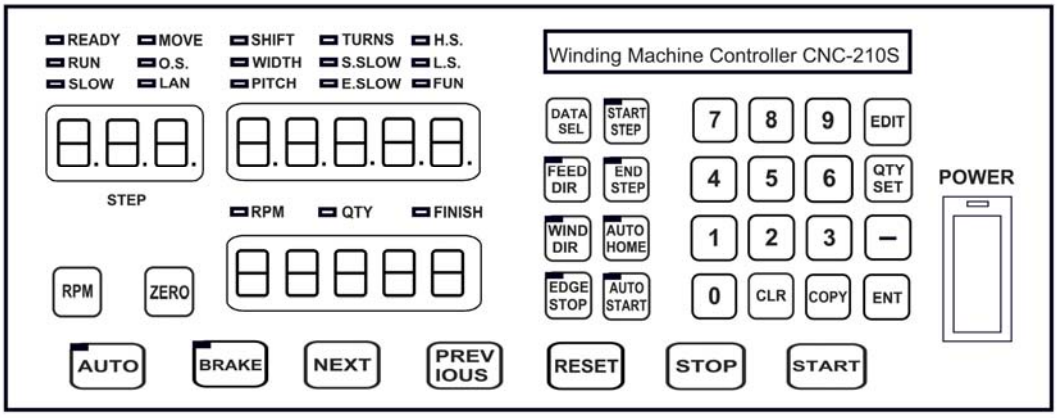
◆Dipping axis offering 10 steps moving speed selection.

◆Offering RS-485 interface for PC linking and data transfer.

◆Software can be update through the personal computer.

◆Power input AC100V~120V、220V~240V 600VA(max).

# 3. FRONT PANEL DESCRIPTION




## 3.1. Power switch

Power supplier equipped, controls the AC power to the controller.

## 3.2. Key pads

0 ~ 9 : 10 key, for entering numerical values.

EDIT : Enter into EDIT mode.

QTY SET : Specify target production quantity.

START STEP : Specify starting step in memory.

END STEP : Specify ending step in memory.

DATA SEL : Select item of parameter during editing.

WIND DIR : **[Wiping refuse]**Select to run a wiping refuse process for current step.

EDGE STOP : **[Move fixture]** Select to move fixture from rear toward operator before left work piece from bath for current step.

AUTO HOME : **[Auto]**Select whether to have auto-starting function for current step.

AUTO START : **[Surface detect]**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).

– : Reduce step number by one, or reduce production counter by one.

CLR : During programming, clear current data to zero.

COPY : Copy the data of previous step into current step.

ENT : Write data into memory.

ZERO : Hold down this key for two seconds to reset production counter.

NEXT : Skip current step and go to the next step.

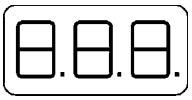
PREV IOUS : Discard current step and go to the previous step

RESET : At any time, discontinues current operation and return to ready mode.

STOP : Pause during running.

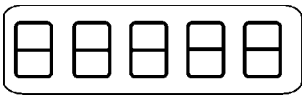
START : Restart during pause, or pause during running.

## 3.3. Digital display



**STEP DISPLAY**：Show the current step number.

**DATA DISPLAY**：During programming, in combination with LED, shows the parameter being programmed. During running or ready mode, show the dipping axis position.



**COUNTER DISPLAY**：Shows production counter.

## 3.4. Status indicators

- ☐ **READY** : Lit means in READY mode, flash means PAUSE mode, Not lit means running or programming in progress.
- ☐ **RUN** : Lit means running in progress; not lit means not in progress.
- ☐ SLOW : No function.
- ☐ **MOVE** : Lit means Dipping axis is fixing the position.
- ☐ O.S : No function.
- ☐ **LAN** : Lit means currently are communicating with network.
- ☐ **FINISH** : Will lit when reaching the preset production counter display count.
- ☐ RPM : No function.
- ☐ **QTY** : Lit means the counter display shows production counter.

## 3.5. Parameters definitions

- ☐ **SHIFT [Position]:** Set the desired position of dipping axis. [Setting range 0.00~ 999.99 mm].
- ☐ **H.S. [Speed]:** Dipping axis moving speed when moving to the desired position. [Setting range from 0~9].
- ☐ **FUN [ Time]:** Set the duration of the dipping axis to stay at desired position. [Setting range from 0.0~9.9sec].

# 4. PROGRAMMING PARAMETER

## 4.1. MEMORY RANGE SELECTION

CNC-210A contains 1000 memory step, by defining the region, users can effectively manage the memory. Various parameters can be stored in different regions and can be retrieved instantaneously. After specifying the regions, programming and operating can be done in those regions; all un-selected regions will retain their original contents and unmodified. When setting the STEP number, the Ending step number must be larger than the Starting step number, or the operation will not start

◆Specifying starting step

In ready mode, press [START STEP] [0~999] [ENT] to selected. [Setting range 0 ~ 999].

◆Specifying ending step

In ready mode, press [END STEP] [0~999] [ENT] to selected. [Setting range 0 ~ 999].

## 4.2. Programming parameter

In READY mode, press [EDIT] [ENT] invokes the programming mode, the STEP DISPLAY shows START STEP, the parameter indicator『SHIFT』lit, the DATA DISPLAY shows SHIFT setting value, the SHIFT can be changed by pressing the numerical keys followed by the [ENT] key.

After that the STEP number will automatically increase by one, to continue set the SHIFT for next step. When the STEP number is larger then the END STEP , the STEP number will restore to the START STEP and the indicator light will change from『SHIFT』 to『H.S』 to specifying the speed for each STEP. Repeat the same procedure using numerical keys and the [ENT] key, all parameters for each STEP can thus programmed, after that press [EDIT] key again to go back to ready mode.

**The following functions are also available:**

[WIND DIR] **[Wiping refuse]**：Select to run a wiping refuse process for current step.

[EDGE STOP] **[Move fixture]**：Select to move fixture from rear toward operator before left work piece from bath.

[AUTO HOME] **[Auto ]**：Select whether to have auto-starting function for current step..

[AUTO START] **[Surface detect]**：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).

[CLR]：Clear the setting value.

[COPY]：Copy the content of the previous step to the current step.

[−]：Go back to the previous step.

[DATA SEL]：To scrolls through different parameters.

Each time when change the parameters and selections, [ENT] key must pressed to effect the change.

## 4.3. Clear all parameters

In the READY mode, press [EDIT] [CLR] [−] [ENT] will clear all the parameter in the memory. Be cautious in using this function or all the data will be lost.

# 5. DIPPING EXECUTION

After set up all data items, press START key, the dipping process begins in accordance with the set-up content. Press STOP key to pause.

The following key functions are available during PAUSE mode:

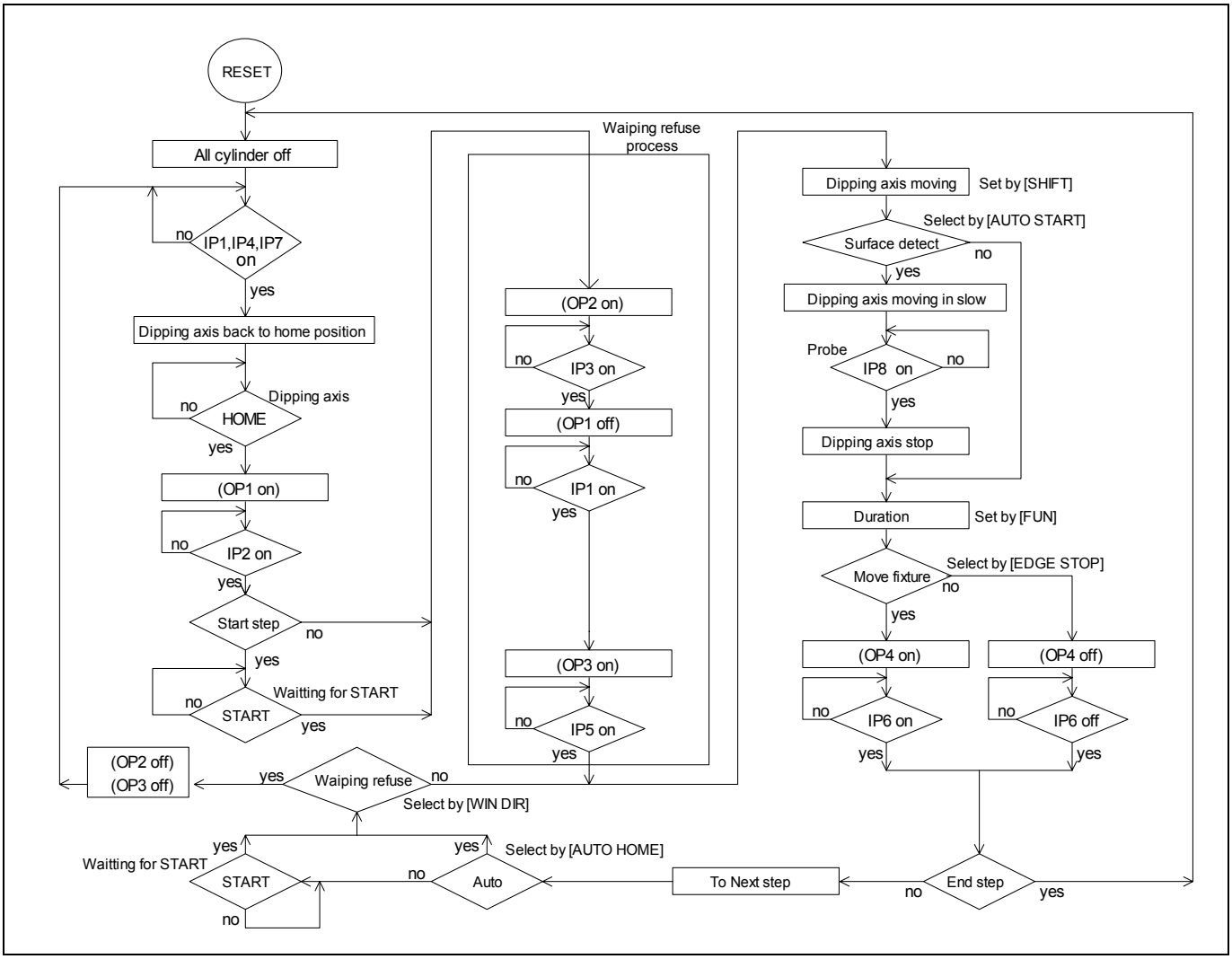
PREV IOUS : Give up current process and regress one step.

NEXT : Finish current step and proceed to next step.

START : Continue.

RESET : Give up current process and go back to the READY mode.

## 5.1. Running sequence



## 5.2. Manual operate

In READY mode, press [EDIT] [5] invokes manual operate mode, in this mode press following keys to test the output function.

- [1]：OP1 Cylinder on/off. (Condition: OP3、OP4 off；IP5、IP6 off；Dipping axis at home)
- [2]：OP2 Cylinder on/off. (Condition: OP3 off；IP5 off；Dipping axis at home)
- [3]：OP3 Cylinder on/off. (Condition: OP1、OP2、OP4 off；IP1、IP4 on)
- [4]：OP4 Cylinder on/off.
- [NEXT]：The dipping axis moves down. (Condition: OP1、OP2 off；IP1、IP4 on)
- [PREVIOUS]：The dipping axis moves up. (Condition: OP1、OP2 off；IP1、IP4 on)
- [ENT]：Finish and back to the READY mode.

## 5.3. Production counter management

Upon turning on the power, the counter display will show the production counter. During operating, each time the process goes from the START STEP to the END STEP, the counter will automatically increase by one.

◆Preset production counter：

In READY mode, press [QTY SET] key once and key in desired values [0~99999] followed by the [ENT] key. When the production counter reaches the preset value, the FINISH led will lit. [Setting range 0~99999].

◆Decrease production counter：

During READY or PAUSE mode, press the [−] key and hold down for two seconds the piece counter will decrease by one.

◆Reset production counter：

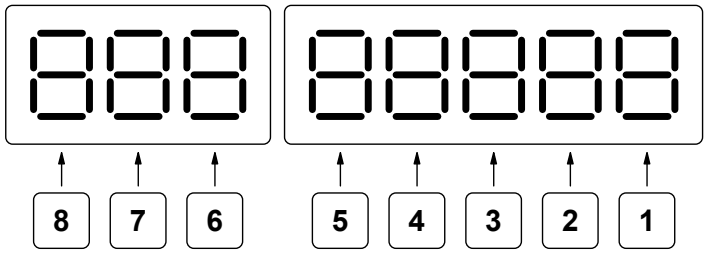
In any time holding down [ZERO] key for two seconds, it will set the piece counter to zero.

# 6. CONFIGURATION SETTING

In the READY mode, press the following keys combination as section, the DATA DISPLAY will show corresponding setting value. If no change is necessary, press the [ENT] key get back to READY mode. Or press [−] key then the parameter can be modified by pressing the numerical key followed by the [ENT] key.

## 6.1. Moving increment selection [EDIT] [DATA SEL] [0] [−]

Press [2] to select moving increment.




[1] [3] [4] [5] [6] [7] [8] : No function.

[2] **Moving increment** : Select the dipping axis moving increment.

**1** represents 0.01mm (4 mm per revolution).

**2** represent 0.02mm (8 mm per revolution).

**4** represent 0.04mm (16 mm per revolution).

## 6.2. Station number [EDIT] [DATA SEL] [1] [−]

Set the station number of the controller. This number is used to identify the station when using RS-485 communication function. Up to 32 stations can be operated on the same network. [Setting range 01~99].

## 6.3. Password [EDIT] [DATA SEL] [2] [−]

This password is used to protect the setting data in memory. After you set this password, you cannot change any parameter and configuration data in normal sequence. You have to key in four numbers of password before press the [EDIT], [START STEP], [END STEP], [QTY SET] keys. If the password has been passed once, you can change any data in normal sequence until you turn off the power or press [RESET] key. You must to remember the password or you cannot change any data. [Setting range 0000~9999]. Set 0000 means no password.

## 6.4. Travel limit [EDIT] [DATA SEL] [3] [−]

Set the maximum travel distance of dipping axis. During running when the dipping axis reaches this position, the step motor stop immediately, and the DATA DISPLAY shows error massage, then RESET and go back to the READY mode. [Setting range 000.00~999.99]. 999.99 Means no limit.

## 6.5. Jogging speed [EDIT] [4]

Jogging speed at which the dipping axis is moving on manual operate. [Setting range 0~9].

## 6.6. Moving speed [EDIT] [6]

Moving speed at which the dipping axis returning to the home position. [Setting range 0~9].

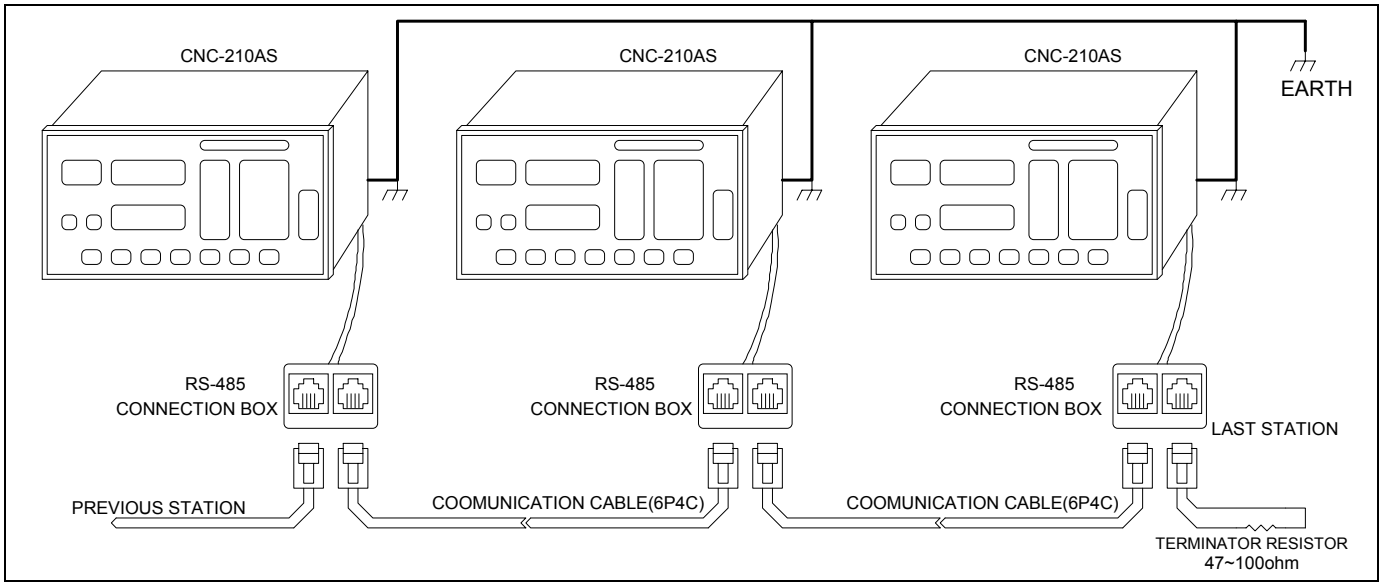
## 6.7. Reset all configuration data [EDIT] [CLR] [0] [ENT]

In READY mode press [EDIT] [CLR] [0] [ENT] keys, it will reset all the configuration data and replace by initial data. Be cautious in use this function.

## 6.8. Data transmit

The CNC-210AS has a RS-485 serial communication interface, can be used to send the setting data to the others station. Up to 32 stations can be operated on the same network.
In this function, set station numbers to the controllers to recognize the controller to which the current data is being sending. (Refer to the section 7.2. station numbers.)

Wiring diagram as below：




In READY mode press following keys combination, its will sent each setting data to target station.

[EDIT] [COPY] [0] [00~99] [ENT] ：Sends configuration setting data to the specify station.

[EDIT] [COPY] [1] [00~99] [ENT] ：Sends parameters to the specify station.

[EDIT] [COPY] [2] [00~99] [ENT] ：Sends password to the specify station.

It will send the parameters from the [START STEP] until to the [END STEP], when sent the parameters from one station to another,

[00~99] Represents target station number. If the target station number specify as “00”, all the stations on the same network will receive the data is being sent.

# 7. MAINTAIN AND TROUBLESHOOTING

## 7.1. Periodically maintain

◆Please periodically clean up the controller inner accumulate dust and dopants.

◆Please periodically check the wire connection between controller and machine if have loose or bad contact.

◆The following parts must be maintained or changed periodically as list below. If any part is found faulty, it must be changed immediately even when it has not yet reached the end of its life, which depends on the operating method and environmental condition.

◆For parts replacement, please contact your sales representative.

| NO | Parts name | Life guideline |
|---|---|---|
| 1 | **HOME SENSOR** | 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, stop winding and then RESET go back to the READY mode.

**Err-0**： The parameters or data in memory are fault.

**Err-1**： The『SHIFT』value sets exceed the Travel Limit.

**Err-5**： RS-485 LAN communicating error.

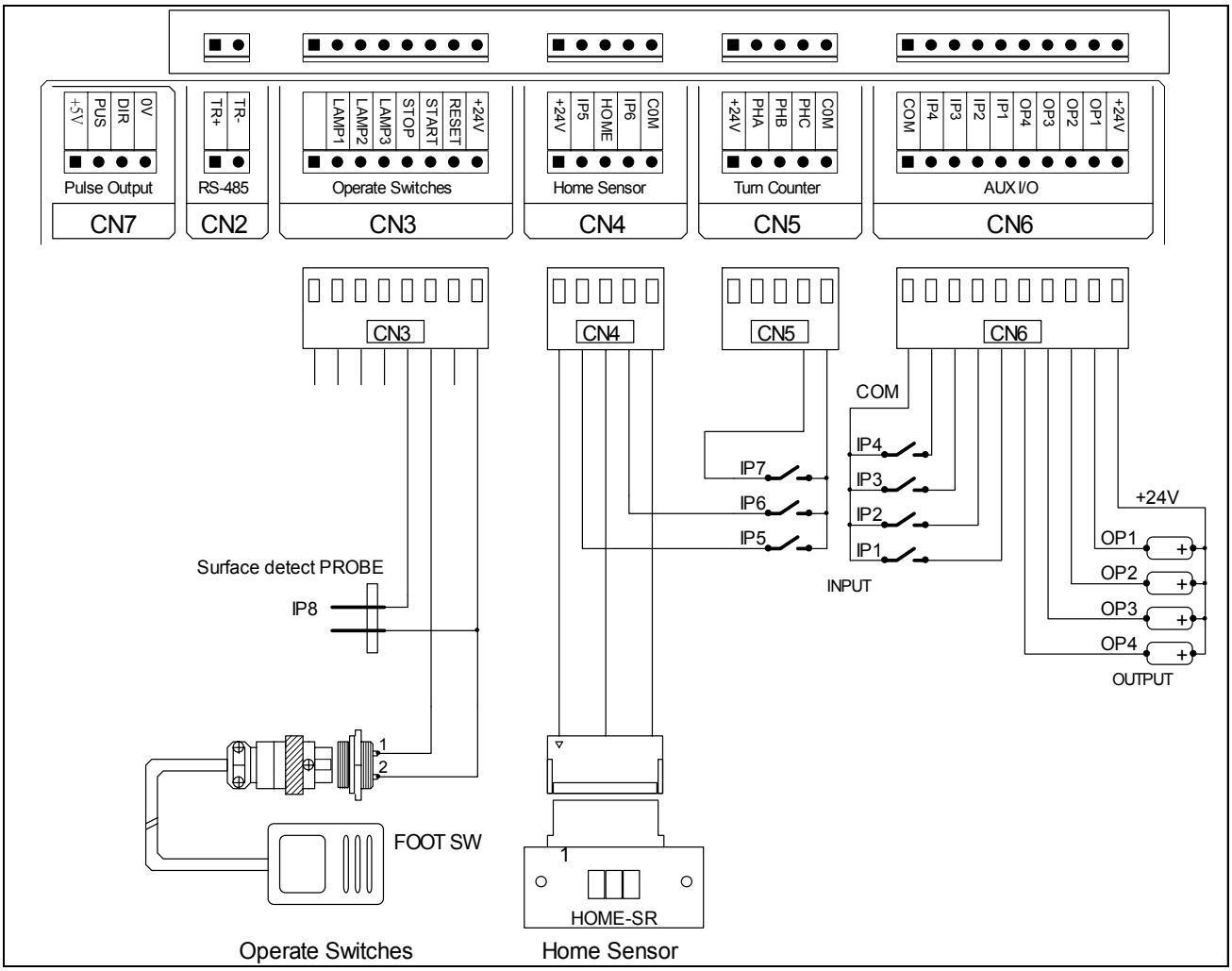
**Err-p**：Password error, key in 4 numbers password before edit.

## 7.3. To abort seeks the original position

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

# 8. INSTALLATION AND WIRING

## 8.1. Wiring diagram for CN2~CN6



## 8.2. Wiring diagram for terminal

◆Drives STEP Motor in directly